GEOTECHNICAL DESIGN & MATERIALS REPORT

US 101/BLOSSOM HILL ROAD INTERCHANGE
IMPROVEMENT PROJECT
SAN JOSE, CALIFORNIA
04-SCl-101, R28.4/R28.9 EA 04-1K280
PROJECT ID 0416000224

For

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1.0 INTRODUCTION

This report presents the results of our geotechnical engineering investigation for the proposed "US 101/Blossom Hill Road Interchange Improvement Project", hereinafter referred to as "PROJECT" in San Jose, California. The work was performed in general accordance with the scope of work outlined in our proposal to HMH Engineers (Designer). The general location of the project site is shown on the "Title and Location Map", Plate 1.

This report addresses design of roadway portion of the project including sound wall, corrosion for reinforced culverts, and structural pavement sections. The investigation included review of readily available soils and geologic literature pertaining to the site including as-built Logs of Test Boring (LOTB), site reconnaissance, obtaining representative soil samples and logging soil materials encountered in exploratory borings, laboratory testing of the representative soil samples, performing engineering analyses, and preparation of this report.

The purpose of this report is to document subsurface soil conditions, provide analyses of anticipated site conditions as they pertain to the project described herein, and to recommend design and construction criteria for the roadway portions of the project. This report also establishes a geotechnical baseline to be used in assessing the existence and scope of changed site conditions, if any. The following deliverables for the bridge structure widening, new bridge structures, and retaining walls are separately prepared by PARIKH Consultants, Inc. (PARIKH)

- Foundation Report for "Blossom Hill Road Overcrossing (Widen) (Br No. 37-0348)";
- Foundation Report for "NB 101 On-Ramp Pedestrian Overcrossing (Br. No. 37-676)";
- Foundation Report for "SB 101 Off-Ramp Pedestrian Undercrossing (Br. No. 37-675J)";
- Foundation Report for "SB 101 On-Ramp Pedestrian Undercrossing (Br. No. 37-675K)".
- Foundation Report for "Retaining Wall No. 1 (Soil Nail Wall) (Bridge No. 37E0125)".
- Foundation Report for "Retaining Wall No. 2 Mechanical Stabilized Embankment (MSE) Wall" (Bridge No. 37E0126).

The report is intended for use by the project roadway design engineer and construction personnel (Resident Engineer) for information and reference purposes only and should not be construed as project specifications.

2.0 EXISTING FACILITIES AND PROPOSED IMPROVEMENTS

The project proposes to modify the US 101/ Blossom Hill Road Interchange to improve traffic operations and connectivity for pedestrians and bicyclists along Blossom Hill Road. The existing Blossom Hill Road Interchange consists of two separate overcrossing structures over US 101 with partial cloverleaf ramps. The project is located within the City of San Jose, in Santa Clara County. It will be implemented as a locally funded project with the City of San Jose performing advertisement, award and administration (AAA) of the construction contract through a Caltrans encroachment permit.

Existing Facilities

Blossom Hill Road is a key connector between job locations, mixed-use housing, commercial development and recreational opportunities in an area where San Jose is focused on developing greater internalization of automobile trips, increased use of transit and expanded active transportation. The level-of-service for existing and forecasted traffic is deficient for existing developments and nearby proposed projects. The configuration of the existing interchange and ramp intersections along Blossom Hill Road are not consistent with the latest standards for accommodating balanced use by vehicles, bicyclists and pedestrians.

Proposed Project Improvements

The proposed project improvements will occur along Blossom Hill Road from east of the Monterey Road/Blossom Hill Road grade separation to the US 101 Northbound Off-Ramp /Coyote Road intersection. All improvements will be constructed within existing Caltrans and City of San Jose rights-of-way.

The southbound and northbound off-ramps from US 101 will be widened to add a turning lane, and the intersection signals will be modified to accommodate the future traffic needs. A ramp meter will be added to the southbound loop on-ramp and the ramp meter at the northbound diagonal on-ramp will be modified.

The proposed improvements on Blossom Hill Road include widening the existing four lanes within the median to provide an additional lane in each direction, plus a fourth eastbound lane which will become an exit-only lane onto the northbound loop on-ramp. This work includes widening the overcrossing between the two existing overcrossing structures over US 101 and seismic retrofit of the existing overcrossings. The connector

from Monterey Road to eastbound Blossom Hill Road will be realigned and the weaving length between the connector and the southbound diagonal on-ramp to US 101 will be increased.

The northbound diagonal on-ramp will be reconstructed at a lower profile to accommodate the POC crossing over it and a soil nail wall with architectural treatment will be constructed between Blossom Hill Road and this on-ramp.

The project also includes modifications to existing drainage systems, erosion control, pavement delineation and signing, and a fiber optic communication duct will be relocated by the utility company.

The following are the improvements proposed for this project other than the roadways.

Bicycle/Pedestrian Improvements

The existing 5-foot sidewalk on the north side of Blossom Hill Road will be replaced with a 10-foot to 12-foot wide "Class I Bike/Pedestrian Path" (Path). The path will begin at Monterey Road near the Xanders Crossing pedestrian overcrossing, cross under the southbound off-ramp and the southbound loop on-ramp with two short span undercrossing structures and connect to the north side of the existing overcrossing. Concrete slope paving with architectural treatment will be constructed at the undercrossing structures. The Class I Bike/Pedestrian path will cross over the northbound diagonal on-ramp and will connect to the existing sidewalk and bike lanes at the US 101/Northbound Off-Ramp/Coyote Road intersection.

Bridge Structures

a) Blossom Hill Road Overcrossing (OC) (Widen) (Br. No. 37-0348) - Median widening of Blossom Hill Road with a new bridge structure over US 101 between the two existing bridge decks to accommodate one additional lane of traffic in both eastbound (EB) and westbound (WB).

b) NB 101 On-Ramp Pedestrian Overcrossing (POC) (Br. No. 37-676) - The Class I Bike/Pedestrian path will cross over the northbound diagonal on-ramp with an easterly approach consisting of a short span concrete slab bridge and mechanically stabilized embankment (MSE) walls, The path would be elevated on a steel truss type structure (approximately 100 feet in length and 12 feet in width) over the NB US 101 on-ramp.

The profile of the NB US 101 on-ramp will be lowered by approximately 10 feet to accommodate the path above.

c) SB 101 On-Ramp Pedestrian Undercrossing (PUC) (Br. No. 37-675K) - The path would pass under the SB US 101 loop on-ramp;

d) SB 101 Off-Ramp PUC (Br. No. 37-675J) - The path would pass under the SB US 101 off-ramp.

Earth Retaining System

Earth retaining systems are proposed at the following locations:

a) Retaining Wall No. 1 (Soil Nail Wall) - An approximately 345-feet long retaining wall would be constructed along westbound Blossom Hill Road at the depressed NB on-ramp to US 101. The height of this wall would be up to approximately 20.5 feet. Soil nail wall is considered for this retaining wall.

b) MSE Wall - Two approximately 260-feet long retaining walls would be constructed on both sides of the path on the east side of the NB on-ramp to US 101. The wall heights would vary up to a maximum of approximately 14.5 feet. Mechanical Stabilized Embankment (MSE) Wall is considered for these retaining walls.

Minor Structures

Approximately 200 feet of existing sound wall will be replaced at a revised alignment to accommodate the POC construction. Sound Wall No. 1 will be near Retaining Wall No. 2 and the NB on-ramp to 101.

Cut and Fill

The following cut/fill will be required for this project:

- Minor cut and fill for the pavement construction.
- Embankment fill for the easterly approach consisting of the MSE wall.
- Fill for the path between Blossom Hill Road and the SB101 On-Ramp PUC.

Our recommendations presented in this report are based on the above information. Any major deviation should be reported to PARIKH for consideration.

3.0 PERTINENT REPORTS AND INVESTIGATION

In addition to the field exploration, we have referred to the following available as-built information for subsoil conditions.

As-built information for Route 82/101 Separation (Bridge No. 37-0348R/L) by Caltrans, dated 1982.

Geotechnical Design and Materials Report for Route 82/101 Interchange Project by Parikh dated 2003.

Geotechnical Investigation Report for Route 82/101 Separation (Widen) (Bridge No. 37-0348) by Parikh dated 2003.

As-built information for the Route 101 mainline pavement sections by Caltrans (dated 1985).

4.0 PHYSICAL SETTING

4.1 Climate

The climate in Santa Clara County is characterized by mild weather conditions. This consists of mild winters, warm summers and small daily and seasonal temperature ranges. Based on the statistical data from "Western Regional Climate Center", extreme temperature ranges from average minimum temperature of approximately 38°F to 58°F in January to average maximum temperature of approximately 53°F to 82°F in July and the average total annual precipitation is around 14.5 inches in the area. Most of the rainfall is recorded in January with the average total monthly precipitation of approximately 3 inches. July is the month with the least rainfall precipitation of 0.01 inches. Freezing weather may be anticipated. However, it is generally not necessary to design for freeze-thaw conditions.

4.2 Topography

US 101 is on relatively flat ground along the project alignment. Within the project area, the original ground elevations range from approximately 200 to 205 feet. Major topographic features include Coyote Creek which is depressed as much as 20 feet below surrounding areas and the Blossom Hill Road embankments as high as 30 feet above the freeway, local roads and the UPRR tracks.

4.3 Surface Drainage Features

Coyote Creek traverses the site east of the project location and has a general northwest direction. Some low hills are located further east of Route 101. It appears that the site drainage in general is by sheet flow to the east towards Coyote Creek and to the north towards Santa Clara Valley, or collected by local drainage systems and dissipates into the San Francisco Bay.

New culverts of 12" RCP and 18" APC are being installed at various locations as shown on the "Drainage Plans".

4.4 Man-Made and Natural Features of Engineering and Construction Significance

The roadway construction for Route 82/101 Interchange has altered the original terrain by placing embankment fill for the on/off ramp areas and the overcrossing structure approaches, up to a maximum height of approximately 25-30 feet. This is a human-made feature.

4.5 Regional Geology and Seismicity

The project site is in the southeastern portion of the San Francisco Bay area in the Coast Range geomorphic province of California. The Coast Range forms a nearly continuous topographic barrier between the California coastline and the San Joaquin Valley. In general, the Coast Range in this region is a double chain of mountain running north-northwest. Between the two chains of mountain lies the basin of San Francisco Bay, including the valleys at the end of the Bay, Petaluma on the north and Santa Clara on the south. Three prominent geologic blocks dominate the San Francisco Bay Area: the Santa Cruz Mountains (western block), the San Francisco Bay (central block), and the East Bay Hills/Diablo range (eastern block).

The general geology in the site vicinity was mainly studied from the "Quaternary Geology of Santa Clara Valley, Santa Clara, Alameda and San Mateo Counties (USGS Open File Report 94-231)", compiled by E.J. Helley, R.W. Graymer, G.A. Phelps, P.K. Showalter and C.M Wentworth (1994) (see attached Plate 3, Geology Map). The older units generally occupy higher elevations. The oldest unit in the vicinity of the project mapped is Undifferentiated Bedrock (br), which is Pliocene and older.

Relatively younger units, i.e., Younger Alluvial Fan Deposits (Qpaf1, Pleistocene), Natural

Levee Deposits (Qhl, Holocene), Alluvial Fan Deposits (Qhaf, Holocene), Flood basin Deposits (Qhb, Holocene) also appear in the project vicinity.

Faults in the vicinity of the project site with a moderate to high potential for surface rupture include the Silver Creek Fault, Hayward (Southern extension) and the Cascade Fault. Significant earthquakes, which have occurred in the region, are generally associated with crustal movements along well-defined active fault zones. A Regional Fault Map (based on Caltrans, 2007), showing the project site location relative to the major active faults in the region, is presented on Plate No. 4.

In the past, numerous earthquakes have originated from the active faults within the region and produced strong ground shaking throughout the area. Per the report, which has been released by the United States Geological Survey (USGS), there is a 63% probability that an earthquake of 6.7 magnitude or greater will be released from one of the active faults within San Francisco Bay Area during the next 30 years. The probability of an earthquake of magnitude 6.7 or greater over Northern California is 93 percent. Such an event will likely produce strong ground shaking at the project location.

5.0 EXPLORATION

5.1 Drilling and Sampling

Based on the preliminary plans and readily available geotechnical data in the area, six borings were conducted at selected locations to the depth of 5 feet below the existing ground surface for the roadway portion of this project. Eleven borings were drilled and three Cone Penetration Tests (CPTs) were conducted at selected locations for the bridge structure widening, new pedestrian overcrossing, new pedestrian undercrossing and two earth retaining systems for this project. The depths of these borings/CPTs are summarized in the table below:

TABLE 1 - SUMMARY OF FIELD EXPLORATION

Design Element	Boring/CPT Numbers	Depths (ft)
Blossom Hill Road OC (Widen)(Br. No. 37-0348 L/R)	R-18-SC-001, R-18-SC-002, CPT-18-SC-003	69.7 – 131.5
NB101 On-Ramp POC (Br. No. 37-676)	R-18-NO-001, R-18-NO-002, R-18-NO-003, CPT-18-NO-004, CPT-18-NO-005	59.7 - 111.5
SB101 On-Ramp PUC (Br. No. 37-675K)	R-18-SO-002 and R-18-SO-003	111.5-121.5
SB101 Off-Ramp PUC (Br. No. 37-675J)	R-18-SO-001 and R-18-SO-002	101.5-121.5
Retaining Wall No.1 (Soil Nail)	R-18-NO-101	56.5
Retaining Wall No.2 (MSE Wall)	R-18-NO-103 and R-18-NO-102	46.5 - 51.5
Pavement Design	R-18-BH-104 through R-18-BH-109	5.0

Approximate locations of these borings are shown on the ”Boring Location Map” (Plates 3A and 4B). The details of the field exploration are included in Appendix A. The descriptions of the materials encountered in the field exploration are shown on the LOTB.

The borings were advanced with a truck-mounted drill rig using 8-inch diameter hollow stem augers and 3.75-inch diameter rotary-wash drilling method. The borings were drilled under the technical supervision of our engineer, who classified and logged the soils encountered during drilling and supervised the collection of soil samples at various depths for visual examination and laboratory testing. The soil samples were obtained during drilling by driving a 2.5-inch Inside Diameter (I.D.) Modified California sampler or a 1.375-inch I.D. Standard Penetration Test (SPT) sampler into the subsurface soils under the impact of a 140-pound hammer having a free fall of 30 inches. The blow counts required to drive the sampler for the last 12 inches are presented on the LOTB, Appendix A. When correlating standard penetration data in similar soils, the blow counts for the Modified California sampler can be converted to equivalent Standard Penetration Test sampler by multiplying a factor of 0.65.

After visual examination, the collected samples were sealed and transported to our laboratory for further evaluation and testing. The boring locations, stations, and relevant information are summarized in Tables 2A through 2C below.

The descriptions of the soil materials encountered in the exploratory borings and relevant boring information are presented on the LOTB attached in Appendix A. The laboratory test methods and results are presented in Appendix B. The logs presented in Appendix A

were prepared from the field logs which were edited after visual re-examination of the soil samples in the laboratory and results of classification tests on selected soil samples as indicated on the LOTB. The preparation of the boring logs was according to the "Soil & Rock Logging, Classifications, and Presentation Manual."

TABLE 2A - SUMMARY OF BORINGS (5 FEET DEEP BULK SAMPLES FOR PAVEMENT DESIGN)

Boring No.	"A" Line Station (ft)	Approx. Ground Elev. (ft)
A-18-BH-104	43+60	207.0
A-18-BH-105	45+35	217.0
A-18-BH-106	44+95	213.0
A-18-BH-107	54+00	226.0
A-18-BH-108	55+50	204.0
A-18-BH-109	58+20	205.0

TABLE 2B – SUMMARY OF BORINGS/CPTS (BRIDGE STRUCTURES)

Location	Boring No.	Station (ft)	Offset (ft)	Boring/CPT Depth (ft)	Approx. Ground Elev. (ft)
Blossom Hill Road OC (Widen) (Br. No. 37-0348 L/R)	R-18-SC-001	"A" Line 56+35	0.0 Lt.	131.5	231.0
	R-18-SC-002	"A" Line 61+20	0.0 Lt.	121.5	226.0
	CPT-18-SC-003	"A" Line 58+05	70.0 Rt.	69.5	203.0
NB101 On-Ramp POC (Br. No. 37-676)	R-18-NO-001	"BP" Line 34+90	19.0 Lt.	111.5	223.0
	R-18-NO-002	"BP" Line 35+85	28.0 Lt.	104.7	223.0
	R-18-NO-003	"BP" Line 37+90	13.0 Rt.	111.5	215.0
	CPT-18-NO-004	"BP" Line 35+85	28.0 Lt.	59.9	223.0
	CPT-18-NO-005	"BP" Line 37+90	13.0 Rt.	71.4	215.0
SB101 Off-Ramp PUC (Br. No. 37-675J)	R-18-SO-001	"AR4" Line 514+75	39.0 Lt.	101.5	221.0
	R-18-SO-002	"AL4" Line 251+90	50.0 Rt.	121.5	220.0
SB101 On-Ramp PUC (Br. No. 37-675K)	R-18-SO-002	"AL4" Line 251+90	50.0 Rt.	121.5	220.0
	R-18-SO-003	"AL4" Line 251+50	30.0 Lt.	111.5	219.0

(1) Boring/CPT location stations and offset and elevations are stated to the nearest foot to be consistent with the LOTB, however they were not surveyed.

CPT-18-NO-004 and CPT-18-NO-005 were conducted to confirm the extent of the potential liquefiable soils encountered in Borings R-18-NO-002 and R-18-NO-003. CPT-18-NO-004 was conducted at the same location as R-18-NO-002 and CPT-18-NO-005 was conducted at the same location as R-18-NO-003.

TABLE 2C - SUMMMARY OF BORINGS (RETAINING WALLS AND SOUND WALL)

Location	Boring No.	Station (ft)	Offset (ft)	Boring Depth (ft)	Approx. Ground Elev. (ft)
Retaining Wall No. 1	R-18-NO-101	"RW1" 7+70	9.0 Lt.	36.5	220.0
Retaining Wall No. 2	R-18-NO-102	"BP" Line 38+65	16.0 Rt.	51.5	213.0
	R-18-NO-103	"BP" Line 40+85	4.0 Rt.	46.5	210.0
Sound Wall No. 1	R-18-NO-001	"BP" Line 34+90	19.0 Lt.	111.5	223.0
	R-18-NO-002	"BP" Line 35+85	28.0 Lt.	104.7	223.0
	R-18-NO-003	"BP" Line 37+90	13.0 Rt.	111.5	215.0

(1) Boring location stations and offset and elevations are stated to the nearest foot to be consistent with the LOTB, however they were not surveyed.

5.2 Geologic Mapping

No site-specific geological mapping was performed because of the flat nature of the project site and lack of surface geologic feature.

5.3 Geophysical Studies

Based on the "Geologic Map of the San Jose East quadrangle, Santa Clara County, California: Dibblee Geological Foundation, Dibblee Foundation Map DF-155, scale 1:24,000", the project site is underlain by Holocene surficial sediments, alluvial gravel, sand and clay soil of valley area. The subsurface soils are relatively uniform. Geophysical techniques such as cross-hole surveys, seismic refraction and reflection were considered unnecessary for this type of geologic condition.

5.4 Instrumentation

The subject was considered and was determined to be not applicable to the project.

5.5 Exploration Notes

The exploratory borings encountered alluvial deposits predominantly consisting of medium stiff to hard lean/fat clay and soft to very stiff silt interbedded with pockets/ lenses/layers of loose to very dense sand. In general, drilling did not encounter any unusual conditions. No caving of the drilled holes was observed in the rotary borings during drilling.

6.0 GEOTECHNICAL TESTING

6.1 In-Situ Testing

In-situ testing consisted of recording blow counts during sampling in the field. Based on our previous experience, when correlating standard penetration data in similar soils, the blow counts for the Modified California Sampler can be converted to equivalent Standard Penetration Test blow counts by multiplying a factor of 0.65 (DMG Special Publication 117 (Guidelines for Analyzing and Mitigating Liquefaction).

Based on the typical SPT-N_{60} values for the soil materials encountered in the field exploration, the subsurface soil conditions generally consist of stiff to hard lean/fat clay and silt with intermittent layers of medium dense to dense sand or gravel. The in-situ test results are presented on the LOTB in Appendix A.

6.2 Laboratory Testing

The following laboratory tests were performed: Laboratory determination of Moisture-Density [American Standard Test Method (ASTM) D-2216], Atterberg Limits (ASTM D-4318), Grain Size Distribution Analysis (ASTM D-420), R-value Test (California Test Method T-301), Corrosion Test (California Test Method T-643), Unconfined Compression Test (ASTM D-2166-00). The laboratory test results relevant to the embankment settlement and global stability, Sound Wall No. 1 are included in Appendix B. Corrosion test results and R-Value test results are also included in Appendix B.

7.0 GEOTECHNICAL CONDITIONS

7.1 Site Geology

General geologic features pertaining to the project site were evaluated by reference to the "Dibblee, T.W.; and Minch, J.A., 2005, Geologic Maps of the San Jose East Quadrangle, Santa Clara County, California; Dibblee Geological Foundation DF-155, scale 1:24,000" and "Dibblee, T.W.; and Minch, J.A., 2005, Geologic Maps of the Santa Teresa Hills Quadrangle, Santa Clara County, California; Dibblee Geological Foundation DF-158, scale 1:24,000". Based on the geologic map, the project site subsurface soils consist of mainly Holocene surficial sediments with alluvial gravel, sand and clay soil of valley areas (Qa).

The general geology of the project area is shown on the "Geologic Map", Plate No. 5.

The map of Quaternary deposits by "Witter, et. al.; 2006; Maps of Quaternary Deposits and Liquefaction Susceptibility in the Central San Francisco Bay Region, California; USGS Open File 2006-1037" differentiates the alluvium beneath the project sites into the following unit, which are labeled and described as:

Qhl - Natural levee deposits of alluvial fans are formed by streams that overtop their banks and deposit sediment adjacent to the channel. They contain coarser material than adjoining inter-levee areas, especially adjacent to creek banks where the coarsest material is deposited during floods (Helley and others, 1979). Levee deposits are loose, moderately to well-sorted sand, silt and clay (Helley and Wesling, 1989). Soils are typically entisols, inceptisols, mollisols, and vertisols. In some parts of the map, the relative ages of younger (Qhl1), intermediate (Qhl2), and older (Qhl3) alluvial fan levee deposits are differentiated from one another.

Qhf - Holocene alluvial fan deposits. Sediment deposited by streams emanating from mountain canyons onto alluvial valley floors or alluvial plains, including debris flow, hyper-concentrated mudflow, and braided stream deposits. Alluvial fan sediment includes sand, gravel, silt, and clay, and is moderately to poorly sorted, and moderately to poorly bedded. It is the most extensive Quaternary map unit in the San Francisco Bay area. In some areas of the map, the relative ages of younger (Qhf1), intermediate (Qhf2), and older (Qhf3) alluvial fan deposits are distinguished from one another.

The quaternary deposits of the project area are shown on the "Quaternary Deposits Map", Plate No. 6.

7.1.1 Lithology

The subject site is underlain by artificial fill that was imported for the roadway construction on various stages and native alluvial soils. Detailed description of subsurface soil conditions is presented in Section 7.2.

7.1.2 Structure

The fault that is closest to the project site is the Silver Creek Fault, which is a strike-slip fault. The structure of the geological units such as bedding, folds, fracture, jointing, and foliation are not evident in the boring information. The deposits are primarily Holocene, Alluvial Fan Levee Deposits (Qhl) and Holocene, Alluvial Fan Deposits (Qhf). Based on the boring logs, medium stiff to very stiff clays with intermittent pockets or lenses of medium dense to dense sands were encountered in the borings.

7.1.3 Existing Slope Stability

The gradient of the existing cut/fill slopes varies; typically ranges from 2(H): 1(V) or flatter. The existing slopes appear in a reasonable condition and slope stability is not a geotechnical concern.

7.2 Subsurface Soil Conditions

Based on the available boring data within the project limits, the subsurface soil conditions at the project site are summarized in Table 3 below:

TABLE 3 - SUMMARY OF SUBSURFACE SOIL CONDITIONS

Structures	Boring/CPT No.	Subsurface Soil Conditions
Blossom Hill Road OC (Widen) (Br. No. 37-0348 L/R)	R-18-SC-001	Medium dense silty sand, underlain by stiff to very stiff lean clay, underlain by medium dense clayey sand, underlain by medium stiff lean clay, underlain by interbedded layers of medium dense sand and soft to very stiff silt/lean clay to the boring depth of 131.5 feet.
	R-18-SC-002	Medium dense silty/clayey sand, underlain by very soft to very stiff silt, underlain by interbedded layers of medium dense to very dense sand and stiff to very stiff lean clay/silt to the boring depth of 121.5 feet.
	CPT-18-SC-003	Stiff to very stiff lean clay, underlain by interbedded layers of medium dense sand and medium stiff to stiff lean clay to the CPT depth of 70 feet.
NB101 Off-Ramp POC (Br. No. 37-676)	R-18-NO-001	Medium dense to dense silty sand, underlain by soft to very stiff lean clay/silt, underlain by dense silty sand/clayey sand/silty gravel, underlain by very stiff fat clay to the depth of boring of 111.5 feet.
	R-18-NO-002	Very stiff lean clay, underlain by stiff lean clay/silt with interbedded layers of medium dense silty sand, underlain by very stiff lean clay, underlain by dense to very dense sand/gravel to the boring depth of 104.5 feet.
	R-18-NO-003	Dense to very dense silty sand, underlain by very stiff lean clay, underlain by interbedded layers of soft to very stiff silt and medium dense clayey sand, underlain by dense gravel/sand, underlain by very stiff lean clay to the boring depth of 111.5 feet.
	CPT-18-NO-004	Very stiff lean clay, underlain by stiff lean clay/silt with interbedded layers of medium dense sand, underlain by stiff to very stiff lean clay.
	CPT-18-NO-005	Dense to very dense silty sand, underlain by very stiff lean clay, underlain by stiff clay, underlain by medium dense sand.
SB101 Off-Ramp PUC (Br. No. 37-675J)	R-18-SO-001	Medium dense to dense silty gravel, underlain by stiff to very stiff fat clay/silt, underlain by medium dense sand, underlain by stiff to very stiff silt/fat clay, underlain by very dense sand to the boring depth of 101.5 feet.
SB101 Off-Ramp PUC (Br. No. 37-675J) /SB101 On-Ramp PUC (Br. No. 37-675K)	R-18-SO-002	Interbedded layers of medium dense to very dense sand/gravel and stiff to hard silt/lean clay, underlain by medium dense clayey sand, underlain by medium stiff to stiff lean clay, underlain by dense to very dense sand/gravel to the boring depth of 121.5 feet.
SB101 On-Ramp PUC (Br. No. 37-675K)	R-18-SO-003	Interbedded layers of dense to very dense silty sand and very stiff lean clay, underlain by medium dense sand/gravel, underlain by interbedded layers of medium stiff to stiff lean clay and medium dense to very dense sand/gravel to the boring depth of 111.5 feet.
Retaining Wall No. 1(Soil Nail Wall)	R-18-NO-101	Dense sand underlain by medium stiff to stiff lean clay/fat clay and silt.
Retaining Wall No. 2 (MSE Wall)	R-18-NO-102	Medium dense to dense sand underlain by stiff to very stiff silt, underlain by medium stiff lean clay, underlain by medium dense sand.
	R-18-NO-103	Medium dense sand (FILL) over very stiff silt, underlain by medium dense to dense gravel and sand layers.

Detailed descriptions of the materials encountered in the exploratory borings are presented in the LOTB in the foundation report of the bridge structures and earth retaining systems in Section 1. It should be noted that these descriptions and related information depict subsurface conditions only at the locations indicated and on the particular date noted on the LOTB. Because of the variability from place to place within soil/rock in general, subsurface soil conditions at other locations may differ from conditions occurring at the locations explored. The abrupt stratum changes shown on the logs may be gradational and relatively minor changes in soil types within a stratum may not be noted due to field limitations. Also, the passage of time may result in a change in the soil conditions at the locations due to environmental changes.

Due to limitations inherent in geotechnical investigations, it is neither uncommon to encounter unforeseen variations in the subsurface soil conditions during construction nor is it practical to determine all such variations during an acceptable program of drilling and sampling for a project of this scope. Such variations, when encountered, generally require additional engineering services to attain a properly constructed project. We, therefore, recommend that a contingency fund be provided to accommodate any additional charges resulting from technical services that may be required during construction.

7.3 Water

7.3.1 Surface Water

The project site is in the vicinity of residential and commercial developments and the overall terrain within the project limits is relatively flat. The surface water/drainage is by sheet flow and is collected in local storm drain systems.

7.3.1.1 Scour

Scour evaluation is not needed sincere there is no waterway underneath the structure.

7.3.1.2 Erosion

The existing slopes have established landscaping to help control erosion. Therefore, erosion is not a concern for this project. New planned slopes are expected to be covered with erosion control planting.

7.3.2 Groundwater

Groundwater measured in the field exploration is summarized in the table below.

TABLE 4 – SUMMARY OF GROUDNWATER

Location	Boring No.	Station (ft)	Offset (ft)	Groundwater Depth (ft)	Approx. Ground Elev. (ft)	Approx. Groundwater Elev. (ft)
Blossom Hill Road OC (Widen)	R-18-SC-001	"A" Line 56+35	0.0 Lt.	30.0	231.0	201.0
	R-18-SC-002	"A" Line 61+20	0.0 Lt.	25.0	226.0	201.0
	CPT-18-SC-003	"A" Line 58+05	70.0 Rt.	26.3	203.0	176.7
NB Diagonal On-Ramp POC	R-18-NO-001	"BP" Line 34+90	19.0 Lt.	30.0	223.0	193.0
	R-18-NO-002	"BP" Line 35+85	28.0 Lt.	25.0	223.0	198.0
	R-18-NO-003	"BP" Line 37+90	13.0 Rt.	32.0	215.0	183.0
	CPT-18-NO-004					
	CPT-18-NO-005					
SB Off-Ramp PUC	R-18-SO-001	"AR4" Line 514+75	39.0 Lt.	32.5	221.0	188.5
	R-18-SO-002	"AL4" Line 251+90	50.0 Rt.	22.0	220.0	198.0
SB Loop On-Ramp PUC	R-18-SO-002	"AL4" Line 251+90	50.0 Rt.	22.0	220.0	198.0
	R-18-SO-003	"AL4" Line 251+50	30.0 Lt.	25.0	219.0	194.0
Retaining Wall No. 1	R-18-NO-101	"RW1" 7+70	9.0 Lt.	14.0	220.0	206.0
Retaining Wall No. 2	R-18-NO-102	"BP" 38+65	16.0 Rt.	28.0	213.0	185.0
	R-18-NO-103	"BP" 40+85	4 Rt.	29.0	210.0	181.0
Sound Wall No. 1	R-18-NO-001	"BP" Line 34+90	19.0 Lt.	30.0	223.0	193.0
	R-18-NO-002	"BP" Line 35+85	28.0 Lt.	25.0	223.0	198.0
	R-18-NO-003	"BP" Line 37+90	13.0 Rt.	32.0	215.0	183.0

Groundwater was encountered at the depths between 14 feet and 32.5 feet below existing ground surface and between Elev. +181.0 feet and Elev. +206.0 feet during the field exploration in August/September 2018.

In our opinion, the groundwater level is anticipated to vary with the passage of time due to seasonal groundwater fluctuation, surface and subsurface flows, ground surface run-off, change in the water level in the nearby creeks and waterways and other environmental factors which may not have been present at the time of our investigation.

7.4 Project Site Seismicity

7.4.1 Ground Motions

The project is located in a seismically active part of northern California. Many

faults that exist in the San Francisco Bay Area are capable of producing earthquakes that may cause strong ground shaking at the site. The attached Fault Map (Plate No. 4) presents the locations of the fault systems relative to the beginning and end of the project limits.

Maximum credible earthquake magnitudes for some of the major faults in the area are determined by Caltrans' recently developed online ARS tool. These maximum credible earthquake magnitudes represent the largest earthquakes that could occur on the given fault based on the current understanding of the regional tectonic structure. The following summarizes the estimated closest distance to the center of the project site.

TABLE 5 – ARS DATA

Fault (Fault ID)	Maximum Moment Magnitude of Fault, M_{Max}	Fault Type	Site-to-Fault Distance, R_{rup}* (miles)	Peak Ground Acceleration (PGA) Based on Deterministic Data (g)
Silver Creek Fault (148)	6.9	Strike Slip	2.14	0.419
Hayward (Southern extension)	6.7	Strike Slip	4.02	0.333
Cascade fault (153)	6.7	Reverse	3.12	0.384
Monte Vista-Shannon (154)	6.4	Reverse	4.83	0.300
Calaveras (Central) 2011 CFM	6.9	Strike Slip	6.67	0.268
San Andreas (Santa Cruz Mts) 2011 CFM-(158)	8.0	Strike Slip	11.87	0.299

*Closest distance (mi) to the fault rupture plane as obtained from Caltrans ARS Online Website.

Based on available geological and seismic data, the possibility of the project site within the project limits to experience strong ground shaking should be considered moderate to high shaking.

7.4.2 Ground Rupture

No active fault passes through the project limits, therefore the potential for ground surface rupture due to faulting does not exist.

8.0 GEOTECHNICAL ANALYSES AND DESIGN

8.1 Dynamic Analysis

8.1.1 Seismic Considerations

The design spectrum was developed in accordance with the 2012 Caltrans Fault Database (Version 2b) and the Acceleration Response Spectrum (ARS) Online web tool (Version 2.3.09). The development of the design ARS curve is based on several input parameters, including site location (longitude/latitude), average shear wave velocity for the top 30m/100 feet (Vs_{30m}), and other site parameters, such as fault characteristics, site-to-fault distances. The current design methods incorporate both "Deterministic and Probabilistic Seismic Hazards" to produce the "Design Response Spectrum".

Average shear wave velocities (V_s) for the top 30m (100 feet) at the locations of various structures should be estimated by using established correlations and the procedure provided in the "Caltrans Methodology for Developing Design Response Spectrum for Use in Seismic Design Recommendations (November 2012)".

8.1.2 Analysis

Based on the available plans, no new major cut slope is planned for the project. Stability analyses of the raised embankment were performed using Program SLOPE/W. The stability under seismic condition was analyzed using pseudo-static approach. The embankment was analyzed as a static condition, and the horizontal force was expressed as a product of a seismic coefficient and the weight of the potential sliding mass. Results of the stability analyses are described in Section 8.3.2.

8.1.3 Liquefaction Potential

Liquefaction is a phenomenon in which saturated cohesionless soils are subject to a temporary but essentially total loss of shear strength under the reversing, cyclic shear stresses associated with earthquake shaking. Submerged cohesionless sands and silts of low relative density are the type of soils, which usually are susceptible

to liquefaction. Clays are generally not susceptible to liquefaction.

Based on the LOTB of the borings drilled in 2003 and the borings drilled and CPTs pushed in 2018, the project site is generally underlain by medium stiff to very stiff clay/silt with interbedded layer of medium dense to very dense sand/gravel.

The liquefaction potential was evaluated in accordance with the methods proposed by Youd, et al. (2001). The evaluation was primarily using the data of borings which encountered loose to medium dense sand. The preliminary seismic input was based on the nearby Silver Creek fault with a Magnitude 6.9 earthquake and a peak ground acceleration of about 0.6 g. This method compares the estimates of the earthquake-induced shear stress to the susceptibility of soil liquefaction. As indicated by soil liquefaction study of Bray (2006), for soils with sufficient fines content so as to separate the coarser particles and control behavior, liquefaction appears to occur in soils where these fines are ether non-plastic or are low plasticity silts and/or silty clays (PI<12%, and LL<37%), and with high water content relative to their liquid limit (w>0.85 LL).

The boring number, location, approximate depth, approximate thickness of the sand pockets/lenses/layers and estimated post-liquefaction settlement are summarized in the Table 6 below.

TABLE 6 – SUMMARY OF POST-LIQUEFACTION SETTLEMENT

Location	Boring No.	Estimated Liquefiable Soil Depth (Approx. Thickness) (ft)	Estimated Liquefiable Soil		Estimated Post-liquefaction Settlement (inches)
			Top Elev. (ft)	Bottom Elev. (ft)	
Blossom Hill Road OC (Widen) (Br. No. 37-0348 L/R)	R-18-SC-001	28 (5.5)	203.0	197.5	1.3
	R-18-SC-002	-	-	-	-
	CPT-18-SC-003	26.5 (2)	176.5	174.5	0.6
		31.3 (3.5)	171.7	168.2	0.9
NB101 On-Ramp POC (Br. No. 37-676)	R-18-NO-001	-	-	-	-
	R-18-NO-002	58.5 (6.5)	164.5	158.0	1.0
	R-18-NO-003	34 (14.5)	181.0	166.5	5.7
		48.5 (8)	166.5	158.5	1.4
		56.5 (8.5)	158.5	150.0	3.0
	CPT-18-NO-004	-	-	-	-
	CPT-18-NO-005	52.5 (6.5)	162.5	156.0	2.5
SB101 Off-Ramp PUC (Br. No. 37-675J)	R-18-SO-001	33.5 (9.5)	187.5	178.0	1.6
		53 (3.5)	168.0	164.5	0.7
	R-18-SO-002	61 (3.5)	159.0	155.5	0.6
SB101 On-Ramp PUC (Br. No. 37-675K)	R-18-SO-002	61 (3.5)	159.0	155.5	0.6
	R-18-SO-003	28 (10.5)	191.0	180.5	1.8
		44 (4)	175.0	171.0	0.7
Retaining Wall No. 1	R-18-NO-101	23 (4.5)	197.0	192.5	1.2
Retaining Wall No. 2	R-18-NO-102	38.5 (4)	174.5	170.5	2.0
	R-18-NO-103	28 (5)	182.0	177.0	1.1
Sound Wall No. 1	R-18-NO-001	-	-	-	-
	R-18-NO-002	58.5 (6.5)	164.5	158.0	1.0
	R-18-NO-003	34 (14.5)	181.0	166.5	5.7
		48.5 (8)	166.5	158.5	1.4
		56.5 (8.5)	158.5	150.0	3.0

Based on the results of the evaluation of liquefaction potential for the above soil borings and CPTs, the estimated post-liquefaction settlements may be on the order of 1 to 6 inches.

In our opinion, the intermittent pockets/lenses/layers of medium dense sands are potentially liquefiable, if saturated. Based on the evaluation, the impact of the post-liquefaction settlement of the potentially liquefiable sands on the roadway should be relatively small because:

- The potentially liquefiable soil layers are generally covered by predominantly cohesive soils, which tend to serve as a "soil mat" and should reduce the potential impact of liquefaction.
- The post-liquefaction settlement probably would be random and localized and could spread out over some distance/area.

Downdrag due to the post-liquefaction settlement will be considered in the vertical pile capacity analyses of the relevant bridge structures.

8.2 Cuts and Excavations

Based on our understanding of the proposed project, the project requires minor cut for the structural pavement construction.

8.2.1 Stability

The stability of the cuts and excavations was considered and was determined to be not applicable for the project.

8.2.2 Rippability

The excavation is anticipated to be in roadway fill and native soils. Based on the field investigation, rippability does not appear to be a concern for construction.

8.2.3 Subsurface Drains

The typical drain backfill should be Caltrans standard permeable material wrapped in appropriate filter fabric. Class 1 or Class 2 Permeable Material is recommended for the structures and underdrain.

Filter fabric for the underdrain of the structures such as bridge abutments, wingwalls and retaining walls should be Class A. Filter fabric for the other locations should be Class C. The filter fabric should be in accordance with Caltrans Standard Specifications 68-1.03B.

8.2.4 Grading Factor

The on-site native soil meeting the project specifications may be used as engineered fill. For preliminary estimate, a grading factor of 0.9 may be assumed for the import materials based on our previous experience.

8.3 Embankments

New approach embankment is proposed for the future east approach embankment of the NB101 On-Ramp POC (Retaining Wall No. 2 MSE Wall) and fill will be placed on the existing ground for the path between Blossom Hill Road and the SB101 On-Ramp PUC

8.3.1 Settlement Evaluation

Based on the estimated maximum fill thickness and the subsurface soil conditions, settlement analyses due to the placement of fill at MSE wall and the path was performed. The subsurface soil conditions, maximum fill thickness and the estimated settlement are summarized in the table below.

TABLE 7 – SUMMARY OF SETTLEMENT ANALYSES

Location	Reference Borings	Approx. Maximum Fill Thickness (ft)	Estimated Settlement (inch)
NB101 On-Ramp POC East Approach Embankment (MSE Wall)	R-18-NO-103	14 feet	~2.5
Existing storm drain below MSE Wall at 25 feet	R-18-NO-103	14 feet	~0.2
Path between Blossom Hill Road and SB101 On-Ramp PUC	R-18-SC-001	15 feet	~3.5

Consolidation Test Results and Assumed Parameters

Consolidation test for the selected soil samples are in progress and the test results are not yet available at the time of preparation of this "Geotechnical Design and Materials Report". The following parameters were assumed for the settlement evaluation in the interim based on the empirical correlations and our engineering judgments.

a) Unconfined Compressive Strength tests result, when available, is used in the settlement calculations (if it is shown in the calculations spreadsheet).

b) The pre-consolidation pressure (Pc) for the samples were estimated by using a factor of 0.25 (Su/p, Skempton 1954, 1957) and dividing the undrained strength (correlated/lab) with this factor. OCR is then calculated by dividing in-situ effective stress to Pc. Clays with OCR greater than or equal to 2.5 is considered to be settling elastically and not considered in consolidation settlement calculations.

c) In addition, the $C_c/(1+e0)$ values are calculated based on our calibration/refitting of the original Lambe & Whitman correlations based on in-house lab results from previous projects. The water content from laboratory tests is used as an input to this correlation.

Results of Settlement Evaluations

Settlement analyses indicate that settlement may be between about 2.5 inches for the east approach embankment (MSE Wall) and about 3.5 inches for the path. The estimated settlements consist of settlement in the over-consolidated (OC) range for clay and elastic settlements for sands and clays (with OCR greater than or equal to 2.5) and normally consolidated (NC) range for clays/silts. A coefficient of consolidation coefficient of 0.08 ft^2/day was used in the calculation based on the existence of predominantly low to non-plastic clays and silts in the borings for the project and liquid limit correlations per NAVFAC DM 7.2. Based on our analysis, a waiting period of 51 days is recommended after the east approach embankments have been built prior to the construction of the piles at Abutment 6 of NB101 On-Ramp POC and after the path has been built prior to the construction of the pavement. The consolidation settlement time calculations are shown in Appendix C.

Settlement Monitoring

Based on the above discussions, majority of the estimated settlements should have been completed at the end of the waiting period as discussed above. This should be confirmed during construction. It is recommended that settlement platforms be installed, and settlement be monitored (per California Test 112) by the contractor during construction. Based on this, the settlement period may have to be modified.

The following are recommended for the proposed settlement platforms:

TABLE 8 – SUMMARY OF SETTLEMENT MONITORING

Location	Proposed Settlement Platforms
NB101 On-Ramp POC East Approach Embankment	a) Minimum of four settlement platforms. b) The settlement platforms should be evenly distributed along the approach embankment
Bike Path	One settlement platform at "BP" Line Station 28+00 and one at "BP" Line Station 28+25

8.3.2 Evaluation of Embankment Stability

Global slope stability analyses were performed for new approach embankment at east approach embankment of NB On-Ramp POC and path between Blossom Hill Road SB101 On-Ramp PUC. A commercial software "Slope/W 2012" was used for the stability analysis with "Spencer Method". Per Caltrans "Guidelines for Foundation Investigations and Reports", pseudo-static analyses may be performed using a seismic coefficient equal to one third of the horizontal peak ground acceleration (1/3 x 0.63 g = 0.21g).

The following are the summaries of the maximum slope height and the result of with factor of safety the global stability analyses are summarized in the table below:

TABLE 9 – SUMMARY OF GLOBAL STABILITY ANALYSES

Location	Max Slope Height (ft)	Result of Analyses	
		Static (1.5)	Seismic (1.1)
East Approach Embankment of NB101 On-Ramp POC	12	3.79	1.52
Path between Blossom Hill Road and SB101 On-Ramp PUC	15	2.74	1.96

Based on the results of the stability analysis, the stability of the proposed modification of the existing embankment appears to be satisfactory for both static condition (F.S. greater than 1.5) and seismic condition (F.S. greater than 1.1). Results of the slope stability analyses are included in Appendix C.

The embankment is proposed to be armored with erosion control items, including fiber rolls and hydroseeded to address the relatively minimal surface drainage flowing across the embankment during the rainy season.

8.3.3 Fills on Existing Slope

Shallow fills will be placed on existing slopes up to 2(H):1(V) inclination on the north side of the bike path near "BP" 21+00 to 23+00 and "BP" 37+00 to 40+00. Fills to be placed on existing slope should be keyed and benched into the existing slope material. The height of the key should not be more than 4 feet and the minimum width should be 6 feet.

8.4 Earth Retaining System

It is our understanding that due to right-of-way and other geometric constraints; the project will require construction of two retaining walls. Retaining wall No. 1 will be constructed to retain the westbound Blossom Hill Road at the depressed NB on-ramp to US 101. Retaining wall No. 2 will retain the embankment fill on the both sides of the path on the east side of the NB on-ramp to US 101. Information of approximate wall locations, type of walls, and maximum wall heights for Retaining Wall Nos. 1 and 2 provided by Biggs Cardosa Associates (BCA) is summarized in Table 10.

TABLE 10 – SUMMARY OF PROPOSED RETAINING WALLS

Retaining Wall No.	Wall Type	Location (Along approx. Station.)	Maximum Design Height (ft)	Bottom of Footing or Levelling Pad Elev. (ft)	Total Length (ft)
Retaining Wall No. 1	Soil Nail Wall	"RW1" Line 506+80 to 510+25.86	20.6	Varies from +211.56 at Begin Wall to +206.64 ft at End Wall	345-10 ¼"
Retaining Wall No. 2	MSE Wall	"BP" Line 37+39.67 to 40+00.00	14.5	Varies from +208.30 ft at Begin Wall to +213.02 ft at End Wall	534'-9"

The foundation recommendations for the proposed retaining walls are included in the separate foundation reports as described in Section 1.0 "Introduction".

8.5 Corrosion Investigation

The corrosion investigation for this project was performed in general accordance with the provisions of California Test Method 643. Chemical tests were performed on selected soil samples to evaluate the corrosion potential of the subsurface soil. A summary of the corrosion test results is presented in Table 11.

TABLE 11 – SUMMARY OF CORROSION TEST RESULTS

Boring No.	Station & Offset	Depth (ft)	Min. Resistivity (ohm-cm)	pH	Sulfate (ppm)	Chloride (ppm)
R-18-SC-001	"A" 56+35 0' Lt.	36	2,680	7.18	0.9	4.6
R-18-SC-002	"A" 61+20 0' Lt.	31	1,880	7.36	29.7	9.4
R-18-NO-001	"BP" 34+90 19' Lt.	31	2,090	7.98	25.4	8.8
R-18-NO-002	"BP" 35+85 28' Rt.	16	1,230	7.23	125.4	5.1
R-18-NO-003	"BP" 37+90 13' Rt.	31	4,820	7.58	42.3	10.6
R-18-SO-001	"AR4" 514+75 39' Lt.	31	1,740	7.92	26.9	4.2
R-18-SO-002	"AL4" 251+90 50' Rt.	21	1,260	7.97	40.0	16.4
R-18-SO-003	"AL4" 251+50 30' Lt.	21	1,340	7.71	34.5	8.7
R-18-NO-101	"RW1" 7+70 9' Lt.	16	1,630	7.32	135.6	6.0
R-18-NO-102	"BP" 38+65 16'Rt.	26	1,150	7.89	74.8	15.8
A-18-BH-104	"A" 43+60 274' Lt.	0-5	2,680	7.47	9.0	6.0
A-18-BH-105	"A" 45+35 55' Lt.	0-5	2,600	7.23	13.5	5.0
A-18-BH-106	"A" 44+95 97' Rt.	0-5	1,450	6.83	28.4	6.1
A-18-BH-107	"A" 34+00 17' Lt.	0-5	1,660	7.39	2.8	4.3
A-18-BH-108	"A" 53+50 178' Lt.	0-5	1,420	7.18	7.0	4.6
A-18-BH-109	"A" 38+20 311' Lt.	0-5	1,690	7.99	50.7	6.4

The Caltrans Corrosion Guidelines March 2018 (Version 3.0) states that soil and water that have a minimum resistivity equals to or less than 1100 ohm-cm, the sample are required to be tested by a certified lab for chlorides and sulfates per CT 417 and CT 422. Caltrans currently considers a site to be corrosive if one or more of the following conditions exist for the representative soil and/or water samples taken at the site: Chloride concentration is 500 ppm or greater, sulfate concentration is 1500 ppm or greater, or the pH is 5.5 or less. Based on the corrosion test results, the project site is considered non-corrosive per Caltrans corrosion design guidelines.

8.6 Culvert Design

For selection of pipe material for culvert and storm drain applications, it is our understanding that AltPipe computer program is used by Caltrans to assist designer. AltPipe program is a web-based tool (http://dap1.dot.ca.gov//design/altpipe/). The computations performed by AltPipe are based on the procedures and California Test Methods described in the Caltrans Highway Design Manual (HDM). AltPipe incorporates current requirements from the HDM supplemented by Caltrans Design Information Bulletin No. 83 (D.I.B. No. 83, June 30, 2003) for abrasion potential and material selection.

The AltPipe program is intended for final design by the civil or hydraulic designer. In addition to soil corrosivity data provided above, the input requires data such as Abrasion Level, 2-5-year Flow Velocity and height of cover that should be determined while finalizing the drainage design.

8.6.1 Concrete Box Culvert Extension

According to the designer, there is no box culverts on this project. Various sizes of RCP and CMP will be extended based on the "Drainage Plan".

8.7 Minor Structure Foundations

8.7.1 Sound Wall

The foundation design of sound wall is recommended to follow Caltrans Geotechnical Manual (July 2010), hereinafter referred to as "Caltrans Manual". Standard sound wall may be supported on a) pile cap; b) trench footing; and c) spread footing choosing standard design from the current Standard Plans (2015 Standard Plan B15-1 to B-15-15). The objective of a sound wall foundation investigation is to verify if the soil strength at the proposed wall location meets or exceeds the soil strength assumed to design the foundation type and size of the sound wall shown on the Standard Plan Sheets. The recommended design parameters, i.e. soil friction angles, were estimated based on the correlation provided in the Caltrans Manual.

Sound Wall 1 "SW1" 506+93.50 to 508+83.50

Sound Wall No. 1 is located along the NB101 On-Ramp POC. The total wall length is 190 feet with design wall height ranges from 12 feet to 16 feet.

Borings R-18-NO-001, R-18-NO-002 and R-18-NO-003, in the vicinity of the proposed sound wall were referred in the geotechnical recommendations for the foundation design of the sound wall. Based on the available boring data, the subsurface soil conditions consist of medium dense to very dense sand, underlain by soft to very stiff lean clay/silt (with interbedded layers of medium dense sand in Boring R-18-NO-002 and R-18-NO-003), underlain by dense to very dense sand/gravel and very stiff lean/fat clay. Groundwater was measured at elevations between +183 feet and +198 feet. Groundwater elevation of +198 feet is assumed

for the foundation design.

Based on the boring data and the plans provided, the associated design parameters for the proposed sound wall are summarized in the following table.

TABLE 12 – RECOMMENDATIONS FOR SOUND WALL NO. 1

Sound Wall No.	Wall Location "SW1"	Design Wall Height (H)	Foundation Type	Ground Line	Friction Angle (ϕ)
1	506+93.50 to 508+83.50	12 feet – 16 feet	CIDH	Case 2	30

CIDH Concrete Pile Diameter

Based on the "Sound Wall Plan Wall No. 1 (Drawing SW-1)" provided by the designer, the top of pile cap elevation ranges from 210.17 feet to 218.17 feet. Based on Caltrans 2015 Standard Plan "Sound Wall Masonry Block on Pile Cap Details (3)" B15-5, the pile length will be 16'-0" for maximum wall height of 12 feet, 14 feet and 16 feet. Based on the assumed groundwater elevation, the bottom of pile cap footing elevation and the pile length, some of the CIDH concrete piles for the sound wall are anticipated to be below groundwater.

Therefore, the minimum diameter of the CIDH concrete pile will need to be 2 feet with the installation of gamma-gamma tubes according to Caltrans requirements. The pile length can remain the same from the pile capacity standpoint. If "dry hole" condition is encountered in the field, the access tubes for gamma-gamma testing may be removed.

Impact of Potential Liquefaction

Based on the estimated pile tip elevation and the elevation of the potentially liquefiable soil as shown in "Table 6 – Summary of Post-Liquefaction Settlement", the pile tip elevations should be above potentially liquefiable soil. It appears that the impact of the potentially liquefiable soil on the foundation pile of the sound wall should be relatively insignificant. The sound wall is expected to "move with the ground".

9.0 STRUCTURAL PAVEMENT

R-value tests were conducted on representative samples collected at subgrade level. We also refer to the tested R-value obtained in 2003 field exploration. The test results are summarized

in Table 13.

TABLE 13 - SUMMARY OF R-VALUE TEST RESULTS

Location	Test Boring	Approximate Station (ft)	Approx. Existing Ground Elev. (ft)	Soil Description	R-value
Blossom Hill	03-BR-11	"A" 49+75 10' Rt.	219	Clay	12
	03-BR-13	"A" 62+85 0' Lt.	220	Clay with Gravel	22
	A-18-BH-107	"A" 34+00 17' Lt.	226	Clayey Sand	25
Connectors to Monterey Rd X and Y Line	A-18-BH-104	"A" 43+60 274' Lt.	207	Silty Sand	69
	A-18-BH-105	"A" 45+35 55' Lt.	217	Silty Sand	60
	A-18-BH-106	"A" 44+95 97' Rt.	213	Clayey Sand	28
NB101On-Ramp AR-1 Line	R-18-NO-101	"RW1" 7+70 9' Lt.	220	Sandy Clay	12
	R-18-NO-102	"BP" 38+65 16'Rt.	213	Clayey Sand with Gravel	44
	R-18-NO-103	"BP" 40+85 4'Rt.	210	Clayey Sand	22
	R-18-NO-001	"BP" 34+90 19' Lt.	223	Clayey Sand	38
NB101On-Ramp AR-1 Line	R-18-NO-002	"BP" 35+85 28' Rt.	223	Sandy Clay with Gravel	20
	R-18-NO-003	"BP" 37+90 13' Rt.	215	Clayey Sand	47
	A-18-BH-109	"A" 38+20 311' Lt.	205	Clayey Sand	28
NB101 Off-ramp AR-2 Line	03-BR-17	"AR2" 499+95 5' Lt.	211	Sandy Clay	28
SB101 Off-Ramp AR-4 Line	R-18-SO-001	"AR4" 514+75 39' Lt.	221	Clayey Sand	14
	R-18-SO-002	"AL4" 251+90 50' Rt.	220	Sandy Clay with Gravel	57
	R-18-SO-003	"AL4" 251+50 30' Lt.	219	Sandy Clay with Gravel	27

Findings and Recommendations:

The design assumptions and recommendations for the structural pavement are discussed below:

1) Based on the R-value test results, the R-values of the subsurface soils from the soil borings within the project limits range from 12 to 69. The basement soils are mainly silty sand/clayey sand or clay with gravel which are either non-plastic or with relatively low plasticity index.

2) Based on the R-value test results, an R-Value of 10, 15 and 20 are assumed for the native soil materials in the design of structural pavement sections at the following locations.

TABLE 14 - SUMMARY OF R-VALUE FOR PAVEMENT DESIGN

Location	Recommended R-Value for Structural Pavement
Blossom Hill Road A1 Line	10

Location	Recommended R-Value for Structural Pavement
Connectors to Monterey Rd. X & Y Lines	20
NB Diagonal On-Ramp AR-1 Line	10
NB Off-Ramp AR-2 Line	15
SB Off-Ramp AR-4 Line	15
SB Loop On-Ramp AL-4 Line	15

3) Pavement recommendations with imported soil materials are also provided in the following tables as an option for the designer in case it is found necessary at a later stage. The minimum R-value of the imported soil materials should be 15 or above.

4) Based on the "Typical Cross Sections" of the "As-Built Plan (Contract No. 04-117374, Date Completed 10-4-1985), the following are the existing pavement sections at different locations:

TABLE 15 - SUMMARY OF EXISTING PAVEMENT SECTIONS

Location	Structural Pavement Section (feet)			
	AC (A)	CTB (A)	AS (4)	Total Thickness (ft)
Blossom Hill Road A1 Line	0.45	0.85	0.70	2.10
Connectors to Monterey Rd. X & Y Lines	0.45	0.85	0.70	2.10
NB Diagonal On-Ramp AR-1	0.35	0.70	0.60	1.65
NB Off-Ramp AR-2 Line	0.45	0.85	0.70	2.10
SB Off-Ramp AR-4 Line	0.45	0.85	0.70	2.10

5) The new pavement design is according to the guidelines of the Caltrans Highway Design Manual (HDM), using HMA; Aggregate Base (AB) and Aggregate Subbase (AS).

6) The widening of all the off-ramps will be on the high side of the super-elevation. Therefore, if open-graded friction course is used, water will be trapped in the open graded friction course of the widening and the flow will be impeded by the HMA of the existing pavement at the saw cut. Surface runoff will be collected by the sheet flow to the low point of the super-elevation. RHMA-O is not recommended for the off-ramp widening.

7) The following Traffic Index (TI) values were provided by the designer:

TABLE 16 - SUMMARY OF DESIGN TRAFFIC INDEX

Location	Design Life	Traffic Index
Blossom Hill Road A1 Line	20	10

Location	Design Life	Traffic Index
Connectors to Monterey Road X and Y Line	20	10
NB Diagonal On-Ramp AR-1 Line	20	10
NB Diagonal On-Ramp AR-1 Line	40	11
NB Off-Ramp AR-2 Line (medium trucks)	20	10
NB Off-Ramp AR-2 Line (heavy trucks)	20	12
SB Off-Ramp AR-4 Line (medium trucks)	20	10
SB Off-Ramp AR-4 Line (heavy trucks)	20	12
US 101 Median	20	8.5
SB Loop On-Ramp AL-4 (medium trucks) Auxiliary Lane	20	10
SB Loop On-Ramp AL-4 (medium trucks) Auxiliary Lane Shoulder	20	5.5

A memorandum documenting the above Traffic Indices used in the pavement recommendations is included in the Appendix C of the report.

8) Open Graded Rubberized Asphalt (RHMA-O) is only used as a non-structural wearing course and Gap-Graded Rubberized Asphalt (RHMA-G) can be used as either a surface course or a non-structural wearing course. The minimum thickness for RHMA (any type) should be 0.10 foot for new construction and rehabilitation. The maximum thickness of RHMA-G should be 0.20 feet.

9) The recommended minimum R-value for Class 2 Aggregate Subbase (AS) is 50.

10) Based on Section 614.5 of the Highway Design Manual, a Subgrade Enhancement Geotextile (SEGT) (Class B2) is required for flexible pavements when the R-value of the basement soil is less than 20.

Based on the Traffic Indices provided by the designer and the design R-value, the recommended structural pavement sections are shown in the tables below.

TABLE 17A - Recommended Structural Pavement Section-Blossom Hill Road A-1 (All Widening)

Design Life	Traffic Index (TI)	Design R-Value	Option	Structural Pavement Section (feet)				
				RHMA-G	HMA-A	AB (2)	AS (2)	Total Thickness (ft)
20	10.0	10	1	0.15	1.10	-	-	1.25
		10	1a	-	1.25	-	-	1.25
		10	2	0.15	0.40	1.75	-	2.30
		10	2a	-	0.55	1.75	-	2.30
		10	3	0.15	0.40	0.75	1.10	2.40
		10	3a	-	0.55	0.75	1.10	2.40

(1) A layer of SEGT (Class B2) is recommended at the pavement subgrade.

TABLE 17B - Recommended Structural Pavement Section- Connectors to Monterey Road X and Y (All Widening)

Design Life	Traffic Index (TI)	Design R-Value	Option	Structural Pavement Section (feet)				
				RHMA-G	HMA-A	AB (2)	AS (2)	Total Thickness (ft)
20	10.0	20	1	0.15	1.00	-	-	1.15
		20	2	0.15	0.40	1.45	-	2.00
		20	3	0.15	0.40	0.75	0.75	2.05

TABLE 17C - Recommended Structural Pavement Section- NB101 On-Ramp AR-1 Line)

Design Life	Traffic Index (TI)	Design R-Value	Option	Structural Pavement Section (feet)					
				RHMA-O	RHMA-G	HMA-A	AB (2)	AS (2)	Total Thickness (ft)
20	10.0	10	1	0.10	0.15	1.10	-	-	1.35
		10	2	0.10	0.15	0.40	1.75	-	2.40
		10	3	0.10	0.15	0.40	0.75	1.10	2.50
40	11.0	10	4	0.10	0.15	1.25	0.50	-	2.00

(1) A layer of SEGT (Class B2) is recommended at the pavement subgrade.
(2) Extra 0.50 feet of AB (Class 2) is placed underneath the full depth HMA for the over 20-Year Design Life flexible pavement.

TABLE 17D - Recommended Structural Pavement Section- NB101 Off-Ramp AR-2 Line (Medium Trucks)

Design Life	Traffic Index (TI)	Design R-Value	Option	Structural Pavement Section (feet)				
				RHMA-G	HMA-A	AB (2)	AS (2)	Total Thickness (ft)
20	10.0	15	1	0.20	1.00	-	-	1.20
		15	2	0.20	0.35	1.60	-	2.15
		15	3	0.20	0.35	0.75	0.90	2.20

(1) A layer of SEGT (Class B2) is recommended at the pavement subgrade.

TABLE 17E - Recommended Structural Pavement Section- NB101 Off-Ramp AR-2 Line (Heavy Trucks)

Design Life	Traffic Index (TI)	Design R-Value	Option	Structural Pavement Section (feet)				
				RHMA-G	HMA-A	AB (2)	AS (2)	Total Thickness (ft)
20	12.0	15	1	0.20	1.30	-	-	1.50
		15	2	0.20	0.45	1.95	-	2.60
		15	3	0.20	0.45	0.90	1.15	2.70

(1) A layer of SEGT (Class B2) is recommended at the pavement subgrade.

TABLE 17F - Recommended Structural Pavement Section- SB101 Off-Ramp AR-4 Line (Medium Trucks)

Design Life	Traffic Index (TI)	Design R-Value	Option	Structural Pavement Section (feet)				
				RHMA-G	HMA-A	AB (2)	AS (2)	Total Thickness (ft)
20	10.0	15	1	0.20	1.00	-	-	1.20
		15	2	0.20	0.35	1.60	-	2.15
		15	3	0.20	0.35	0.75	0.90	2.20

(1) A layer of SEGT (Class B2) is recommended at the pavement subgrade.

TABLE 17G - Recommended Structural Pavement Section- SB101 Off-Ramp AR-4 Line (Heavy Trucks)

Design Life	Traffic Index (TI)	Design R-Value	Option	Structural Pavement Section (feet)				
				RHMA-G	HMA-A	AB (2)	AS (2)	Total Thickness (ft)
20	12.0	15	1	0.20	1.30	-	-	1.50
		15	2	0.20	0.45	1.95	-	2.60
		15	3	0.20	0.45	0.90	1.15	2.70

(1) A layer of SEGT (Class B2) is recommended at the pavement subgrade.

TABLE 17H - Recommended Structural Pavement Section- US101 Median

Design Life	Traffic Index (TI)	Design R-Value	Option	Structural Pavement Section (feet)				
				RHMA-G	HMA-A	AB (2)	AS (2)	Total Thickness (ft)
20	8.5	10	1	0.20	0.85	-	-	1.05
		10	2	0.20	0.25	1.45	-	1.90
		10	3	0.20	0.25	0.65	0.90	2.00

(1) A layer of SEGT (Class B2) is recommended at the pavement subgrade.

TABLE 17I - Recommended Structural Pavement Section- SB101 Loop On-Ramp AL-4 Line (Medium Trucks) Auxiliary Lane

Design Life	Traffic Index (TI)	Design R-Value	Option	Structural Pavement Section (feet)				
				RHMA-G	HMA-A	AB (2)	AS (2)	Total Thickness (ft)
20	10	15	1	0.20	1.00	-	-	1.20
		15	2	0.20	0.35	1.60	-	2.15
		15	3	0.20	0.35	0.75	0.90	2.20

(1) A layer of SEGT (Class B2) is recommended at the pavement subgrade.

TABLE 17J - Recommended Structural Pavement Section- Maintenance Vehicle Pullout along Existing On-Ramp

Design Life	Traffic Index (TI)	Design R-Value	Option	Structural Pavement Section (feet)				
				RHMA-G	HMA-A	AB (2)	AS (2)	Total Thickness (ft)
20	5.5	15	1	-	0.25	0.45	0.40	1.10

(1) A layer of SEGT (Class B2) is recommended at the pavement subgrade.

RHMA-O: Rubberized Asphalt Concrete (Type O); RHMA-G: Rubberized Asphalt Concrete (Type G);
HMA-A: Hot Mix Asphalt (Type A); AB (Cl. 2): Aggregate Base (Class 2);
AS (Cl. 2): Aggregate Subbase (Class 2)

Note: If RHMA-G (rubberized hot mix asphalt) is required, equal thickness of RHMA-G can be taken from the HMA-A

10.0 MATERIAL SOURCES

There are several commercial sources of asphalt, concrete, and aggregate products in the vicinity of the project area. Some of the available commercial suppliers in the vicinity of the project area are listed in Table 18 below.

TABLE 18 – SOURCE OF IMPORTED BORROW

Source	Location	Approx. Haul Distance from Center of Project (One way, miles)
Concrete Ready Mix, Inc.	33 Hillsdale Ave, San Jose, CA	4.3
West Coast Aggregate	55 Hillsdale Ave, San Jose, CA	4.3
Cemex San Jose	2005 Stone Ave, San Jose, CA	6.0

11.0 MATERIAL DISPOSAL

The project will require disposal of excess excavated material off site. Disposal of Aerially Deposited Lead (ADL) and other contaminated material is beyond the scope of this report.

12.0 CONSTRUCTION CONSIDERATIONS

12.1 Construction Advisories

These sections are written primarily for the engineer responsible for the preparation of plans and specifications. Since these sections identify potential construction issues related to the project, it may also be of use to the Agency's representatives involved in monitoring of construction activity. The field investigation performed by PARIKH primarily addresses design issues and was not planned specifically to identify construction issues.

Majority of the project consists of local road and ramp widening, bridges widening, construction of retaining walls, sound walls and pavement construction; therefore, traffic control is required to maintain traffic flow during construction. Underground utilities should be expected within the project limit. The contractor should verify the utility lines, be aware of the existing conditions and plan the construction activities accordingly.

In our opinion, conventional equipment may be used to excavate the on-site soil materials. The materials to be excavated may consist of soft to very stiff clays with varying amounts of loose to dense sands. Localized subgrade pumping may be encountered during earthwork construction depending on the weather, moisture condition of the subsurface soils, and surface drainage conditions. Equipment mobility may also be difficult if the subgrade is wet. In which case, the subgrade soils may require reworking, aeration, or over-excavation and replacing with dry granular fill to facilitate earthwork construction. It is possible that unknown old buried utilities or abandoned structures, concrete rubble etc. are located along the alignment. It might require special equipment and additional efforts

to remove these buried objects.

Prospective contractors for the project must evaluate construction-related issues on the basis of their own knowledge and experience in the local area, on the basis of similar projects in other localities, or on the basis of field investigation on the site performed by them, taking into account their proposed construction methods and procedures. In addition, construction activities related to excavation and lateral earth support must conform to safety requirements of Occupational Safety Health Administration (OSHA) and other applicable municipal and State regulatory agencies.

Construction Considerations for Cast-In-Drilled-Hole (CIDH) Concrete Piles. Due to the presence of the cohesionless soils, the construction of the CIDH piles for the sound walls, and/or other facilities may be difficult. Such formation may be hard to drill and prone to cave in during excavation. Raveling or caving is expected which may require additional drilling and cleaning effort and may increase the concrete volume for the piles. It is prudent to make the contractor aware of these conditions so that he takes appropriate steps to comply with the standards and maintain the integrity of the CIDH Concrete piles. The use of temporary steel casing should be anticipated at all times to maintain the integrity of the piles. Prior to construction, the qualifications and previous work experience of the potential sub-contractors should be reviewed. The intent is to help select qualified contractors to reduce construction issues.

Caltrans standard specifications and standard special provisions (SSP) for "Cast-in-Place Concrete Piling" should be used for the construction of CIDH piles. Vertical inspection pipes for acceptance testing should be provided in all CIDH piles that are 24 inches in diameter or larger, except when the holes are dry or when the holes are dewatered without the use of temporary casing to control groundwater. The acceptance test should include Gamma-Gamma Logging and may also include cross-hole sonic logging. Gamma-Gamma Logging should be performed in accordance with California Test Method 233 (CT233) to check the homogeneity of the CIDH piles. CT233 defines pile rejection criteria based on the statistical principles of mean and three standard deviations to analyze the homogeneity of a pile. Anomalies detected should be evaluated by the designer for their significance and potential impact on design and to see if mitigation plans are

required. Details of the acceptance testing and Gamma-Gamma Logging are contained in Caltrans SSP and CT233.

All piles excavations should be observed by the geotechnical engineer or regulatory agency prior to the placement of reinforcement and concrete so that if conditions differ from those anticipated, appropriate recommendations can be made.

Groundwater was encountered at various depths in some of the soil borings. Seasonal groundwater fluctuation may saturate the soft/loose native soil within the depth of proposed excavations. This may adversely affect the construction. Localized subgrade pumping may occur during grading operations as well. Assuming a rise of 5 feet in groundwater level from dry season to wet season, groundwater may be encountered at some locations during excavation for retaining wall footing and pavement construction etc. The following can be considered to help mitigate the potential relatively shallow groundwater that may be encountered:

(a) Over-excavate and backfilled with aggregate base

- Over-excavate a minimum depth of 2 feet. Place a layer of high strength geofabric (Mirafi 600X or equivalent) or SEGT over the over-excavated subgrade;
- Place a minimum of 2 feet of compacted aggregate base over the geofabric or SEGT. The ends of the geofabric/SEGT should then be overlapped on top of the aggregate base for a minimum distance of 2 feet.

(b) Plan the construction in the dry season.

12.2 Construction Consideration that Influence Specifications

The contractor should verify the existing utility line conditions. These locations should not be used for stockpiling of borrow materials. Any utility conflicts with proposed construction should also be reviewed prior to construction.

12.3 Construction Monitoring and Instrumentation

The construction monitoring and instrumentation was discussed in Section 8.3.1.

12.4 Hazardous Waste Considerations

The project environmental study report should be referred to for further details about any hazardous materials within the project.

12.5 Differing Site Conditions

The soil conditions described in this report are based on available boring data. It should be noted that these borings depict subsurface soil conditions and groundwater conditions only at the locations drilled and at the time drilled. Because of the variability from place to place within soils in general, and the nature of geologic depositions, subsurface soil conditions and groundwater conditions could change between the explored boring locations.

Early communication should be made between the Resident Engineer, the Contractor and the Geotechnical Engineer as soon as conditions that differ from those established in this report are recognized by any of the parties. Additional recommendations could be provided if such conditions arise.

13.0 RECOMMENDATIONS AND SPECIFICATIONS

13.1 Summary of Recommendations

If the designer has questions or concerns with any of these recommendations, or, if conditions are found to be different during construction, the Geotechnical Engineer who prepared this report should be contacted. Additional fieldwork, analysis or changes in recommendations may be required during the construction phase. These services may be provided under a separate authorization, as necessary. A concise summary of the geotechnical recommendations is presented below:

(a) The boring data indicates that the subsurface soil conditions generally consist of medium stiff to hard lean/fat clay and soft to very stiff silt interbedded with pockets/ lenses/layers of loose to very dense sand (Ref.: Section 7.2)

(b) Groundwater was encountered at the depths between 14 feet and 32.5 feet below existing ground surface and between Elev. +181.0 feet and Elev. +206.0 feet during the field exploration in August/September 2018. (Ref: Section 7.3.2).

(c) The anticipated Peak Ground Acceleration at the project site is 0.63 g. Liquefaction potential is considered low to moderate within the project limit. The impact of liquefaction potential should be relatively minimal for the roadway portion of the project. (Ref: Section 8.1.3)

(d) The settlement due to the raised embankment for the NB101 On-Ramp POC east approach embankment and the fill placement for the path between Blossom Hill Road and SB101 On-Ramp PUC has been evaluated. The upper-bound settlement may be on the order of 0.6 to 1.4 inches. A waiting period of 45 days is recommended for the raised embankment for the NB101 On-Ramp POC east approach embankment prior to the pile installation and construction of the pavement. A waiting period of 45 days is recommended for the fill placement for the path between Blossom Hill Road and SB101 On-Ramp PUC prior to the construction of the pavement. (Ref.: Section 8.3.1).

(e) The structural pavement sections were calculated based on R-Value of 10, 15 and 20 and 20-Year and 40-Year projected Traffic Indices. Structural pavement sections for the project are provided for flexible pavement section (Ref: Section 9).

13.2 Recommended Materials Specifications

13.2.1 Standard Specifications

Unless otherwise stated in the special provisions, all materials specifications should conform to Caltrans Standard Specifications, 2015 or 2018 edition, including but not limited to the following: Earthwork, Structure Backfill, Pervious Backfill Material, Subgrade Enhancement Geotextile, Thermoplastic Pipes, Hot-Mix Asphalt, Aggregate Base, Lean Concrete Base and Permeable Material etc.

13.2.2 Special Provisions

Imported Borrow:

Imported material should be in accordance with the specifications set forth in Caltrans Section 19. In particular the material placed within 4 feet of the finish pavement subgrade should meet the following requirements:

1. Free of organic or other deleterious materials.

2. An R-value of no less than 15.

Aggregate Base: Aggregate Base (Class 2) shall conform to the provisions in Section 26 of the Caltrans Standard Specifications, 2015 or 2018.

Permeable Material: Permeable Materials shall consist of hard, durable, clean sand, gravel or crushed stone and shall be free from organic material, clay balls or other deleterious substances. The percentage composition by weight of Permeable Materials shall conform to the Caltrans 2015 or 2018 Standard Specifications.

14.0 INVESTIGATION LIMITATIONS

Our services consist of professional opinions and recommendations made in accordance with generally accepted geotechnical engineering principles and practices and are based on our field exploration and the assumption that the soil conditions do not deviate from observed conditions.

No warranty, expressed or implied, of merchantability or fitness, is made or intended in connection with our work or by the furnishing of oral or written reports or findings. The scope of our services did not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in structures, soil, surface water, groundwater or air, below or around this site. Unanticipated soil conditions are commonly encountered and cannot be fully determined by taking soil samples and excavating test borings; different soil conditions may require that additional expenditures be made during construction to attain a properly constructed project. Some contingency fund is thus recommended to accommodate these possible extra costs.

This report has been prepared for the project as described earlier, to assist the engineer in the design of this project. In the event any changes in the design or location of the facilities are planned, or if any variations or undesirable conditions are encountered during construction, our findings and recommendations shall not be considered valid unless the changes or variations are reviewed and our recommendations modified or approved by us in writing.

This report is issued with the understanding that it is the designer's responsibility to ensure that the information and recommendations contained herein are incorporated into the project

and that necessary steps are also taken to see that the recommendations are carried out in the field.

The findings in this report are valid as of the present date. However, changes in the soil conditions can occur with the passage of time, whether they are due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or from the broadening of knowledge. Accordingly, the findings in this report might be invalidated, wholly or partially, by changes outside of our control.

Very truly yours,
PARIKH CONSULTANTS, INC.

Alston Lam, P.E., G.E. 2605
Project Engineer

Y. David Wang, Ph.D., P.E., 52911
Senior Engineer

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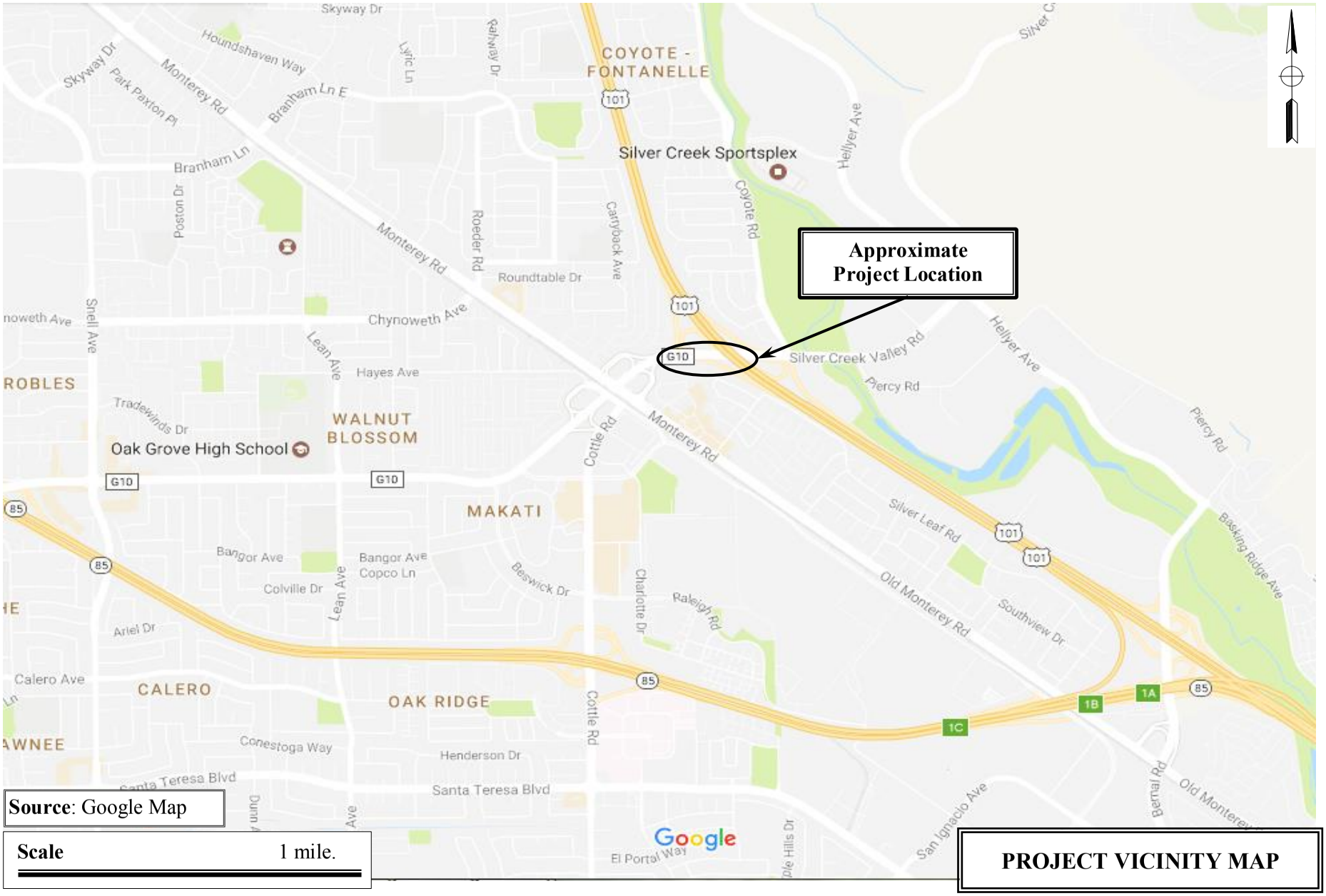
REFERENCES

1. Western Regional Climate Center/Educational and Travel Pages/Average Temperatures/Northern California.
2. Caltrans Department of Transportation, 2010, Soil & Rock Logging, Classification, and Presentation Manual, Office of Structural Foundations California Department of Transportation.
3. Geologic Map of the San Francisco Bay Region by R.W. Graymer et. Al.
4. Caltrans ARS Online Tool (Ver. 2.3.09), http://dap3.dot.ca.gov/ARS_Online/.
5. Caltrans Bridge Design Specifications (November 2003)
6. Caltrans Department of Transportation, "Seismic Design Criteria", Version 1.7, April 2013.
7. California Department of Transportation, Highway Design Manual, sixth edition, November 20, 2017.
8. California Department of Transportation, 2015, Standard Specifications, Sections 1 through



PROJECT VICINITY MAP

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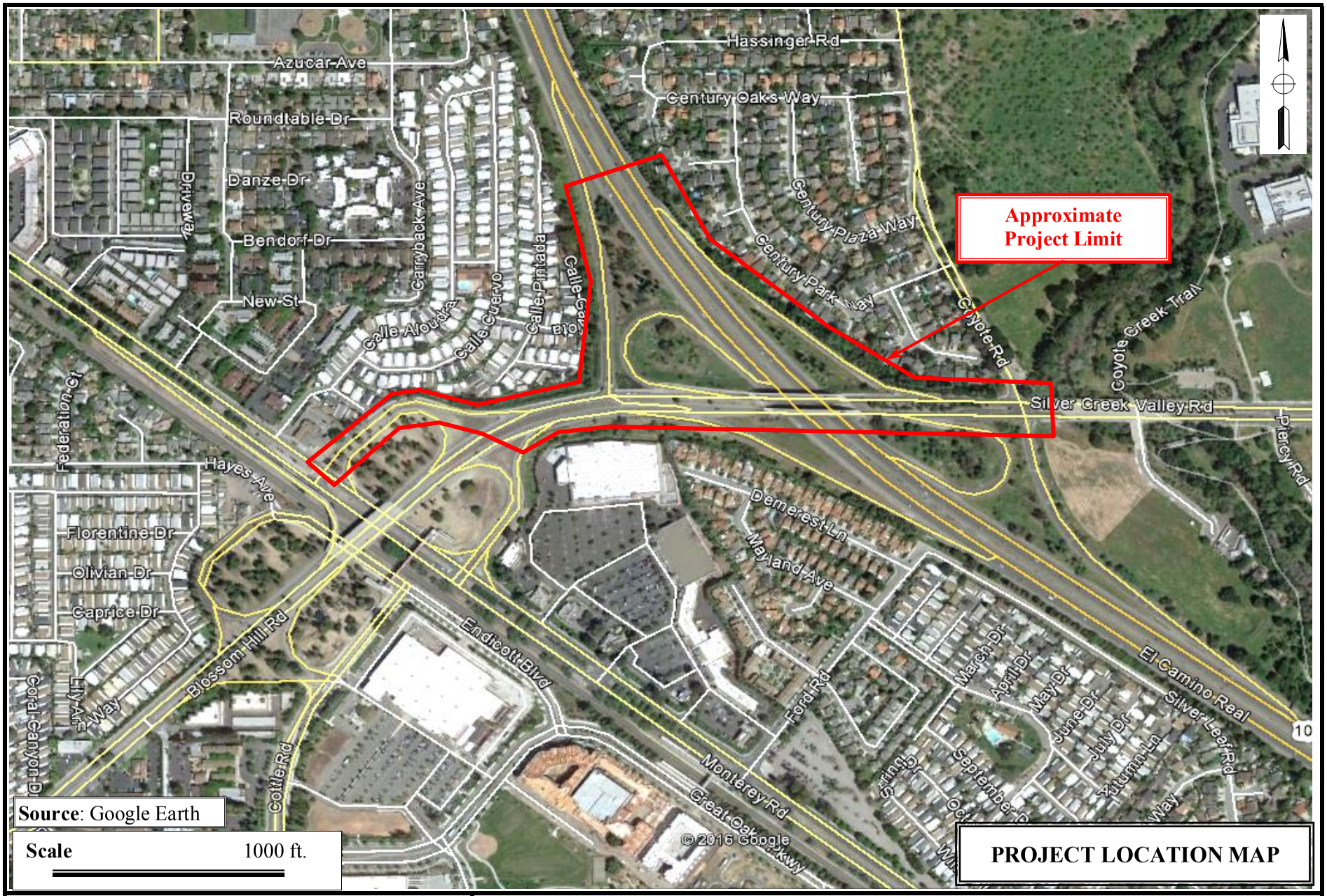
US 101/Blossom Hill Road Interchange Improvement Project
San Jose, California

JOB NO.: 2016-146-GDR	PLATE NO.: 1



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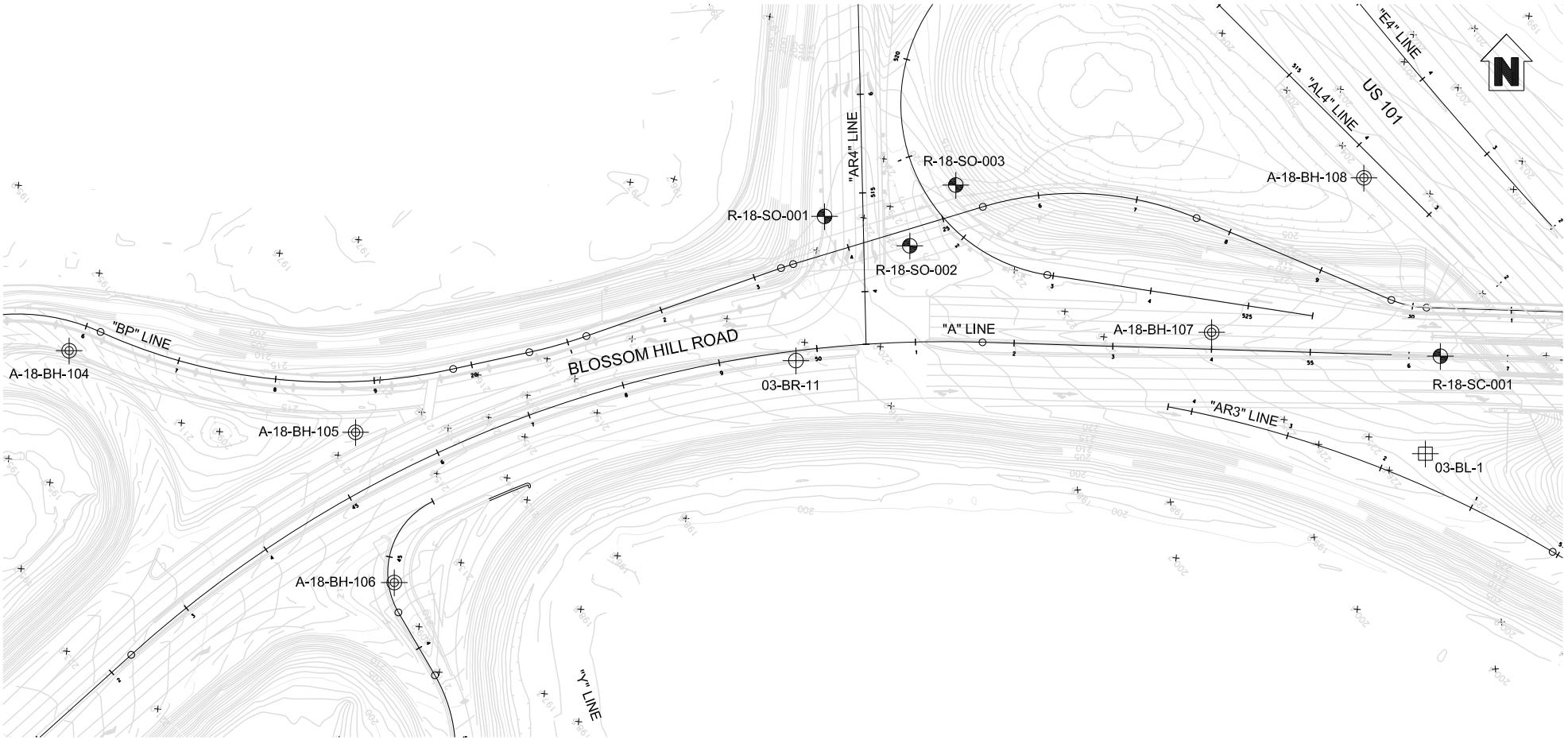
US 101/Blossom Hill Road Interchange Improvement Project
San Jose, California

JOB NO.: 2016-146-GDR	PLATE NO.: 2



LEGEND

A-18-SC-001
Approx. Boring Location (Drilled by PARIKH in 2018)

CPT-18-SC-003
Approx. CPT Location (Pushed by PARIKH in 2018)

A-18-BH-104
Approx. Boring (5 feet) Location (Drilled by PARIKH in 2018)

03-BL-1
Approx. Boring Location (Drilled by PARIKH in 2003)

03-BR-13
Approx. Boring (5 feet) Location (Drilled by PARIKH in 2003)

SCALE: 1 inch = 200 feet

Note: All units are in feet unless otherwise specified
Reference Map was provided by HMH Engineers.

BORING LOCATION MAP

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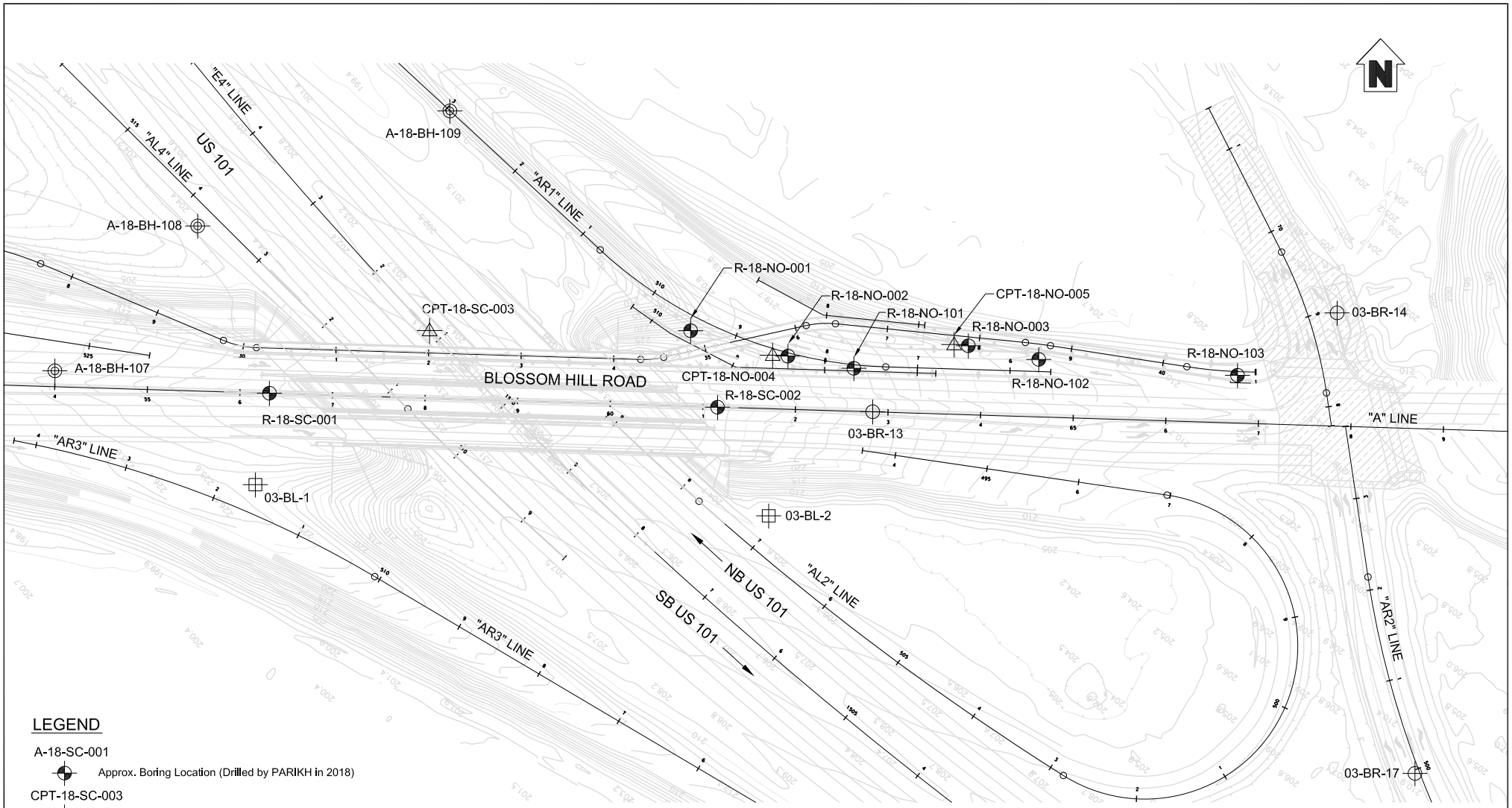
US 101/BLOSSOM HILL ROAD INTERCHANGE IMPROVEMENT PROJECT
SAN JOSE, CALIFORNIA

JOB NO.:2016-146-GDR | PLATE NO: 3A



LEGEND

A-18-SC-001
Approx. Boring Location (Drilled by PARIKH in 2018)

CPT-18-SC-003
Approx. CPT Location (Pushed by PARIKH in 2018)

A-18-BH-104
Approx. Boring (5 feet) Location (Drilled by PARIKH in 2018)

03-BL-1
Approx. Boring Location (Drilled by PARIKH in 2003)

03-BR-13
Approx. Boring (5 feet) Location (Drilled by PARIKH in 2003)

SCALE: 1 inch = 200 feet

Note: All units are in feet unless otherwise specified
Reference Map was provided by HMH Engineers.

BORING LOCATION MAP

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US 101/BLOSSOM HILL ROAD INTERCHANGE IMPROVEMENT PROJECT
SAN JOSE, CALIFORNIA

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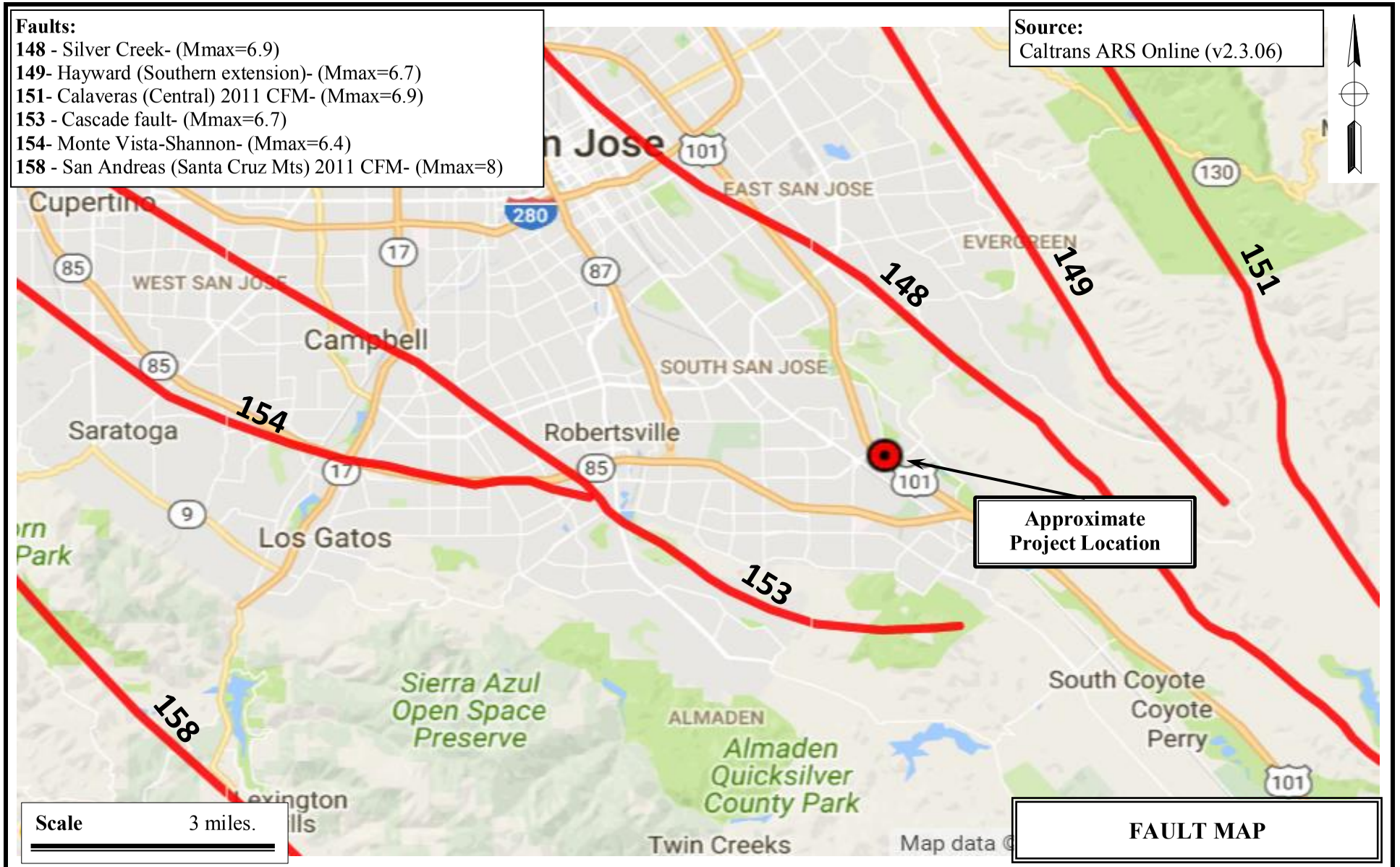

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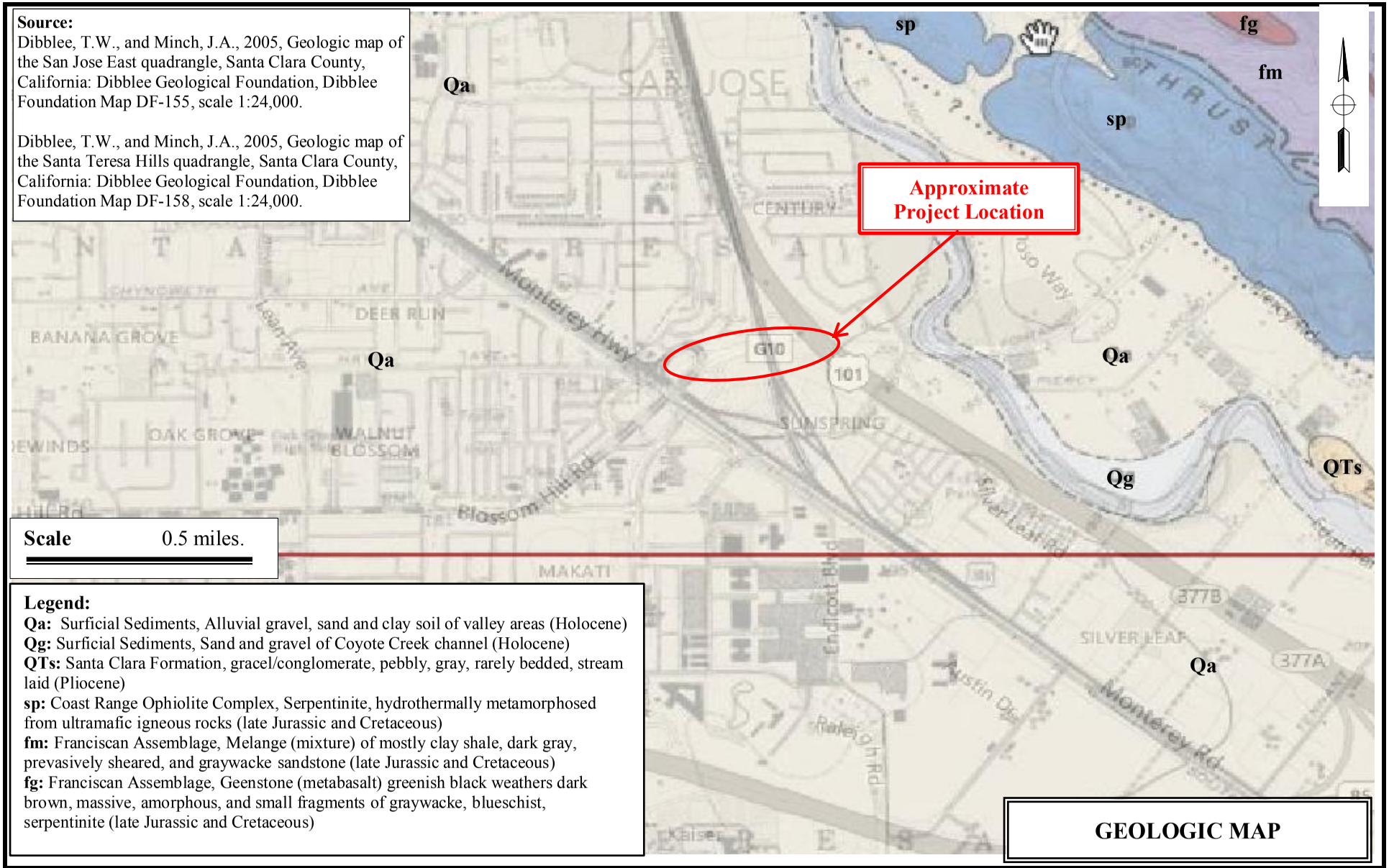
US 101/Blossom Hill Road Interchange Improvement Project
San Jose, California

JOB NO.: 2016-146-GDR	PLATE NO.: 4



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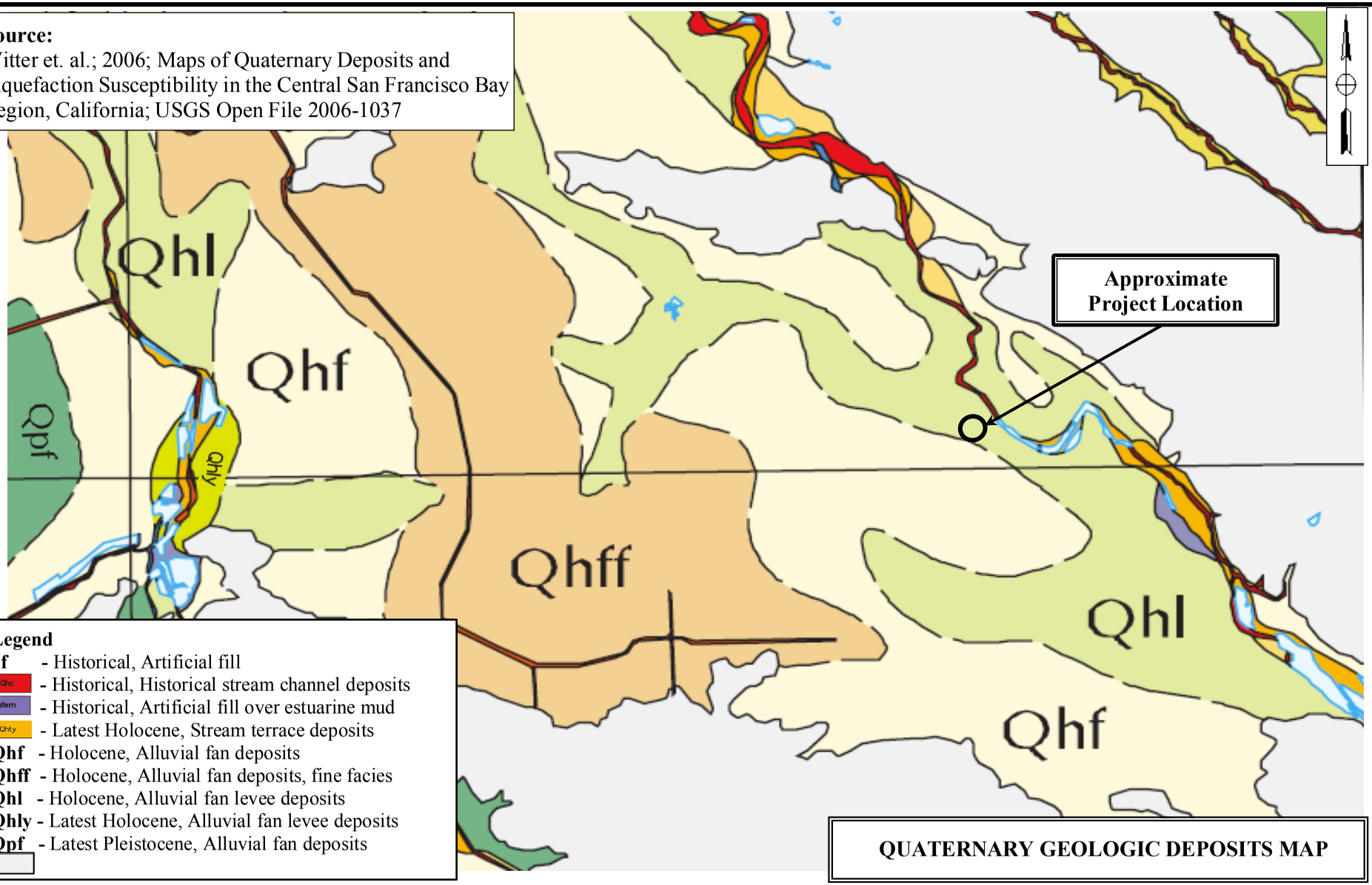
US 101/Blossom Hill Road Interchange Improvement Project
San Jose, California

JOB NO.: 2016-146-GDR	PLATE NO.: 5

Source:
Witter et. al.; 2006; Maps of Quaternary Deposits and Liquefaction Susceptibility in the Central San Francisco Bay Region, California; USGS Open File 2006-1037



Legend

- **af** - Historical, Artificial fill
- Qhc - Historical, Historical stream channel deposits
- afem - Historical, Artificial fill over estuarine mud
- Qhty - Latest Holocene, Stream terrace deposits
- **Qhf** - Holocene, Alluvial fan deposits
- **Qhff** - Holocene, Alluvial fan deposits, fine facies
- **Qhl** - Holocene, Alluvial fan levee deposits
- **Qhly** - Latest Holocene, Alluvial fan levee deposits
- **Qpf** - Latest Pleistocene, Alluvial fan deposits

QUATERNARY GEOLOGIC DEPOSITS MAP

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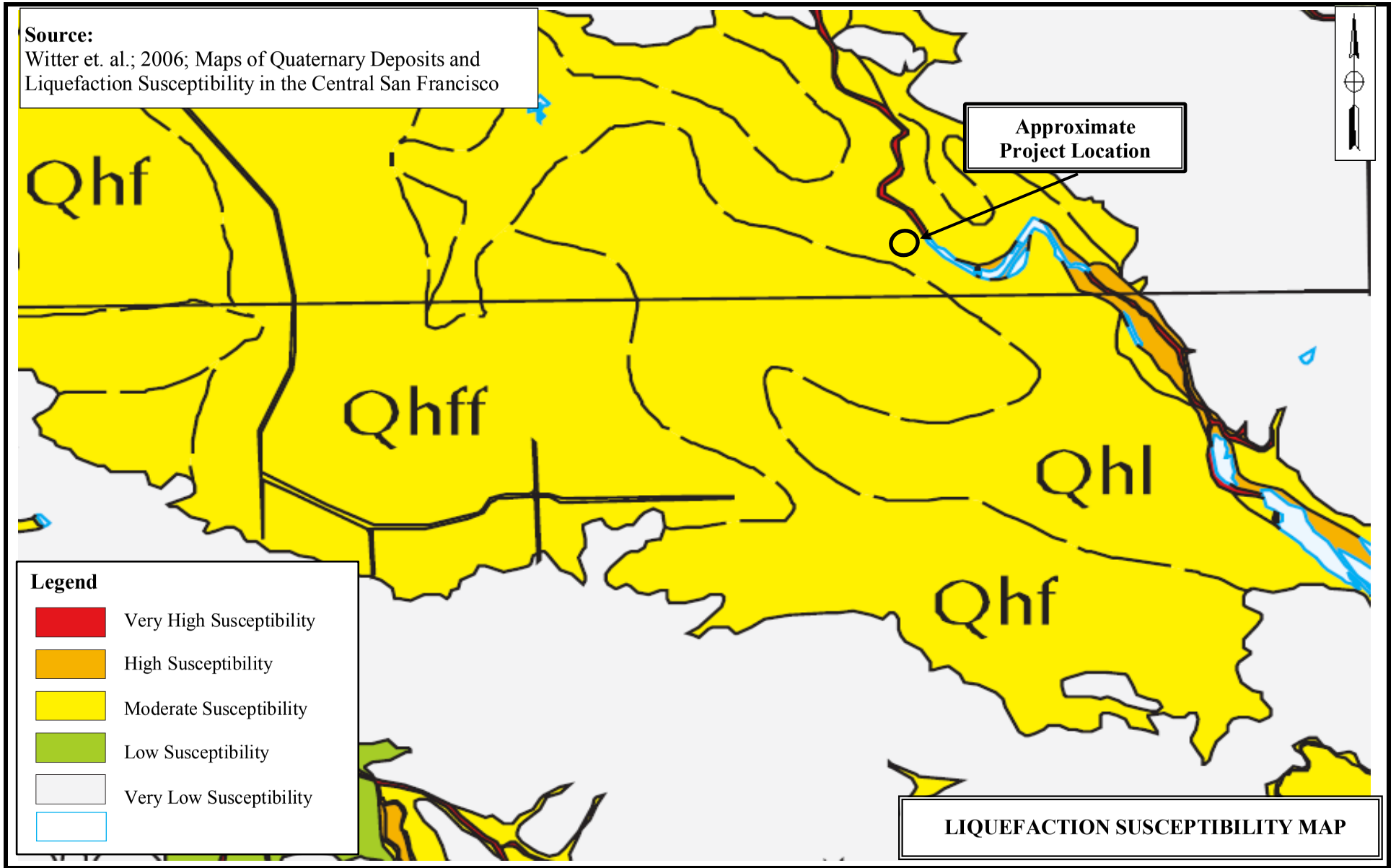
US 101/Blossom Hill Road Interchange Improvement Project
San Jose, California

JOB NO.: 2016-146-GDR	PLATE NO.: 6



PARIKH
Practicing in the Geosciences

US 101/Blossom Hill Road Interchange Improvement Project
San Jose, California

JOB NO.: 2016-146-GDR	PLATE NO.: 7

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	101	R28.4/R28.9		

Linda M Grevera 01-20-20
REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

LINDA M. GREVERA No. 43591 Exp. CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

HMH
1570 OAKLAND ROAD
SAN JOSE, CA 95131

CITY OF SAN JOSE
DEPARTMENT OF TRANSPORTATION
200 E. SANTA CLARA STREET
SAN JOSE, CA 95113

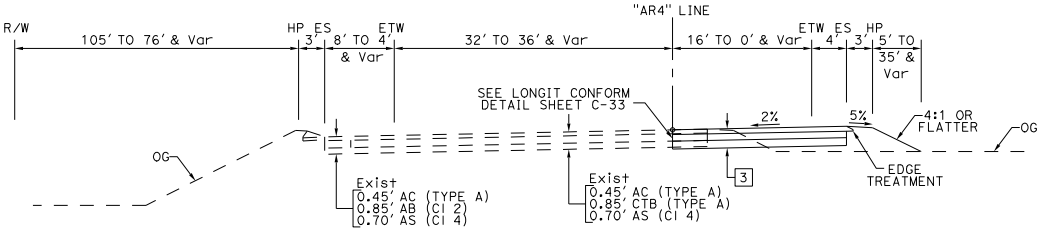
NOTES:

1. DIMENSIONS OF THE PAVEMENT STRUCTURES (STRUCTURAL SECTIONS) ARE SUBJECT TO TOLERANCES SPECIFIED IN THE STANDARD SPECIFICATIONS.
2. SUPERELEVATIONS ARE SHOWN ON THE SUPERELEVATION DIAGRAMS.
3. ALL EXISTING STRUCTURAL SECTIONS SHOWN ARE BASED ON PREVIOUS AS-BUILTS AND ARE CONSIDERED APPROXIMATE.
4. FOR LOCATION AND TYPES OF DIKES, CURBS, MGS AND BARRIERS, SEE THE "L" AND "C" SHEETS.
5. FOR LOCATION AND TYPES OF DRAINAGE DITCHES, SEE THE DRAINAGE PLANS.
6. FOR LOCATION OF SAWCUT LINES, SEE THE "L" AND "C" SHEETS.
7. FOR SLOPE ROUNDING, SEE CONSTRUCTION DETAILS.
8. WHENEVER A FILL SLOPE IS STEEPER THAN 4:1, THE SUBBASE IS TO BE EXTENDED TO THE FILL SLOPE.
9. EXISTING UTLITIES HAVE NOT BEEN PLOTTED ON THESE TYPICAL CROSS SECTIONS.
10. FOR LOCATION OF "(WHERE SHOWN)" WORK ITEMS, SEE THE "L" AND "C" SHEETS.

DESIGN DESIGNATION

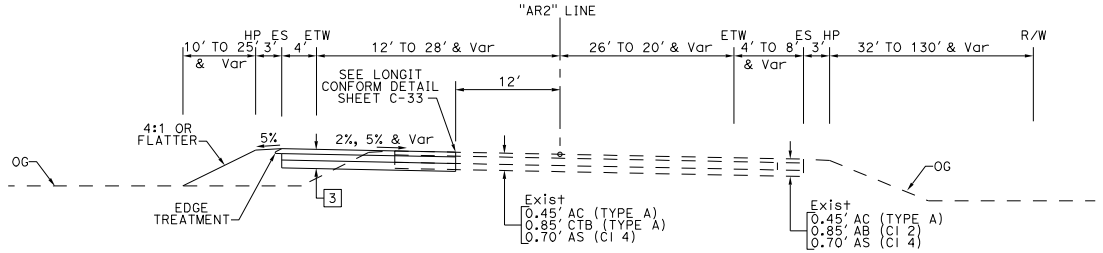
ADT (2017)	160,700	D	55.0%
ADT (2040)	200,000	T	8.0%
DHV	12,000	V	80 mph
ESAL	37,500,000	TI_{20}	14.0

PAVEMENT CLIMATE REGION: CENTRAL COAST



"AR4" 514+87 TO "AR4" 519+13

ROUTE 101
SB OFF-RAMP TO BLOSSOM HILL Rd



"AR2" 498+84 TO "AR2" 503+27

ROUTE 101
NB OFF-RAMP TO BLOSSOM HILL Rd

TYPICAL STRUCTURE SECTIONS

*	1	0.15' RHMA-G 0.40' HMA (TYPE A) 0.75' AB (CLASS 2) 1.10' AS (CLASS 2)
*	2	0.10' RHMA-O 0.15' RHMA-G 1.25' HMA (TYPE A) 0.50' AB (CLASS 2)
*	3	0.20' RHMA-G 0.35' HMA (TYPE A) 0.75' AB (CLASS 2) 0.90' AS (CLASS 2)
*	4	0.15' RHMA-G 0.40' HMA (TYPE A) 0.75' AB (CLASS 2) 0.75' AS (CLASS 2)
*	5	0.25' HMA (TYPE A) 0.50' AB (CLASS 2)
	6	0.33' PCC 0.50' AB (CLASS 2)
*	7	0.25' HMA (TYPE A) 0.45' AB (CLASS 2) 0.40' AS (CLASS 2)
*	8	0.20' RHMA-G 0.25' HMA (TYPE A) 0.65' AB (CLASS 2) 0.90' AS (CLASS 2)
	9	0.15' RHMA-G 1.20' HMA (TYPE A) 0.33' AB (CLASS 2)
	10	COLD PLANE 0.15' AC Pvmt 0.15' RHMA-G
	11	COLD PLANE 0.15' AC Pvmt 0.15' RHMA-G HMA LEVELING COURSE (Var)

* INSTALL SUBGRADE ENHANCEMENT GEOTEXTILE (CLASS B-2)

TYPICAL CROSS SECTIONS

NO SCALE

X-1

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CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR
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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	101	R28.4/R28.9		

Linda M Grevera 01-20-20
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PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — LINDA M. GREVERA — No. 43591 — Exp. — CIVIL — STATE OF CALIFORNIA

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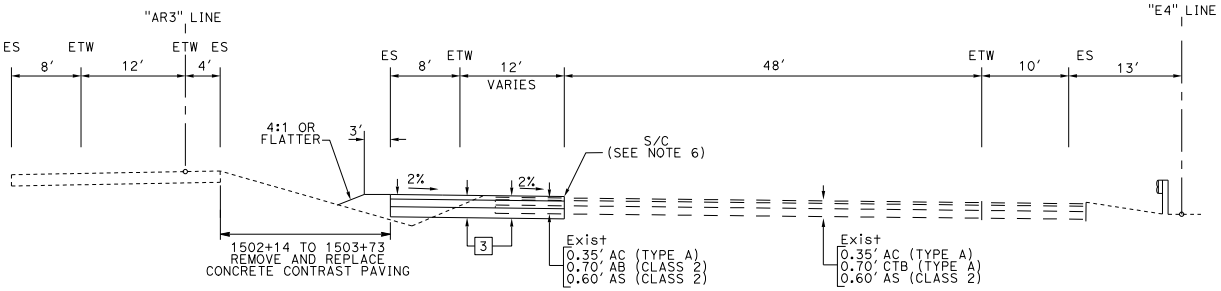
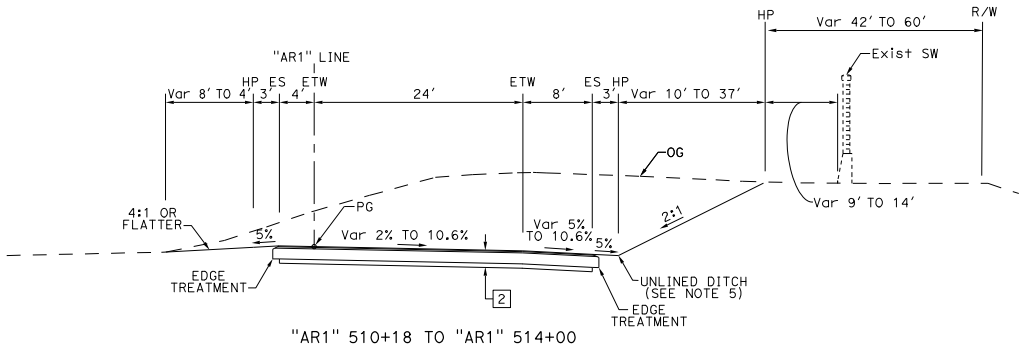


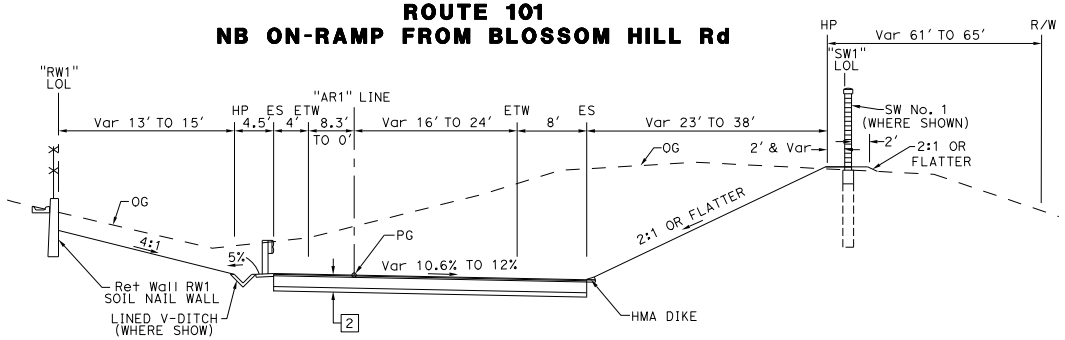
"E4" 1502+14 TO 1508+39.43

ROUTE 101 AUXILIARY LANE AT SB LOOP ON-RAMP FROM BLOSSOM HILL Rd



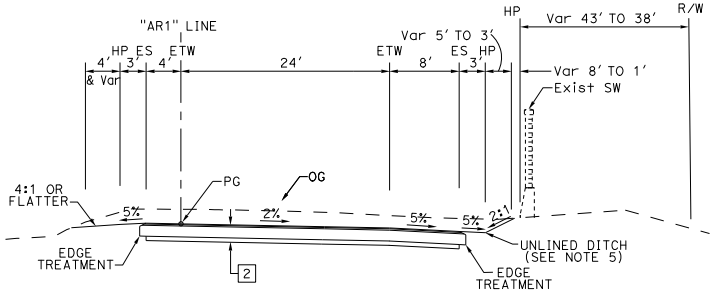
"AR1" 510+18 TO "AR1" 514+00

ROUTE 101 NB ON-RAMP FROM BLOSSOM HILL Rd



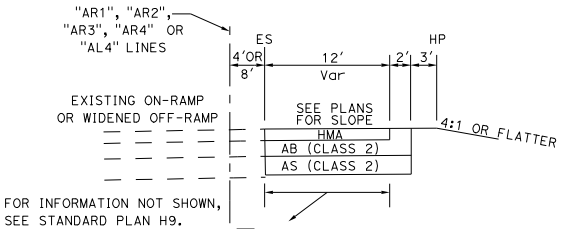
"AR1" 508+21 TO "AR1" 510+18

ROUTE 101 NB ON-RAMP FROM BLOSSOM HILL Rd



"AR1" 514+00 TO "AR1" 517+02

ROUTE 101 NB ON-RAMP FROM BLOSSOM HILL Rd



2 "AR1" 515+00 TO "AR1" 515+85
3 "AR2" 500+00 TO "AR2" 500+85
"AR4" 507+08 TO "AR4" 507+93
7 "AR3" 506+00 TO "AR1" 506+85
"AL4" 516+05 TO "AL4" 516+97

MAINTENANCE VEHICLE PULLOUT (MVP)

TYPICAL CROSS SECTIONS

NO SCALE

FOR NOTES, LEGEND &/OR ABBREVIATIONS, SEE SHEET X-1

X-2

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCl	101	R28.4/R28.9		

Linda M Grevera 01-20-20
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REGISTERED PROFESSIONAL ENGINEER
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No. 43591
Exp. CIVIL
STATE OF CALIFORNIA

PLANS APPROVAL DATE

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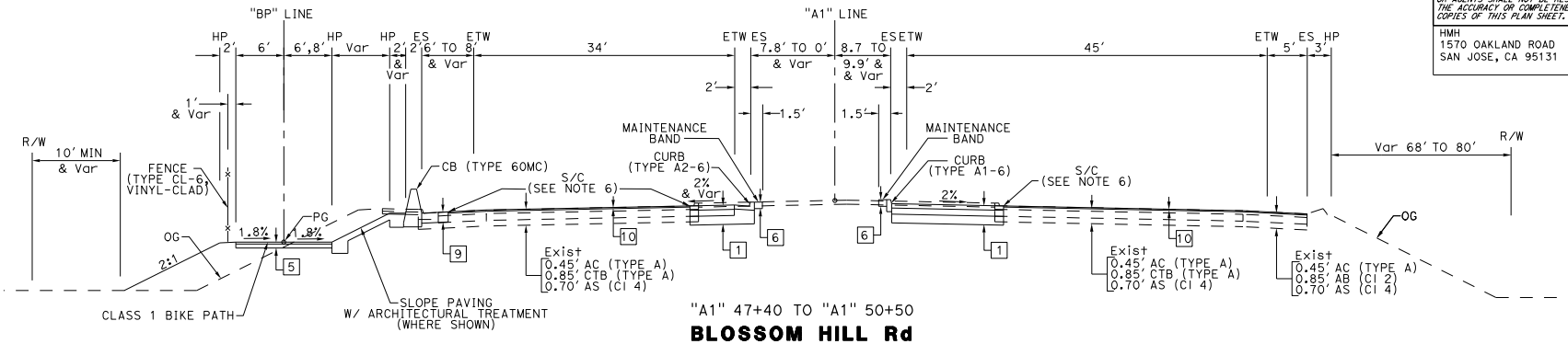
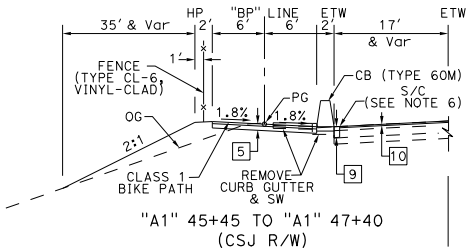
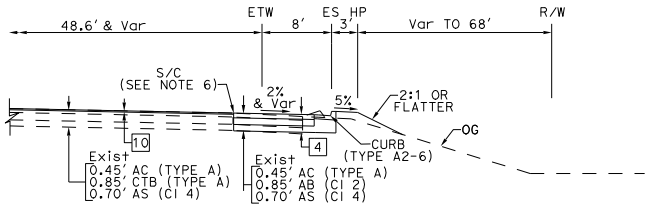


"A1" 47+40 TO "A1" 50+50

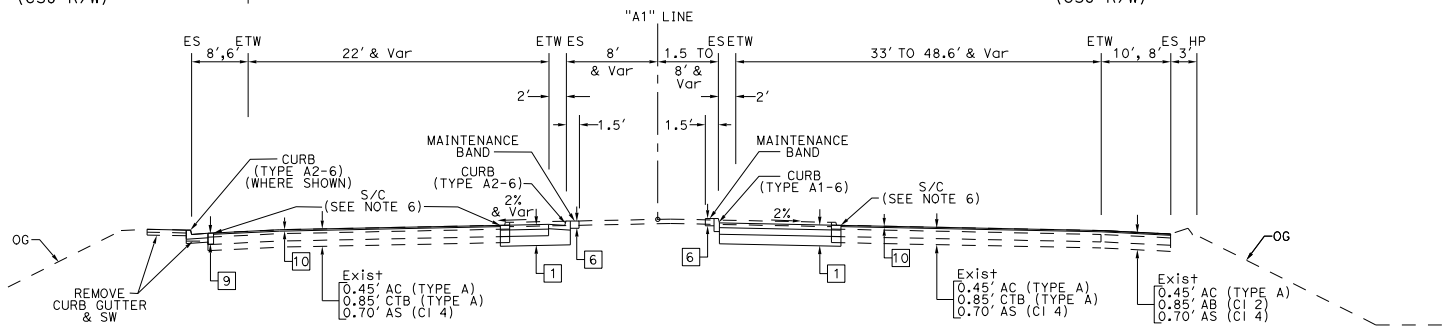
BLOSSOM HILL Rd
(CSJ R/W)



"A1" 45+45 TO "A1" 47+40
(CSJ R/W)



"A1" 45+74 TO "A1" 47+80
(CSJ R/W)



"A1" 42+66 TO "A1" 47+40

BLOSSOM HILL Rd
(CSJ R/W)

TYPICAL CROSS SECTIONS

NO SCALE

FOR NOTES, LEGEND &/OR ABBREVIATIONS, SEE SHEET X-1

X-3

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TIME PLOTTED => 14:59

BORDER LAST REVISED 7/2/2010
USERNAME => mabay
DGN FILE => 460500ca003.dgn
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
UNIT 0000
PROJECT NUMBER & PHASE 0416000224

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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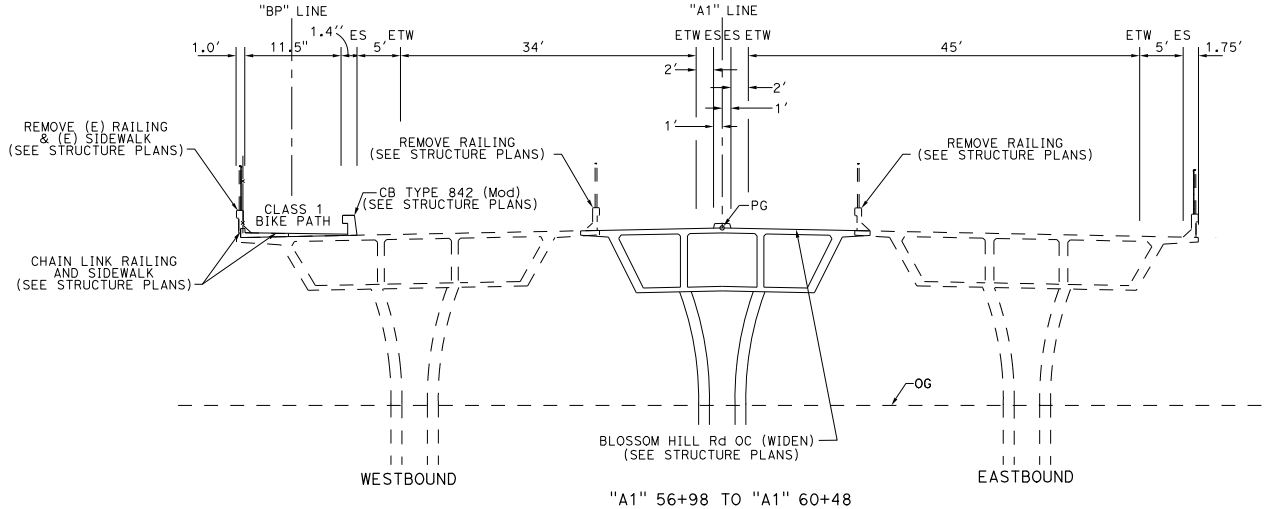
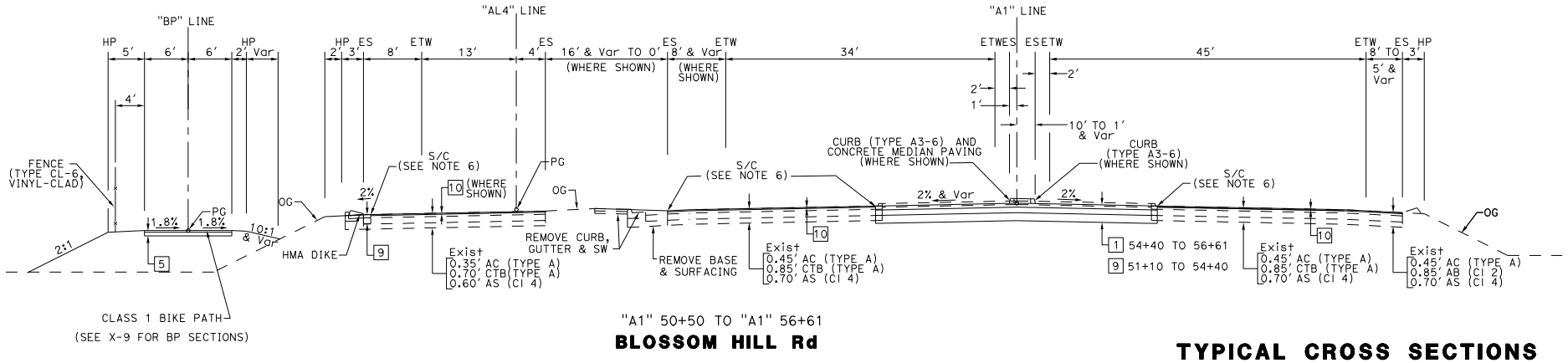


"A1" 56+98 TO "A1" 60+48

BLOSSOM HILL Rd OC



"A1" 50+50 TO "A1" 56+61

BLOSSOM HILL Rd

TYPICAL CROSS SECTIONS

NO SCALE

FOR NOTES, LEGEND &/OR ABBREVIATIONS, SEE SHEET X-1

X-4

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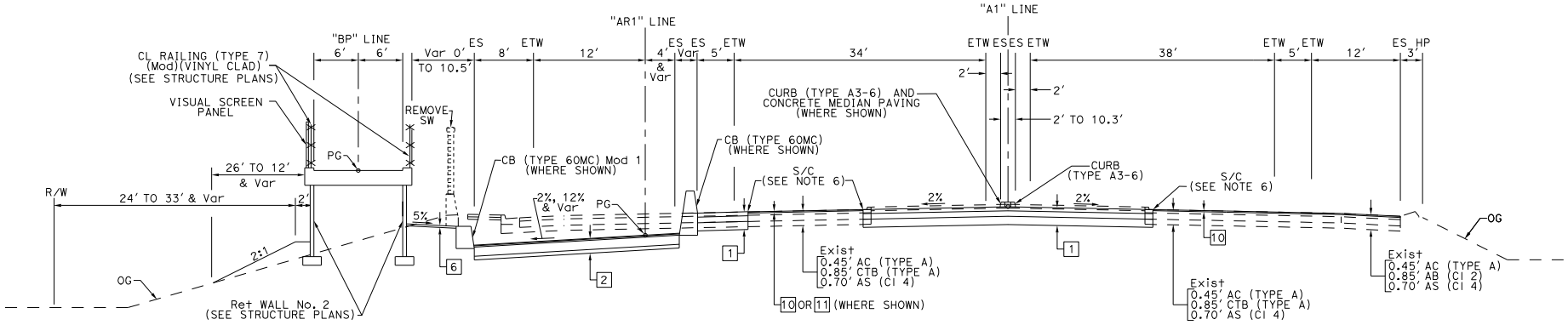
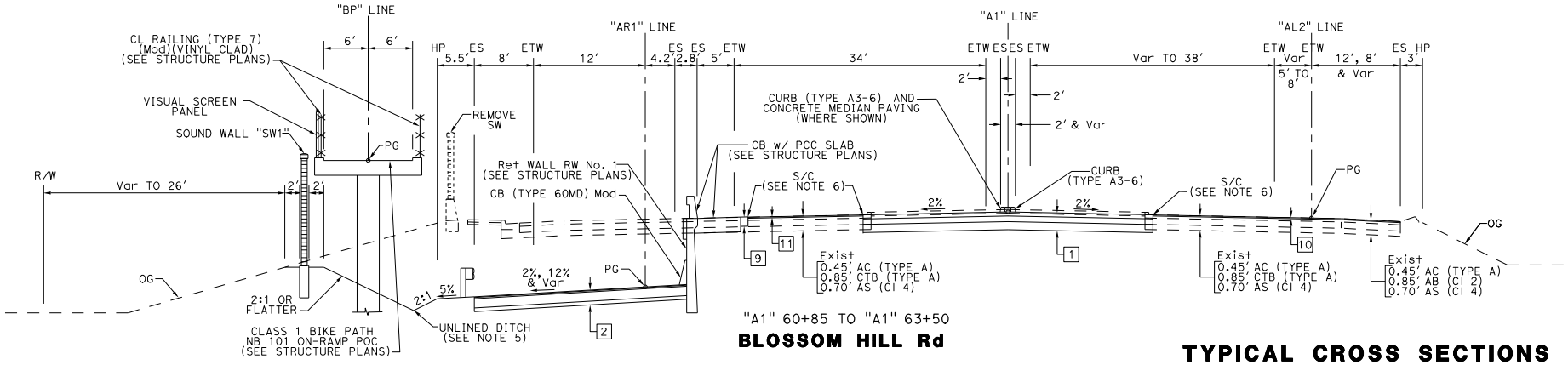


"A1" 63+50 TO "A1" 64+50

BLOSSOM HILL Rd



"A1" 60+85 TO "A1" 63+50

BLOSSOM HILL Rd

TYPICAL CROSS SECTIONS

NO SCALE

FOR NOTES, LEGEND &/OR ABBREVIATIONS, SEE SHEET X-1

X-5

LAST REVISION 02-25-19 | DATE PLOTTED => 14-JAN-2020 | TIME PLOTTED => 14:59

BORDER LAST REVISED 7/2/2010 | USERNAME => mabay | DGN FILE => 460500ca005.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0000 | PROJECT NUMBER & PHASE 0416000224

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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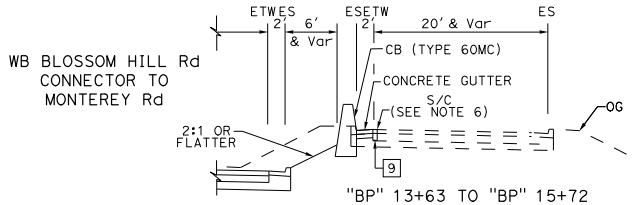
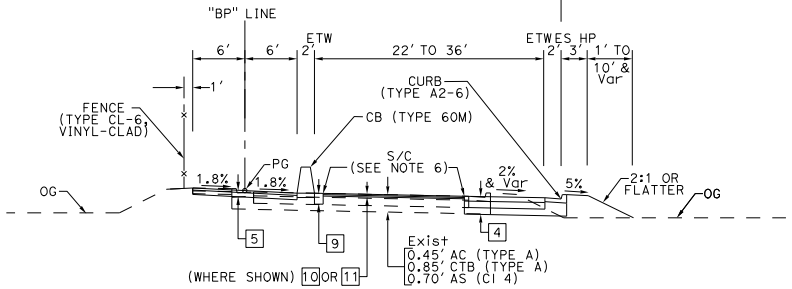
MONTEREY Rd LOOP CONNECTOR TO WB BLOSSOM HILL Rd



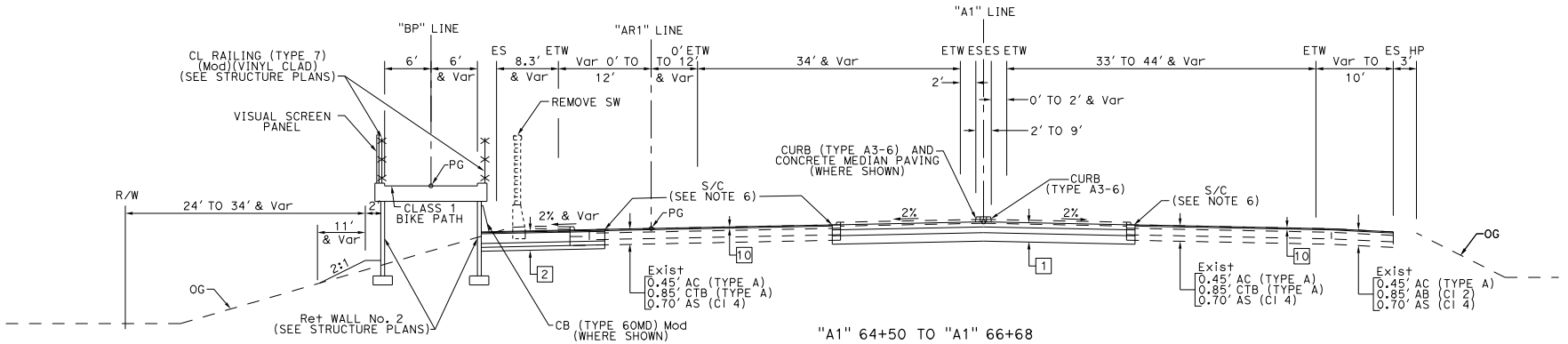
"BP" 13+63 TO "BP" 15+72



"BP" 12+28 TO "BP" 19+37

WB BLOSSOM HILL Rd CONNECTOR TO MONTEREY Rd

(CSJ R/W)



"A1" 64+50 TO "A1" 66+68

BLOSSOM HILL Rd

TYPICAL CROSS SECTIONS

NO SCALE

FOR NOTES, LEGEND &/OR ABBREVIATIONS, SEE SHEET X-1

X-6

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DGN FILE => 460500ca006.dgn
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
UNIT 0000
PROJECT NUMBER & PHASE 0416000224

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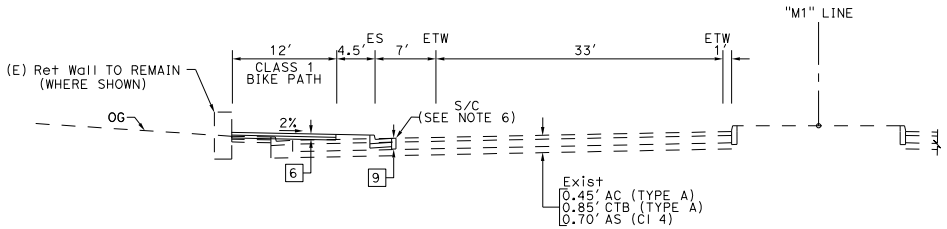
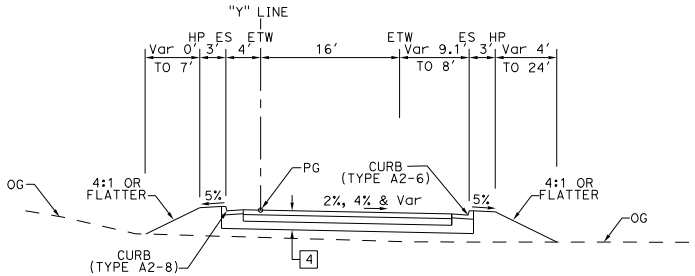


"M1" 204+00 TO "M1" 207+40

MONTEREY Rd

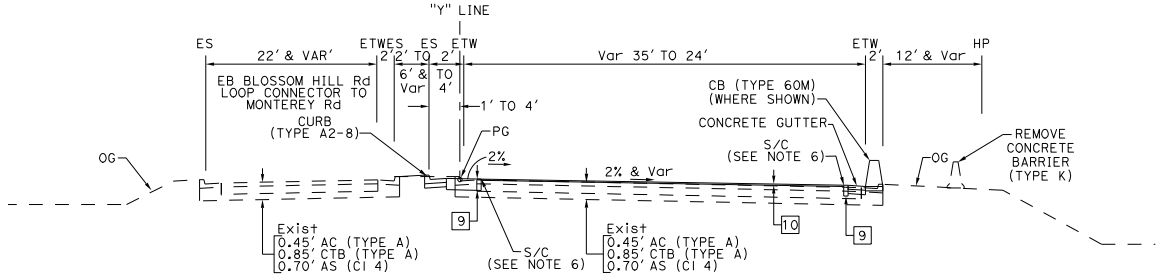
(CSJ R/W)



"Y" 43+66 TO "Y" 45+15

MONTEREY Rd CONNECTOR TO EB BLOSSOM HILL Rd

(CSJ R/W)



"Y" 41+82 TO "Y" 43+66

MONTEREY Rd CONNECTOR TO EB BLOSSOM HILL Rd

(CSJ R/W)

TYPICAL CROSS SECTIONS

NO SCALE

X-7

FOR NOTES, LEGEND &/OR ABBREVIATIONS, SEE SHEET X-1

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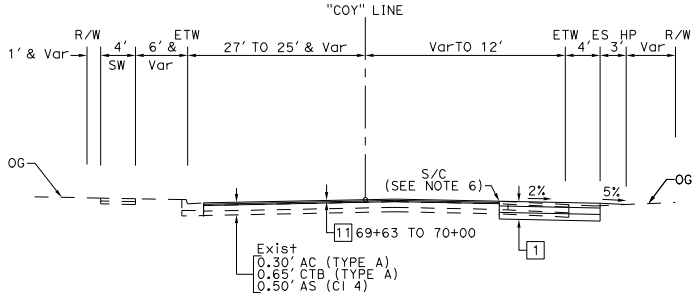
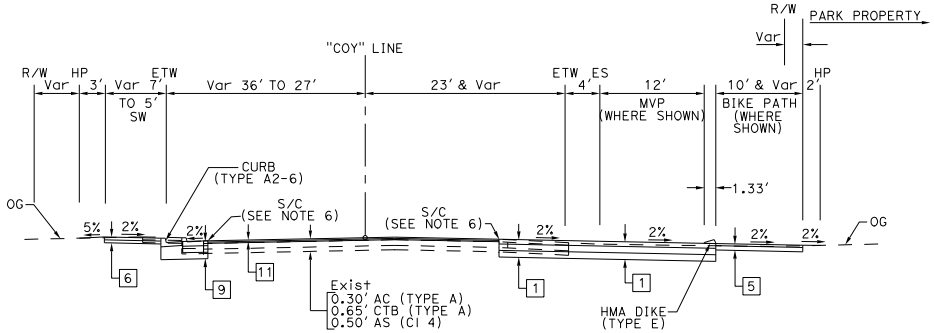


"COY" 69+63 TO "COY" 70+95

COYOTE Rd



"COY" 68+53 TO "COY" 69+63

COYOTE Rd

FOR NOTES, LEGEND &/OR ABBREVIATIONS, SEE SHEET X-1

TYPICAL CROSS SECTIONS

NO SCALE

X-8

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION | CONSULTANT FUNCTIONAL SUPERVISOR: WILLIAM J. WAGNER | CALCULATED-DESIGNED BY | CHECKED BY | REVISED BY | DATE REVISED

BORDER LAST REVISED 7/2/2010 | USERNAME => mabay | DGN FILE => 460500ca008.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0000 | PROJECT NUMBER & PHASE 0416000224

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	101	R28.4/R28.9		

Linda M Grevera 01-20-20
REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — LINDA M. GREVERA — No. 43591 — Exp. — CIVIL — STATE OF CALIFORNIA

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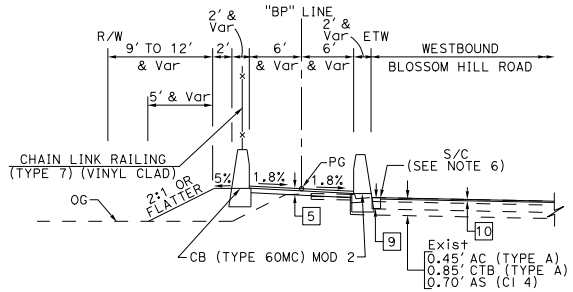
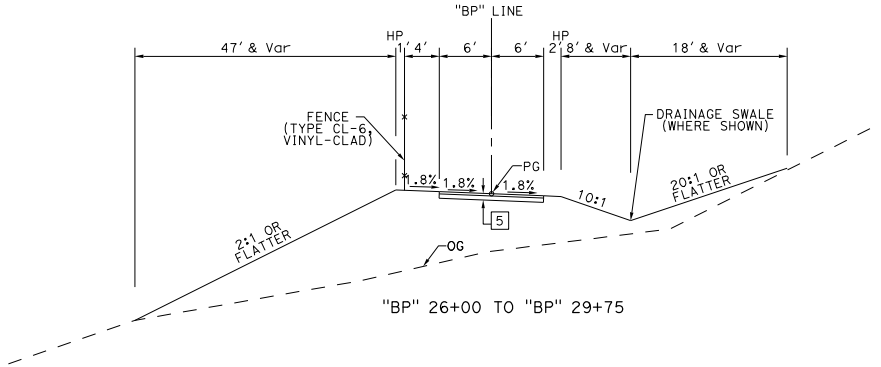
HMH
1570 OAKLAND ROAD
SAN JOSE, CA 95131

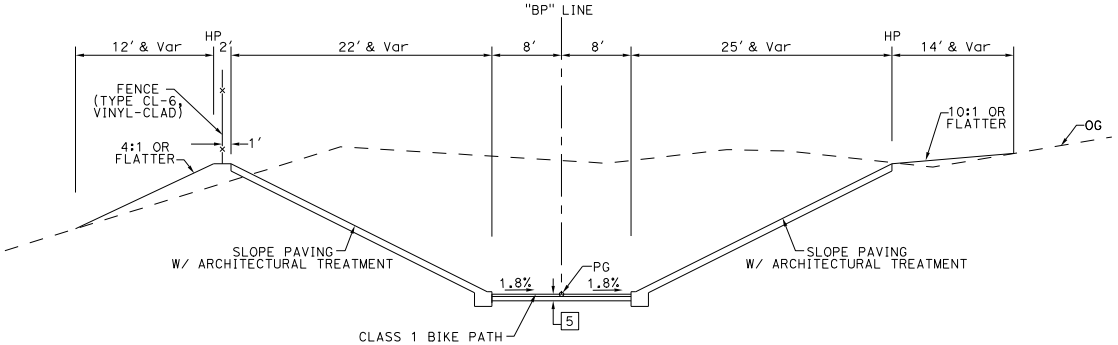
CITY OF SAN JOSE
DEPARTMENT OF TRANSPORTATION
200 E. SANTA CLARA STREET
SAN JOSE, CA 95113



"BP" 40+00 TO "BP" 40+77



"BP" 26+00 TO "BP" 29+75



"BP" 24+40 TO "BP" 24+90

TYPICAL CROSS SECTIONS

NO SCALE

X-9

FOR NOTES, LEGEND &/OR ABBREVIATIONS, SEE SHEET X-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: WILLIAM J. WAGNER
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 02-25-19
DATE PLOTTED => 14-JAN-2020
TIME PLOTTED => 14:59

BORDER LAST REVISED 7/2/2010
USERNAME => mabay
DGN FILE => 460500ca009.dgn
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
UNIT 0000
PROJECT NUMBER & PHASE 0416000224

APPENDIX A

APPENDIX A

FIELD EXPLORATION

The test borings were advanced with a truck-mounted drill rig using 8-inch diameter hollow-stem auger and 5-inch diameter rotary wash drilling method. Selected drive samples were obtained from the borings at various depths using a 2.5 inches I.D. Modified California Sampler or a 1.375 inches I.D. Standard Penetration Sampler (ASTM Test Method No. 1586). The sampler was driven into the subsurface soils under the impact of a 140 pounds hammer having a free fall of 30 inches. The blow counts required to drive the sampler for the last 12 inches are presented on the boring logs in the Log of Test Borings (LOTB), Appendix A. (When correlating standard penetration data, the blow counts for the Modified California Sampler can be taken as roughly twice that for the Standard Penetration Test in similar soils). Pocket penetration tests were also performed on clay samples to evaluate their consistency. The borings were drilled under the technical supervision of our engineer, who visually classified in the field (according to the Unified Soil Classification System) and logged the soils encountered during drilling. The engineer supervised the collection and transportation of soil samples at various depths for visual examination and laboratory testing. Upon completion of drilling, all the borings were backfilled with cement grout and grouted to the ground surface.

The descriptions of the soils encountered and relevant boring information are presented on the boring logs in the LOTB in Appendix A. The logs presented in Appendix A were prepared from the field logs which were edited after visual re-examination of the soil samples in the laboratory and results of classification tests on selected soil samples as indicated on the logs.

The descriptions and related information presented on the boring logs in the LOTB depict subsurface conditions only at the locations indicated on the plan and on the particular date noted on the logs. Because of the variability from place to place within soil/rock in general, subsurface conditions at other locations may differ from conditions occurring at the locations explored. The abrupt stratum changes shown on the logs may be gradational and relatively minor changes in soil types within a stratum may not be noted on the logs due to field limitations. Also, the passage of time may result in a change in the soil conditions at these locations due to environmental changes.

LOG OF TEST BORINGS
(FIELD EXPLORATION PERFORMED IN 2018)

NOTES:

Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock, Logging, Classification, and Presentation Manual (2010)

See Caltrans 2015 Standard Plans A10F, A10G and A10H for Soil and Rock Legend.

All dimensions are in feet unless otherwise shown

BENCH MARK:

NGS QQ453 (HS 2787)
Elev. 190.83
4.7 miles northwest along the southern Pacific Company Railroad from the station at Coyote.

Vertical Datum: NAVDBB
Horizontal Datum: CCS83, Zone 3, Epoch 2010.00 in U.S Survey Feet.

BOREHOLE LOCATION TABLE

Hole ID	Alignment Name	Station and Offset
R-18-NO-001	"BP" Line	34+90 19' Lt.
R-18-NO-002	"BP" Line	35+85 28' Rt.
R-18-NO-003	"BP" Line	37+90 13' Rt.
CPT-18-NO-004	"BP" Line	35+85 28' Rt.
CPT-18-NO-005	"BP" Line	37+90 13' Rt.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
04	SCI	101	R28.4/R28.9		

GEOTECHNICAL PROFESSIONAL — 4-9-19 DATE

GARY PARIKH No. 666 Exp. 12/31/19 GEOTECHNICAL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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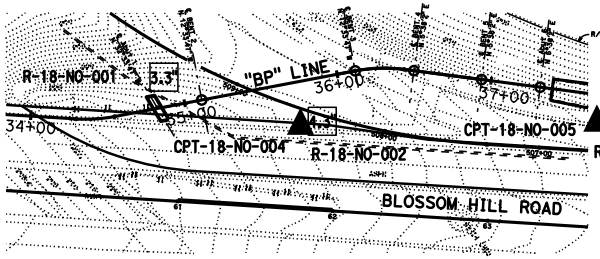
CITY OF SAN JOSE DOT
200 E. SANTA CLARA St., 8th FLOOR
SAN JOSE, CA 95113

PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131



PLAN
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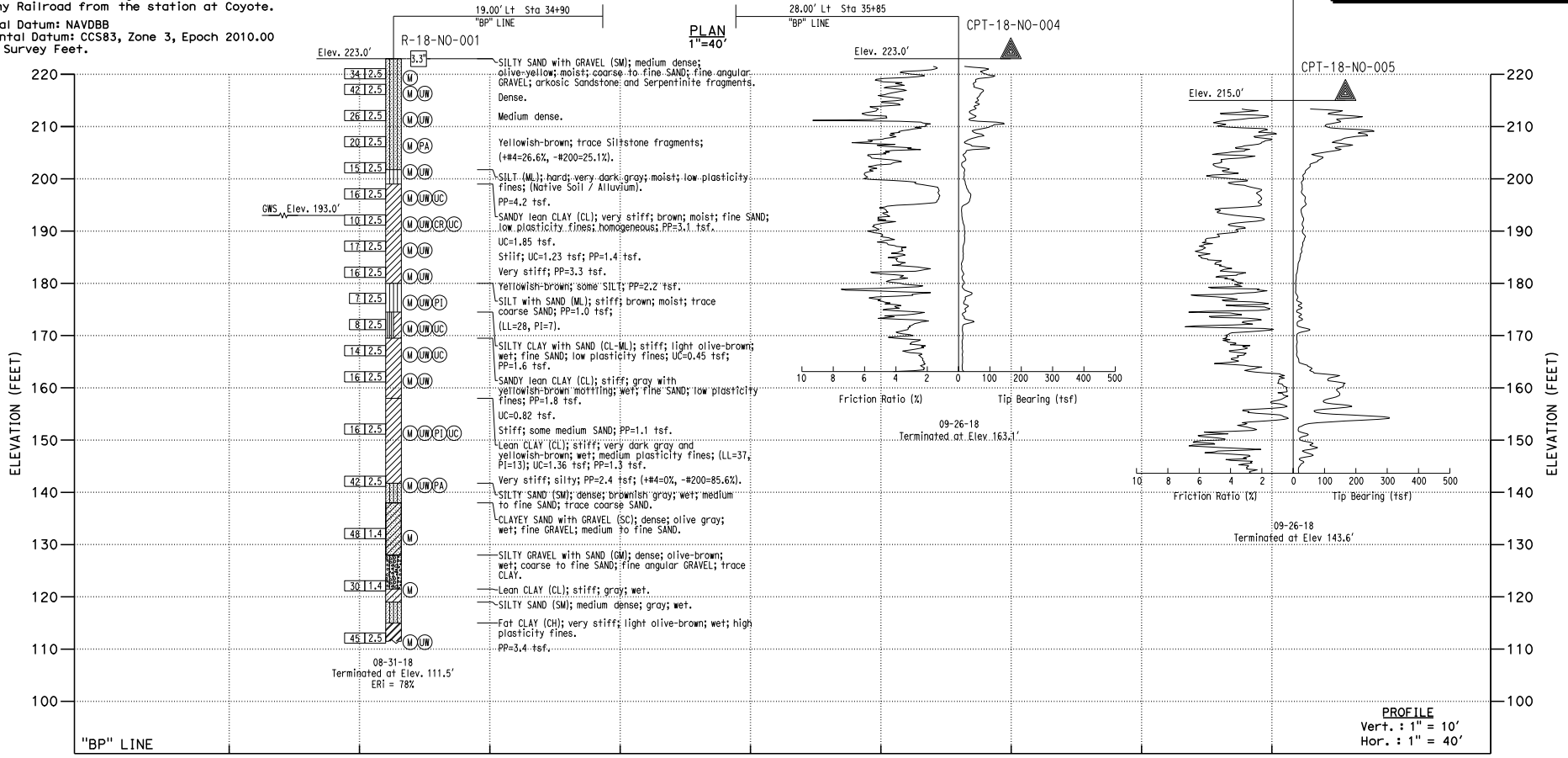

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 40'

DESIGN OVERSIGHT	DRAWN BY	KIM OUYANG	L.S. BHANGOO	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	ALSTON LAM	BRIDGE NO. 37-676	NB 101 ON-RAMP POC
SIGN OFF DATE	CHECKED BY	ALSTON LAM	FIELD INVESTIGATION BY: DATE: AUGUST 2018 TO SEPTEMBER 2018		PROJECT ENGINEER	POST MILES R28.61	LOG OF TEST BORINGS 1 OF 2

GS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 03/14/12)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 0000
PROJECT NUMBER & PHASE: 04160002241 CONTRACT NO.: 04-1K2804

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES			SHEET	OF
7-11-18	4-9-19		28	29

FILE => NB101 on ramp poc-ltb01.dgn

USERNAME => ogouthier DATE PLOTTED => 01-APR-2019 TIME PLOTTED => 16:30

NOTES:

Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock, Logging, Classification, and Presentation Manual (2010)

See Caltrans 2015 Standard Plans A10F, A10G and A10H for Soil and Rock Legend.

All dimensions are in feet unless otherwise shown

BENCH MARK:

NGS QQ453 (HS 2787)
Elev. 190.83
4.7 miles northwest along the southern Pacific Company Railroad from the station at Coyote.

Vertical Datum: NAVDBB
Horizontal Datum: CCS83, Zone 3, Epoch 2010.00 in U.S Survey Feet.

BOREHOLE LOCATION TABLE

Hole ID	Alignment Name	Station and Offset
R-18-NO-001	"BP" Line	34+90 19' Lt.
R-18-NO-002	"BP" Line	35+85 28' Rt.
R-18-NO-003	"BP" Line	37+90 13' Rt.
CPT-18-NO-004	"BP" Line	35+85 28' Rt.
CPT-18-NO-005	"BP" Line	37+90 13' Rt.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
04	SCI	101	R28.4/R28.9		

GEOTECHNICAL PROFESSIONAL — 4-9-19 DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12/31/19 — GEOTECHNICAL — STATE OF CALIFORNIA

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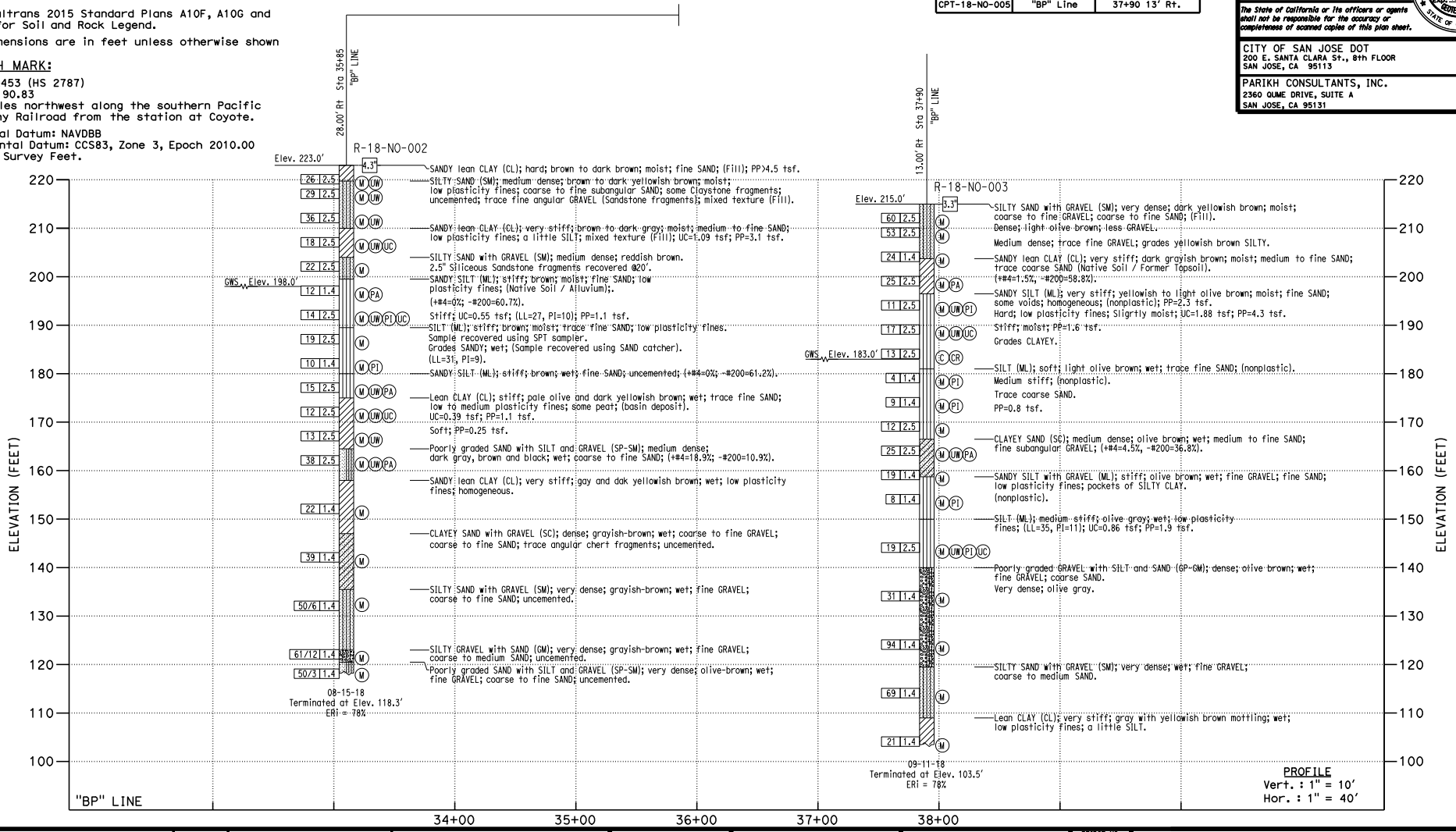
200 E. SANTA CLARA St., 8th FLOOR
SAN JOSE, CA 95113

PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131



PROFILE
Vert. : 1" = 10'
Hor. : 1" = 40'

DESIGN OVERSIGHT	DRAWN BY	KIM OUYANG	L.S. BHANGOO	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	ALSTON LAM	BRIDGE NO. 37-676	NB 101 ON-RAMP POC
SIGN OFF DATE	CHECKED BY	ALSTON LAM	FIELD INVESTIGATION BY: DATE: AUGUST 2018 TO SEPTEMBER 2018		PROJECT ENGINEER	POST MILES R28.61	LOG OF TEST BORINGS 2 OF 2

GS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 03/14/12)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 0000
PROJECT NUMBER & PHASE: 04160002241 CONTRACT NO.: 04-1K2804

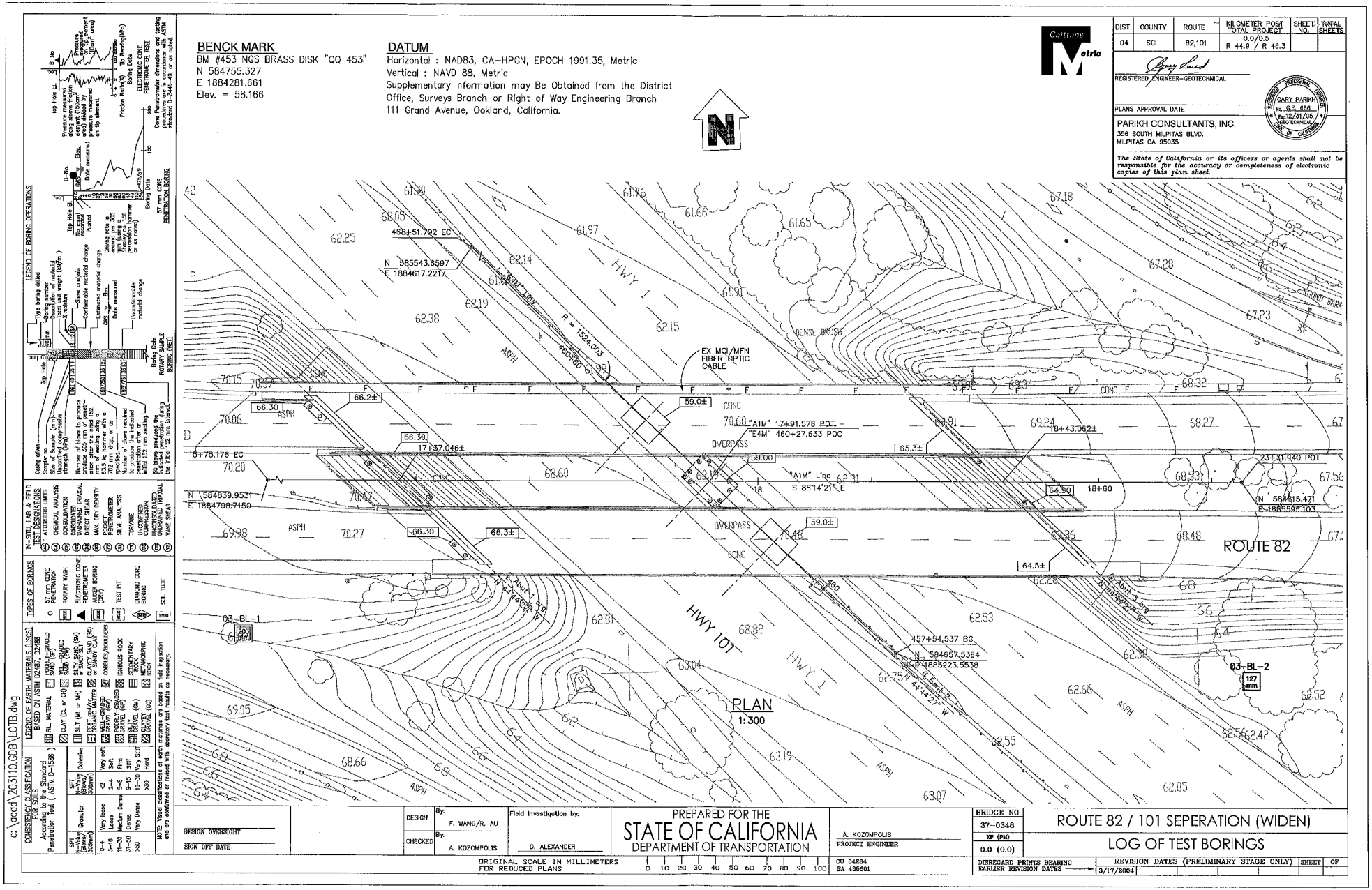
DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES			SHEET	OF
7-11-18	4-9-19		29	29

FILE => NB101 on ramp poc-ltb02.dgn

USERNAME => ogourmer DATE PLOTTED => 01-APR-2019 TIME PLOTTED => 16:30

REFERENCE LOG OF TEST BORINGS
(FIELD EXPLORATION PERFORMED IN 2003 AND 2018)



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SCI	82,101	0.0/0.5 R 44.9 / R 46.3		

REGISTERED ENGINEER-GEOTECHNICAL

PLANS APPROVAL DATE

GARY PARIKH No. G.E. 668 Exp. 12/31/05 GEOTECHNICAL REGISTERED PROFESSIONAL ENGINEER STATE OF CALIFORNIA

PARIKH CONSULTANTS, INC.
356 SOUTH MILPITAS BLVD.
MILPITAS CA 95035

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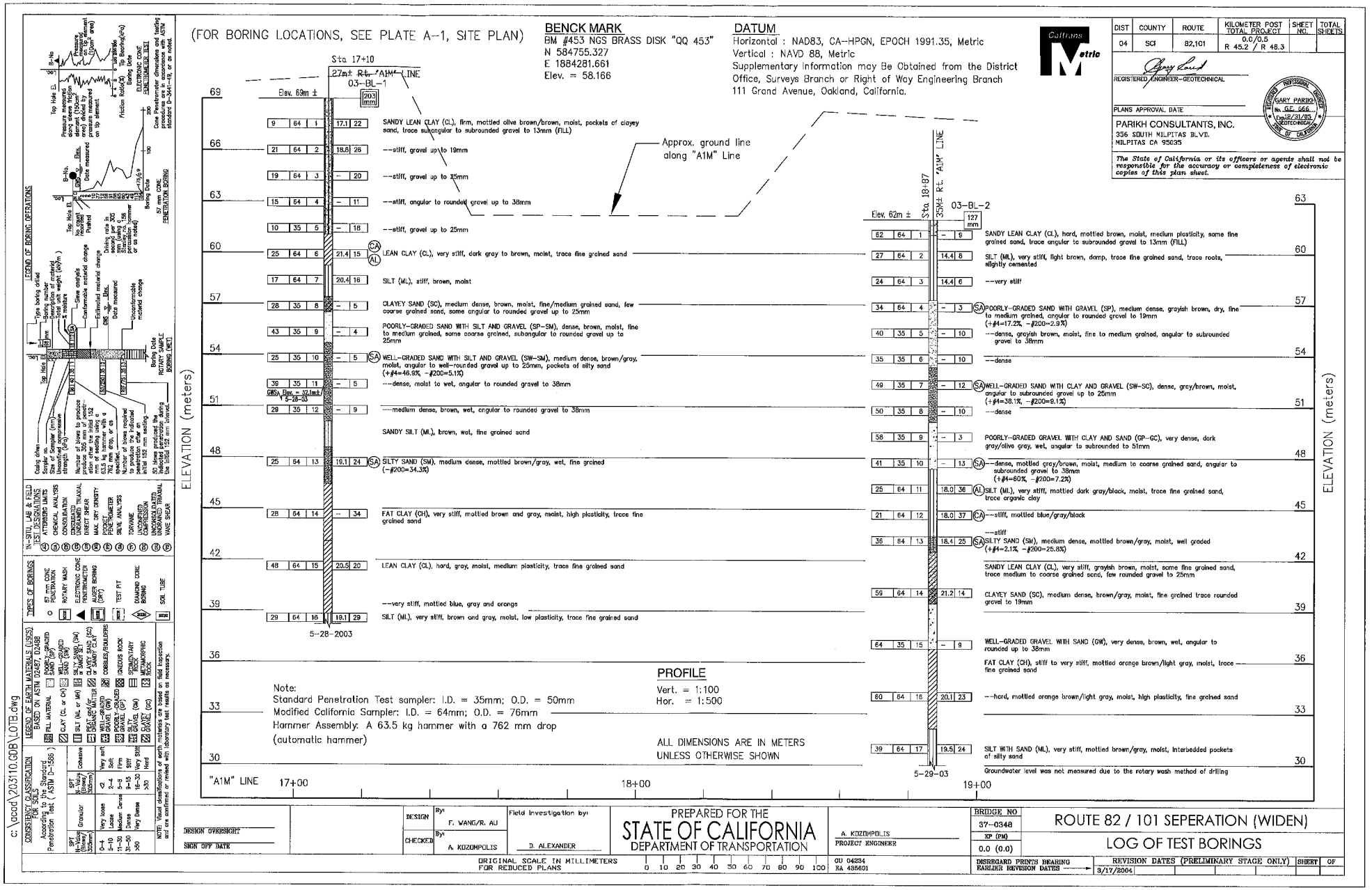
c:\acad\203110.GDB\LOTB.dwg


(FOR BORING LOCATIONS, SEE PLATE A-1, SITE PLAN)
BENCK MARK
BM #453 NGS BRASS DISK "QQ 453"
N 584755.327
E 1884281.661
Elev. = 58.166
DATUM
Horizontal : NAD83, CA-HPGN, EPOCH 1991.35, Metric
Vertical : NAVD 88, Metric
Supplementary Information may Be Obtained from the District Office, Surveys Branch or Right of Way Engineering Branch
111 Grand Avenue, Oakland, California.
Caltrans Metric
DIST 04 | COUNTY SCI | ROUTE 82,101 | KILOMETER POST TOTAL PROJECT 0.0/0.5 R 45.2 / R 46.3 | SHEET NO. | TOTAL SHEETS
REGISTERED ENGINEER-GEOTECHNICAL
PLANS APPROVAL DATE
PARIKH CONSULTANTS, INC.
356 SOUTH MILPITAS BLVD.
MILPITAS CA 95035
REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. GE. 666 Exp.12/31/05 GEOTECHNICAL STATE OF CALIFORNIA
The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.
Sta. 17+10
27m± Rt. "A1M" LINE
03-BL-1
Elev. 69m ±
Sta. 18+87
35M± Rt. "A1M" LINE
03-BL-2
Elev. 62m ±
Approx. ground line along "A1M" Line
ELEVATION (meters)
SANDY LEAN CLAY (CL), firm, mottled olive brown/brown, moist, pockets of clayey sand, trace subangular to subrounded gravel to 13mm (FILL)
--stiff, gravel up to 19mm
--stiff, gravel up to 25mm
--stiff, angular to rounded gravel up to 38mm
--stiff, gravel up to 25mm
LEAN CLAY (CL), very stiff, dark gray to brown, moist, trace fine grained sand
SILT (ML), stiff, brown, moist
CLAYEY SAND (SC), medium dense, brown, moist, fine/medium grained sand, few coarse grained sand, some angular to rounded gravel up to 25mm
POORLY-GRADED SAND WITH SILT AND GRAVEL (SP-SM), dense, brown, moist, fine to medium grained, some coarse grained, subangular to rounded gravel up to 25mm
WELL-GRADED SAND WITH SILT AND GRAVEL (SW-SM), medium dense, brown/gray, moist, angular to well-rounded gravel up to 25mm, pockets of silty sand (+#4=46.9%, -#200=5.1%)
---dense, moist to wet, angular to rounded gravel to 38mm
---medium dense, brown, wet, angular to rounded gravel to 38mm
SANDY SILT (ML), brown, wet, fine grained sand
SILTY SAND (SM), medium dense, mottled brown/gray, wet, fine grained (-#200=34.3%)
FAT CLAY (CH), very stiff, mottled brown and gray, moist, high plasticity, trace fine grained sand
LEAN CLAY (CL), hard, gray, moist, medium plasticity, trace fine grained sand
--very stiff, mottled blue, gray and orange
SILT (ML), very stiff, brown and gray, moist, low plasticity, trace fine grained sand
5-28-2003
SANDY LEAN CLAY (CL), hard, mottled brown, moist, medium plasticity, some fine grained sand, trace angular to subrounded gravel to 13mm (FILL)
SILT (ML), very stiff, light brown, damp, trace fine grained sand, trace roots, slightly cemented
--very stiff
POORLY-GRADED SAND WITH GRAVEL (SP), medium dense, grayish brown, dry, fine to medium grained, angular to rounded gravel to 19mm (+#4=17.2%, -#200=2.9%)
---dense, grayish brown, moist, fine to medium grained, angular to subrounded gravel to 38mm
---dense
WELL-GRADED SAND WITH CLAY AND GRAVEL (SW-SC), dense, gray/brown, moist, angular to subrounded gravel up to 25mm (+#4=38.1%, -#200=9.1%)
---dense
POORLY-GRADED GRAVEL WITH CLAY AND SAND (GP-GC), very dense, dark gray/olive gray, wet, angular to subrounded to 51mm
---dense, mottled gray/brown, moist, medium to coarse grained sand, angular to subrounded gravel to 38mm (+#4=60%, -#200=7.2%)
SILT (ML), very stiff, mottled dark gray/black, moist, trace fine grained sand, trace organic clay
---stiff, mottled blue/gray/black
---stiff
SILTY SAND (SM), medium dense, mottled brown/gray, moist, well graded (+#4=2.1%, -#200=25.8%)
SANDY LEAN CLAY (CL), very stiff, grayish brown, moist, some fine grained sand, trace medium to coarse grained sand, few rounded gravel to 25mm
CLAYEY SAND (SC), medium dense, brown/gray, moist, fine grained trace rounded gravel to 19mm
WELL-GRADED GRAVEL WITH SAND (GW), very dense, brown, wet, angular to rounded up to 38mm
FAT CLAY (CH), stiff to very stiff, mottled orange brown/light gray, moist, trace fine grained sand
--hard, mottled orange brown/light gray, moist, high plasticity, fine grained sand
SILT WITH SAND (ML), very stiff, mottled brown/gray, moist, interbedded pockets of silty sand
Groundwater level was not measured due to the rotary wash method of drilling
5-29-03
PROFILE
Vert. = 1:100
Hor. = 1:500
ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN
Note:
Standard Penetration Test sampler: I.D. = 35mm; O.D. = 50mm
Modified California Sampler: I.D. = 64mm; O.D. = 76mm
Hammer Assembly: A 63.5 kg hammer with a 762 mm drop (automatic hammer)
"A1M" LINE
17+00
18+00
19+00
LEGEND OF BORING OPERATIONS
IN-SITU, LAB & FIELD TEST DESIGNATIONS
TYPES OF BORINGS
LEGEND OF EARTH MATERIALS (USCS) BASED ON ASTM D2487, D2488
CONSISTENCY CLASSIFICATION FOR SOILS According to the Standard Penetration Test (ASTM D-1586)
NOTE: Visual identifications of earth materials are based on field inspection and can confirmed or revised with laboratory test results as necessary.
DESIGN OVERSIGHT
SIGN OFF DATE
DESIGN BY: F. WANG/R. AU
CHECKED BY: A. KOZOMPOLIS
Field Investigation by: D. ALEXANDER
PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
A. KOZOMPOLIS PROJECT ENGINEER
ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100
OU 04234 EA 485601
BRIDGE NO 37-0348
KP (PM) 0.0 (0.0)
ROUTE 82 / 101 SEPERATION (WIDEN)
LOG OF TEST BORINGS
DISREGARD PRINTS BEARING EARLIER REVISION DATES
REVISION DATES (PRELIMINARY STAGE ONLY) 8/17/2004
SHEET OF
c:\acad\203110.GDB\LOTB.dwg

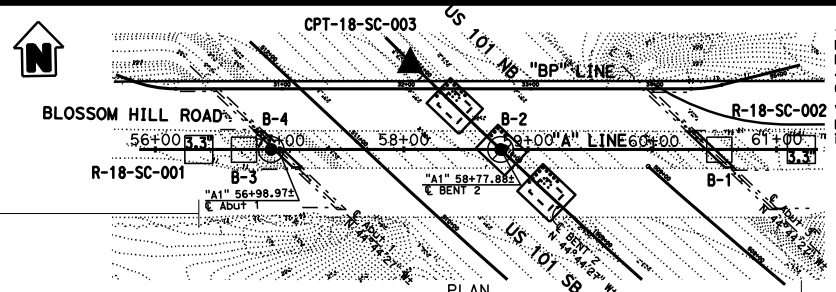
NOTES:

Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock, Logging, Classification, and Presentation Manual (2010)

See Caltrans 2015 Standard Plans A10F, A10G and A10H for Soil and Rock Legend.

All dimensions are in feet unless otherwise shown



BENCH MARK:

NGS QQ453 (HS 2787)
Elev. 190.83
4.7 miles northwest along the southern Pacific Company Railroad from the station at Coyote.

Vertical Datum: NAVDBB
Horizontal Datum: CCS83, Zone 3, Epoch 2010.00
in U.S Survey Feet.

BOREHOLE LOCATION TABLE

Hole ID	Alignment Name	Station and Offset
R-18-SC-001	"A" Line	56+35 0' Lt.
R-18-SC-002	"A" Line	61+20 0' Lt.
CPT-18-SC-003	"A" Line	58+05 70' Rt.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
04	SCI	101	R28.4/R28.9		

GEOTECHNICAL PROFESSIONAL — 4-9-19 DATE

PLANS APPROVAL DATE

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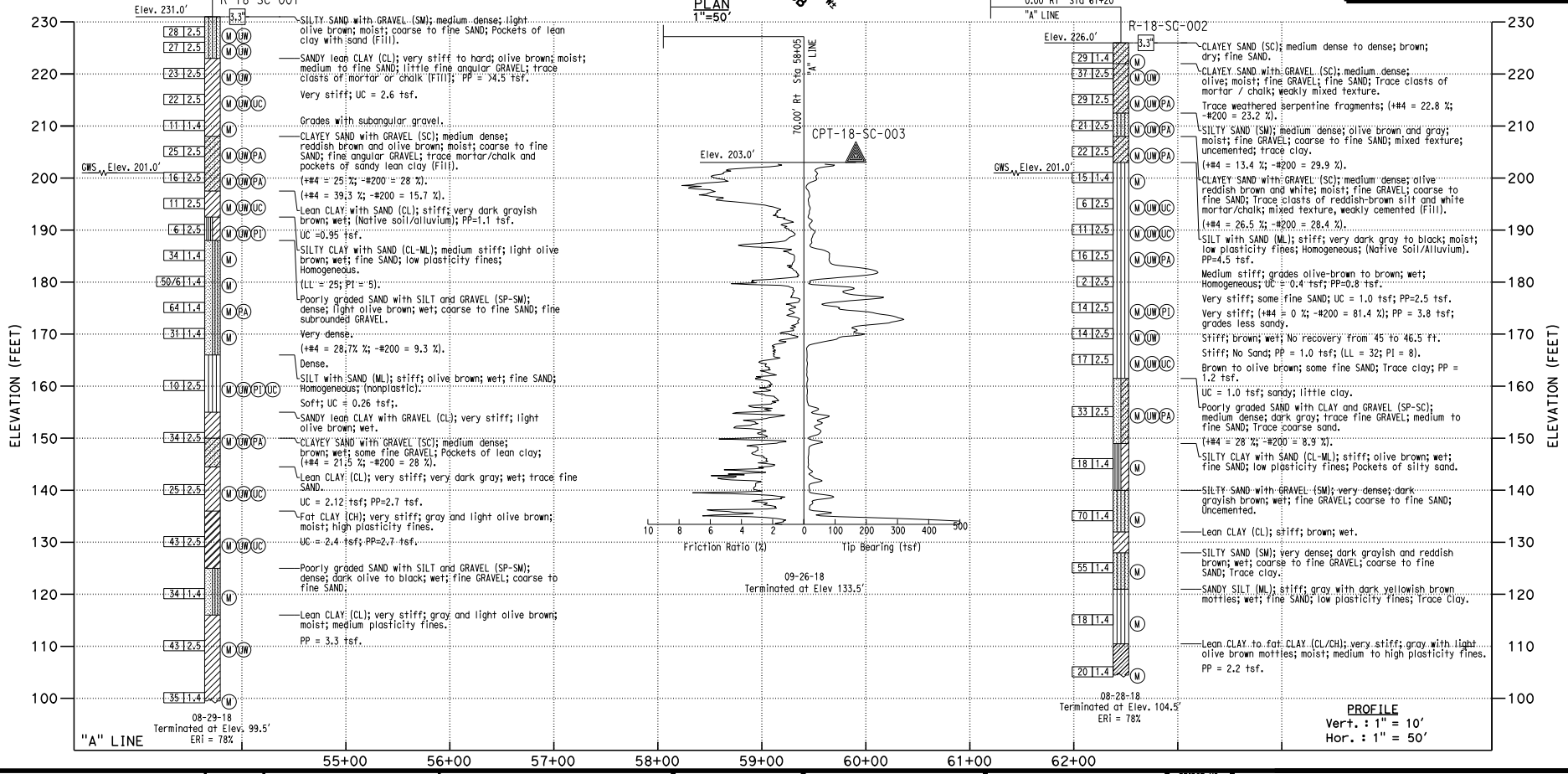
REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12/31/19 — GEOTECHNICAL — STATE OF CALIFORNIA

CITY OF SAN JOSE DOT
200 E. SANTA CLARA St., 8th FLOOR
SAN JOSE, CA 95113

PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131



DESIGN OVERSIGHT / SIGN OFF DATE	DRAWN BY: KIM OUYANG	L.S. BHANGOO — FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	ALSTON LAM — PROJECT ENGINEER	BRIDGE NO. 37-0348	BLOSSOM HILL ROAD OC (WIDEN)	
	CHECKED BY: ALSTON LAM	DATE: AUGUST 2018 TO SEPTEMBER 2018			POST MILES R28.61	LOG OF TEST BORINGS 1 OF 2	

GS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 03/14/12)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 0000
PROJECT NUMBER & PHASE: 04160002241 CONTRACT NO.: 04-1K2804

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES			SHEET	OF
7-11-18	4-9-19		25	26

FILE => Blossom_Hill_Rd-1Tb01.dgn

USERNAME => ogourmer DATE PLOTTED => 04-JUN-2019 TIME PLOTTED => 11:13

NOTES:

Standard Penetration Test Sampler: I.D. = 1.4";
O.D. = 2" Modified California Sampler: I.D. = 2.5";
O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock, Logging, Classification, and Presentation Manual (2010)

See Caltrans 2015 Standard Plans A10F, A10G and A10H for Soil and Rock Legend.

All dimensions are in feet unless otherwise shown

BENCH MARK:

NGS QQ453 (HS 2787)
Elev. 190.83
4.7 miles northwest along the southern Pacific Company Railroad from the station at Coyote.

Vertical Datum: NAVDBB
Horizontal Datum: CCS83, Zone 3, Epoch 2010.00
in U.S Survey Feet.

BOREHOLE LOCATION TABLE

Hole ID	Alignment Name	Station and Offset
R-18-SO-001	"AR4" Line	514+75 39' Lt.
R-18-SO-002	"AR4" Line	514+45 47' Rt.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
04	SCI	101	R28.4/R28.9		

GEOTECHNICAL PROFESSIONAL — 4-9-19 DATE

PLANS APPROVAL DATE

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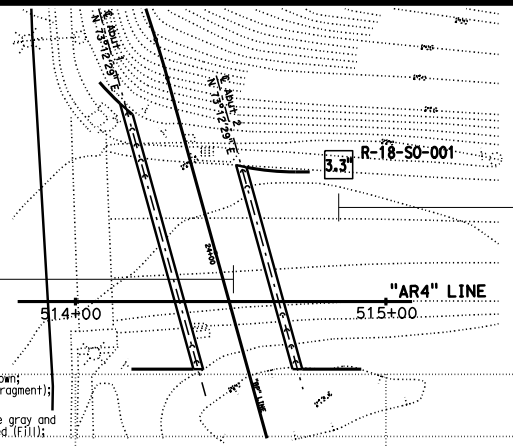
CITY OF SAN JOSE DOT
200 E. SANTA CLARA St., 8th FLOOR
SAN JOSE, CA 95113

PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131



PLAN
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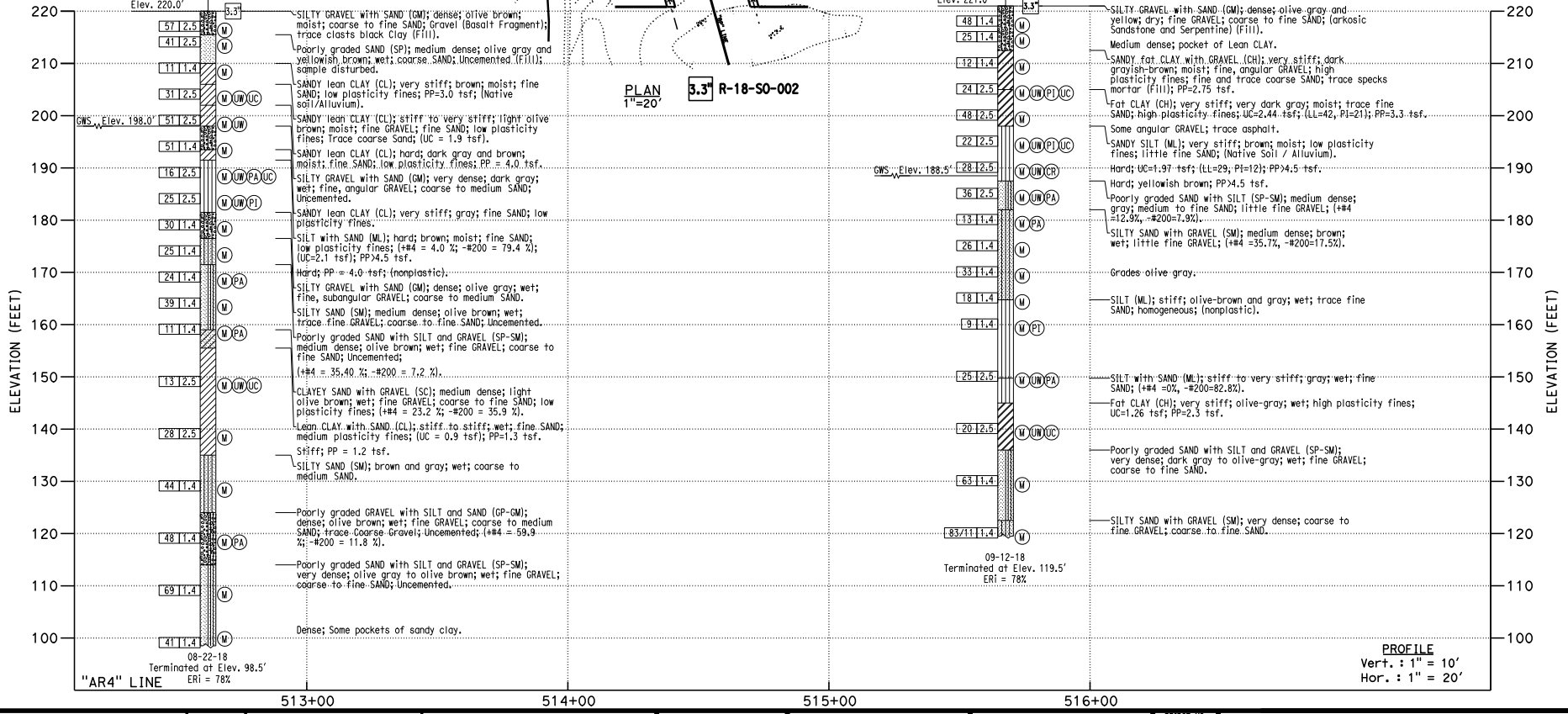


PROFILE
Vert. : 1" = 10'
Hor. : 1" = 20'

DESIGN OVERSIGHT	DRAWN BY	KIM OUYANG	L.S. BHANGOO	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	ALSTON LAM	BRIDGE NO. 37-675J	SB101 OFF-RAMP PEDESTRIAN UC
SIGN OFF DATE	CHECKED BY	ALSTON LAM	FIELD INVESTIGATION BY: DATE: AUGUST 2018 TO SEPTEMBER 2018		PROJECT ENGINEER	POST MILES R28.75	LOG OF TEST BORINGS 1 OF 1

GS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 03/14/12)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 0000
PROJECT NUMBER & PHASE: 04160002241 CONTRACT NO.: 04-1K2804

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES		SHEET	OF
7-11-18	4-9-19	14	14

FILE => SB101 off-ramp puc-1tb01.dgn

USERNAME => ogourmer DATE PLOTTED => 01-APR-2019 TIME PLOTTED => 16:34

NOTES:

Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock, Logging, Classification, and Presentation Manual (2010)

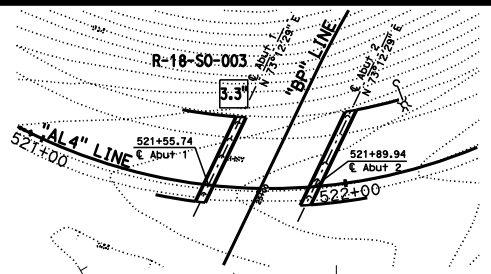
See Caltrans 2015 Standard Plans A10F, A10G and A10H for Soil and Rock Legend.

All dimensions are in feet unless otherwise shown

BENCH MARK:

NGS QQ453 (HS 2787)
Elev. 190.83
4.7 miles northwest along the southern Pacific Company Railroad from the station at Coyote.

Vertical Datum: NAVDBB
Horizontal Datum: CCS83, Zone 3, Epoch 2010.00 in U.S Survey Feet.



BOREHOLE LOCATION TABLE

Hole ID	Alignment Name	Station and Offset
R-18-SO-002	"AL4" Line	251+90 50' Rt.
R-18-SO-003	"AL4" Line	251+50 30' Lt.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
04	SCI	101	R28.4/R28.9		

GEOTECHNICAL PROFESSIONAL — 4-9-19 DATE

GARY PARIKH No. 666 Exp. 12/31/19 GEOTECHNICAL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

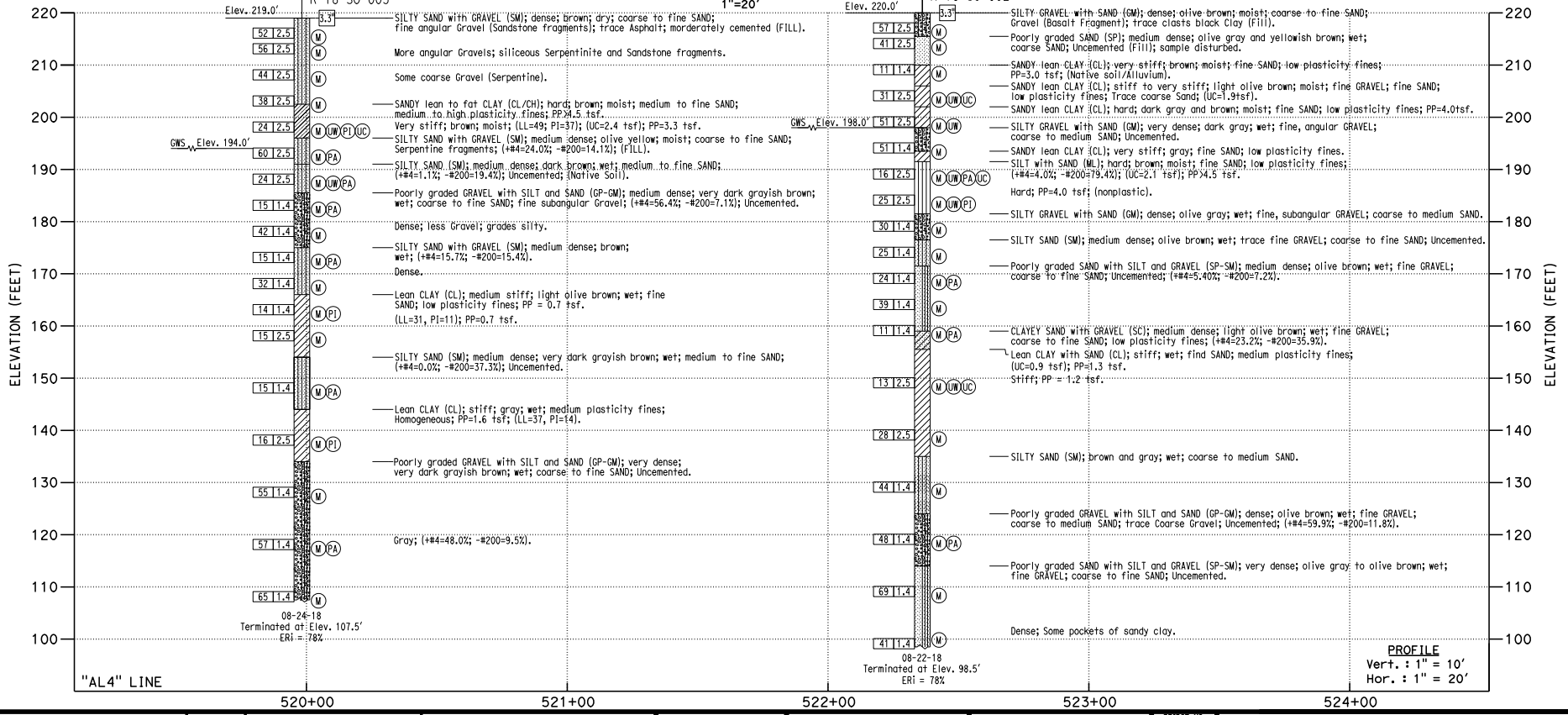
PLANS APPROVAL DATE

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

CITY OF SAN JOSE DOT
200 E. SANTA CLARA St., 8th FLOOR
SAN JOSE, CA 95113

PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

PLAN
1"=20'



R-18-SO-003

3.3'				SILTY SAND with GRAVEL (SM); dense; brown; dry; coarse to fine SAND; fine angular Gravel (Sandstone fragments); trace Asphalt; morderately cemented (FILL).
52	2.5	M		
56	2.5	M		More angular Gravels; siliceous Serpentinite and Sandstone fragments.
44	2.5	M		Some coarse Gravel (Serpentine).
38	2.5	M		SANDY lean to fat CLAY (CL/CH); hard; brown; moist; medium to fine SAND; medium to high plasticity fines; PP>4.5 tsf.
24	2.5	M UW PI UC		Very stiff; brown; moist; (LL=49; PI=37); (UC=2.4 tsf); PP=3.3 tsf.
60	2.5	M PA		SILTY SAND with GRAVEL (SM); medium dense; olive yellow; moist; coarse to fine SAND; Serpentine fragments; (+#4=24.0%; -#200=14.1%); (FILL).
24	2.5	M UW PA		SILTY SAND (SM); medium dense; dark brown; wet; medium to fine SAND; (+#4=1.1%; -#200=19.4%); Uncemented; (Native Soil).
15	1.4	M PA		Poorly graded GRAVEL with SILT and SAND (GP-GM); medium dense; very dark grayish brown; wet; coarse to fine SAND; fine subangular Gravel; (+#4=56.4%; -#200=7.1%); Uncemented.
42	1.4	M		Dense; less Gravel; grades silty.
15	1.4	M PA		SILTY SAND with GRAVEL (SM); medium dense; brown; wet; (+#4=15.7%; -#200=15.4%).
32	1.4	M		Dense.
14	1.4	M PI		Lean CLAY (CL); medium stiff; light olive brown; wet; fine SAND; low plasticity fines; PP = 0.7 tsf. (LL=31, PI=11); PP=0.7 tsf.
15	2.5	M		SILTY SAND (SM); medium dense; very dark grayish brown; wet; medium to fine SAND; (+#4=0.0%; -#200=37.3%); Uncemented.
15	1.4	M PA		Lean CLAY (CL); stiff; gray; wet; medium plasticity fines; Homogeneous; PP=1.6 tsf; (LL=37, PI=14).
16	2.5	M PI		Poorly graded GRAVEL with SILT and SAND (GP-GM); very dense; very dark grayish brown; wet; coarse to fine SAND; Uncemented.
55	1.4	M		
57	1.4	M PA		Gray; (+#4=48.0%; -#200=9.5%).
65	1.4	M		

08-24-18
Terminated at Elev. 107.5'
ERI = 78%

R-18-SO-002

3.3'				SILTY GRAVEL with SAND (GM); dense; olive brown; moist; coarse to fine SAND; Gravel (Basalt Fragment); trace clasts black Clay (Fill).
57	2.5	M		
41	2.5	M		Poorly graded SAND (SP); medium dense; olive gray and yellowish brown; wet; coarse SAND; Uncemented (Fill); sample disturbed.
11	1.4	M		SANDY lean CLAY (CL); very stiff; brown; moist; fine SAND; low plasticity fines; PP=3.0 tsf; (Native soil/Alluvium).
31	2.5	M UW UC		SANDY lean CLAY (CL); stiff to very stiff; light olive brown; moist; fine GRAVEL; fine SAND; low plasticity fines; Trace coarse Sand; (UC=1.9tsf).
				SANDY lean CLAY (CL); hard; dark gray and brown; moist; fine SAND; low plasticity fines; PP=4.0tsf.
51	2.5	M UW		SILTY GRAVEL with SAND (GM); very dense; dark gray; wet; fine, angular GRAVEL; coarse to medium SAND; Uncemented.
51	1.4	M		SANDY lean CLAY (CL); very stiff; gray; fine SAND; low plasticity fines.
16	2.5	M UW PA UC		SILT with SAND (ML); hard; brown; moist; fine SAND; low plasticity fines; (+#4=4.0%; -#200=79.4%); (UC=2.1 tsf); PP>4.5 tsf.
25	2.5	M UW PI		Hard; PP=4.0 tsf; (nonplastic). SILTY GRAVEL with SAND (GM); dense; olive gray; wet; fine, subangular GRAVEL; coarse to medium SAND.
30	1.4	M		
25	1.4	M		SILTY SAND (SM); medium dense; olive brown; wet; trace fine GRAVEL; coarse to fine SAND; Uncemented.
24	1.4	M PA		Poorly graded SAND with SILT and GRAVEL (SP-SM); medium dense; olive brown; wet; fine GRAVEL; coarse to fine SAND; Uncemented; (+#4=5.40%; -#200=7.2%).
39	1.4	M		
11	1.4	M PA		CLAYEY SAND with GRAVEL (SC); medium dense; light olive brown; wet; fine GRAVEL; coarse to fine SAND; low plasticity fines; (+#4=23.2%; -#200=35.9%).
				Lean CLAY with SAND (CL); stiff; wet; find SAND; medium plasticity fines; (UC=0.9 tsf); PP=1.3 tsf.
13	2.5	M UW UC		Stiff; PP = 1.2 tsf.
28	2.5	M		
				SILTY SAND (SM); brown and gray; wet; coarse to medium SAND.
44	1.4	M		
48	1.4	M PA		Poorly graded GRAVEL with SILT and SAND (GP-GM); dense; olive brown; wet; fine GRAVEL; coarse to medium SAND; trace Coarse Gravel; Uncemented; (+#4=59.9%; -#200=11.8%).
69	1.4	M		Poorly graded SAND with SILT and GRAVEL (SP-SM); very dense; olive gray to olive brown; wet; fine GRAVEL; coarse to fine SAND; Uncemented.
41	1.4	M		Dense; Some pockets of sandy clay.

08-22-18
Terminated at Elev. 98.5'
ERI = 78%

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 20'

DESIGN OVERSIGHT	DRAWN BY	KIM OUYANG	L.S. BHANGOO	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	ALSTON LAM	BRIDGE NO. 37-675K	SB101 ON-RAMP PEDESTRIAN UC
SIGN OFF DATE	CHECKED BY	ALSTON LAM	FIELD INVESTIGATION BY: DATE: AUGUST 2018 TO SEPTEMBER 2018		PROJECT ENGINEER	POST MILES R28.74	LOG OF TEST BORINGS 1 OF 1

GS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 03/14/12)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 0000
PROJECT NUMBER & PHASE: 04160002241 CONTRACT NO.: 04-1K2804

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES			SHEET	OF
7-11-18	4-9-19		12	12

FILE => SB 101 on-ramp puc-1tb01.dgn

USERNAME => ogourmer DATE PLOTTED => 01-APR-2019 TIME PLOTTED => 16:33

NOTES:

Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock, Logging, Classification, and Presentation Manual (2010)

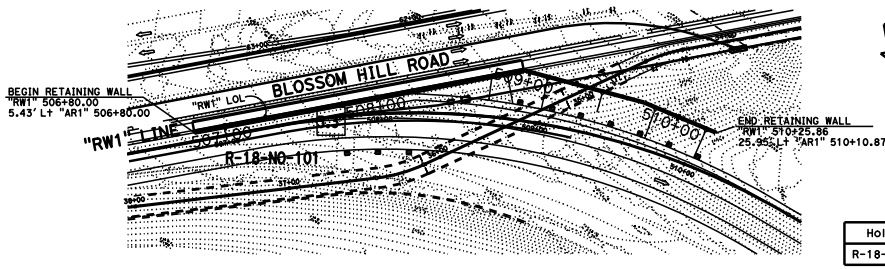
See Caltrans 2015 Standard Plans A10F, A10G and A10H for Soil and Rock Legend.

All dimensions are in feet unless otherwise shown

BENCH MARK:

NGS QQ453 (HS 2787)
Elev. 190.83
4.7 miles northwest along the southern Pacific Company Railroad from the station at Coyote.

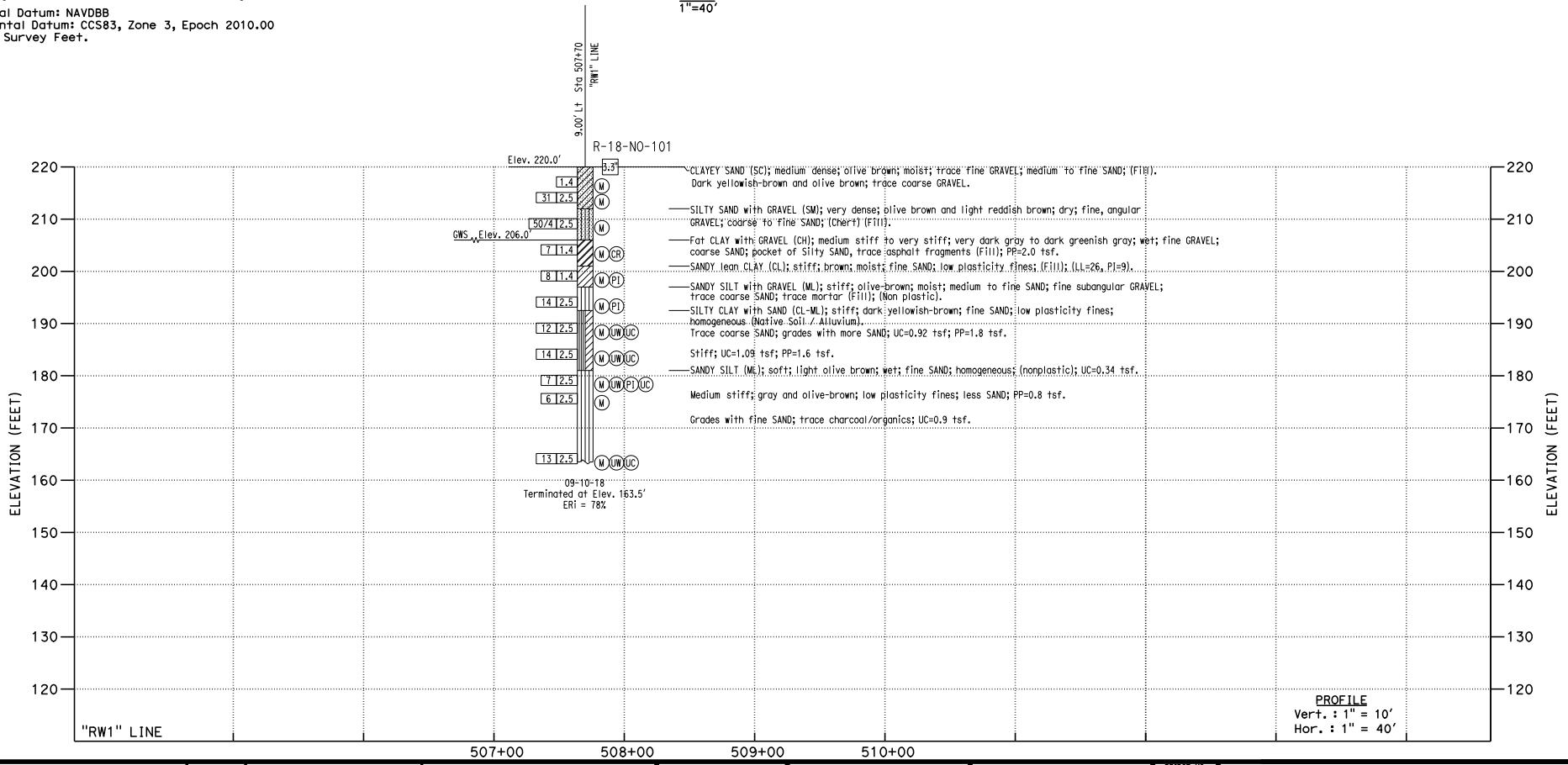
Vertical Datum: NAVDBB
Horizontal Datum: CCS83, Zone 3, Epoch 2010.00 in U.S Survey Feet.



PLAN
1"=40'

BOREHOLE LOCATION TABLE

Hole ID	Alignment Name	Station and Offset
R-18-NO-101	"RW1" Line	507+70 9' Lt.



PROFILE
Vert. : 1" = 10'
Hor. : 1" = 40'

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
04	SCI	101	R28.4/R28.9		

GEOTECHNICAL PROFESSIONAL — 4-9-19 DATE

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12/31/19 — GEOTECHNICAL — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CITY OF SAN JOSE DOT
200 E. SANTA CLARA St., 8th FLOOR
SAN JOSE, CA 95113

PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

DESIGN OVERSIGHT
SIGN OFF DATE

DRAWN BY: KIM OUYANG
CHECKED BY: ALSTON LAM

L.S. BHANGOO
FIELD INVESTIGATION BY:
DATE: AUGUST 2018 TO SEPTEMBER 2018

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

ALSTON LAM
PROJECT ENGINEER

BRIDGE NO. 37E0125
POST MILES R28.61

RETAINING WALL NO. 1-SOIL NAIL WALL
LOG OF TEST BORINGS 1 OF 1

GS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 03/14/12)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 0000
PROJECT NUMBER & PHASE: 04160002241 CONTRACT NO.: 04-1K2804

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES			SHEET	OF
9-11-18	4-9-19		10	10

FILE => RW1-1tb01.dgn

USERNAME => ogourmer DATE PLOTTED => 02-APR-2019 TIME PLOTTED => 11:24

NOTES:

Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3" Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock, Logging, Classification, and Presentation Manual (2010)

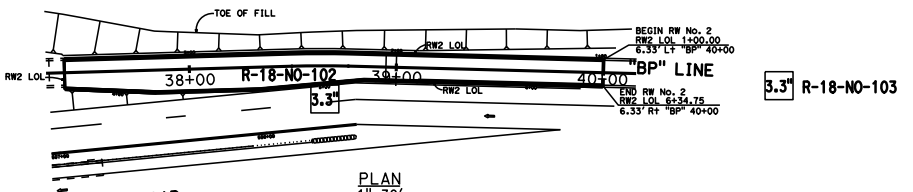
See Caltrans 2015 Standard Plans A10F, A10G and A10H for Soil and Rock Legend.

All dimensions are in feet unless otherwise shown

BENCH MARK:

NGS QQ453 (HS 2787)
Elev. 190.83
4.7 miles northwest along the southern Pacific Company Railroad from the station at Coyote.

Vertical Datum: NAVDBB
Horizontal Datum: CCS83, Zone 3, Epoch 2010.00
in U.S Survey Feet.



PLAN
1"=30'

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
04	SCI	101	R28.4/R28.9		

GEOTECHNICAL PROFESSIONAL — 4-9-19 DATE

REGISTERED PROFESSIONAL ENGINEER — GARY PARIKH — No. 666 — Exp. 12/31/19 — GEOTECHNICAL — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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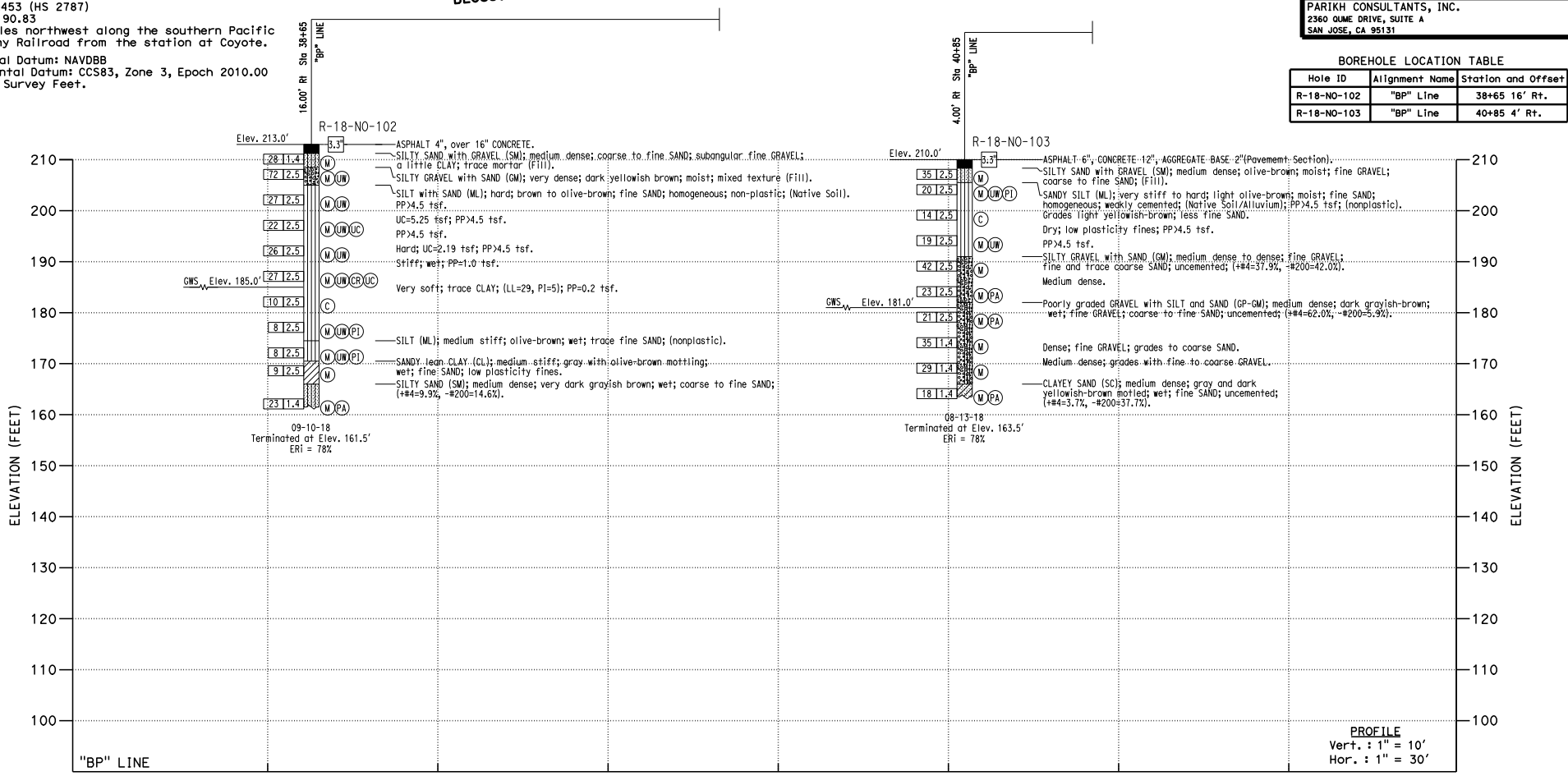
CITY OF SAN JOSE DOT
200 E. SANTA CLARA St., 8th FLOOR
SAN JOSE, CA 95113

PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

BOREHOLE LOCATION TABLE

Hole ID	Alignment Name	Station and Offset
R-18-NO-102	"BP" Line	38+65 16' Rt.
R-18-NO-103	"BP" Line	40+85 4' Rt.



PROFILE
Vert. : 1" = 10'
Hor. : 1" = 30'

DESIGN OVERSIGHT	DRAWN BY	KIM OUYANG	L.S. BHANGOO	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	ALSTON LAM	BRIDGE NO. 37E0126	RETAINING WALL NO. 2
SIGN OFF DATE	CHECKED BY	ALSTON LAM	FIELD INVESTIGATION BY: DATE: AUGUST 2018 TO SEPTEMBER 2018		PROJECT ENGINEER	POST MILES R28.61	LOG OF TEST BORINGS 1 OF 1

GS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 03/14/12)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 0000
PROJECT NUMBER & PHASE: 04160002241 CONTRACT NO.: 04-1K2804

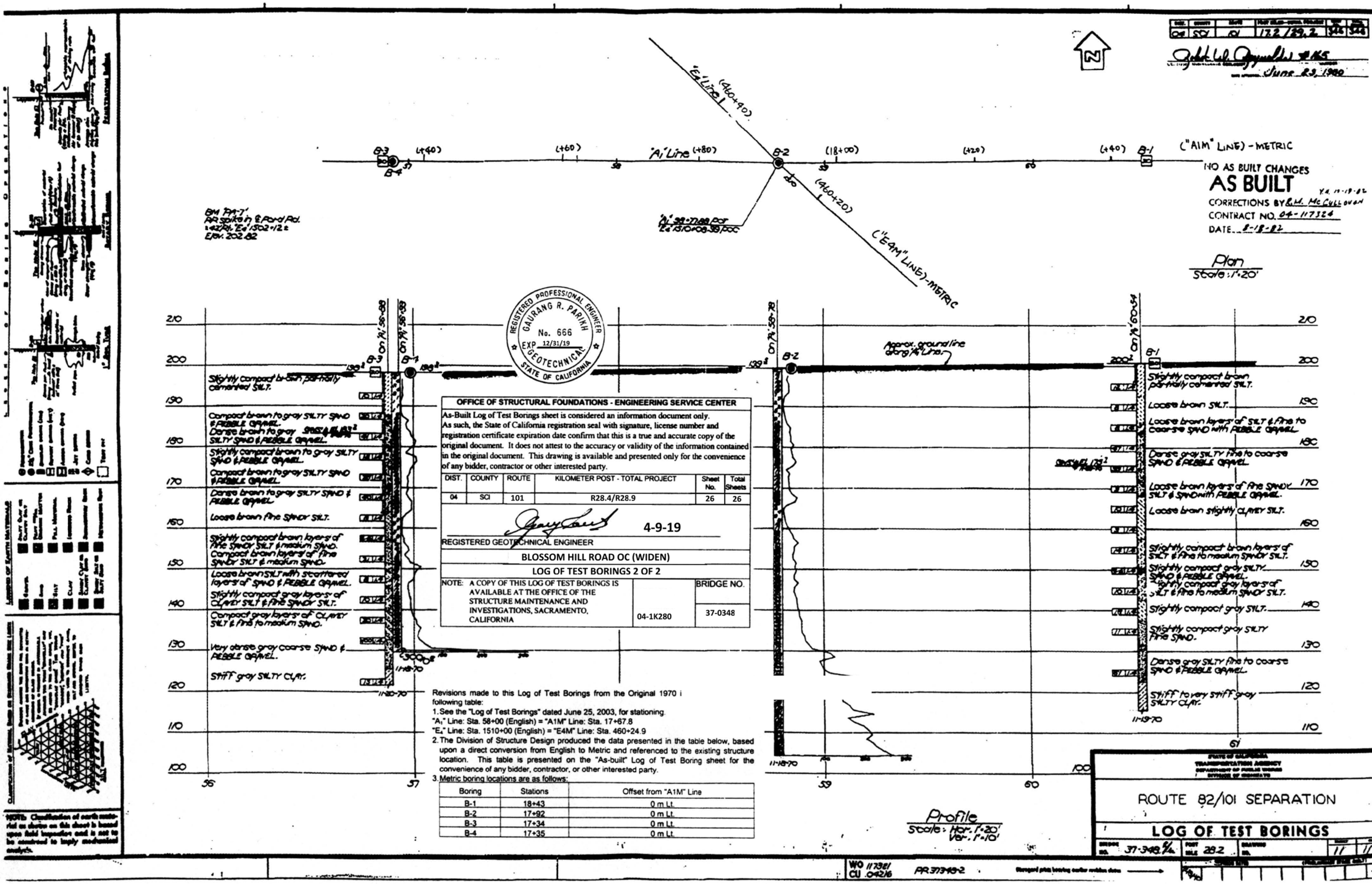
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES			SHEET	OF
7-11-18	4-9-19		10	10

FILE => RW2-1tb01.dgn

USERNAME => ogourmer DATE PLOTTED => 02-APR-2019 TIME PLOTTED => 11:26

AS-BUILT LOG OF TEST BORINGS



OFFICE OF STRUCTURAL FOUNDATIONS - ENGINEERING SERVICE CENTER

As-Built Log of Test Borings sheet is considered an information document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	KILOMETER POST - TOTAL PROJECT	Sheet No.	Total Sheets
04	SCI	101	R28.4/R28.9	26	26

REGISTERED PROFESSIONAL ENGINEER GAURANG R. PARIKH No. 666 EXP 12/31/19 GEOTECHNICAL STATE OF CALIFORNIA

4-9-19

REGISTERED GEOTECHNICAL ENGINEER

BLOSSOM HILL ROAD OC (WIDEN)

LOG OF TEST BORINGS 2 OF 2

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT THE OFFICE OF THE STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA — 04-1K280 — BRIDGE NO. 37-0348

Revisions made to this Log of Test Borings from the Original 1970 i following table:

1. See the "Log of Test Borings" dated June 25, 2003, for stationing.
"A1" Line: Sta. 58+00 (English) = "A1M" Line: Sta. 17+67.8
"E1" Line: Sta. 1510+00 (English) = "E4M" Line: Sta. 460+24.9
2. The Division of Structure Design produced the data presented in the table below, based upon a direct conversion from English to Metric and referenced to the existing structure location. This table is presented on the "As-built" Log of Test Boring sheet for the convenience of any bidder, contractor, or other interested party.
3. Metric boring locations are as follows:

Boring	Stations	Offset from "A1M" Line
B-1	18+43	0 m Lt.
B-2	17+92	0 m Lt.
B-3	17+34	0 m Lt.
B-4	17+35	0 m Lt.

ROUTE 82/101 SEPARATION

LOG OF TEST BORINGS

WO 117321 CU 04216 PR 37348-2

APPENDIX B

APPENDIX B
LABORATORY TESTS

Classification Tests

The field classification of the samples was visually verified in the laboratory according to the Unified Soil Classification System. The results are presented on "Log of Test Borings", Appendix A.

Moisture-Density

The natural moisture contents were determined for selected undisturbed samples of the soils in accordance with American Standard Test Method (ASTM) D-2216 and dry unit weights were calculated based on natural moisture contents and total unit weights. This information was used to classify and correlate the soils. The results are presented on Plate Nos. B-1A through B-C, "Summary of Laboratory Test Results", Appendix B.

Atterberg Limits

The Atterberg Limits were determined for selected samples of the fine-grained materials. These results were used to classify the soils, as well as to obtain an indication of the expansion potential with variations in moisture content. The Atterberg Limits were determined in accordance with ASTM D-4318. The results of the test are presented on Plate No. B-2, "Plasticity Chart", Appendix B.

Grain Size Classification

Grain size classification tests (ASTM D-422) were performed on selected samples of granular soil to aid in the classification. The results are presented on Plate Nos. B-3A through B-3D, "Grain Size Distribution Curves", Appendix B.

Unconfined Compression Tests

Strength tests were performed on selected undisturbed samples using unconfined compression machine. Unconfined compression tests were performed in accordance with ASTM D 2166. The results are presented on Plate Nos. B-4A through B-4P, "Unconfined Compression Test", Appendix B.

Corrosion Tests

Corrosion tests were performed on selected samples to determine the corrosion potential of the soils. The pH and minimum resistivity tests were performed according to California Test Method CT-643. Sulfate (California Test Method CT-417) and chloride (California Test Method CT-422) tests were performed by Sunland Analytical. The test results are presented on Plate Nos. B-5A and B-5M, Appendix B.

R-Value Tests

R-value tests were performed on selected bulk samples for pavement design. The tests were performed according to California Test Method CT-301. The test results are presented on Plate Nos B-6A through B-6R, Appendix B.

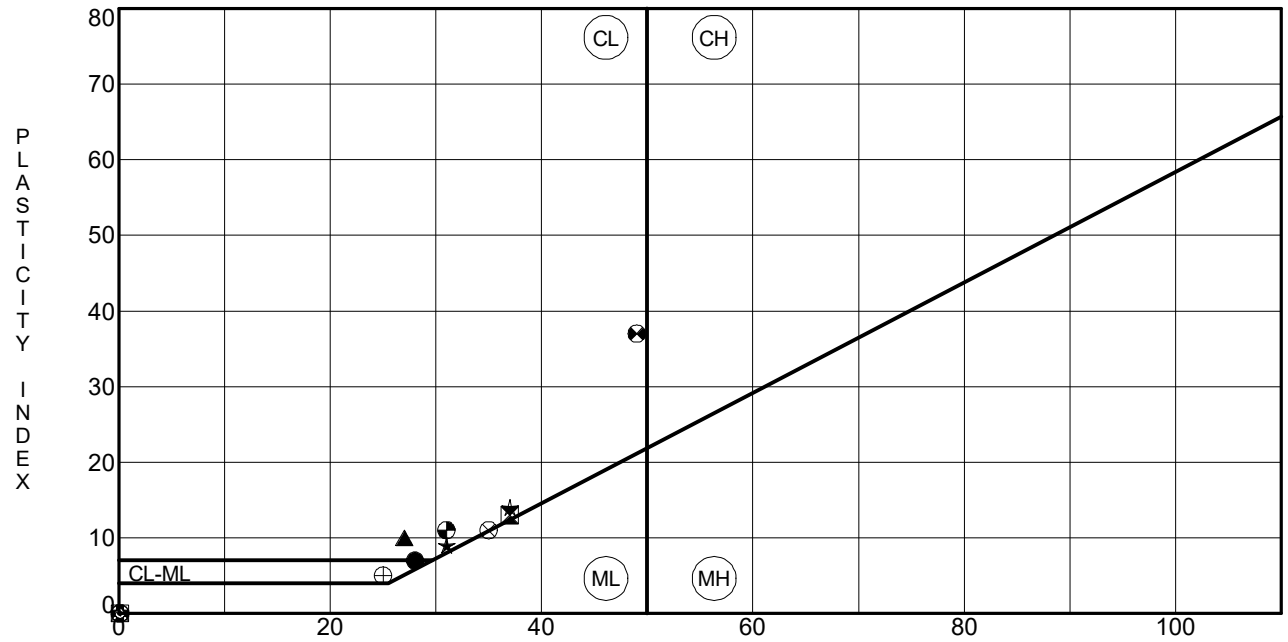
LABORATORY TEST SUMMARY

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
R-18-NO-001	1	3.0	SM	22.4	-						
R-18-NO-001	2	6.0	SM	20.4	92.7						
R-18-NO-001	3	11.0	SM	20.2	108.0						
R-18-NO-001	4	16.0	SM	12.1	-				26.6	25.1	
R-18-NO-001	5	21.0	SM	27.5	91.8						
R-18-NO-001	6	26.0	CL	18.2	109.7						0.93
R-18-NO-001	7	31.0	CL	18.3	108.5						0.62
R-18-NO-001	8	36.0	CL	26.7	102.0						
R-18-NO-001	9	41.0	CL	19.6	114.5						
R-18-NO-001	10	46.0	ML	26.0	99.0	28	21	7			
R-18-NO-001	11	51.0	CL-ML	27.3	102.5						0.23
R-18-NO-001	12	56.0	CL	22.2	104.1						0.41
R-18-NO-001	13	61.0	CL	22.6	104.4						
R-18-NO-001	14	71.0	CL	28.3	94.2	37	24	13			0.68
R-18-NO-001	15	81.0	CL	25.2	99.0					85.6	
R-18-NO-001	16	91.0	SC	11.2	-						
R-18-NO-001	17	101.0	GM	8.8	-						
R-18-NO-001	18	111.0	CH	23.3	105.4						
R-18-NO-002	1	3.0	CL	15.9	113.0						
R-18-NO-002	2	6.0	SM	22.0	98.9						
R-18-NO-002	3	11.0	SM	24.2	96.6						
R-18-NO-002	4	16.0	CL	19.0	105.2						0.55
R-18-NO-002	5	21.0	SM	0.4	-						
R-18-NO-002	6	26.0	ML	16.2	-				0.0	60.7	
R-18-NO-002	7	31.0	ML	19.9	101.1	27	17	10			0.28
R-18-NO-002	8	36.0	ML	31.0	-						
R-18-NO-002	9	41.0	ML	21.6	-	31	22	9			
R-18-NO-002	10	46.0	ML	24.5	96.2				0.0	61.2	
R-18-NO-002	11	51.0	CL	10.2	111.8						0.2
R-18-NO-002	12	56.0	CL	25.2	96.8						
R-18-NO-002	13	61.0	SP-SM	12.6	111.1				18.9	10.9	
R-18-NO-002	14	71.0	CL	12.3	-						
R-18-NO-002	15	81.0	SC	31.1	-						
R-18-NO-002	16	90.0	SM	3.9	-						
R-18-NO-002	17	101.0	GM	7.0	-						
R-18-NO-002	18	104.5	SP-SM	7.5	-						
R-18-NO-003	1	3.0	SM	6.6	-						
R-18-NO-003	2	6.0	SM	18.6	-						
R-18-NO-003	3	11.0	SM	18.8	-						
R-18-NO-003	4	16.0	CL	14.5	-				1.5	58.8	
R-18-NO-003	5	21.0	ML	23.2	71.5	NP	NP	NP			
R-18-NO-003	6	26.0	ML	15.7	114.5						0.94
R-18-NO-003	7	31.0	ML	-	-						

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
R-18-NO-003	8	36.0	ML	23.0	-	NP	NP	NP			
R-18-NO-003	9	41.0	ML	29.2	-	NP	NP	NP			
R-18-NO-003	10	46.0	ML	25.9	-						
R-18-NO-003	11	51.0	SC	21.0	106.3				4.5	36.8	
R-18-NO-003	12	56.0	SC	16.8	-						
R-18-NO-003	13	61.0	ML	15.8	-	NP	NP	NP			
R-18-NO-003	14	71.0	ML	28.2	93.2	35	24	11			0.43
R-18-NO-003	15	81.0	GP-GM	6.4	-						
R-18-NO-003	16	91.0	GP-GM	8.8	-						
R-18-NO-003	17	101.0	SM	8.8	-						
R-18-NO-003	18	111.0	CL	26.5	-						
R-18-SC-001	1	3.0	SM	23.2	99.8						
R-18-SC-001	2	6.0	SM	30.1	91.2						
R-18-SC-001	3	11.0	CL	26.2	98.7						
R-18-SC-001	4	16.0	CL	22.2	100.0						1.3
R-18-SC-001	5	21.0	CL	25.4	-						
R-18-SC-001	6	26.0	SC	28.9	98.2				25.0	28.0	
R-18-SC-001	7	31.0	SC	11.1	139.7				39.3	15.7	
R-18-SC-001	8	36.0	CL	18.3	108.6						0.5
R-18-SC-001	9	41.0	CL	19.4	106.4	25	20	5			
R-18-SC-001	10	46.0	SP-SM	6.8	-						
R-18-SC-001	11	51.0	SP-SM	8.3	-						
R-18-SC-001	12	56.0	SP-SM	11.6	-				28.7	9.3	
R-18-SC-001	13	61.0	SP-SM	12.5	-						
R-18-SC-001	14	71.0	ML	26.6	96.9	NP	NP	NP			0.1
R-18-SC-001	15	81.0	SP-SC	15.6	123.7				21.5	28.0	
R-18-SC-001	16	91.0	CL	26.8	96.5						1.0
R-18-SC-001	17	101.0	CH	22.8	113.7						1.2
R-18-SC-001	18	111.0	SP-SM	8.2	-						
R-18-SC-001	19	121.0	CL	22.8	104.7						
R-18-SC-001	20	131.0	CL	15.2	-						
R-18-SO-003	1	3.0	SM	2.5	-						
R-18-SO-003	2	6.0	SM	26.8	-						
R-18-SO-003	3	11.0	SM	22.2	-						
R-18-SO-003	4	16.0	CL/CH	27.2	-						
R-18-SO-003	5	21.0	CL/CH	17.4	107.8	49	12	37			1.21
R-18-SO-003	6	26.0	SM	26.7	-				24.0	14.1	
R-18-SO-003	7	31.0	SP	19.2	105.7				1.1	19.4	
R-18-SO-003	8	36.0	SP-SM	6.4	-				56.4	7.1	
R-18-SO-003	9	41.0	SM	6.1	-						
R-18-SO-003	10	46.0	SM	16.7	-				15.7	15.4	
R-18-SO-003	11	51.0	SM	10.1	-						
R-18-SO-003	12	56.0	CL	23.9	-	31	20	11			

Borehole	Sample Number	Depth	Classi-fication	Water Content	Dry Density	Liquid Limit	Plastic Limit	Plasticity Index	% > Sieve 4	% < Sieve 200	Unconfined Shear Strength (tsf)
R-18-SO-003	13	61.0	CL	27.2	-						
R-18-SO-003	14	71.0	SM	23.6	-				0.0	37.3	
R-18-SO-003	15	81.0	CH	26.8	-	37	23	14			
R-18-SO-003	16	91.0	SP-SM	9.2	-						
R-18-SO-003	17	101.0	SP-SM	7.8	-				48.3	9.5	
R-18-SO-003	18	111.0	SP-SM	8.1	-						

ATTERBERG LIMITS



PLASTICITY

	BOREHOLE	SAMPLE #	DEPTH	LL	PL	PI	Fines	Classification
●	R-18-NO-001	10	46.0	28	21	7		SILT with SAND
⧓	R-18-NO-001	14	71.0	37	24	13		Lean CLAY
▲	R-18-NO-002	7	31.0	27	17	10		SANDY SILT
★	R-18-NO-002	9	41.0	31	22	9		SILT
⊙	R-18-NO-003	5	21.0	NP	NP	NP		SANDY SILT
✿	R-18-NO-003	8	36.0	NP	NP	NP		SILT
○	R-18-NO-003	9	41.0	NP	NP	NP		SILT
△	R-18-NO-003	13	61.0	NP	NP	NP		SANDY SILT with GRAVEL
⊗	R-18-NO-003	14	71.0	35	24	11		SILT
⊕	R-18-SC-001	9	41.0	25	20	5		Lean CLAY with SAND
□	R-18-SC-001	14	71.0	NP	NP	NP		SILT with SAND
⊛	R-18-SO-003	5	21.0	49	12	37		SANDY lean to fat CLAY
◕	R-18-SO-003	12	56.0	31	20	11		Lean CLAY
☆	R-18-SO-003	15	81.0	37	23	14		Fat CLAY

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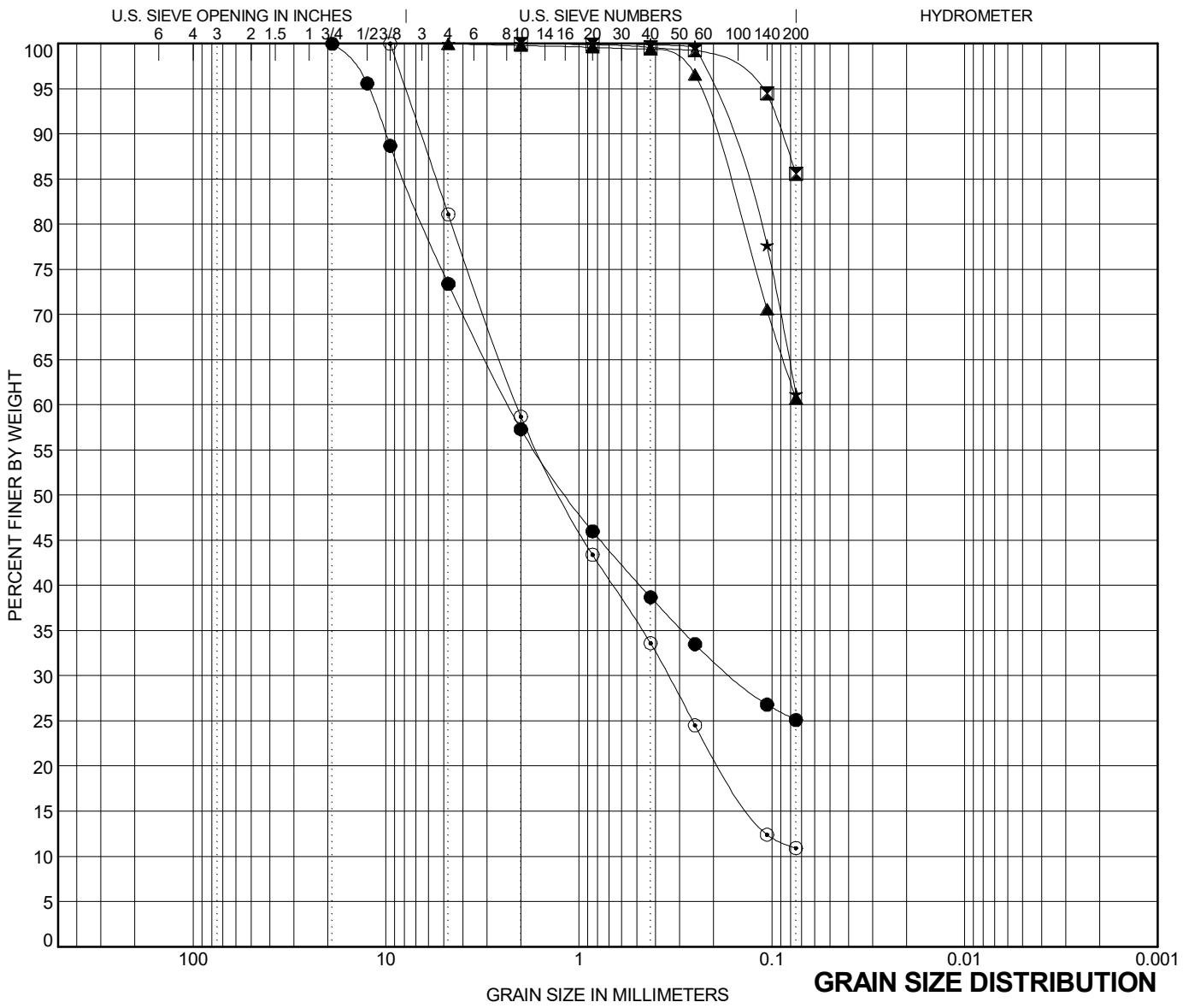
JOB NO: 2016-146-GDR | PLATE NO: B-2

GRAIN SIZE DISTRIBUTION CURVE



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	R-18-NO-001	4	16.0	SILTY SAND with GRAVEL					
⊠	R-18-NO-001	15	81.0	Lean CLAY					
▲	R-18-NO-002	6	26.0	SANDY SILT					
★	R-18-NO-002	10	46.0	SANDY SILT					
⊙	R-18-NO-002	13	61.0	Poorly graded SAND with SILT				0.93	34.51

BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	R-18-NO-001	4	16.0	19	2.312	0.16		26.6	48.3	25.1
⊠	R-18-NO-001	15	81.0	2				0.0	14.4	85.6
▲	R-18-NO-002	6	26.0	4.75				0.0	39.3	60.7
★	R-18-NO-002	10	46.0	4.75				0.0	38.8	61.2
⊙	R-18-NO-002	13	61.0	9.5	2.103	0.345		18.9	70.2	10.9

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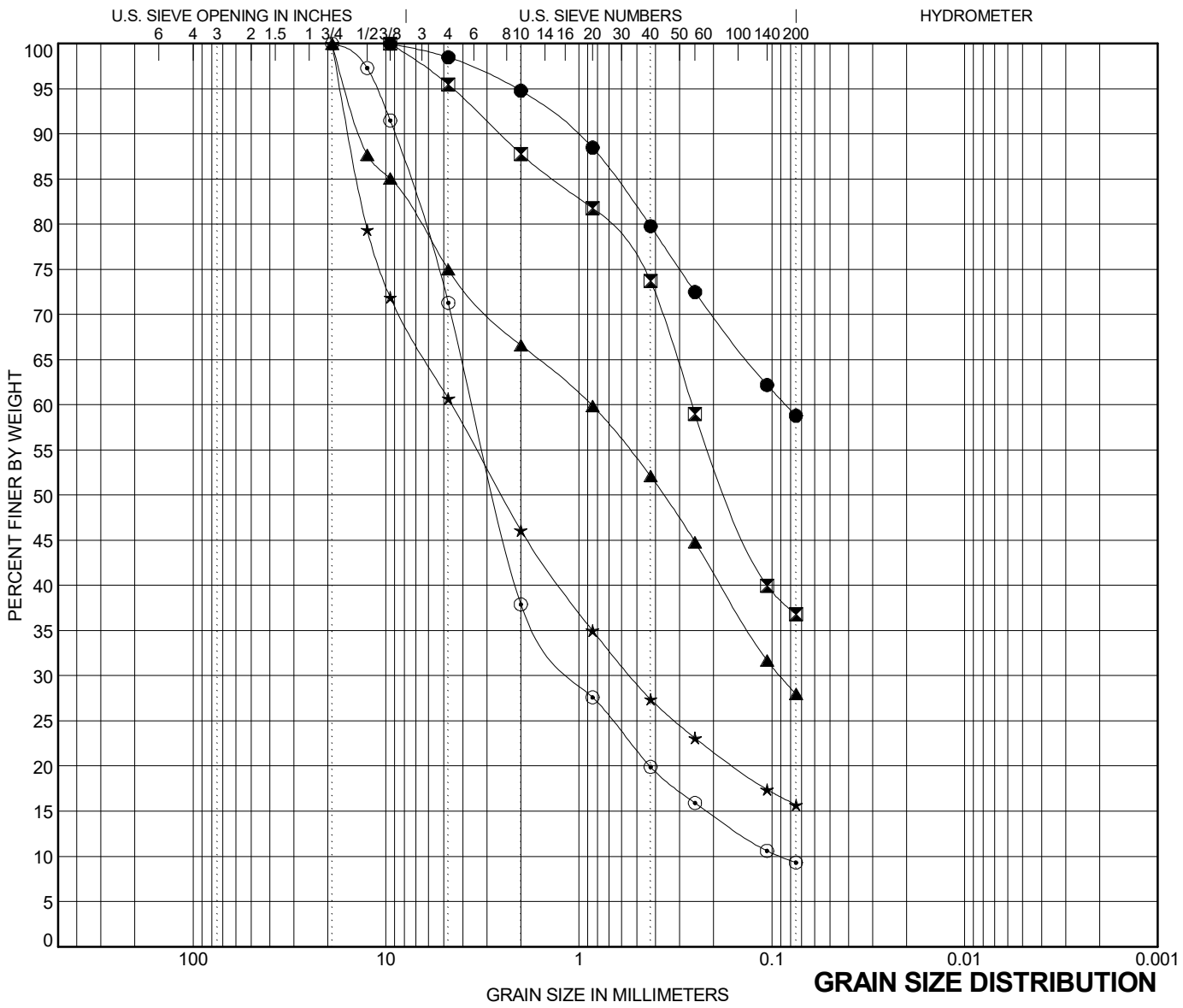
SAN JOSE, CALIFORNIA

JOB NO: 2016-146-GDR

PLATE NO: B-3A



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	R-18-NO-003	4	16.0	SANDY lean CLAY					
⊠	R-18-NO-003	11	51.0	CLAYEY SAND					
▲	R-18-SC-001	6	26.0	CLAYEY SAND with GRAVEL					
★	R-18-SC-001	7	31.0	CLAYEY SAND with GRAVEL					
⊙	R-18-SC-001	12	56.0	Poorly graded SAND with SILT and GRAVEL				3.36	39.23

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	R-18-NO-003	4	16.0	9.5	0.085			1.5	39.7	58.8	
⊠	R-18-NO-003	11	51.0	9.5	0.259			4.5	58.7	36.8	
▲	R-18-SC-001	6	26.0	19	0.861	0.09		25.0	47.0	28.0	
★	R-18-SC-001	7	31.0	19	4.557	0.539		39.3	45.0	15.7	
⊙	R-18-SC-001	12	56.0	19	3.545	1.038	0.09	28.7	62.0	9.3	

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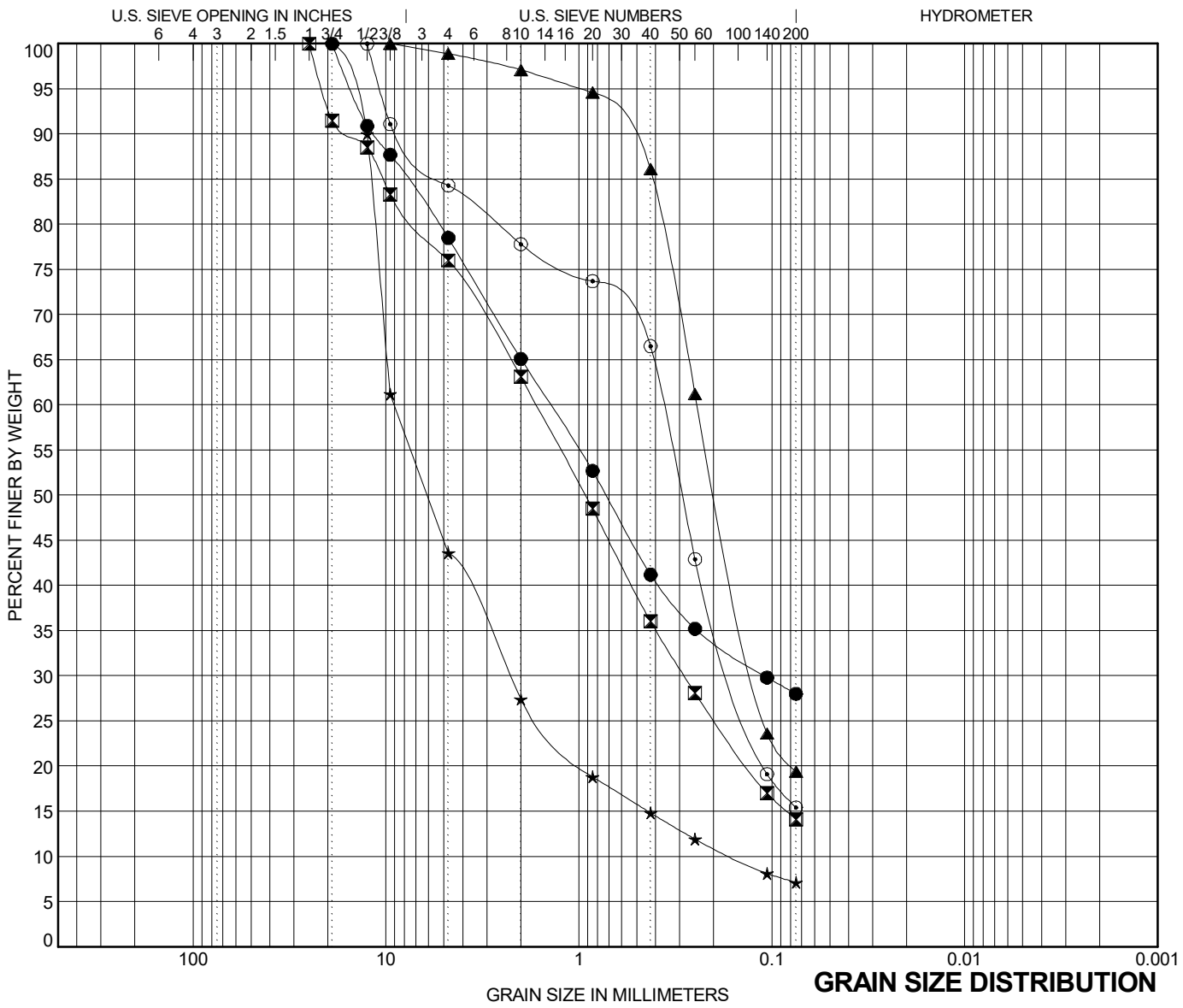
SAN JOSE, CALIFORNIA

JOB NO: 2016-146-GDR

PLATE NO: B-3B



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	R-18-SC-001	15	81.0	CLAYEY SAND with GRAVEL					
⊠	R-18-SO-003	6	26.0	SILTY SAND with GRAVEL					
▲	R-18-SO-003	7	31.0	Poorly graded SAND					
★	R-18-SO-003	8	36.0	Poorly graded SAND with SILT and GRAVEL				3.58	55.66
⊙	R-18-SO-003	10	46.0	SILTY SAND with GRAVEL					

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	R-18-SC-001	15	81.0	19	1.407	0.109		21.5	50.5	28.0	
⊠	R-18-SO-003	6	26.0	25	1.668	0.284		24.0	61.9	14.1	
▲	R-18-SO-003	7	31.0	9.5	0.243	0.123		1.1	79.5	19.4	
★	R-18-SO-003	8	36.0	19	9.061	2.298	0.163	56.4	36.5	7.1	
⊙	R-18-SO-003	10	46.0	12.5	0.367	0.157		15.7	68.9	15.4	

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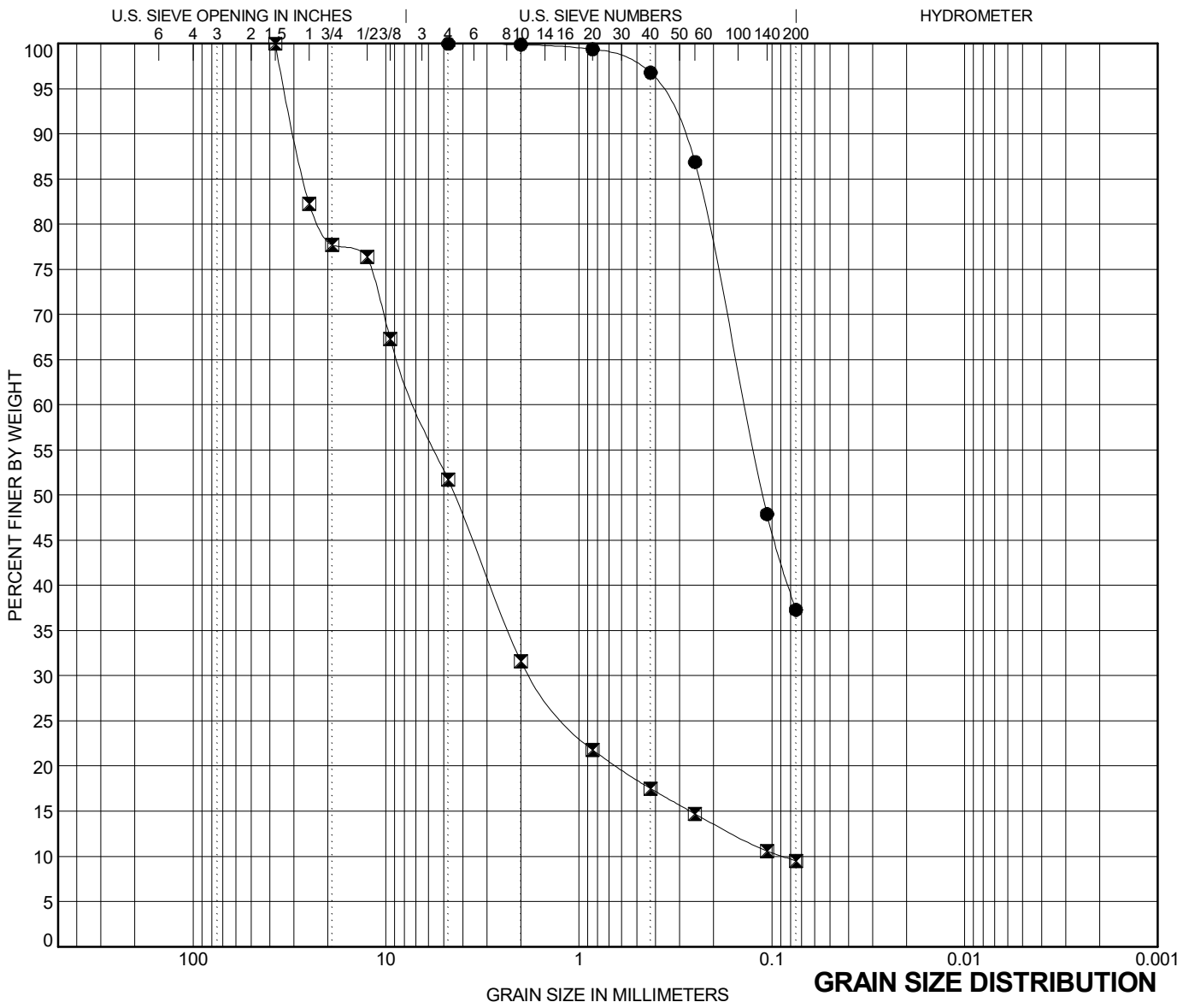
SAN JOSE, CALIFORNIA

JOB NO: 2016-146-GDR | **PLATE NO: B-3C**



GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING	SAMPLE #	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	R-18-SO-003	14	71.0	SILTY SAND					
⊠	R-18-SO-003	17	101.0	Poorly graded SAND with SILT and GRAVEL				5.02	78.25

	BORING	SAMPLE #	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	R-18-SO-003	14	71.0	4.75	0.138			0.0	62.7	37.3	
⊠	R-18-SO-003	17	101.0	37.5	6.868	1.739	0.088	48.3	42.2	9.5	

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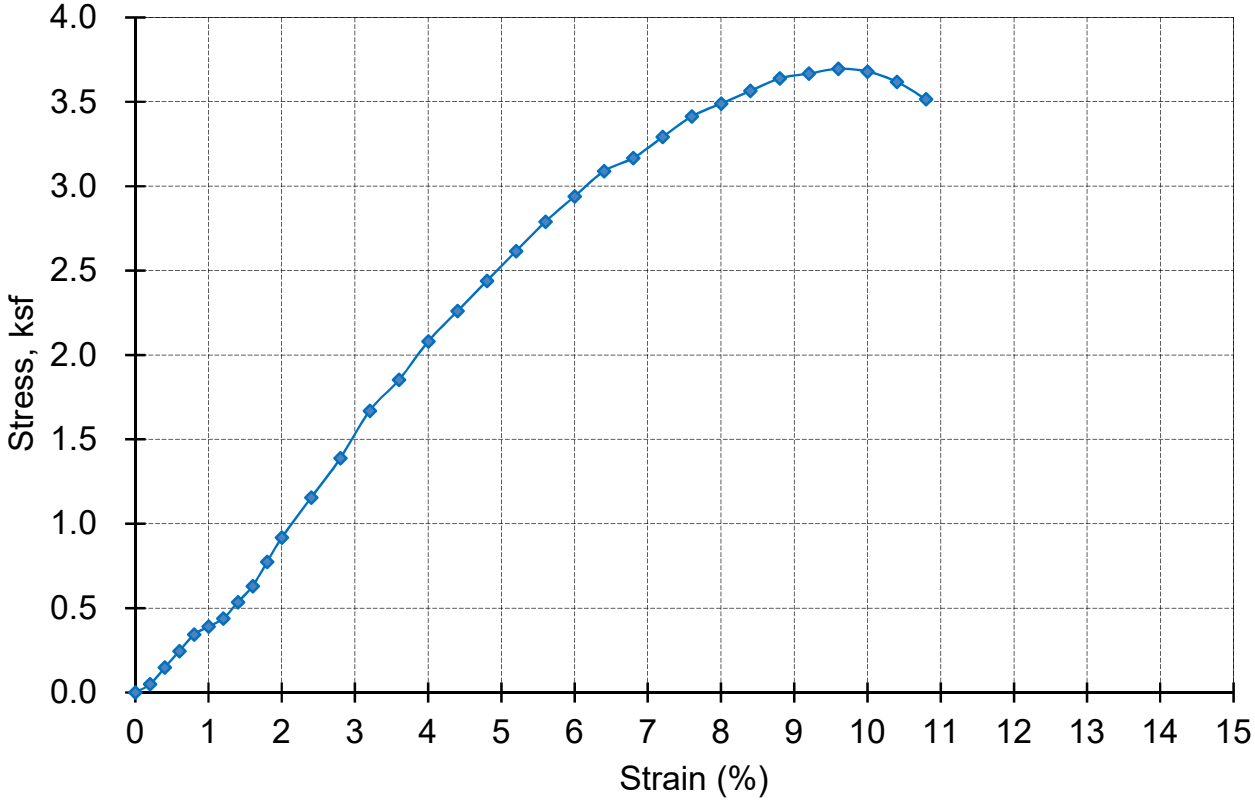
SAN JOSE, CALIFORNIA

JOB NO: 2016-146-GDR | **PLATE NO: B-3D**

UNCONFINED COMPRESSION TEST

UNCONFINED COMPRESSION TEST



Boring No.:	R-18-NO-001	**Unconfined Compressive Strength (ksf):**	3.70
Sample No. :	6	**Shear Strength (ksf)**	1.85
Depth (feet):	26	**Strain @ Failure (%):**	9.6
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	110
Test Method	ASTM D2166	**Water Content (%):**	18.2
Material Type:	CL		
Material Description:	Sandy Lean Clay		

Initial Height (inch):	5.00
Initial Diameter (inch)	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min)	0.1

Remarks:

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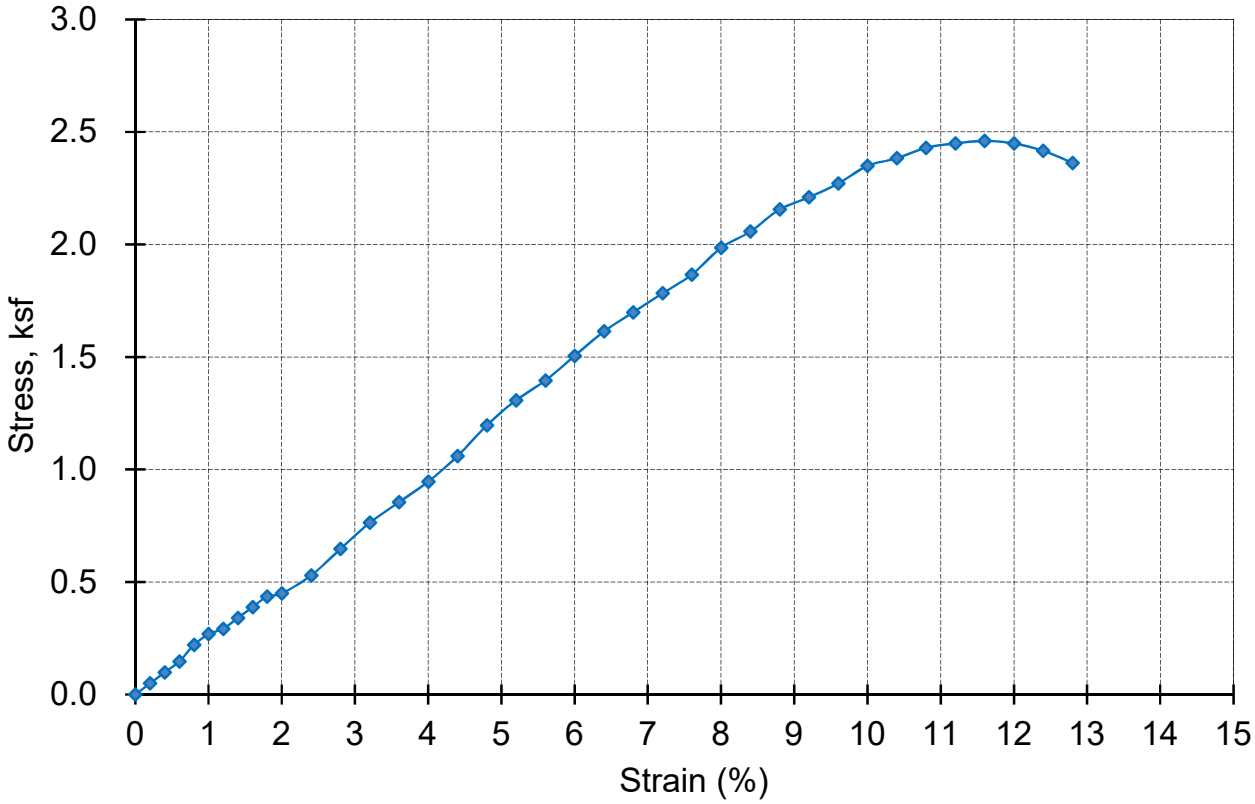
US 101/ Blossom Hill Road Interchange Improvement Project
San Jose, California

JOB NO.: 2016-146-GDR | **PLATE NO.: B-4A**

UNCONFINED COMPRESSION TEST



Boring No.:	R-18-NO-001
Sample No. :	7
Depth (feet):	31
Sample Type:	MC - 2.416 inch dia.
Test Method	ASTM D2166
Material Type:	CL
Material Description:	Sandy Lean Clay
Initial Height (inch):	5.00
Initial Diameter (inch)	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min)	0.1

Unconfined Compressive Strength (ksf):	2.46
Shear Strength (ksf)	1.23
Strain @ Failure (%):	11.6
Initial Dry Density (pcf):	109
Water Content (%):	18.3

Remarks:

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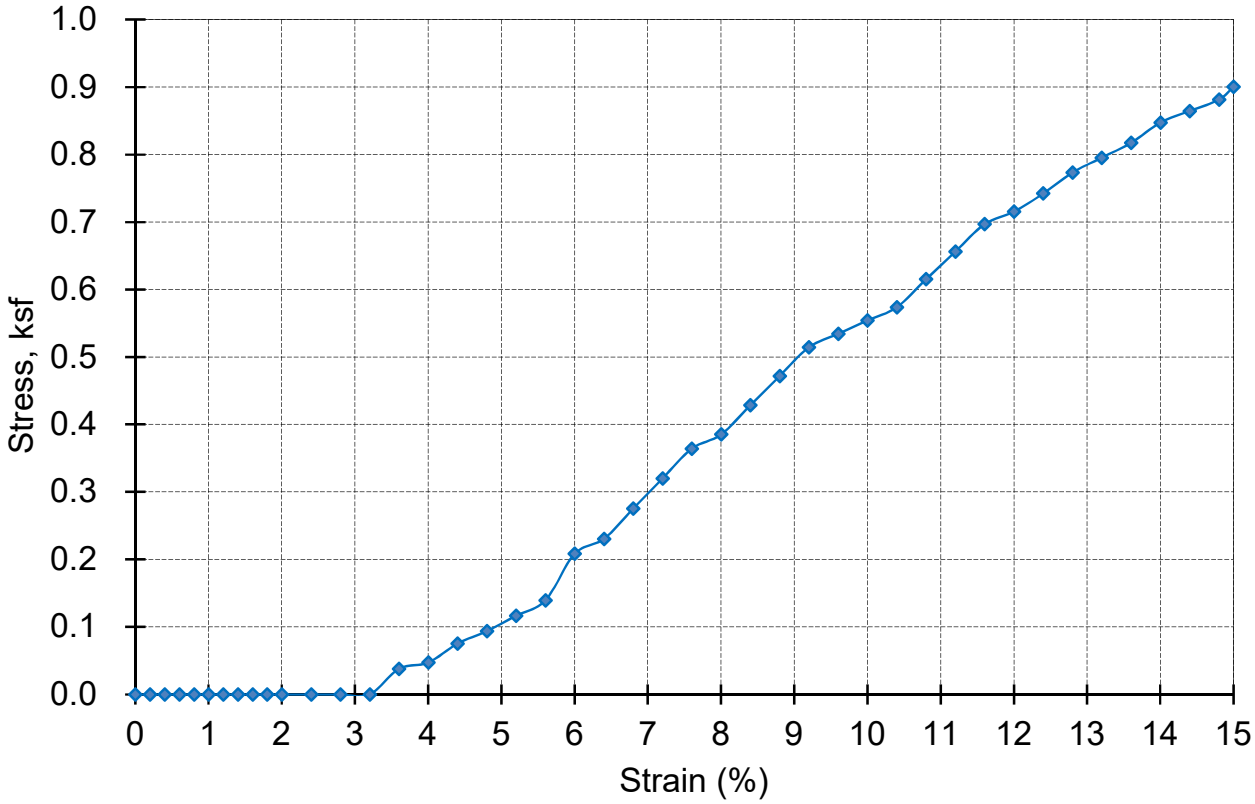
San Jose, California

JOB NO.: 2016-146-GDR | **PLATE NO.: B-4B**

UNCONFINED COMPRESSION TEST



Boring No.:	R-18-NO-001	**Unconfined Compressive Strength (ksf):**	0.90
Sample No. :	11	**Shear Strength (ksf)**	0.45
Depth (feet):	51	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	103
Test Method	ASTM D2166	**Water Content (%):**	27.3
Material Type:	CL-ML		
Material Description:	Silty Clay with Sand		

Initial Height (inch):	5.00
Initial Diameter (inch)	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min)	0.1

Remarks:

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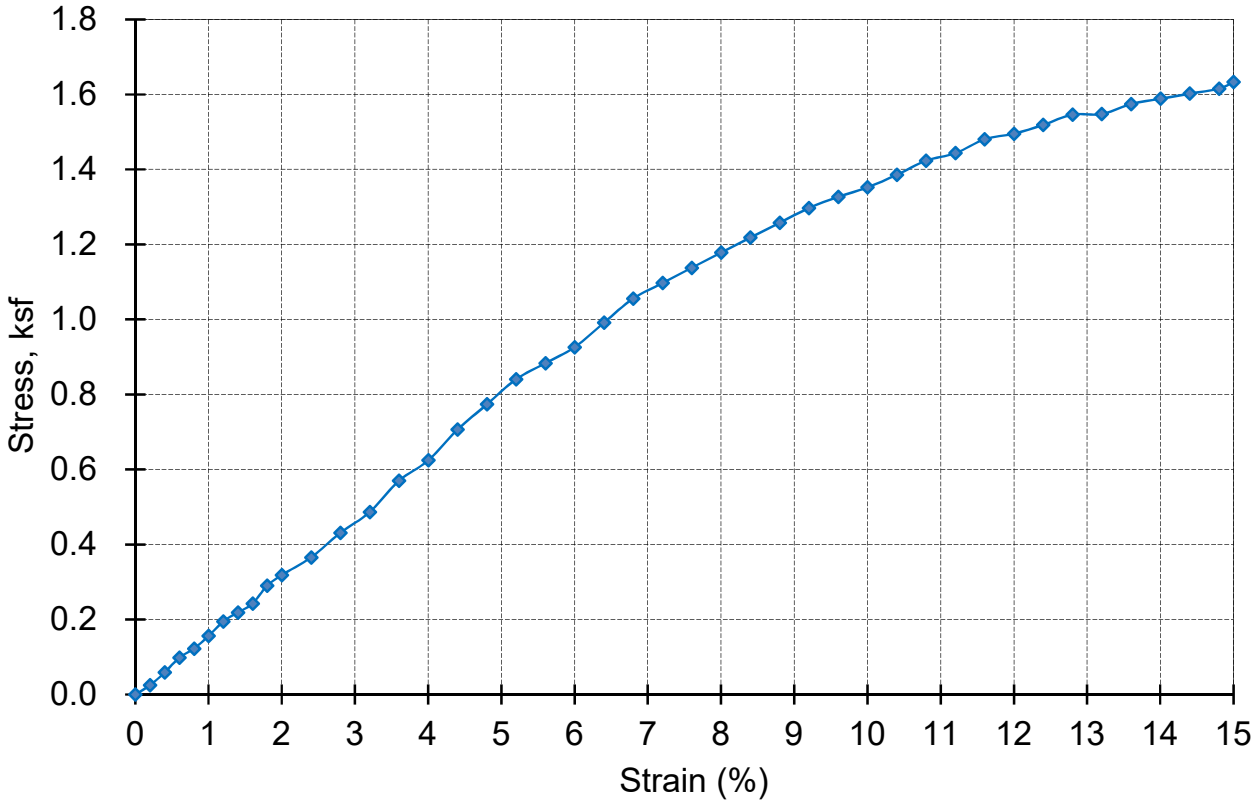
JOB NO.: 2016-146-GDR | **PLATE NO.: B-4C**

UNCONFINED COMPRESSION TEST



Boring No.:	R-18-NO-001	**Unconfined Compressive Strength (ksf):**	1.63
Sample No. :	12	**Shear Strength (ksf)**	0.82
Depth (feet):	56	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	104
Test Method	ASTM D2166	**Water Content (%):**	22.2
Material Type:	CL		
Material Description:	Sandy Lean Clay		

Initial Height (inch):	5.00
Initial Diameter (inch)	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min)	0.1

Remarks:

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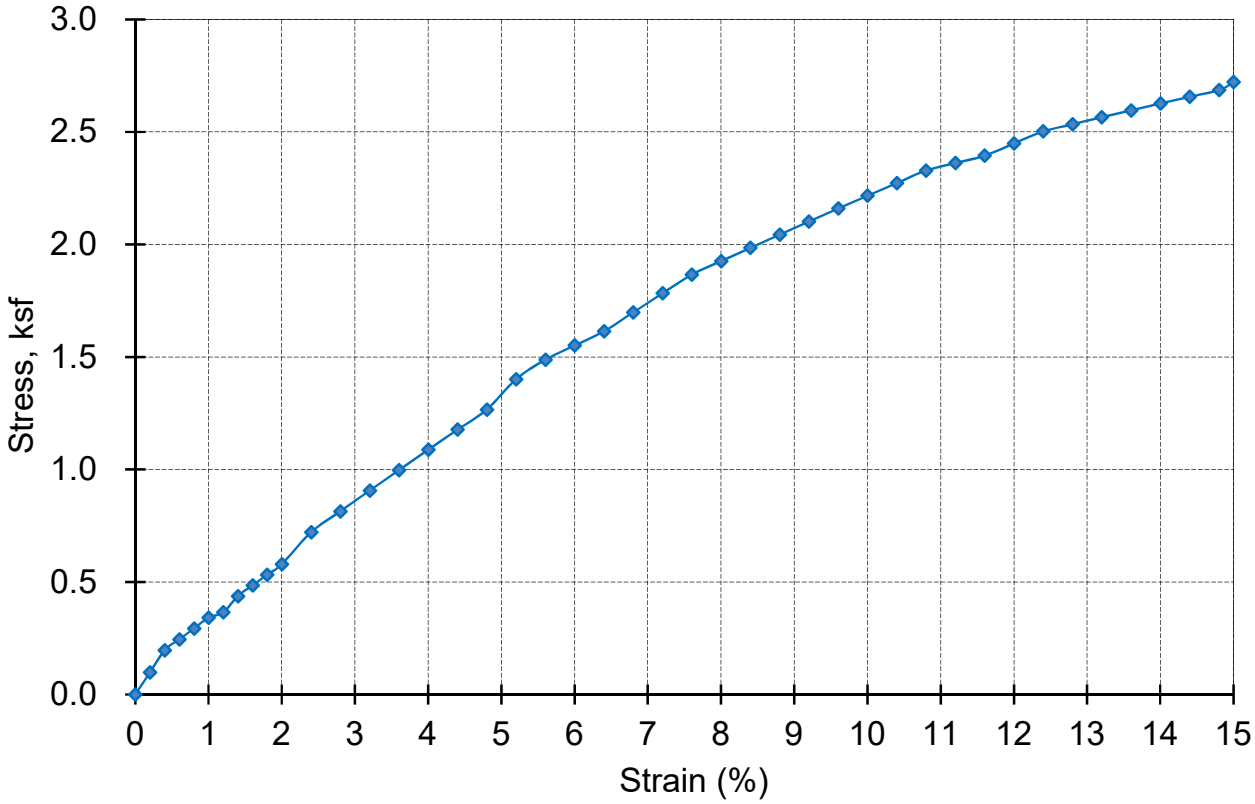
JOB NO.: 2016-146-GDR | **PLATE NO.: B-4D**

UNCONFINED COMPRESSION TEST



Boring No.:	R-18-NO-001	**Unconfined Compressive Strength (ksf):**	2.72
Sample No. :	14	**Shear Strength (ksf)**	1.36
Depth (feet):	71	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	94
Test Method	ASTM D2166	**Water Content (%):**	28.3
Material Type:	CL		
Material Description:	LEAN CLAY		

Initial Height (inch):	5.00
Initial Diameter (inch)	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min)	0.1

Remarks:

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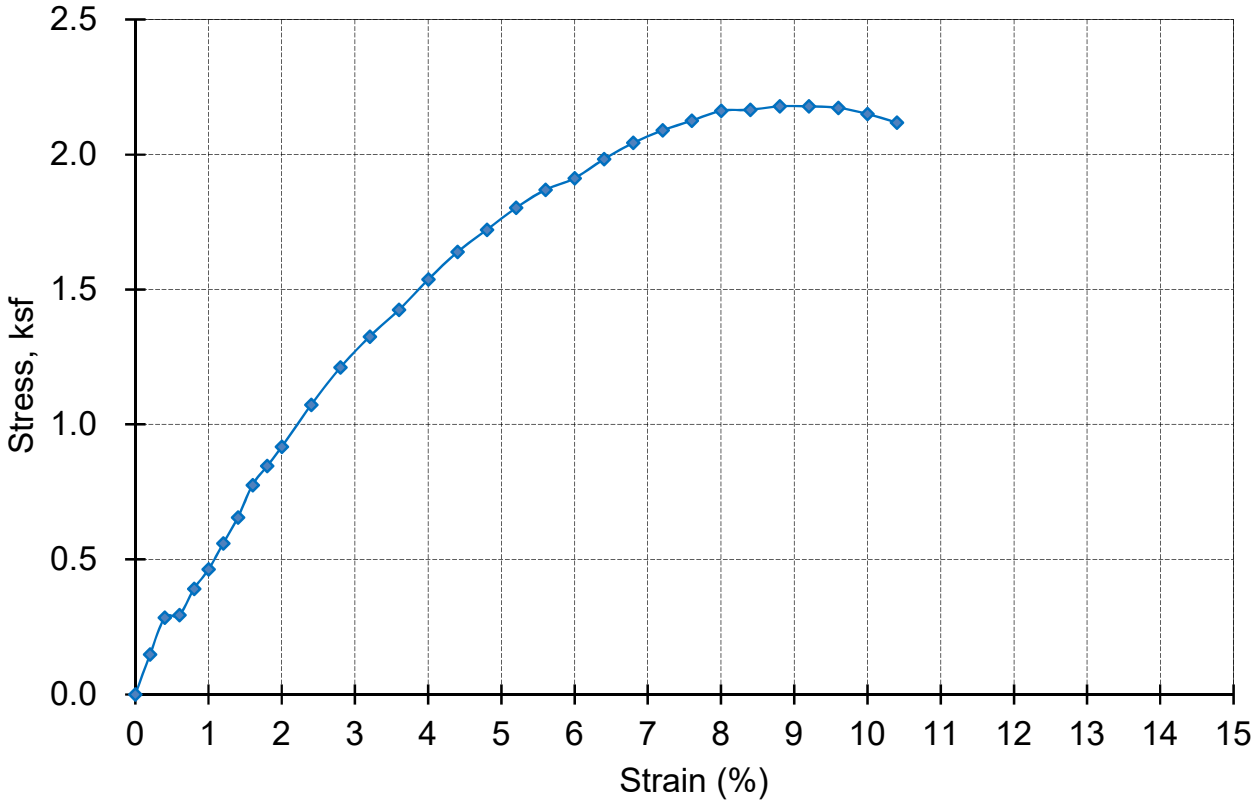
JOB NO.: 2016-146-GDR | **PLATE NO.: B-4E**

UNCONFINED COMPRESSION TEST



Boring No.:	R-18-NO-002	**Unconfined Compressive Strength (ksf):**	2.18
Sample No. :	4	**Shear Strength (ksf)**	1.09
Depth (feet):	16	**Strain @ Failure (%):**	8.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	105
Test Method	ASTM D2166	**Water Content (%):**	19.0
Material Type:	CL		
Material Description:	Sandy Lean Clay		

Initial Height (inch):	5.00
Initial Diameter (inch)	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min)	0.1

Remarks:

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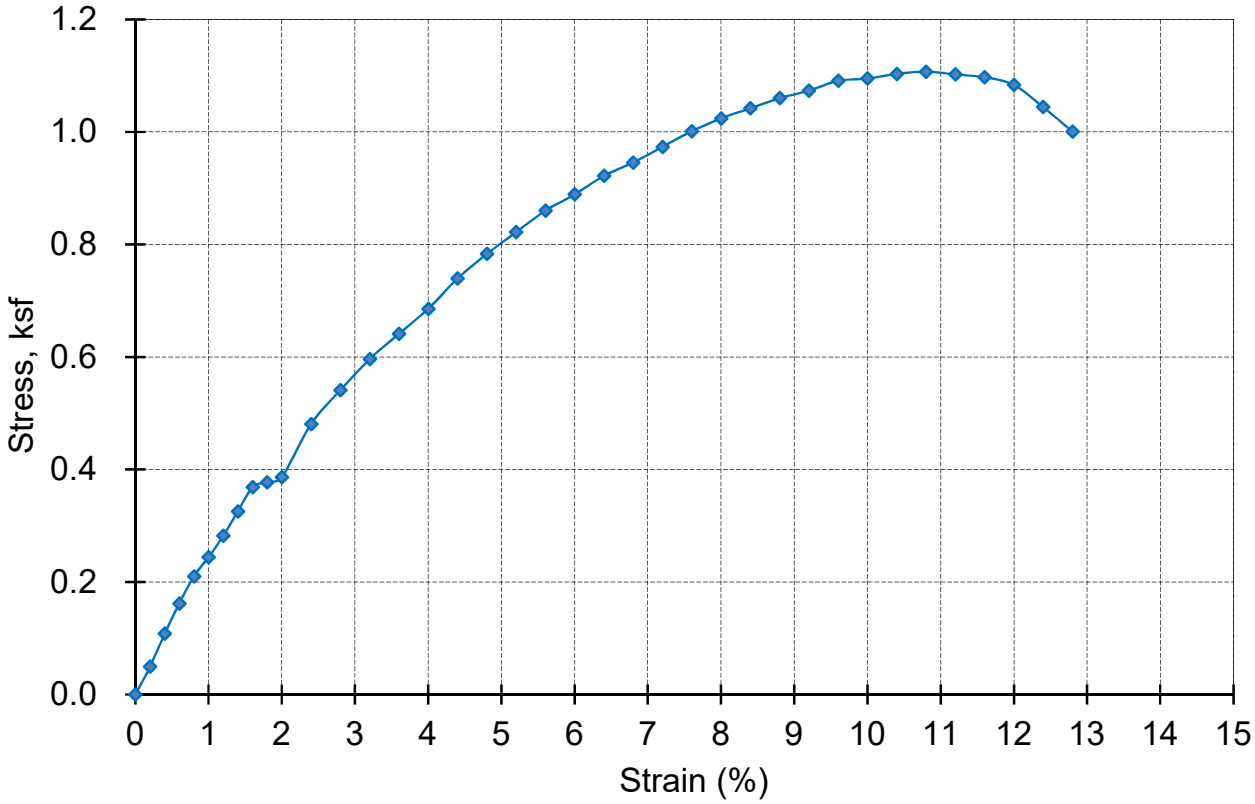
San Jose, California

JOB NO.: 2016-146-GDR | **PLATE NO.: B-4F**

UNCONFINED COMPRESSION TEST



Boring No.:	R-18-NO-002	**Unconfined Compressive Strength (ksf):**	1.11
Sample No. :	7	**Shear Strength (ksf)**	0.55
Depth (feet):	31	**Strain @ Failure (%):**	10.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	101
Test Method	ASTM D2166	**Water Content (%):**	19.9
Material Type:	CL		
Material Description:	LEAN CLAY		

Initial Height (inch):	5.00
Initial Diameter (inch)	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min)	0.1

Remarks:

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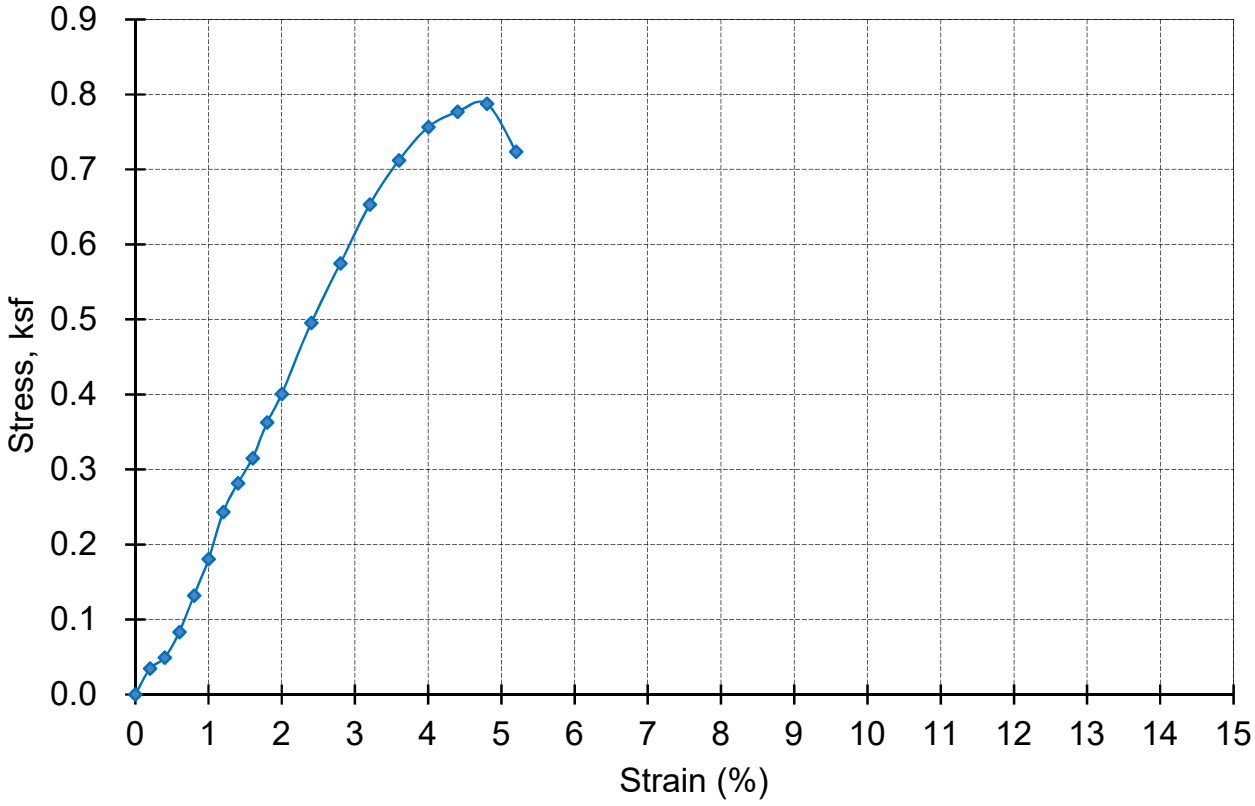
San Jose, California

JOB NO.: 2016-146-GDR | **PLATE NO.: B-4G**

UNCONFINED COMPRESSION TEST



Boring No.:	R-18-NO-002
Sample No. :	11
Depth (feet):	51
Sample Type:	MC - 2.416 inch dia.
Test Method	ASTM D2166
Material Type:	CL
Material Description:	LEAN CLAY
Initial Height (inch):	5.00
Initial Diameter (inch)	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min)	0.1

Unconfined Compressive Strength (ksf):	0.79
Shear Strength (ksf)	0.39
Strain @ Failure (%):	4.8
Initial Dry Density (pcf):	112
Water Content (%):	10.2

Remarks:

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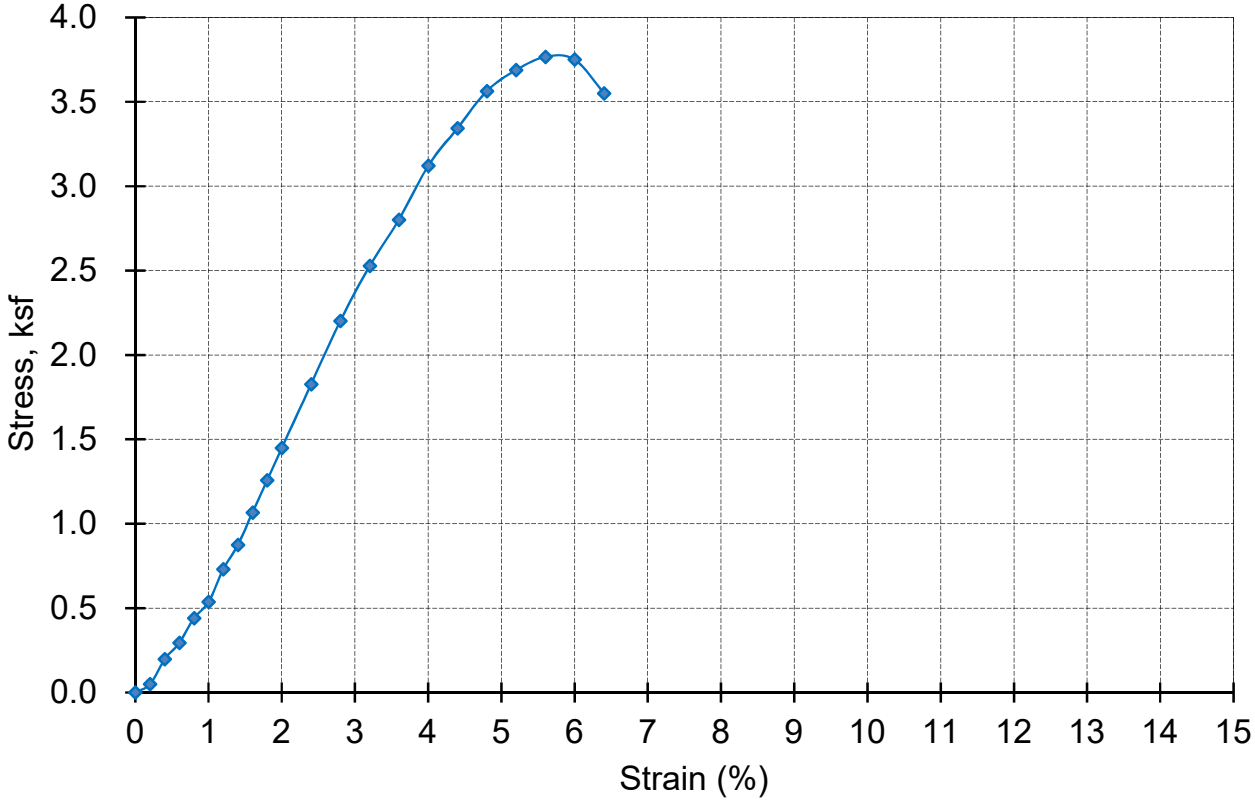
San Jose, California

JOB NO.: 2016-146-GDR | **PLATE NO.: B-4H**

UNCONFINED COMPRESSION TEST



Boring No.:	R-18-NO-003	**Unconfined Compressive Strength (ksf):**	3.77
Sample No. :	6	**Shear Strength (ksf)**	1.88
Depth (feet):	26	**Strain @ Failure (%):**	5.6
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	115
Test Method	ASTM D2166	**Water Content (%):**	15.7
Material Type:	ML		
Material Description:	Sandy Silt		

Initial Height (inch):	5.00
Initial Diameter (inch)	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min)	0.1

Remarks:

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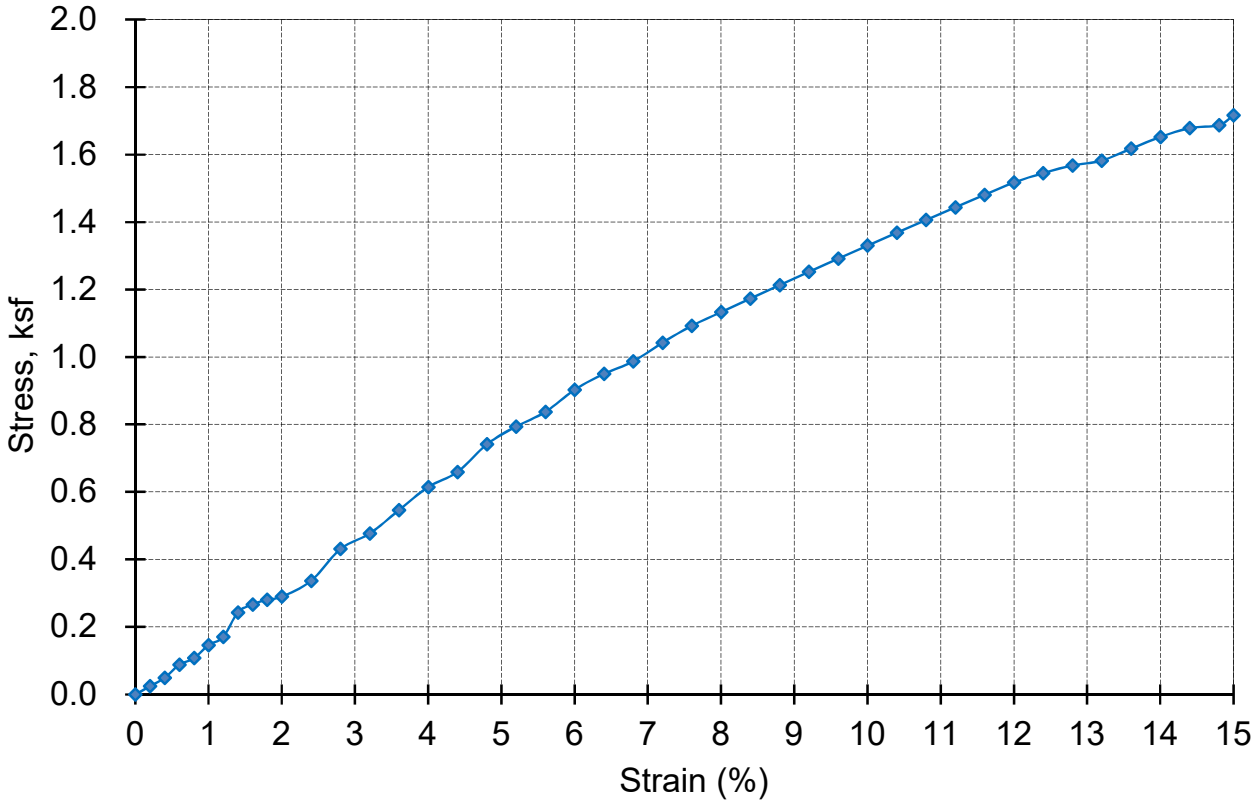
JOB NO.: 2016-146-GDR | **PLATE NO.: B-4I**

UNCONFINED COMPRESSION TEST



Boring No.:	R-18-NO-003	**Unconfined Compressive Strength (ksf):**	1.72
Sample No. :	14	**Shear Strength (ksf)**	0.86
Depth (feet):	71	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	93
Test Method	ASTM D2166	**Water Content (%):**	28.2
Material Type:	ML		
Material Description:	Silt		

Initial Height (inch):	5.00
Initial Diameter (inch)	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min)	0.1

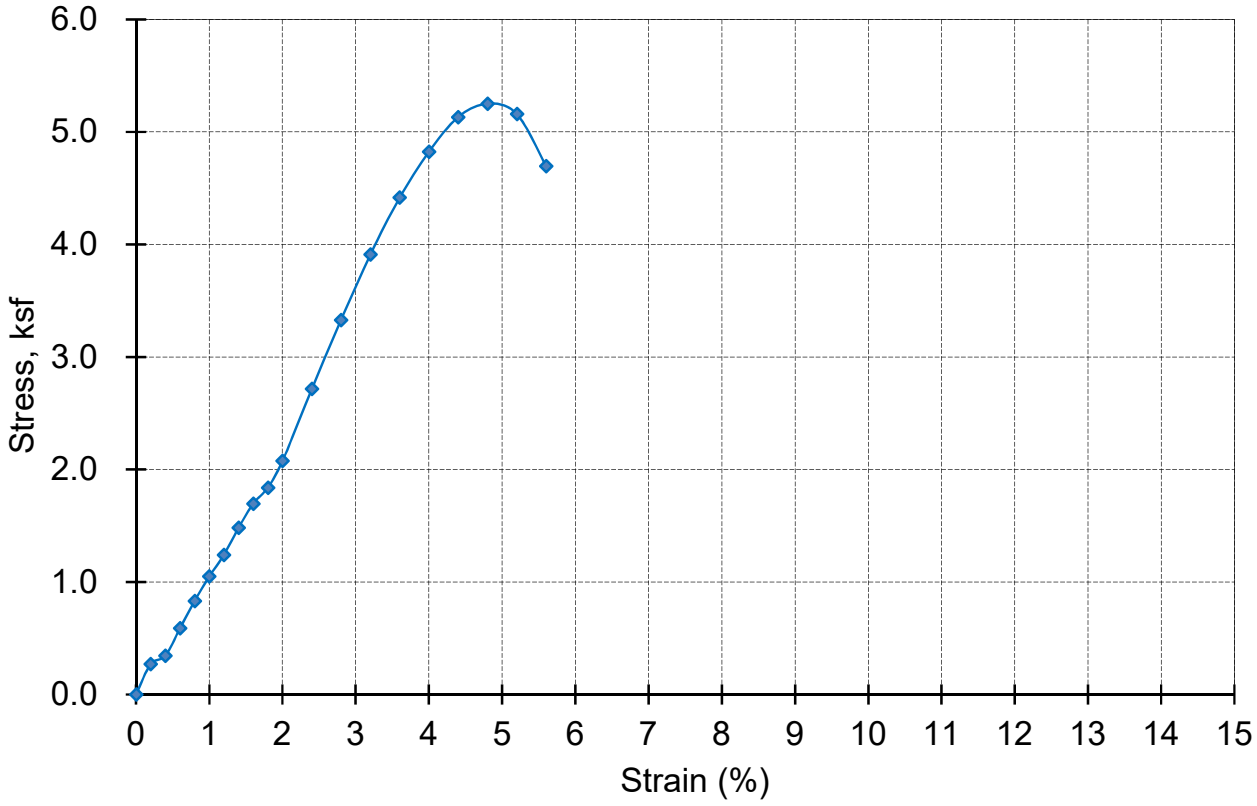
Remarks:

PARIKH
Practicing in the Geosciences

US 101/ Blossom Hill Road Interchange Improvement Project
San Jose, California

JOB NO.: 2016-146-GDR | **PLATE NO.: B-4J**

UNCONFINED COMPRESSION TEST



Boring No.:	R-18-SC-001	**Unconfined Compressive Strength (ksf):**	5.25
Sample No. :	4	**Shear Strength (ksf)**	2.63
Depth (feet):	16	**Strain @ Failure (%):**	4.8
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	100
Test Method	ASTM D2166	**Water Content (%):**	22.2
Material Type:	CL		
Material Description:	Sandy Lean Clay		

Initial Height (inch):	5.00
Initial Diameter (inch)	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min)	0.1

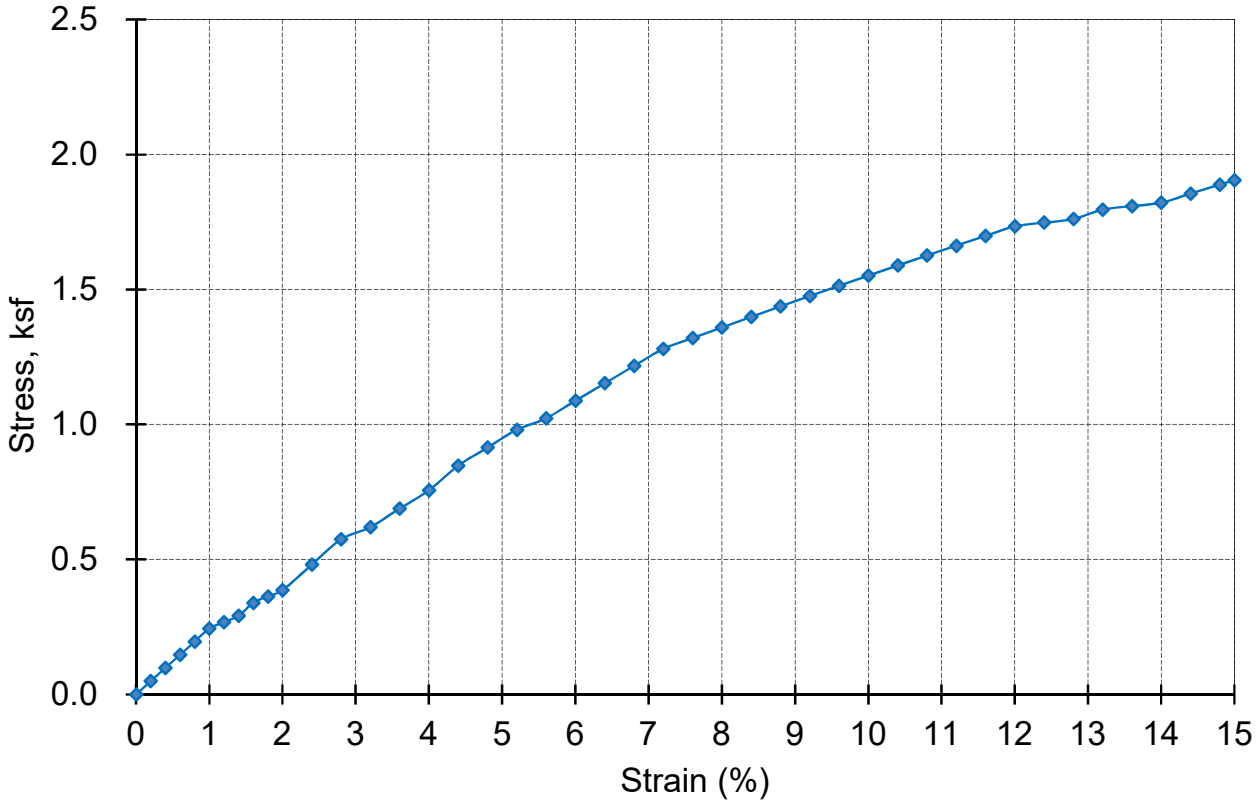
Remarks:

PARIKH
Practicing in the Geosciences

US 101/ Blossom Hill Road Interchange Improvement Project
San Jose, California

JOB NO.: 2016-146-GDR | **PLATE NO.: B-4K**

UNCONFINED COMPRESSION TEST



Boring No.:	R-18-SC-001	**Unconfined Compressive Strength (ksf):**	1.90
Sample No. :	8	**Shear Strength (ksf)**	0.95
Depth (feet):	36	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	109
Test Method	ASTM D2166	**Water Content (%):**	18.3
Material Type:	CL		
Material Description:	Lean Clay with Sand		

Initial Height (inch):	5.00
Initial Diameter (inch)	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min)	0.1

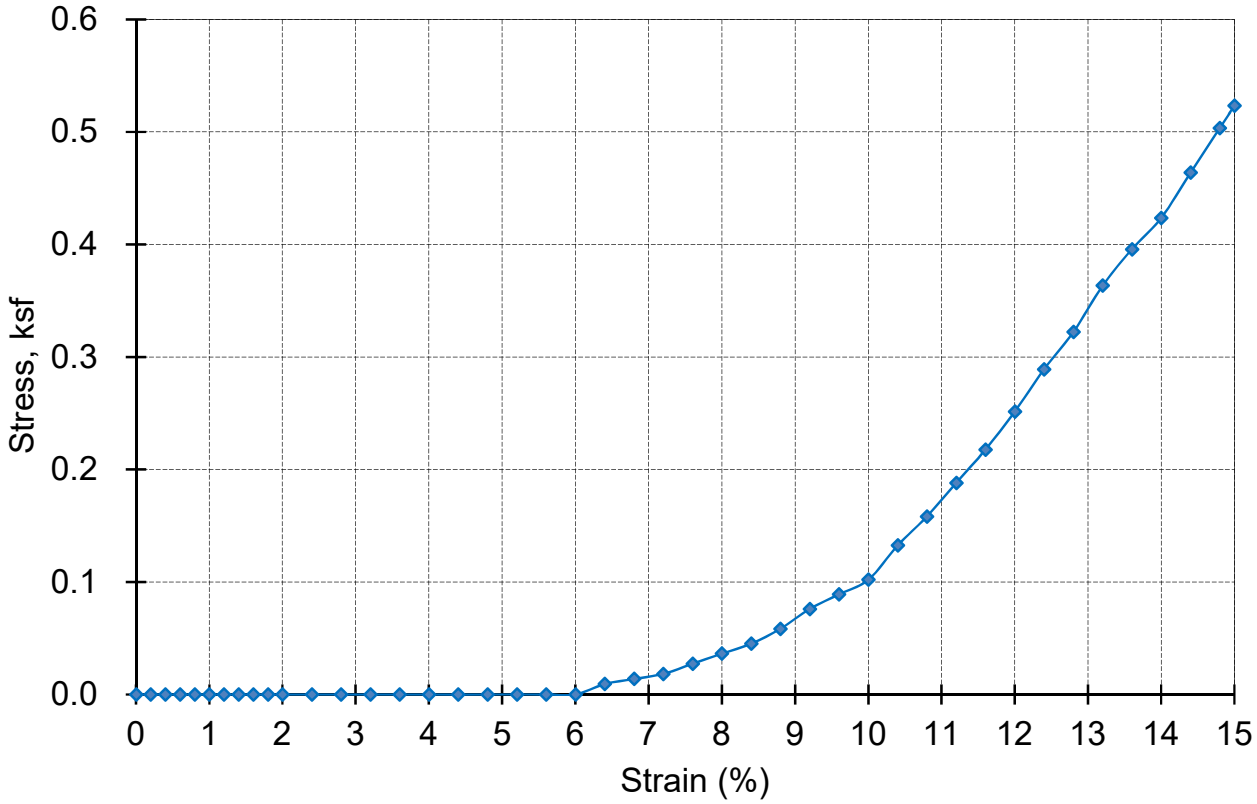
Remarks:

PARIKH
Practicing in the Geosciences

US 101/ Blossom Hill Road Interchange Improvement Project
San Jose, California

JOB NO.: 2016-146-GDR | **PLATE NO.: B-4L**

UNCONFINED COMPRESSION TEST



Boring No.:	R-18-SC-001	**Unconfined Compressive Strength (ksf):**	0.52
Sample No. :	14	**Shear Strength (ksf)**	0.26
Depth (feet):	71	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	97
Test Method	ASTM D2166	**Water Content (%):**	26.6
Material Type:	ML		
Material Description:	Silt with Sand		

Initial Height (inch):	5.00
Initial Diameter (inch)	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min)	0.1

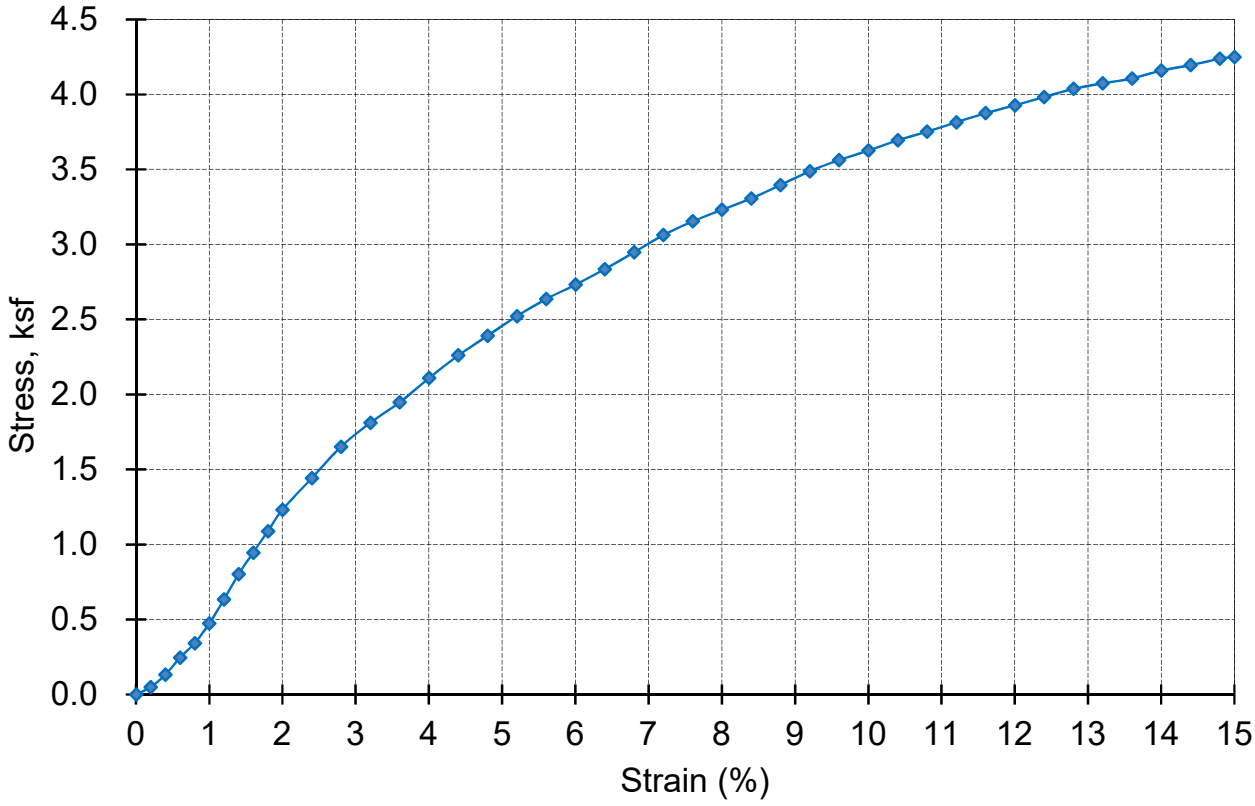
Remarks:

PARIKH
Practicing in the Geosciences

US 101/ Blossom Hill Road Interchange Improvement Project
San Jose, California

JOB NO.: 2016-146-GDR | **PLATE NO.: B-4M**

UNCONFINED COMPRESSION TEST



Boring No.:	R-18-SC-001	**Unconfined Compressive Strength (ksf):**	4.25
Sample No. :	16	**Shear Strength (ksf)**	2.12
Depth (feet):	91	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	97
Test Method	ASTM D2166	**Water Content (%):**	26.8
Material Type:	CL		
Material Description:	Lean Clay		

Initial Height (inch):	5.00
Initial Diameter (inch)	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min)	0.1

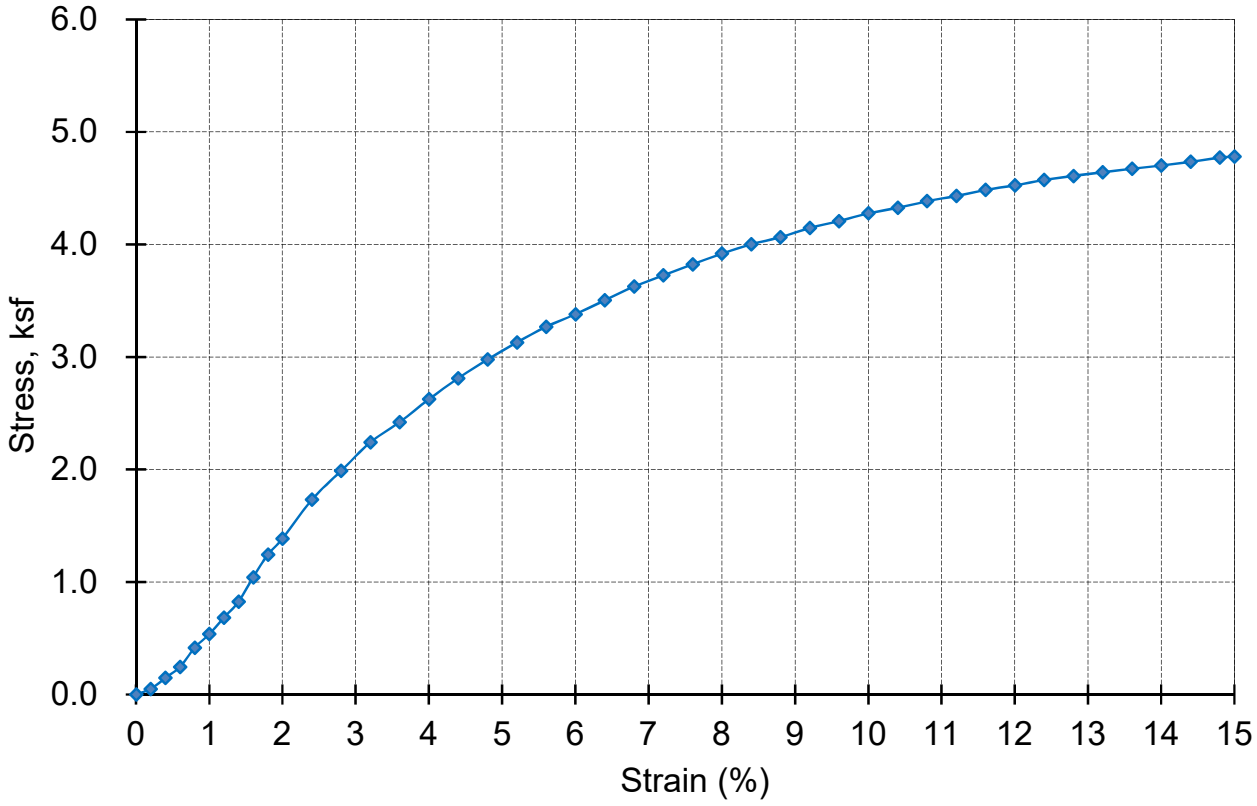
Remarks:

PARIKH
Practicing in the Geosciences

US 101/ Blossom Hill Road Interchange Improvement Project
San Jose, California

JOB NO.: 2016-146-GDR | **PLATE NO.: B-4N**

UNCONFINED COMPRESSION TEST



Boring No.:	R-18-SC-001	**Unconfined Compressive Strength (ksf):**	4.78
Sample No. :	17	**Shear Strength (ksf)**	2.39
Depth (feet):	101	**Strain @ Failure (%):**	15.0
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	114
Test Method	ASTM D2166	**Water Content (%):**	22.8
Material Type:	CH		
Material Description:	Fat Clay		

Initial Height (inch):	5.00
Initial Diameter (inch)	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min)	0.1

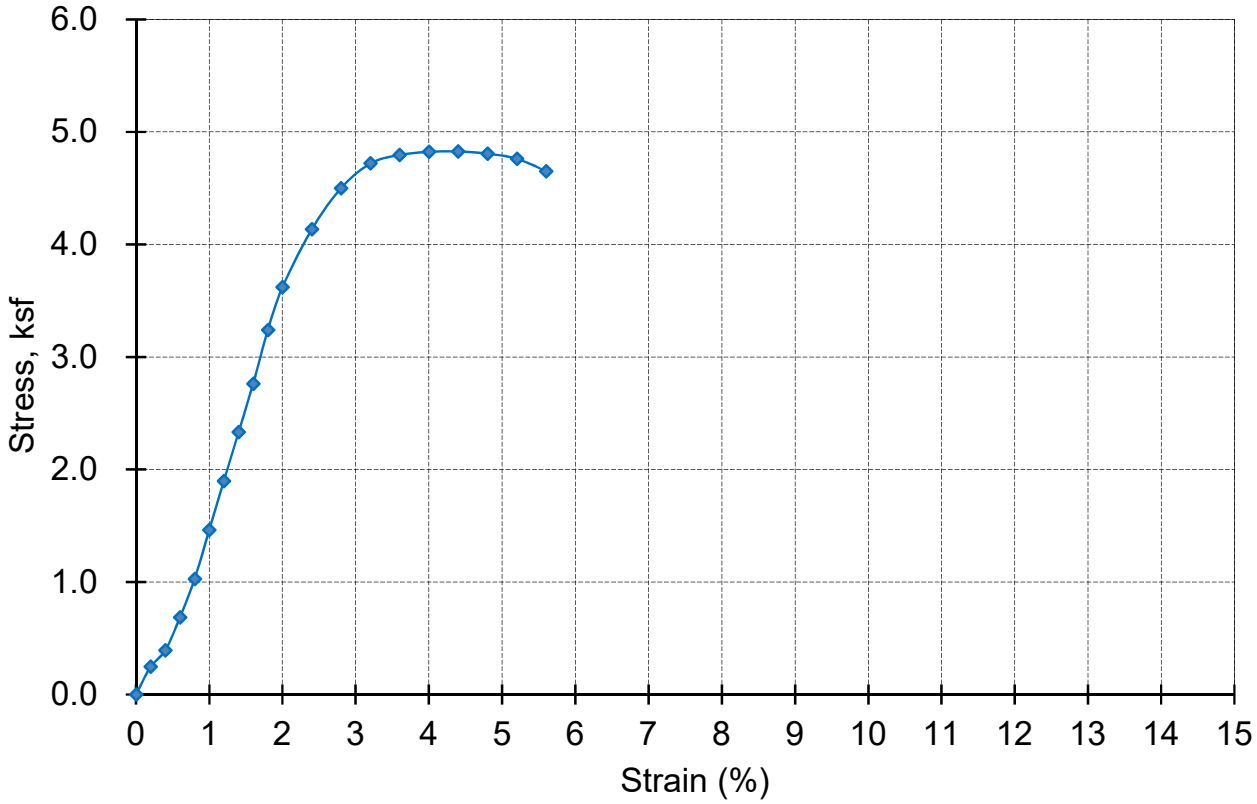
Remarks:

PARIKH
Practicing in the Geosciences

US 101/ Blossom Hill Road Interchange Improvement Project
San Jose, California

JOB NO.: 2016-146-GDR | **PLATE NO.: B-4O**

UNCONFINED COMPRESSION TEST



Boring No.:	R-18-SO-003	**Unconfined Compressive Strength (ksf):**	4.83
Sample No. :	5	**Shear Strength (ksf)**	2.41
Depth (feet):	21	**Strain @ Failure (%):**	4.4
Sample Type:	MC - 2.416 inch dia.	**Initial Dry Density (pcf):**	108
Test Method	ASTM D2166	**Water Content (%):**	17.4
Material Type:	CL/CH		
Material Description:	Sandy Lean Clay to Fat Clay		

Initial Height (inch):	5.00
Initial Diameter (inch)	2.42
Initial Area (ft^2):	0.032
Strain Rate (inch/min)	0.1

Remarks:

PARIKH
Practicing in the Geosciences

US 101/ Blossom Hill Road Interchange Improvement Project
San Jose, California

JOB NO.: 2016-146-GDR | **PLATE NO.: B-4P**

CORROSION TEST

Sunland Analytical
11419 Sunrise Gold Cir.#10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/26/18
Date Submitted 09/21/18

To: Nasir Ahmad
Parikh Consultants Inc.
2360 Qume Dr. Suite A
San Jose, CA, 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 2016-146-BOC Site ID: R-18-SC-001@36'
Thank you for your business.

* For future reference to this analysis please use SUN # 78103 - 163332

EVALUATION FOR SOIL CORROSION

Soil pH	7.18	
Minimum Resistivity	2.68	ohm-cm (x1000)
Chloride	4.6 ppm	0.0005 %
Sulfate-S	0.9 ppm	0.0001 %

METHODS:
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

PLATE NO.: B-5A

Sunland Analytical
11419 Sunrise Gold Cir.#10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/26/18
Date Submitted 09/21/18

To: Nasir Ahmad
Parikh Consultants Inc.
2360 Qume Dr. Suite A
San Jose, CA, 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 2016-146-BOC Site ID: R-18-SC-002@31'
Thank you for your business.

* For future reference to this analysis please use SUN # 78103 - 163333

EVALUATION FOR SOIL CORROSION

Soil pH	7.36	
Minimum Resistivity	1.88	ohm-cm (x1000)
Chloride	9.4 ppm	0.0009 %
Sulfate-S	29.7 ppm	0.003 %

METHODS:
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

PLATE NO.: B-5B

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 10/17/2018
Date Submitted 10/10/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2016-146-NOC Site ID : R18NO001 7@31FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 78265-163683.

EVALUATION FOR SOIL CORROSION

Soil pH	7.98	
Minimum Resistivity	2.09 ohm-cm (x1000)	
Chloride	8.8 ppm	00.00088 %
Sulfate	25.4 ppm	00.00254 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

PLATE NO.: B-5C

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 10/17/2018
Date Submitted 10/10/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2016-146-NOC Site ID : R18N0002 4@16FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 78267-163686.

EVALUATION FOR SOIL CORROSION

Soil pH	7.23	
Minimum Resistivity	1.23 ohm-cm (x1000)	
Chloride	5.1 ppm	00.00051 %
Sulfate	125.4 ppm	00.01254 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

PLATE NO.: B-5D

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 10/03/2018
Date Submitted 09/28/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2016-146-NOC Site ID : R-18-NO-003@31'
Thank you for your business.

* For future reference to this analysis please use SUN # 78178-163493.

EVALUATION FOR SOIL CORROSION

Soil pH	7.58	
Minimum Resistivity	4.82 ohm-cm (x1000)	
Chloride	10.6 ppm	00.00106 %
Sulfate	42.3 ppm	00.00423 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

PLATE NO.: B-5E

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 10/10/2018
Date Submitted 10/05/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2016-146-RW1 Site ID : R-18-SO-001@31'
Thank you for your business.

* For future reference to this analysis please use SUN # 78232-163611.

EVALUATION FOR SOIL CORROSION

Soil pH	7.92	
Minimum Resistivity	1.74 ohm-cm (x1000)	
Chloride	4.2 ppm	00.00042 %
Sulfate	26.9 ppm	00.00269 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

PLATE NO.: B-5F

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/19/2018
Date Submitted 09/13/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2016-146-LUC Site ID : R-18-SO-002@21'
Thank you for your business.

* For future reference to this analysis please use SUN # 78032-163159.

EVALUATION FOR SOIL CORROSION

Soil pH	7.97		
Minimum Resistivity	1.26 ohm-cm (x1000)		
Chloride	16.4 ppm	00.00164	%
Sulfate	40.0 ppm	00.00400	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

PLATE NO.: B-5G

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/19/2018
Date Submitted 09/13/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2016-146-LUC Site ID : R-18-SO-003@21'
Thank you for your business.

* For future reference to this analysis please use SUN # 78032-163158.

EVALUATION FOR SOIL CORROSION

Soil pH	7.71		
Minimum Resistivity	1.34 ohm-cm (x1000)		
Chloride	8.7 ppm	00.00087	%
Sulfate	34.5 ppm	00.00345	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

PLATE NO.: B-5H

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 10/10/2018
Date Submitted 10/05/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2016-146-RW1 Site ID : R-18-NO-101@16'
Thank you for your business.

* For future reference to this analysis please use SUN # 78232-163610.

EVALUATION FOR SOIL CORROSION

Soil pH	7.32	
Minimum Resistivity	1.63 ohm-cm (x1000)	
Chloride	6.0 ppm	00.00060 %
Sulfate	135.6 ppm	00.01356 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

PLATE NO.: B-5I

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 10/17/2018
Date Submitted 10/10/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2016-146-NOC Site ID : R18NO102 6@26FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 78267-163687.

EVALUATION FOR SOIL CORROSION

Soil pH	7.89	
Minimum Resistivity	1.15 ohm-cm (x1000)	
Chloride	15.8 ppm	00.00158 %
Sulfate	74.8 ppm	00.00748 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

PLATE NO.: B-5J

Sunland Analytical
11419 Sunrise Gold Cir.#10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/26/18
Date Submitted 09/21/18

To: Nasir Ahmad
Parikh Consultants Inc.
2360 Qume Dr. Suite A
San Jose, CA, 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 2016-146-GDR Site ID: A-18-BH-104@0-5'
Thank you for your business.

* For future reference to this analysis please use SUN # 78104 - 163334

EVALUATION FOR SOIL CORROSION

Soil pH	7.47	
Minimum Resistivity	2.68	ohm-cm (x1000)
Chloride	6.0 ppm	0.0006 %
Sulfate-S	9.0 ppm	0.0009 %

METHODS:
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

PLATE NO.: B-5K

Sunland Analytical
11419 Sunrise Gold Cir.#10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/26/18
Date Submitted 09/21/18

To: Nasir Ahmad
Parikh Consultants Inc.
2360 Qume Dr. Suite A
San Jose, CA, 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 2016-146-GDR Site ID: A-18-BH-105@0-5'
Thank you for your business.

* For future reference to this analysis please use SUN # 78104 - 163335

EVALUATION FOR SOIL CORROSION

Soil pH	7.23	
Minimum Resistivity	2.60	ohm-cm (x1000)
Chloride	5.0 ppm	0.0005 %
Sulfate-S	13.5 ppm	0.0014 %

METHODS:
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

PLATE NO.: B-5L

Sunland Analytical
11419 Sunrise Gold Cir.#10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/26/18
Date Submitted 09/21/18

To: Nasir Ahmad
Parikh Consultants Inc.
2360 Qume Dr. Suite A
San Jose, CA, 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 2016-146-GDR Site ID: A-18-BH-106@0-5'
Thank you for your business.

* For future reference to this analysis please use SUN # 78104 - 163336

EVALUATION FOR SOIL CORROSION

Soil pH	6.83	
Minimum Resistivity	1.45	ohm-cm (x1000)
Chloride	6.1 ppm	0.0006 %
Sulfate-S	28.4 ppm	0.0028 %

METHODS:
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

PLATE NO.: B-5M

Sunland Analytical
11419 Sunrise Gold Cir.#10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/26/18
Date Submitted 09/21/18

To: Nasir Ahmad
Parikh Consultants Inc.
2360 Qume Dr. Suite A
San Jose, CA, 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 2016-146-GDR Site ID: A-18-BH-107@0-5'
Thank you for your business.

* For future reference to this analysis please use SUN # 78104 - 163337

EVALUATION FOR SOIL CORROSION

Soil pH	7.39	
Minimum Resistivity	1.66	ohm-cm (x1000)
Chloride	4.3 ppm	0.0004 %
Sulfate-S	2.8 ppm	0.0003 %

METHODS:
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

PLATE NO.: B-5N

Sunland Analytical
11419 Sunrise Gold Cir.#10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/26/18
Date Submitted 09/21/18

To: Nasir Ahmad
Parikh Consultants Inc.
2360 Qume Dr. Suite A
San Jose, CA, 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 2016-146-GDR Site ID: A-18-BH-108@0-5'
Thank you for your business.

* For future reference to this analysis please use SUN # 78104 - 163338

EVALUATION FOR SOIL CORROSION

Soil pH	7.18	
Minimum Resistivity	1.42	ohm-cm (x1000)
Chloride	4.6 ppm	0.0005 %
Sulfate-S	7.0 ppm	0.0007 %

METHODS:
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

PLATE NO.: B-5O

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 09/26/2018
Date Submitted 09/21/2018

To: Nasir Ahmad
Parikh Consultants, Inc.
2360 Qume Dr. Suite A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 2016-146-GDR Site ID : A-18-BH-109@0-5'
Thank you for your business.

* For future reference to this analysis please use SUN # 78104-163339.

EVALUATION FOR SOIL CORROSION

Soil pH	7.99	
Minimum Resistivity	1.69 ohm-cm (x1000)	
Chloride	6.4 ppm	00.00064 %
Sulfate	50.7 ppm	00.00507 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

PLATE NO.: B-5P

R-VALUE TEST

R-value Test Report (Caltrans 301)

Job No.:	2016-146-GDR	**Date:**	10/04/18	**Initial Moisture,**	13.7
Client:	Parikh Consultants, Inc.	**Tested**	PJ	**R-value**	**38**
Project:	Blossom Hill Rd. IC Improvement Project	**Reduced**	RU		
Sample	R-18-NO-001 @ 0-5'	**Checked**	DC	**Expansion Pressure**	**0** psf
Soil Type:	Olive Gray Clayey SAND				

Specimen Number	A	B	C	D
Exudation Pressure, psi	152	316	524	
Prepaired Weight, grams	1200	1200	1200	
Final Water Added, grams/cc	32	12	0	
Weight of Soil & Mold, grams	3189	3161	3157	
Weight of Mold, grams	2098	2105	2098	
Height After Compaction, in.	2.56	2.44	2.44	
Moisture Content, %	16.7	14.8	13.7	
Dry Density, pcf	110.7	114.3	115.8	
Expansion Pressure, psf	0	0	99	
Stabilometer @ 1000				
Stabilometer @ 2000	120	84	56	
Turns Displacement	3.76	3.28	2.96	
R-value	19	39	60	

Remarks:

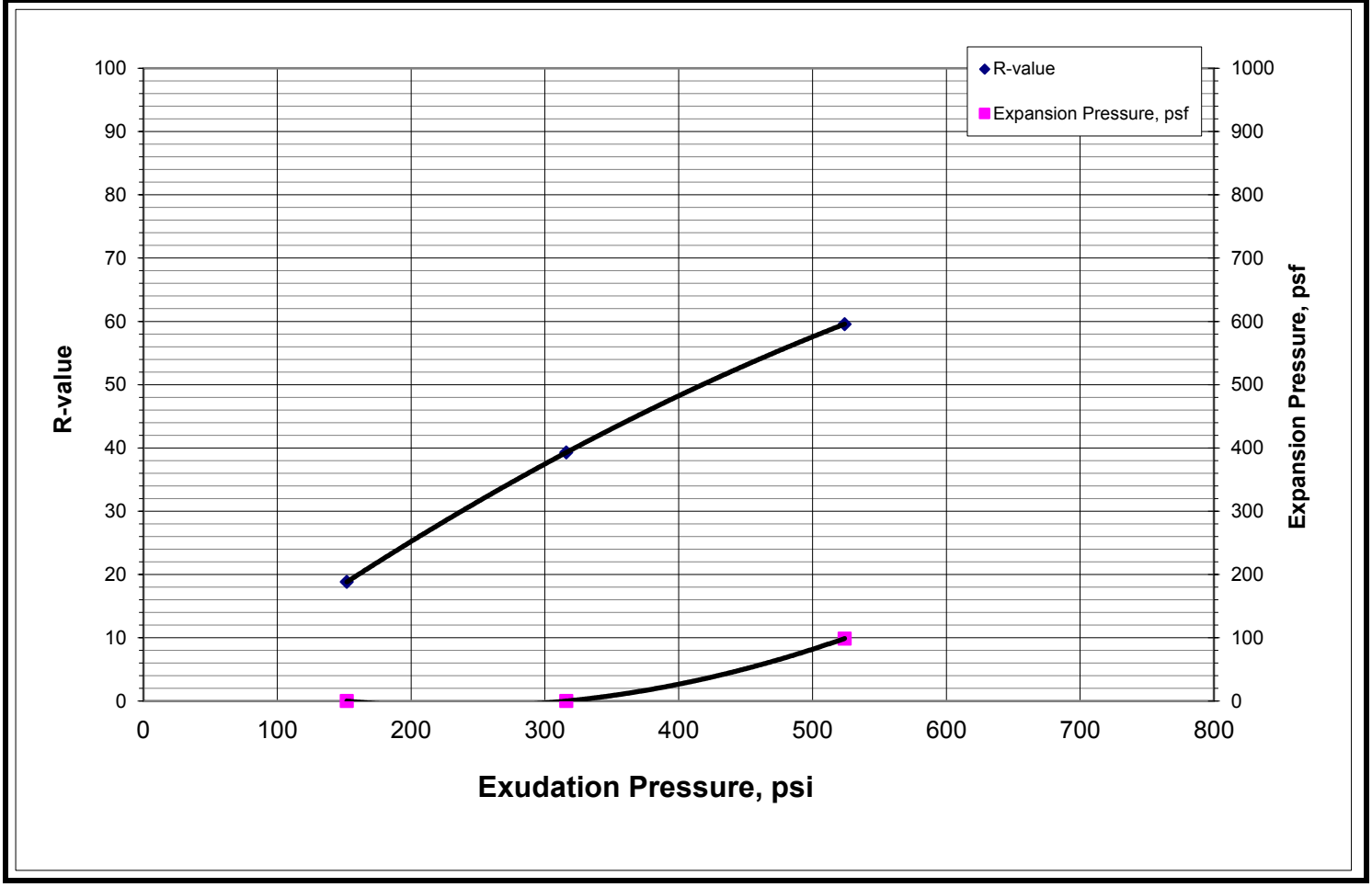
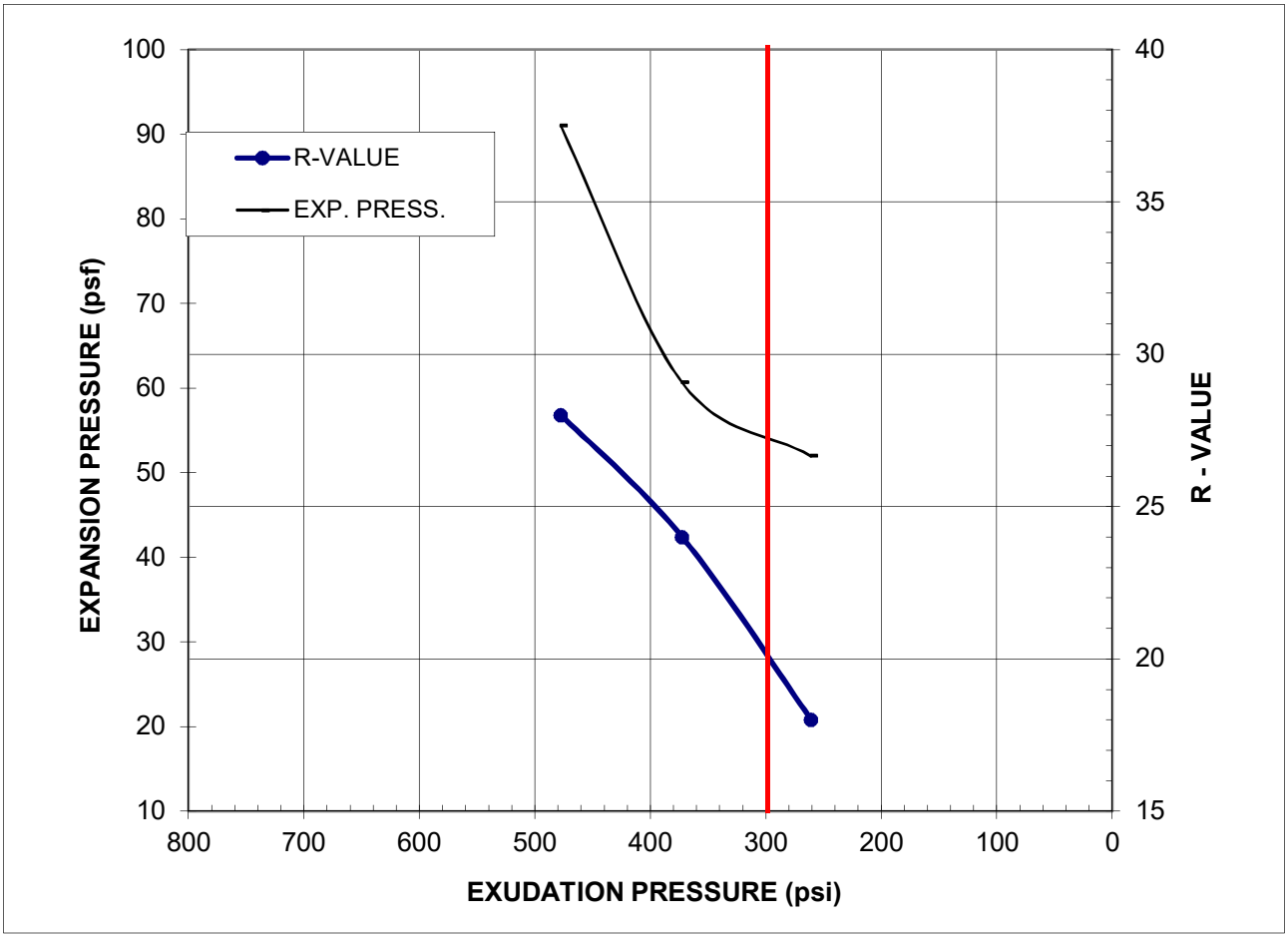


Plate No.: B-6A

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 452-9000

Project Name:	US 101/Blossom Hill Road Interchange Improvement Project			Date:	8/30/18
Client:	City Of San Jose			Project #:	2016-146-GDR
Sample #:	R-18-NO-002	Depth:	0'-5'	Lab #:	M997
Location		Onsite / Native		Sample Date:	
Material :	Brown Sandy Clay With Gravel			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	260.7	372.3	477.35
Expansion Pressure, psf	51.96	60.62	90.93
R-Value	18	24	28
Moisture Content at Test, %	21.6	20.6	17.1
Dry Density at Test, pcf	102.7	105.6	108.8

R-Value @ 300 psi Exudation Pressure = 20

Expansion Pressure @300 psi Exudation, psf = **55**

Minimum R-Value Requirement:

Comments:

Report By: Nasir Ahmad

RVALUE with calcs pdp

Plate No.: B-6B

R-value Test Report (Caltrans 301)

Job No.:	2016-146-GDR	**Date:**	10/09/18	**Initial Moisture,**	13.3
Client:	Parikh Consultants, Inc.	**Tested**	PJ	**R-value**	47
Project:	Blossom Hill Rd. IC Improvement Project	**Reduced**	RU		
Sample	R-18-NO-003 @ 0-5'	**Checked**	DC	**Expansion Pressure**	0 psf
Soil Type:	Olive Clayey SAND				

Specimen Number	A	B	C	D	Remarks:
Exudation Pressure, psi	214	272	475		
Prepaired Weight, grams	1200	1200	1200		
Final Water Added, grams/cc	30	15	0		
Weight of Soil & Mold, grams	3194	3161	3149		
Weight of Mold, grams	2098	2116	2097		
Height After Compaction, in.	2.57	2.37	2.39		
Moisture Content, %	16.1	14.7	13.3		
Dry Density, pcf	111.3	116.5	117.8		
Expansion Pressure, psf	0	0	86		
Stabilometer @ 1000					
Stabilometer @ 2000	117	72	42		
Turns Displacement	3.94	3.78	3.72		
R-value	20	41	63		

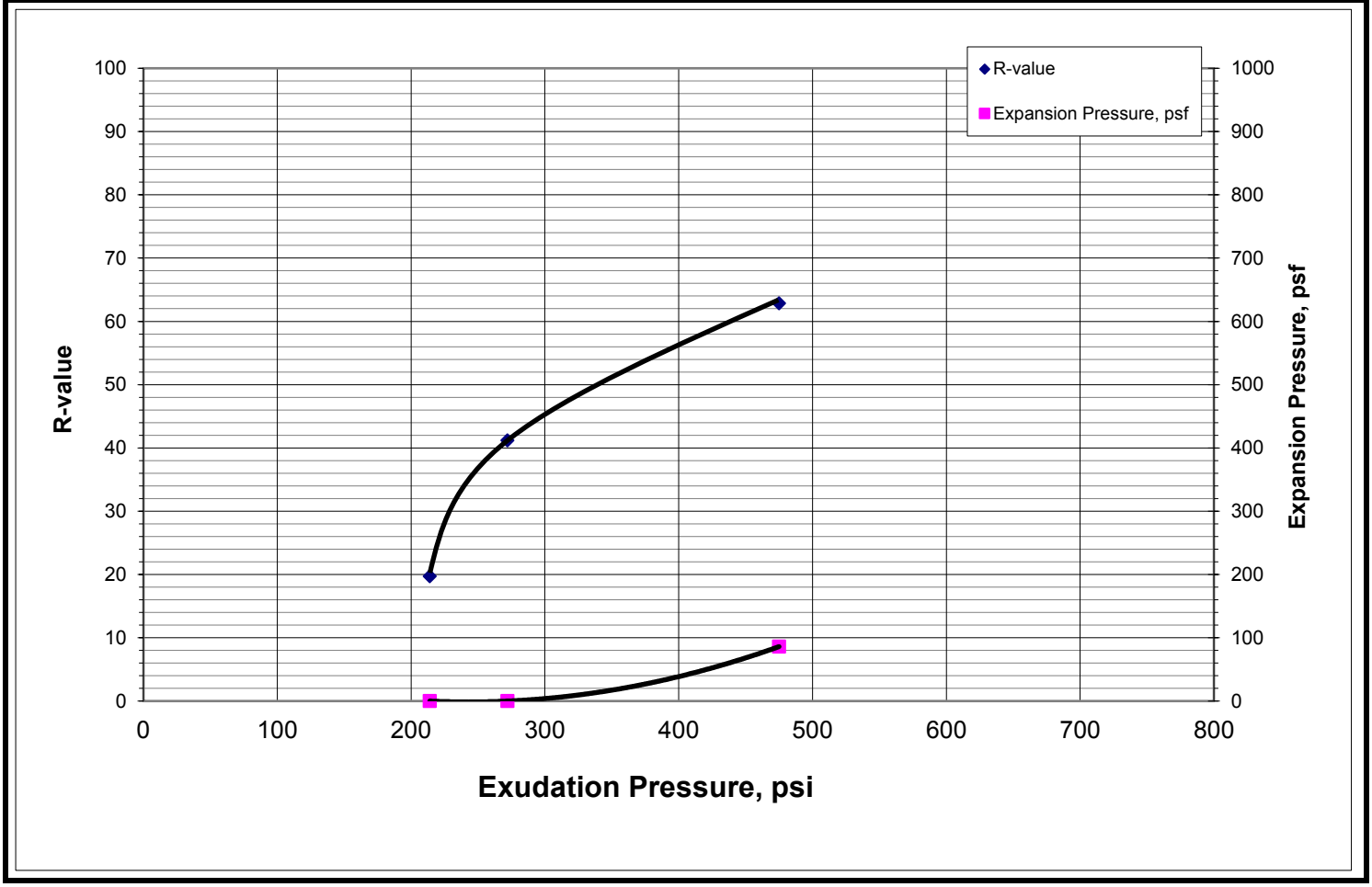


Plate No.: B-6C

R-value Test Report (Caltrans 301)

Job No.:	2016-146-GDR	**Date:**	10/03/18	**Initial Moisture,**	19.1
Client:	Parikh Consultants, Inc.	**Tested**	PJ	**R-value**	12
Project:	Blossom Hill Rd. IC Improvement Project	**Reduced**	RU		
Sample	R-18-NO-101 @ 0-5'	**Checked**	DC	**Expansion Pressure**	20 psf
Soil Type:	Olive Sandy CLAY				

Specimen Number	A	B	C	D
Exudation Pressure, psi	162	412	593	
Prepaired Weight, grams	1200	1200	1200	
Final Water Added, grams/cc	60	40	30	
Weight of Soil & Mold, grams	3119	3113	3027	
Weight of Mold, grams	2116	2102	2064	
Height After Compaction, in.	2.59	2.49	2.34	
Moisture Content, %	25.1	23.1	22.1	
Dry Density, pcf	93.9	100.0	102.2	
Expansion Pressure, psf	0	95	301	
Stabilometer @ 1000				
Stabilometer @ 2000	146	122	88	
Turns Displacement	3.40	3.18	3.00	
R-value	7	20	36	

Remarks:

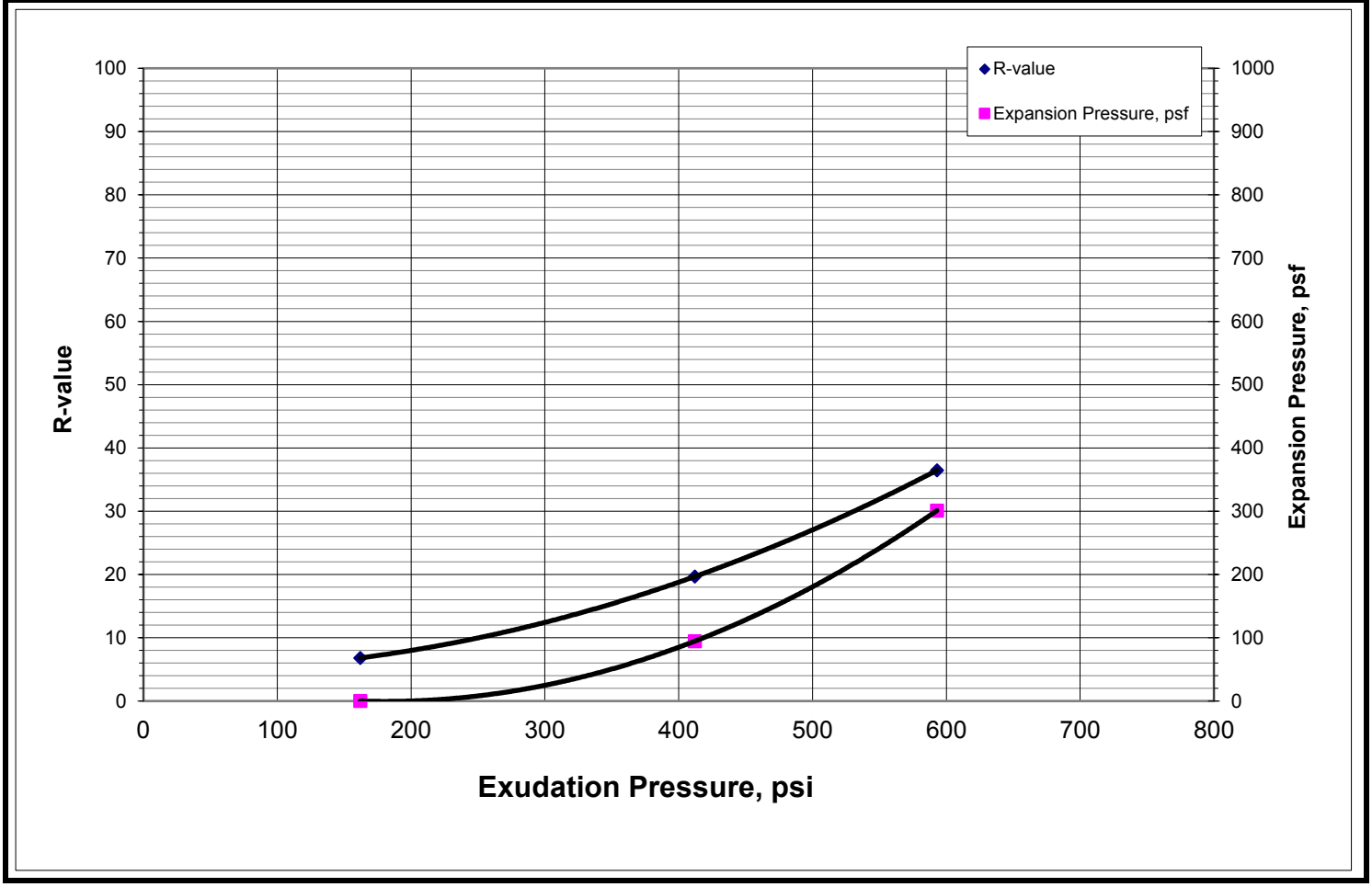


Plate No.: B-6D

R-value Test Report (Caltrans 301)

Job No.:	2016-146-GDR	**Date:**	10/04/18	**Initial Moisture,**	11.5
Client:	Parikh Consultants, Inc.	**Tested**	PJ	**R-value**	44
Project:	Blossom Hill Rd. IC Improvement Project	**Reduced**	RU		
Sample	R-18-NO-102 @ 0-5'	**Checked**	DC	**Expansion Pressure**	0 psf
Soil Type:	Olive Gray Clayey SAND w/ Gravel				

Specimen Number	A	B	C	D
Exudation Pressure, psi	122	281	453	
Prepaired Weight, grams	1200	1200	1200	
Final Water Added, grams/cc	45	25	10	
Weight of Soil & Mold, grams	3188	3170	3161	
Weight of Mold, grams	2094	2102	2116	
Height After Compaction, in.	2.53	2.48	2.33	
Moisture Content, %	15.7	13.9	12.5	
Dry Density, pcf	113.3	114.6	120.9	
Expansion Pressure, psf	0	0	52	
Stabilometer @ 1000				
Stabilometer @ 2000	123	82	40	
Turns Displacement	3.82	3.38	3.20	
R-value	16	41	67	

Remarks:

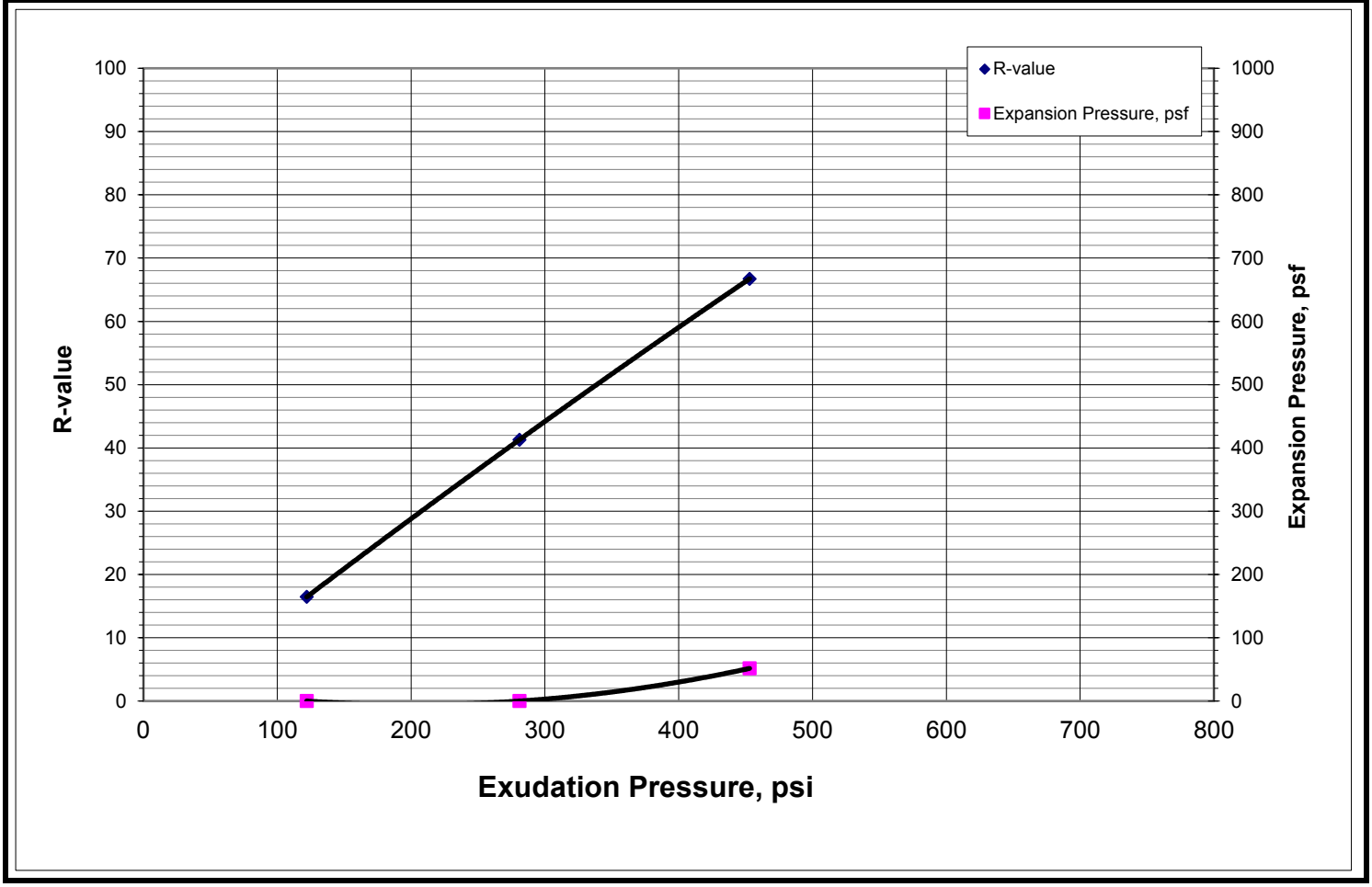


Plate No.: B-6E

R-value Test Report (Caltrans 301)

Job No.:	2016-146-GDR	**Date:**	10/08/18	**Initial Moisture,**	12.7
Client:	Parikh Consultants, Inc.	**Tested**	PJ	**R-value**	**22**
Project:	Blossom Hill Rd. IC Improvement Project	**Reduced**	RU		
Sample	R-18-NO-103 @ 0-5'	**Checked**	DC	**Expansion Pressure**	**60** psf
Soil Type:	Olive Brown Clayey SAND				

Specimen Number	A	B	C	D	Remarks:
Exudation Pressure, psi	247	301	460		
Prepaired Weight, grams	1200	1200	1200		
Final Water Added, grams/cc	50	30	15		
Weight of Soil & Mold, grams	3158	3150	3155		
Weight of Mold, grams	2064	2098	2105		
Height After Compaction, in.	2.60	2.42	2.37		
Moisture Content, %	17.4	15.5	14.1		
Dry Density, pcf	108.6	114.1	117.7		
Expansion Pressure, psf	0	56	129		
Stabilometer @ 1000					
Stabilometer @ 2000	126	112	78		
Turns Displacement	4.24	3.68	3.82		
R-value	14	22	37		

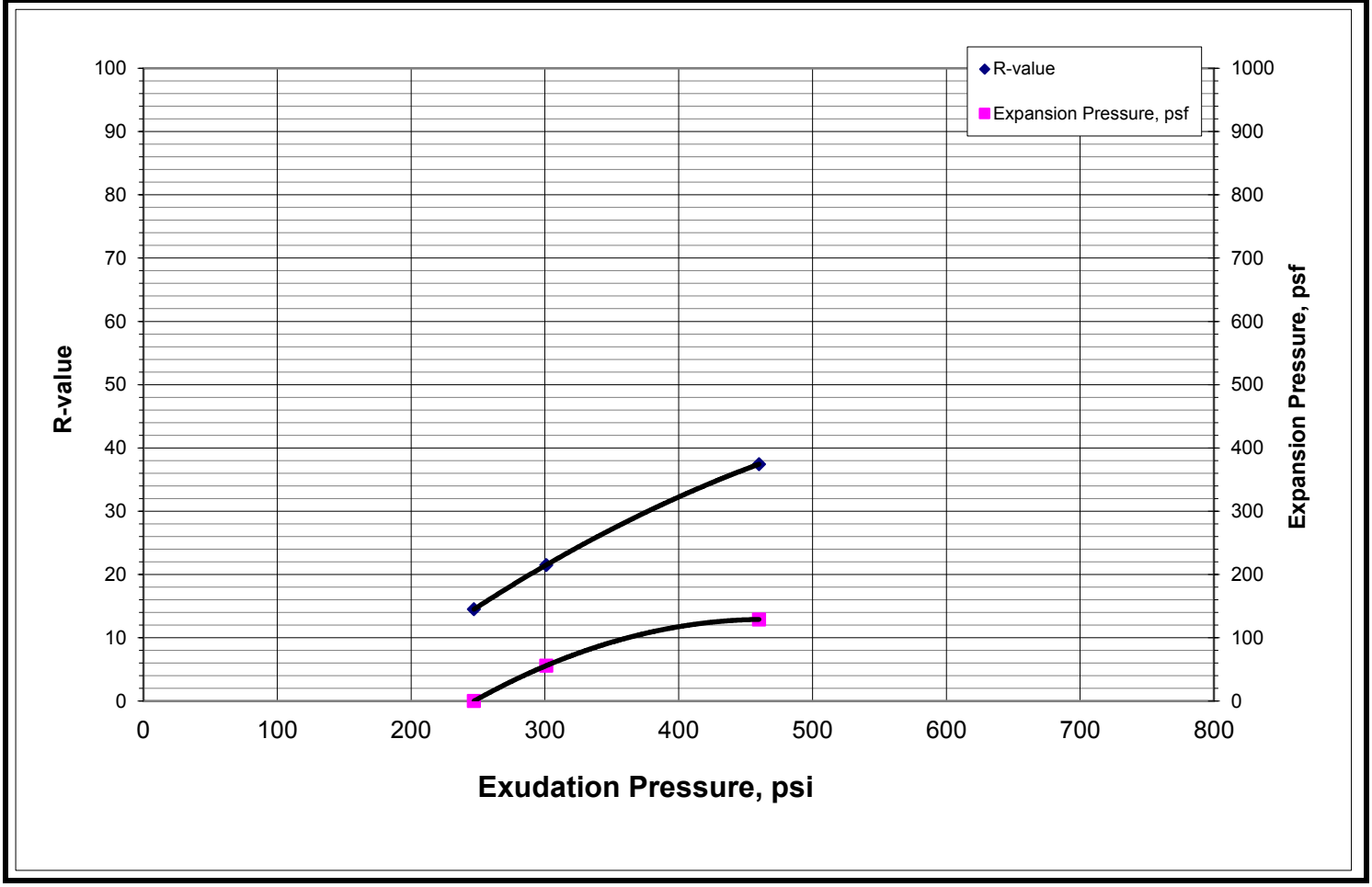


Plate No.: B-6F

R-value Test Report (Caltrans 301)

Job No.:	2016-146-GDR	**Date:**	10/05/18	**Initial Moisture,**	19.9
Client:	Parikh Consultants, Inc.	**Tested**	PJ	**R-value**	14
Project:	Blossom Hill Road IC Improvement Project	**Reduced**	RU		
Sample	R-18-SO-001 @ 0-5'	**Checked**	DC	**Expansion Pressure**	0 psf
Soil Type:	Greenish Gray Sandy CLAY/ Clayey SAND				

Specimen Number	A	B	C	D
Exudation Pressure, psi	220	337	534	
Prepaired Weight, grams	1200	1200	1200	
Final Water Added, grams/cc	60	40	20	
Weight of Soil & Mold, grams	3085	3108	3143	
Weight of Mold, grams	2099	2098	2105	
Height After Compaction, in.	2.51	2.50	2.50	
Moisture Content, %	25.9	23.9	21.9	
Dry Density, pcf	94.6	98.8	103.2	
Expansion Pressure, psf	0	9	172	
Stabilometer @ 1000				
Stabilometer @ 2000	134	125	108	
Turns Displacement	3.76	3.68	3.30	
R-value	11	16	27	

Remarks:

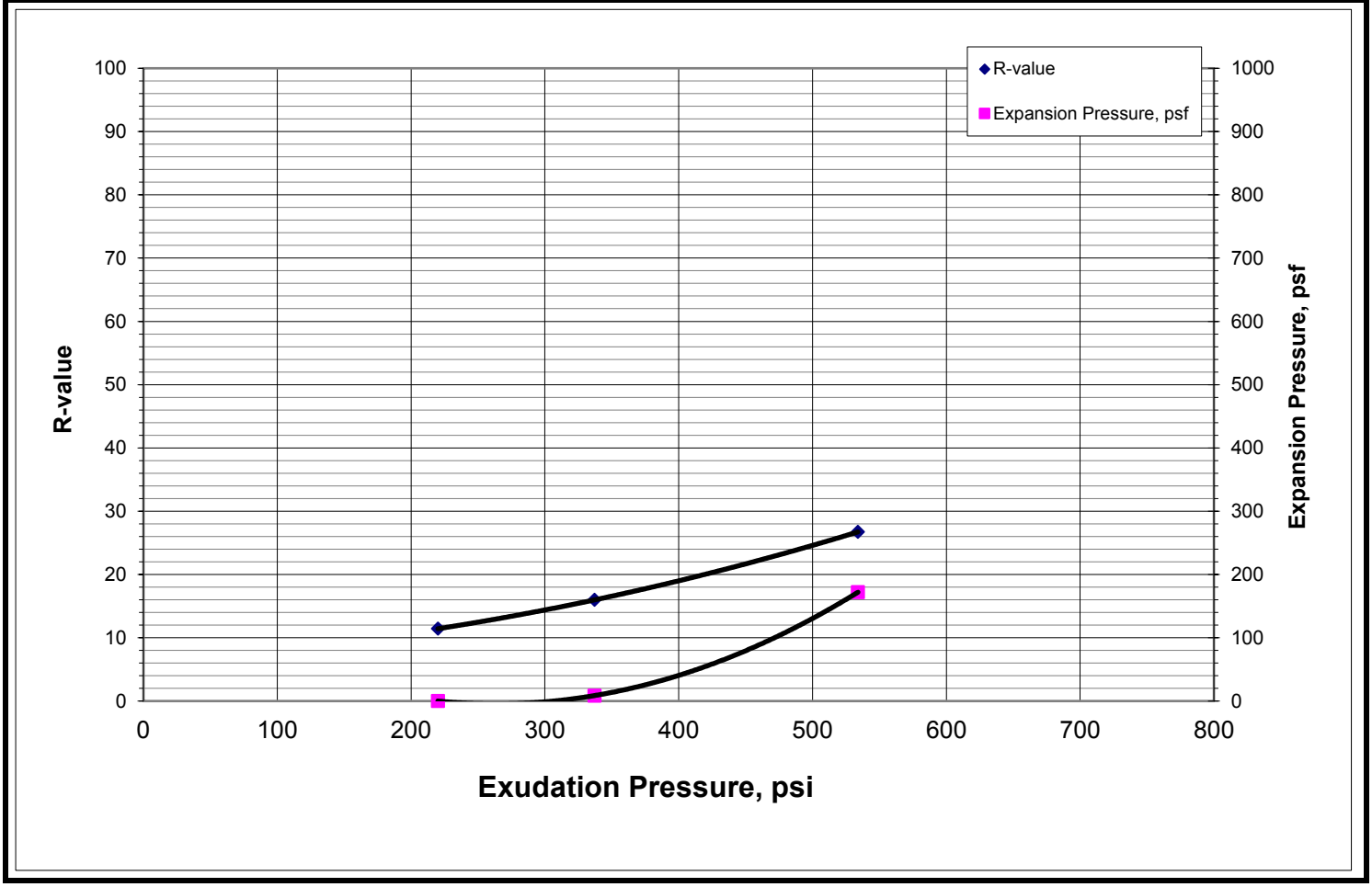
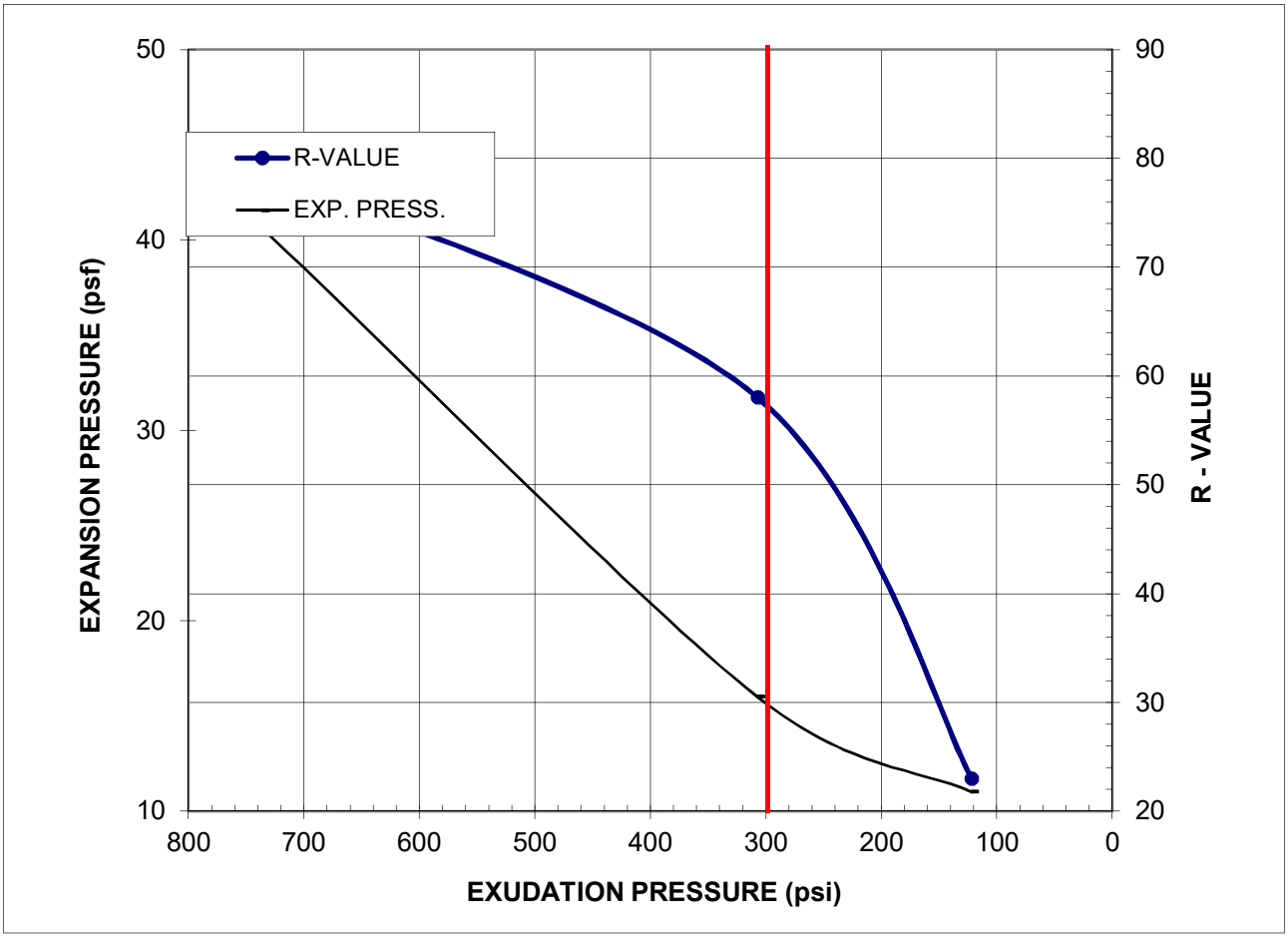


Plate No.: B-6G

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 452-9000

Project Name:	US 101/Blossom Hill Road Interchange Improvement Project			Date:	8/30/18
Client:	City Of San Jose			Project #:	2016-146-GDR
Sample #:	R-18-SO-002	Depth:	0'-5'	Lab #:	M997
Location		Onsite / Native		Sample Date:	
Material :	Brown Sandy Clay With Gravel			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	121.51	307	742.7
Expansion Pressure, psf	11	16	41
R-Value	23	58	79
Moisture Content at Test, %	22.6	20.7	14.5
Dry Density at Test, pcf	100.4	104.2	109.1

R-Value @ 300 psi Exudation Pressure = 57

Expansion Pressure @300 psi Exudation, psf = **17**

Minimum R-Value Requirement:

Comments:

Report By: Nasir Ahmad

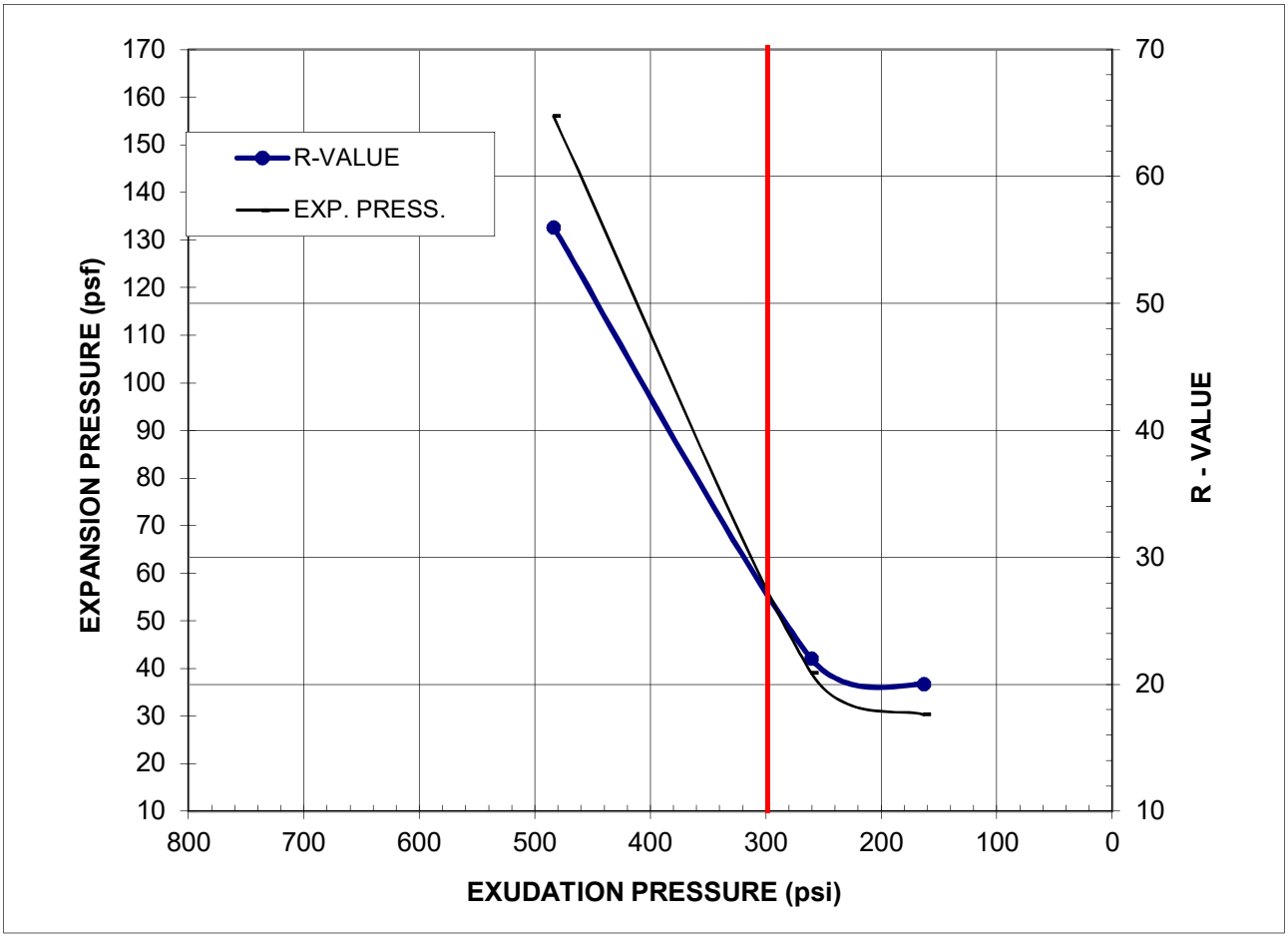
RVALUE with calcs pdp

Plate No.: B-6H

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 452-9000

Project Name:	US 101/Blossom Hill Road Interchange Improvement Project			Date:	8/30/18
Client:	City Of San Jose			Project #:	2016-146-GDR
Sample #:	R-18-SO-003	Depth:	0'-5'	Lab #:	M997
Location		Onsite / Native		Sample Date:	
Material :	Brown Sandy Clay With Gravel			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	163.04	260.42	483.7
Expansion Pressure, psf	30.31	38.97	155.9
R-Value	20	22	56
Moisture Content at Test, %	24.0	23.1	21.1
Dry Density at Test, pcf	98.3	101.2	102.1

R-Value @ 300 psi Exudation Pressure = 27

Expansion Pressure @300 psi Exudation, psf = **55**

Minimum R-Value Requirement:

Comments:

Report By: Nasir Ahmad

RVALUE with calcs pdp

Plate No.: B-6l

R-value Test Report (Caltrans 301)

Job No.:	2016-146-GDR	**Date:**	10/05/18	**Initial Moisture,**	15.1
Client:	Parikh Consultants, Inc.	**Tested**	PJ	**R-value**	**69**
Project:	Blossom Hill Rd. IC Improvement Project	**Reduced**	RU		
Sample	A-18-BH-104 @ 0-5'	**Checked**	DC	**Expansion Pressure**	**20** psf
Soil Type:	Greenish Gray Silty SAND (slightly plastic)				

Specimen Number	A	B	C	D
Exudation Pressure, psi	121	289	660	
Prepaired Weight, grams	1200	1200	1200	
Final Water Added, grams/cc	40	20	5	
Weight of Soil & Mold, grams	3112	3093	3147	
Weight of Mold, grams	2090	2077	2116	
Height After Compaction, in.	2.52	2.52	2.48	
Moisture Content, %	19.0	17.0	15.6	
Dry Density, pcf	103.3	104.4	109.0	
Expansion Pressure, psf	0	17	112	
Stabilometer @ 1000				
Stabilometer @ 2000	80	35	24	
Turns Displacement	4.68	4.24	4.06	
R-value	35	68	78	

Remarks:

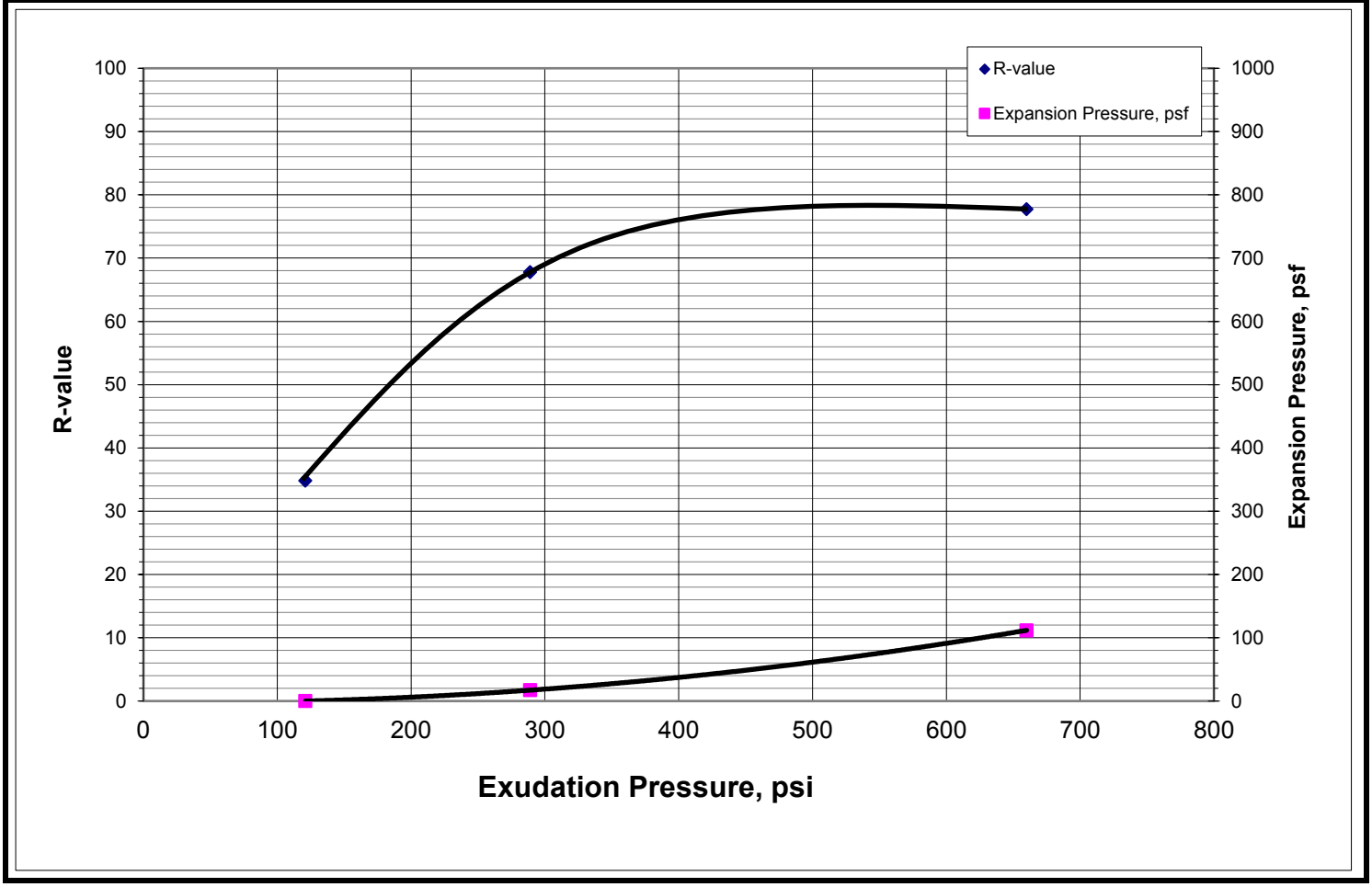


Plate No.: B-6J

R-value Test Report (Caltrans 301)

Job No.:	2016-146-GDR	**Date:**	10/08/18	**Initial Moisture,**	13.3
Client:	Parikh Consultants, Inc.	**Tested**	PJ	**R-value**	**60**
Project:	Blossom Hill Rd. IC Improvement Project	**Reduced**	RU		
Sample	A-18-BH-105 @ 0-5'	**Checked**	DC	**Expansion Pressure**	**0** psf
Soil Type:	Olive Silty SAND				

Specimen Number	A	B	C	D
Exudation Pressure, psi	135	216	772	
Prepaired Weight, grams	1200	1200	1200	
Final Water Added, grams/cc	40	20	0	
Weight of Soil & Mold, grams	3190	3163	3123	
Weight of Mold, grams	2106	2097	2094	
Height After Compaction, in.	2.54	2.48	2.43	
Moisture Content, %	17.0	15.2	13.3	
Dry Density, pcf	110.5	113.2	113.3	
Expansion Pressure, psf	0	0	77	
Stabilometer @ 1000				
Stabilometer @ 2000	94	65	22	
Turns Displacement	4.42	4.35	4.00	
R-value	28	46	79	

Remarks:

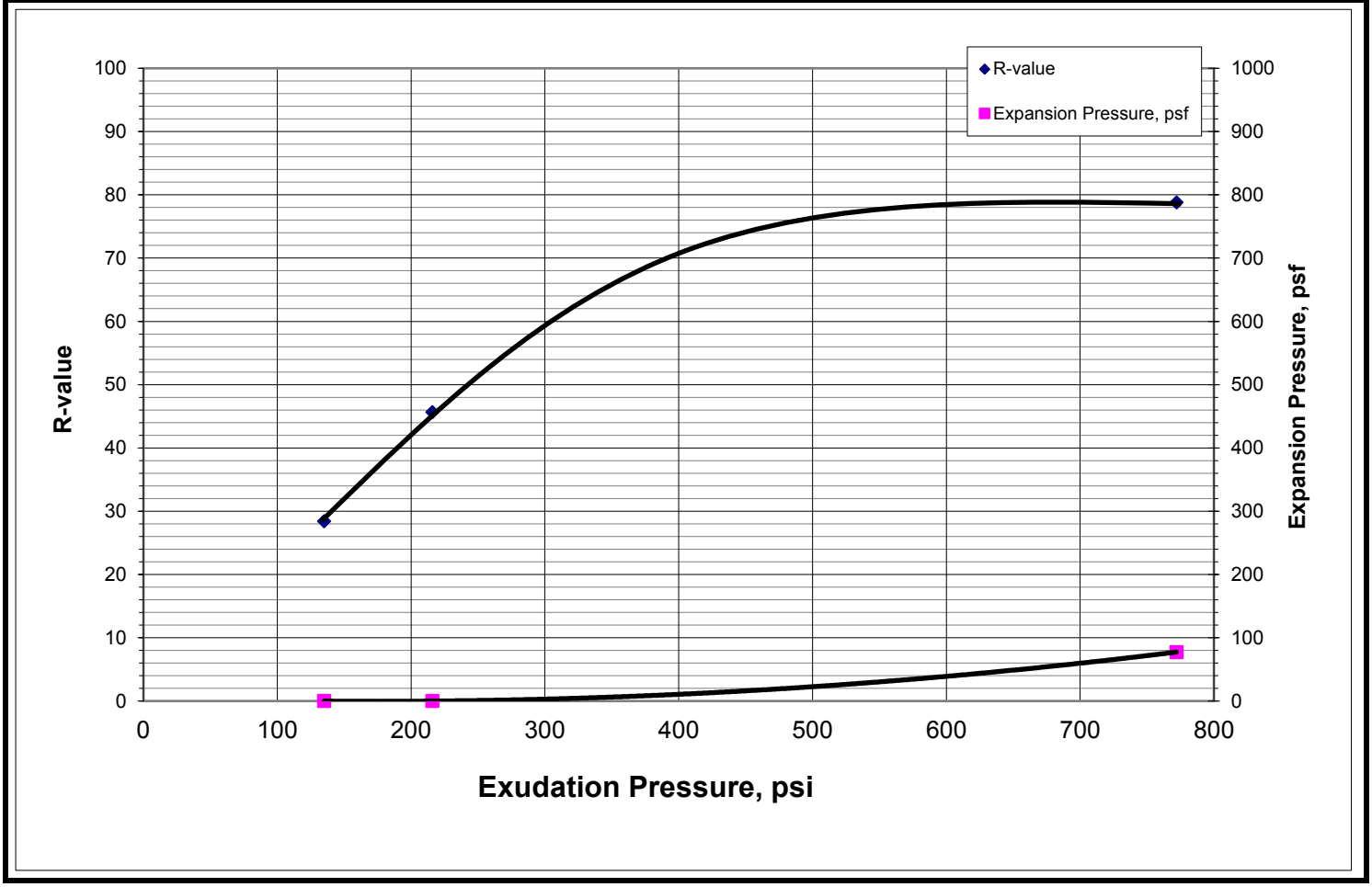


Plate No.: B-6K

R-value Test Report (Caltrans 301)

Job No.:	2016-146-GDR	**Date:**	10/08/18	**Initial Moisture,**	18.3
Client:	Parikh Consultants, Inc.	**Tested**	PJ	**R-value**	**28**
Project:	Blossom Hill Rd. IC Improvement Project	**Reduced**	RU		
Sample	A-18-BH-106 @ 0-5'	**Checked**	DC	**Expansion Pressure**	**50** psf
Soil Type:	Dark Gray Clayey SAND				

Specimen Number	A	B	C	D	Remarks:
Exudation Pressure, psi	105	178	398		
Prepaired Weight, grams	1200	1200	1200		
Final Water Added, grams/cc	55	35	10		
Weight of Soil & Mold, grams	3072	3139	3112		
Weight of Mold, grams	2077	2106	2116		
Height After Compaction, in.	2.52	2.66	2.42		
Moisture Content, %	23.8	21.8	19.3		
Dry Density, pcf	96.7	96.7	104.6		
Expansion Pressure, psf	0	0	129		
Stabilometer @ 1000					
Stabilometer @ 2000	130	124	77		
Turns Displacement	4.43	3.96	3.70		
R-value	12	17	40		

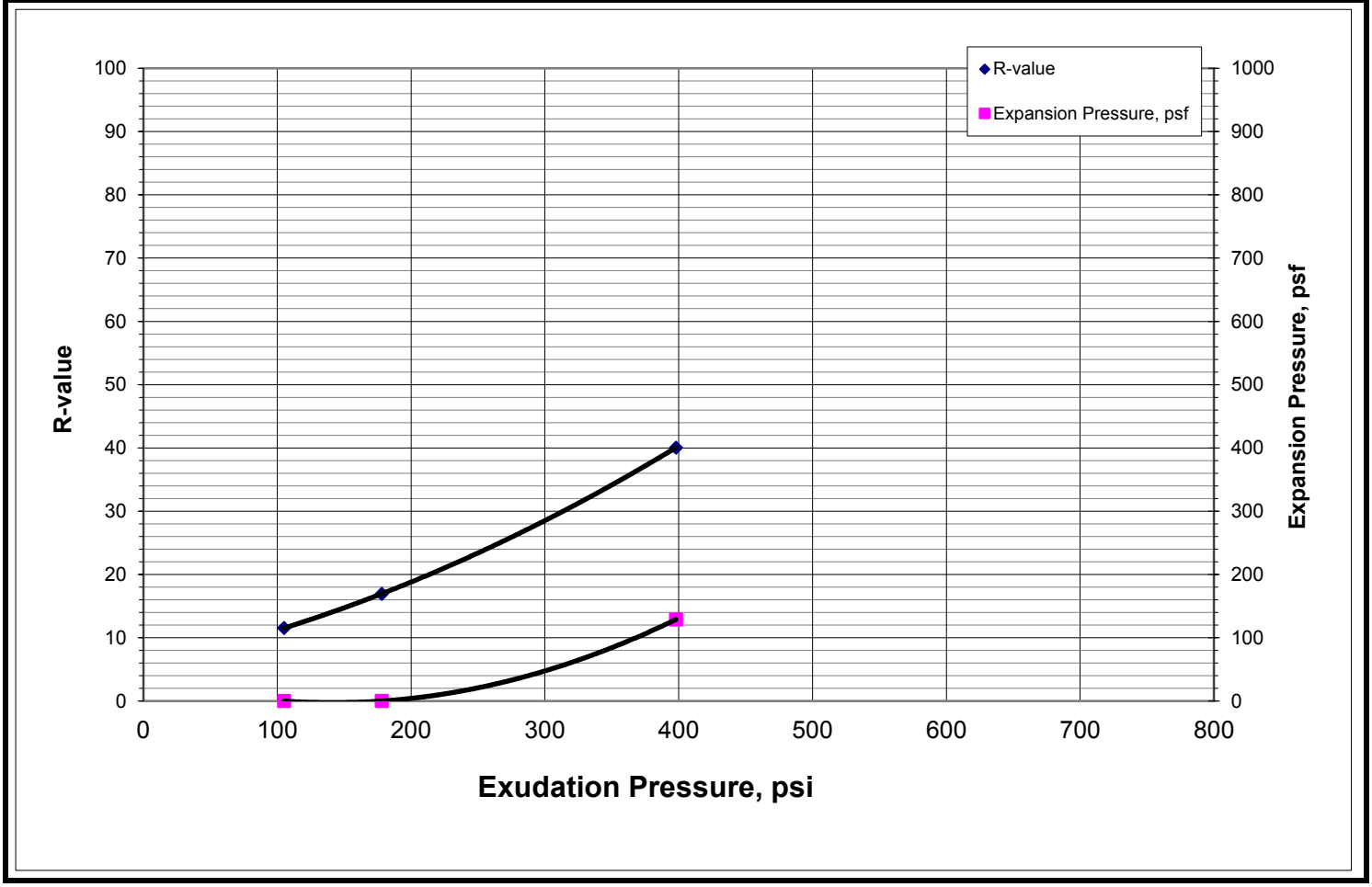


Plate No.: B-6L

R-value Test Report (Caltrans 301)

Job No.:	2016-146-GDR	**Date:**	10/03/18	**Initial Moisture,**	18.9
Client:	Parikh Consultants, Inc.	**Tested**	PJ	**R-value**	**25**
Project:	Blossom Hill Rd. IC Improvement Project	**Reduced**	RU		
Sample	A-18-BH-107 @ 0-5'	**Checked**	DC	**Expansion Pressure**	**10** psf
Soil Type:	Olive Gray Clayey SAND				

Specimen Number	A	B	C	D	Remarks:
Exudation Pressure, psi	162	362	471		
Prepaired Weight, grams	1200	1200	1200		
Final Water Added, grams/cc	50	30	20		
Weight of Soil & Mold, grams	3147	3106	3112		
Weight of Mold, grams	2106	2097	2094		
Height After Compaction, in.	2.65	2.52	2.46		
Moisture Content, %	23.9	21.9	20.9		
Dry Density, pcf	96.1	99.6	103.7		
Expansion Pressure, psf	0	26	73		
Stabilometer @ 1000					
Stabilometer @ 2000	135	101	94		
Turns Displacement	3.86	3.50	3.30		
R-value	12	29	35		

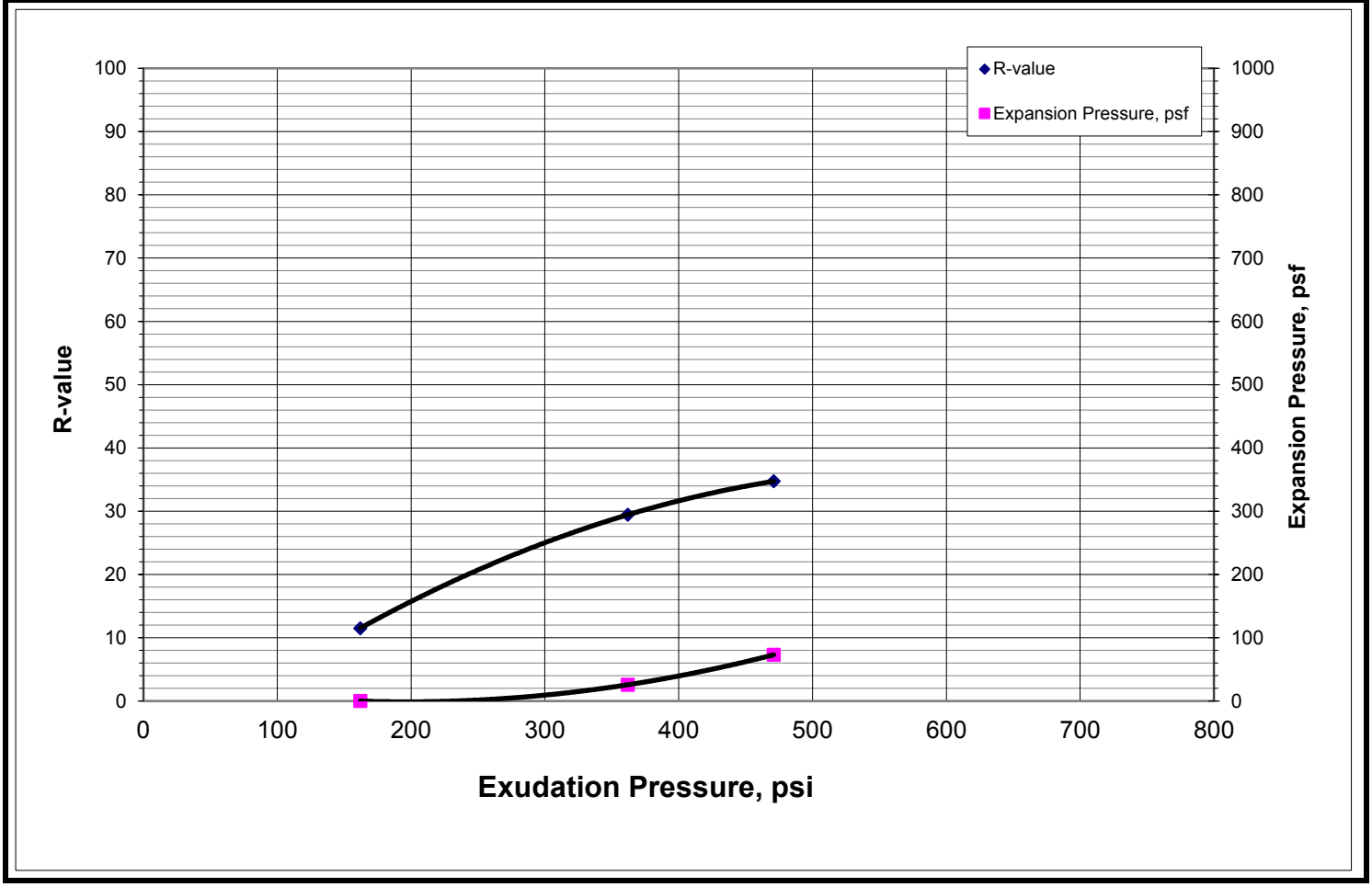


Plate No.: B-6M

R-value Test Report (Caltrans 301)

Job No.:	2016-146-GDR	**Date:**	10/04/18	**Initial Moisture,**	14.8
Client:	Parikh Consultants, Inc.	**Tested**	PJ	**R-value**	**11**
Project:	Blossom Hill Rd. IC Improvement Project	**Reduced**	RU		
Sample	A-18-BH-108 @ 0-5'	**Checked**	DC	**Expansion Pressure**	**40** psf
Soil Type:	Olive Gray Clayey SAND				

Specimen Number	A	B	C	D
Exudation Pressure, psi	297	219	401	
Prepaired Weight, grams	1200	1200	1200	
Final Water Added, grams/cc	55	70	35	
Weight of Soil & Mold, grams	3156	3133	3126	
Weight of Mold, grams	2106	2097	2064	
Height After Compaction, in.	2.60	2.51	2.53	
Moisture Content, %	20.1	21.5	18.2	
Dry Density, pcf	102.0	103.0	107.7	
Expansion Pressure, psf	34	0	159	
Stabilometer @ 1000				
Stabilometer @ 2000	137	143	122	
Turns Displacement	3.58	3.93	3.36	
R-value	11	7	19	

Remarks:

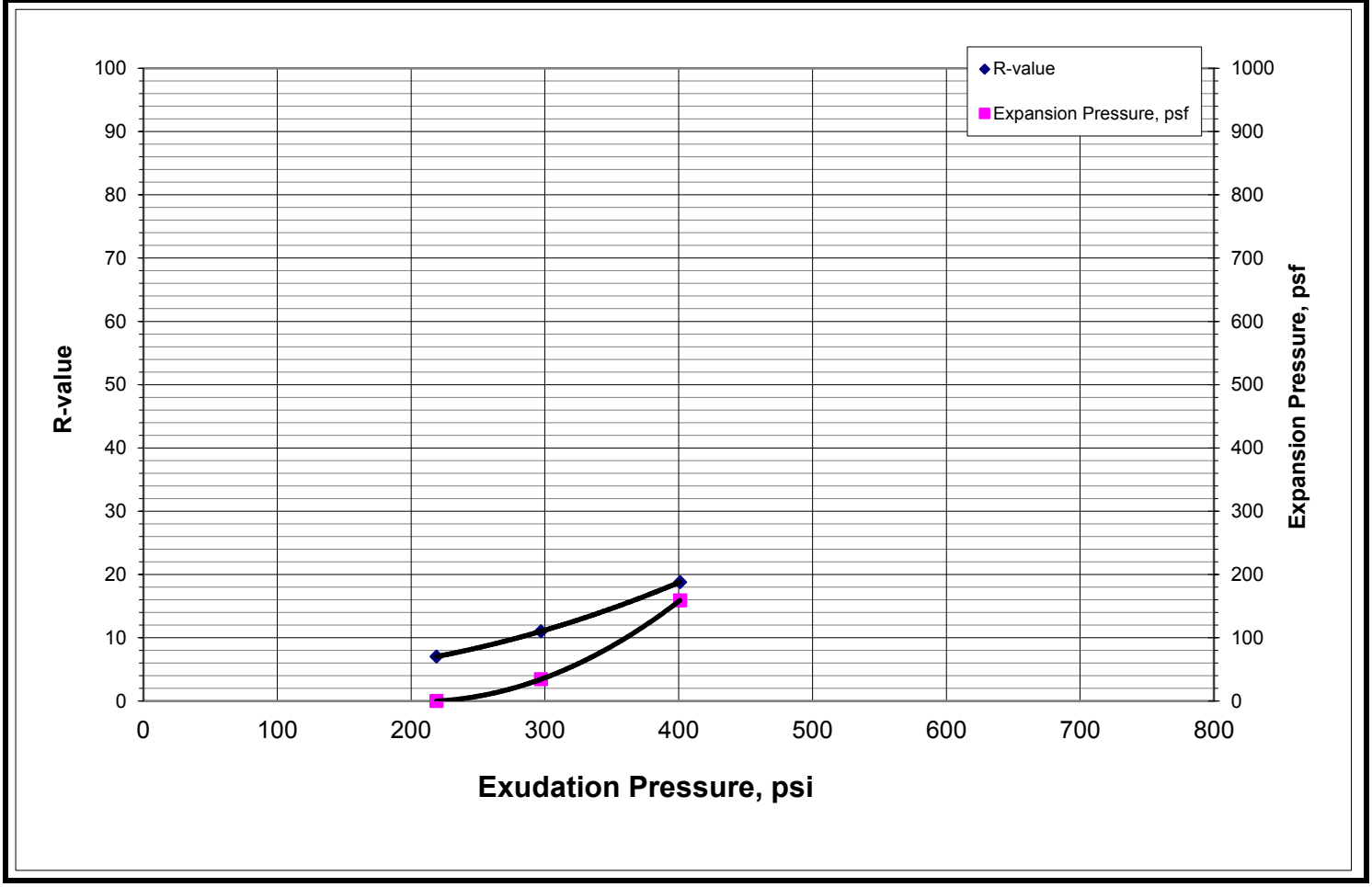


Plate No.: B-6N

R-value Test Report (Caltrans 301)

Job No.:	2016-146-GDR	**Date:**	10/04/18	**Initial Moisture,**	13.7
Client:	Parikh Consultants, Inc.	**Tested**	PJ	**R-value**	**28**
Project:	Blossom Hill Rd. IC Improvement Project	**Reduced**	RU		
Sample	A-18-BH-109 @ 0-5'	**Checked**	DC	**Expansion Pressure**	**20** psf
Soil Type:	Grayish Brown Sandy CLAY/ Clayey SAND				

Specimen Number	A	B	C	D
Exudation Pressure, psi	142	267	356	
Prepaired Weight, grams	1200	1200	1200	
Final Water Added, grams/cc	60	40	20	
Weight of Soil & Mold, grams	3165	3169	3114	
Weight of Mold, grams	2077	2090	2099	
Height After Compaction, in.	2.64	2.55	2.37	
Moisture Content, %	19.4	17.5	15.6	
Dry Density, pcf	104.7	109.2	112.3	
Expansion Pressure, psf	0	9	56	
Stabilometer @ 1000				
Stabilometer @ 2000	132	108	80	
Turns Displacement	4.34	4.05	3.88	
R-value	12	23	36	

Remarks:

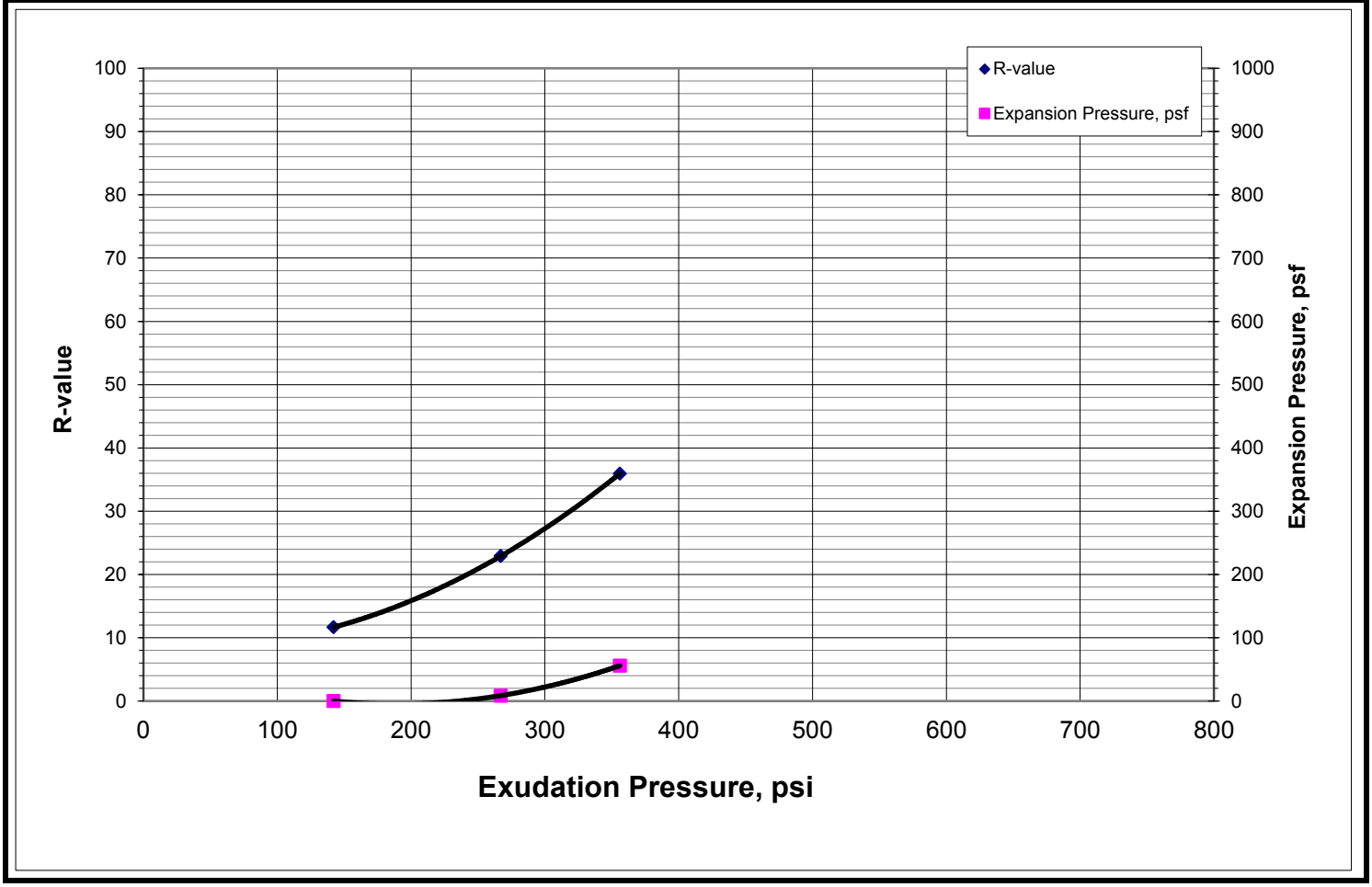
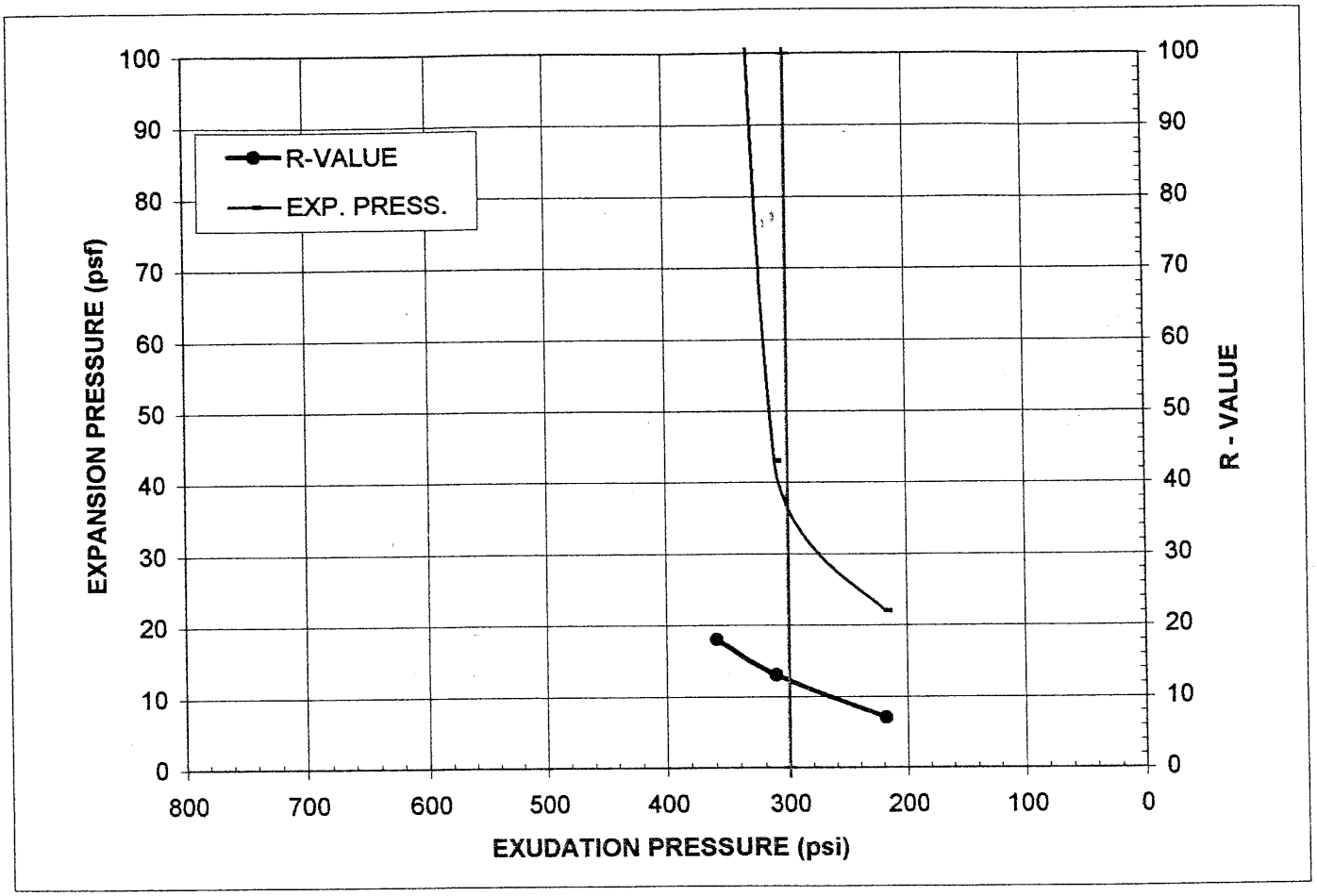


Plate No.: B-6O

R-VALUE REPORT

Parikh Consultants, Inc. — ASTM D2844 or CTM 301 — (408) 945-1011

Project Name:	Route 82/101 Interchange			Date:	08/25/03
Client:	R & M			Project #:	203110.GDB
Sample #:	BR - 11	Depth:	0.5' - 4'	Lab #:	M442
Location / Source:		Native		Sample Date:	
Material :	Heavy clay, black			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	218	311	359
Expansion Pressure, psf	22	43	251
R-Value	7	13	18
Moisture Content at Test, %	25.1	23.1	21.6
Dry Density at Test, pcf	96.1	100.2	102.2

R-Value @ 300 psi Exudation Pressure = **12**

Expansion Pressure @300 psi Exudation, psf = **37**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

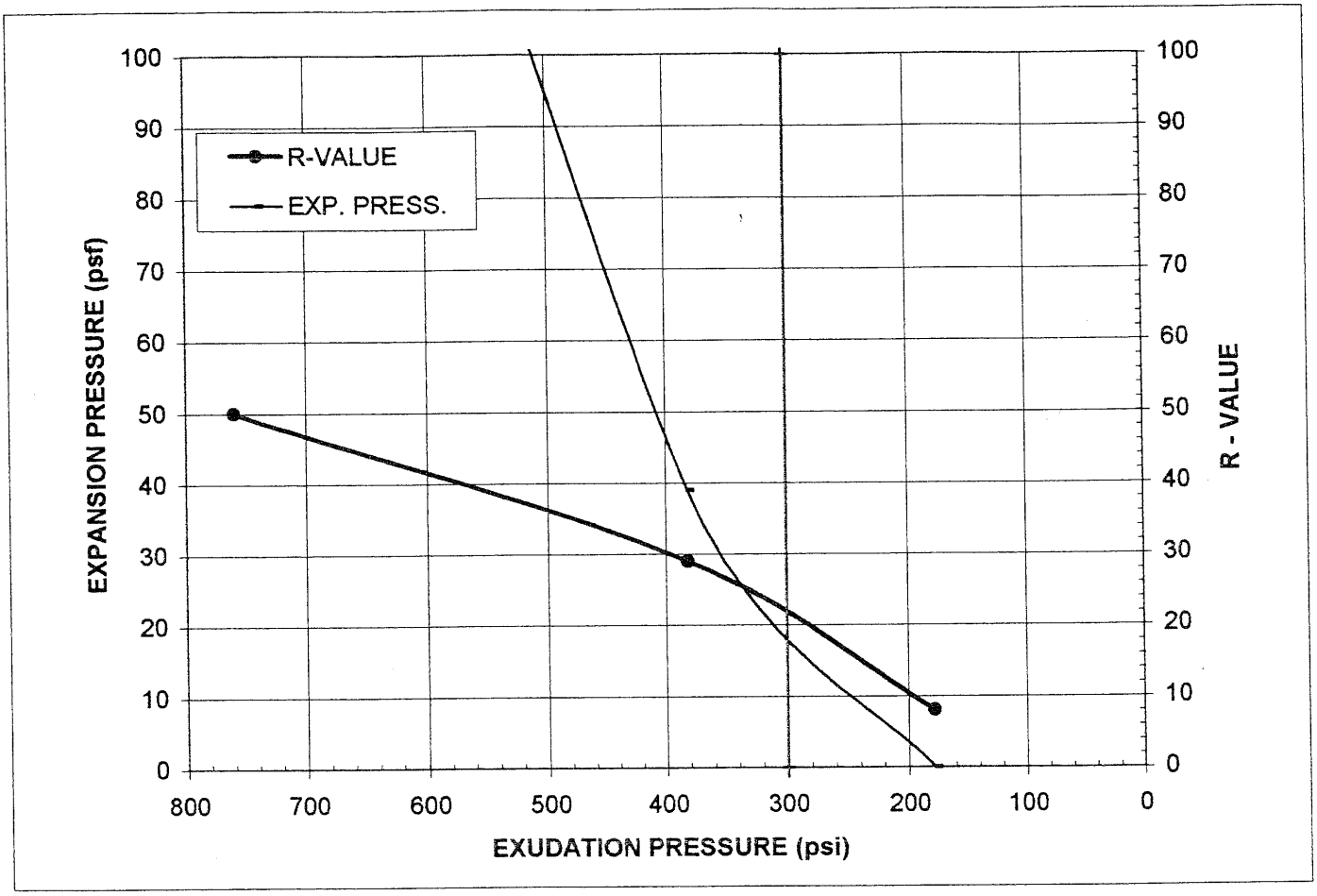
RVALUE with calcs pdp

Plate No.: B-6P

R-VALUE REPORT

Parikh Consultants, Inc. | ASTM D2844 or CTM 301 | (408) 945-1011

Project Name:	Route 82/101 Interchange			Date:	08/25/03
Client:	R & M			Project #:	203110.GDB
Sample #:	BR - 13	Depth:	1' - 4'	Lab #:	M442
Location / Source:		Native		Sample Date:	
Material :	Clay with gravel, brown			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	178	382	760
Expansion Pressure, psf	0	39	234
R-Value	8	29	50
Moisture Content at Test, %	14.6	12.8	11.0
Dry Density at Test, pcf	117.2	122.3	126.9

R-Value @ 300 psi Exudation Pressure = **22**

Expansion Pressure @300 psi Exudation, psf = **18**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

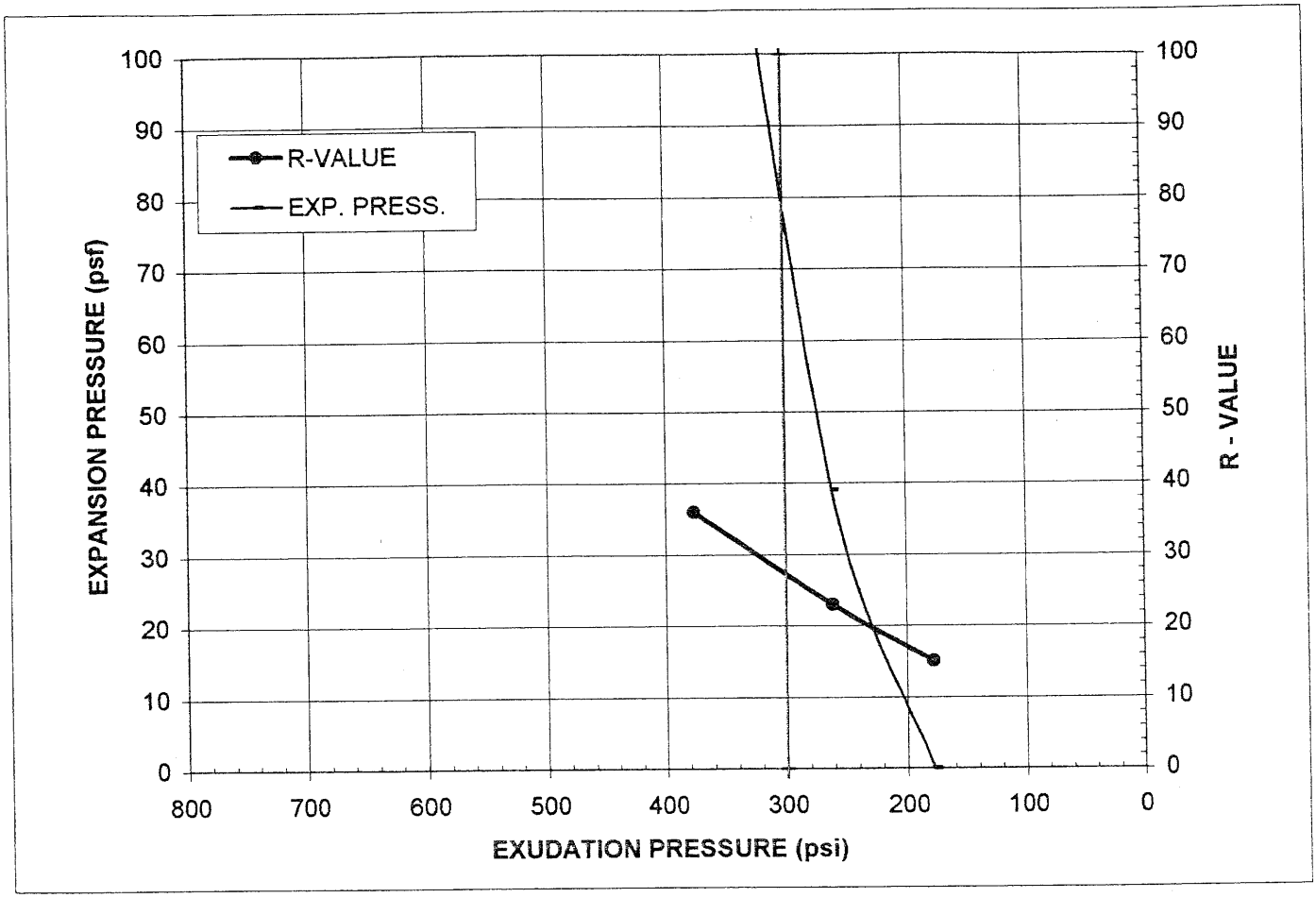
RVALUE with calcs pdp

Plate No.: B-6Q

R-VALUE REPORT

Parikh Consultants, Inc. | ASTM D2844 or CTM 301 | (408) 945-1011

Project Name:	Route 82/101 Interchange			Date:	08/25/03
Client:	R & M			Project #:	203110.GDB
Sample #:	BR - 17	Depth:	1' - 4'	Lab #:	M442
Location / Source:		Native		Sample Date:	
Material :	Sandy clay, brown			Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	178	261	376
Expansion Pressure, psf	0	39	169
R-Value	15	23	36
Moisture Content at Test, %	18.1	16.2	15.3
Dry Density at Test, pcf	108.6	112.5	113.7

R-Value @ 300 psi Exudation Pressure = **28**

Expansion Pressure @300 psi Exudation, psf = **80**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

RVALUE with calcs pdp

Plate No.: B-6R

APPENDIX C

LIQUEFACTION ANALYSES

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Northbound Diagonal On-Ramp Pedestrian Overcrossing***
PROJECT NO. ***2016-146-BOC***
BORING NO. ***R-18-SC-001***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Silver Creek Fault
a_{max} *(g)=* 0.63
FAULT M_w = 6.9

GW DEPTH (ft)= 30
BOREHOLE DIA (in)= 3.3
HAMMER ENERGY = 78%
CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 30 *(below OG)*
MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	4.0	1	3	1	28	MC	18.2	1.3	0.75	1.0	1.00	17.7	345.0	1.7	30.2		30.2		345.0	345.0	1.0	0.4	1.0	1.0			
4.0	8.0	2	6	1	27	MC	17.6	1.3	0.80	1.0	1.00	18.3	700.0	1.7	30.9		30.9		700.0	700.0	1.0	0.4	1.0	1.0			
8.0	13.0	3	11	2	23	MC	15.0	1.3	0.85	1.0	1.00	16.5	1300.0	1.2	20.5												
13.0	18.0	4	16	2	22	MC	14.3	1.3	0.95	1.0	1.00	17.7	1900.0	1.0	18.1												
18.0	23.0	5	21	2	11	SPT	11.0	1.3	0.95	1.2	1.00	16.3	2500.0	0.9	14.6												
23.0	28.0	6	26	1	25	MC	16.3	1.3	1.00	1.0	1.00	21.1	3100.0	0.8	17.0	28%	23.9		3100.0	3100.0	0.9	0.4	0.9	1.0			
28.0	33.5	7	31	1	16	MC	10.4	1.3	1.00	1.0	1.00	13.5	3637.6	0.7	10.0	16%	13.2	0.1	3700.0	3637.6	0.9	0.4	0.8	1.0	(0.39)	1.91%	1.26
33.5	38.5	8	36	2	11	MC	7.2	1.3	1.00	1.0	1.00	9.3	3925.6	0.7	6.6												
38.5	43.0	9	41	2	6	MC	3.9	1.3	1.00	1.0	1.00	5.1	4213.6	0.7	3.5												
43.0	48.0	10	46	1	34	SPT	34.0	1.3	1.00	1.2	1.00	53.0	4501.6	0.7	35.4		35.4		5500.00	4501.6	0.8	0.4	0.7	1.0	NON-LIQ.		
48.0	53.0	11	51	1	50	SPT	50.0	1.3	1.00	1.2	1.00	78.0	4789.6	0.6	50.4		50.4		6100.00	4789.6	0.7	0.4	0.7	1.0	NON-LIQ.		
53.0	58.0	12	56	1	64	SPT	64.0	1.3	1.00	1.2	1.00	99.8	5077.6	0.6	62.7	9%	64.5		6700.00	5077.6	0.7	0.4	0.7	1.0	NON-LIQ.		
58.0	65.0	13	61	1	31	SPT	31.0	1.3	1.00	1.2	1.00	48.4	5365.6	0.6	29.5		29.5	0.4	7300.00	5365.6	0.7	0.4	0.7	1.0	NON-LIQ.		
65.0	76.0	14	71	1	10	MC	6.5	1.3	1.00	1.0	1.00	8.5	5941.6	0.6	4.9	75%	10.9	0.1	8500.00	5941.6	0.6	0.3	0.8	1.0	(0.35)	2.21%	2.92
76.0	81.0	15	81	2	34	MC	22.1	1.3	1.00	1.0	1.00	28.7	6517.6	0.6	15.9												
81.0	86.5	15	81.5	1	34	MC	22.1	1.3	1.00	1.0	1.00	28.7	6546.4	0.6	15.9	28%	22.6	0.3	9760.00	6546.4	0.5	0.3	0.7	1.0	(0.64)	1.28%	0.84
86.5	95.0	16	91	2	25	MC	16.3	1.3	1.00	1.0	1.00	21.1	7093.6	0.5	11.2												
95.0	106.0	17	101	2	43	MC	28.0	1.3	1.00	1.0	1.00	36.3	7669.6	0.5	18.6												
106.0	115.0	18	111	1	34	SPT	34.0	1.3	1.00	1.2	1.00	53.0	8245.6	0.5	26.1		26.1	0.3	13300.00	8245.6	0.5	0.3	0.6	1.0	NON-LIQ.		
115.0	125.0	19	121	2	43	MC	28.0	1.3	1.00	1.0	1.00	36.3	8827.6	0.5	17.3												
125.0	131.5	20	131	2	35	SPT	35.0	1.3	1.00	1.2	1.00	54.6	9419.6	0.5	25.2												

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Northbound Diagonal On-Ramp Pedestrian Overcrossing***
PROJECT NO. ***2016-146-BOC***
BORING NO. ***R-18-SC-002***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Silver Creek Fault
a_{max} *(g)=* 0.63
FAULT M_w *=* 6.9

GW DEPTH (ft)= 25

BOREHOLE DIA (in)= 3.3
HAMMER ENERGY = 78%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 25 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	4.0	1	3	1	29	SPT	29.0	1.3	0.75	1.2	1.00	33.9	345.0	1.7	57.7		57.7		345.0	345.0	1.0	0.4	1.0	1.0			
4.0	8.0	2	6	1	37	MC	24.1	1.3	0.80	1.0	1.00	25.0	700.0	1.7	42.3		42.3		700.0	700.0	1.0	0.4	1.0	1.0			
8.0	13.5	3	11	1	29	MC	18.9	1.3	0.85	1.0	1.00	20.8	1300.0	1.2	25.8	23%	32.5		1300.0	1300.0	1.0	0.4	1.0	1.0			
13.5	18.0	4	16	1	21	MC	13.7	1.3	0.95	1.0	1.00	16.9	1900.0	1.0	17.3	30%	24.7		1900.0	1900.0	1.0	0.4	1.0	1.0			
18.0	23.0	5	21	1	22	MC	14.3	1.3	0.95	1.0	1.00	17.7	2500.0	0.9	15.8	28%	22.6		2500.0	2500.0	1.0	0.4	0.9	1.0			
23.0	28.0	6	26	2	15	SPT	15.0	1.3	1.00	1.2	1.00	23.4	3037.6	0.8	19.0												
28.0	33.0	7	31	2	6	MC	3.9	1.3	1.00	1.0	1.00	5.1	3325.6	0.8	3.9												
33.0	38.0	8	36	2	11	MC	7.2	1.3	1.00	1.0	1.00	9.3	3613.6	0.7	6.9												
38.0	43.0	9	41	2	16	MC	10.4	1.3	1.00	1.0	1.00	13.5	3901.6	0.7	9.7	81%											
43.0	48.0	10	46	2	2	MC	1.3	1.3	1.00	1.0	1.00	1.7	4189.6	0.7	1.2												
48.0	53.0	11	51	2	14	MC	9.1	1.3	1.00	1.0	1.00	11.8	4477.6	0.7	7.9												
53.0	58.0	12	56	2	14	MC	9.1	1.3	1.00	1.0	1.00	11.8	4765.6	0.6	7.7												
58.0	64.5	13	61	2	17	MC	11.1	1.3	1.00	1.0	1.00	14.4	5053.6	0.6	9.0												
64.5	77.0	14	71	1	33	MC	21.5	1.3	1.00	1.0	1.00	27.9	5629.6	0.6	16.6	9%	17.4	0.2	8500.00	5629.6	0.6	0.4	0.7	1.0	(0.45)	1.55%	2.33
77.0	86.0	15	81	2	18	SPT	18.0	1.3	1.00	1.2	1.00	28.1	6205.6	0.6	15.9												
86.0	96.0	16	91	1	70	SPT	70.0	1.3	1.00	1.2	1.00	109.2	6781.6	0.5	59.3		59.3		10900.00	6781.6	0.5	0.3	0.6	1.0	NON-LIQ.		
96.0	105.0	17	101	1	55	SPT	55.0	1.3	1.00	1.2	1.00	85.8	7357.6	0.5	44.7		44.7		12100.00	7357.6	0.5	0.3	0.6	1.0	NON-LIQ.		
105.0	115.5	18	111	2	18	SPT	18.0	1.3	1.00	1.2	1.00	28.1	7933.6	0.5	14.1												
115.5	121.5	19	121	2	20	SPT	20.0	1.3	1.00	1.2	1.00	31.2	8509.6	0.5	15.1												

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
0.16	2.00	0.00	9.97	0.16	0.00	0.33	2.00	0.00	9.95	0.16	0.00
0.49	2.00	0.00	9.92	0.16	0.00	0.66	2.00	0.00	9.90	0.16	0.00
0.82	2.00	0.00	9.87	0.16	0.00	0.98	2.00	0.00	9.85	0.16	0.00
1.15	2.00	0.00	9.82	0.16	0.00	1.31	2.00	0.00	9.80	0.16	0.00
1.48	2.00	0.00	9.77	0.16	0.00	1.64	2.00	0.00	9.75	0.16	0.00
1.80	2.00	0.00	9.72	0.16	0.00	1.97	2.00	0.00	9.70	0.16	0.00
2.13	2.00	0.00	9.67	0.16	0.00	2.30	2.00	0.00	9.65	0.16	0.00
2.46	2.00	0.00	9.62	0.16	0.00	2.62	2.00	0.00	9.60	0.16	0.00
2.79	2.00	0.00	9.57	0.16	0.00	2.95	2.00	0.00	9.55	0.16	0.00
3.12	2.00	0.00	9.52	0.16	0.00	3.28	2.00	0.00	9.50	0.16	0.00
3.44	2.00	0.00	9.47	0.16	0.00	3.61	2.00	0.00	9.45	0.16	0.00
3.77	2.00	0.00	9.42	0.16	0.00	3.94	2.00	0.00	9.40	0.16	0.00
4.10	2.00	0.00	9.37	0.16	0.00	4.27	2.00	0.00	9.35	0.16	0.00
4.43	2.00	0.00	9.32	0.16	0.00	4.59	2.00	0.00	9.30	0.16	0.00
4.76	2.00	0.00	9.27	0.16	0.00	4.92	2.00	0.00	9.25	0.16	0.00
5.09	2.00	0.00	9.22	0.16	0.00	5.25	2.00	0.00	9.20	0.16	0.00
5.41	2.00	0.00	9.17	0.16	0.00	5.58	2.00	0.00	9.15	0.16	0.00
5.74	2.00	0.00	9.12	0.16	0.00	5.91	2.00	0.00	9.10	0.16	0.00
6.07	2.00	0.00	9.07	0.16	0.00	6.23	2.00	0.00	9.05	0.16	0.00
6.40	2.00	0.00	9.02	0.16	0.00	6.56	2.00	0.00	9.00	0.16	0.00
6.73	2.00	0.00	8.97	0.16	0.00	6.89	2.00	0.00	8.95	0.16	0.00
7.05	2.00	0.00	8.92	0.16	0.00	7.22	2.00	0.00	8.90	0.16	0.00
7.38	2.00	0.00	8.87	0.16	0.00	7.55	2.00	0.00	8.85	0.16	0.00
7.71	2.00	0.00	8.82	0.16	0.00	7.87	2.00	0.00	8.80	0.16	0.00
8.04	2.00	0.00	8.77	0.16	0.00	8.20	2.00	0.00	8.75	0.16	0.00
8.37	2.00	0.00	8.72	0.16	0.00	8.53	2.00	0.00	8.70	0.16	0.00
8.69	2.00	0.00	8.67	0.16	0.00	8.86	2.00	0.00	8.65	0.16	0.00
9.02	2.00	0.00	8.62	0.16	0.00	9.19	2.00	0.00	8.60	0.16	0.00
9.35	2.00	0.00	8.57	0.16	0.00	9.51	2.00	0.00	8.55	0.16	0.00
9.68	2.00	0.00	8.52	0.16	0.00	9.84	2.00	0.00	8.50	0.16	0.00
10.01	2.00	0.00	8.47	0.16	0.00	10.17	2.00	0.00	8.45	0.16	0.00
10.33	2.00	0.00	8.42	0.16	0.00	10.50	2.00	0.00	8.40	0.16	0.00
10.66	2.00	0.00	8.37	0.16	0.00	10.83	2.00	0.00	8.35	0.16	0.00
10.99	2.00	0.00	8.32	0.16	0.00	11.15	2.00	0.00	8.30	0.16	0.00
11.32	2.00	0.00	8.27	0.16	0.00	11.48	2.00	0.00	8.25	0.16	0.00
11.65	2.00	0.00	8.22	0.16	0.00	11.81	2.00	0.00	8.20	0.16	0.00
11.98	2.00	0.00	8.17	0.16	0.00	12.14	2.00	0.00	8.15	0.16	0.00
12.30	2.00	0.00	8.12	0.16	0.00	12.47	2.00	0.00	8.10	0.16	0.00
12.63	2.00	0.00	8.07	0.16	0.00	12.80	2.00	0.00	8.05	0.16	0.00
12.96	2.00	0.00	8.02	0.16	0.00	13.12	2.00	0.00	8.00	0.16	0.00
13.29	2.00	0.00	7.97	0.16	0.00	13.45	2.00	0.00	7.95	0.16	0.00
13.62	2.00	0.00	7.92	0.16	0.00	13.78	2.00	0.00	7.90	0.16	0.00
13.94	2.00	0.00	7.87	0.16	0.00	14.11	2.00	0.00	7.85	0.16	0.00
14.27	2.00	0.00	7.82	0.16	0.00	14.44	2.00	0.00	7.80	0.16	0.00
14.60	2.00	0.00	7.77	0.16	0.00	14.76	2.00	0.00	7.75	0.16	0.00
14.93	2.00	0.00	7.72	0.16	0.00	15.09	2.00	0.00	7.70	0.16	0.00
15.26	2.00	0.00	7.67	0.16	0.00	15.42	2.00	0.00	7.65	0.16	0.00
15.58	2.00	0.00	7.62	0.16	0.00	15.75	2.00	0.00	7.60	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
15.91	2.00	0.00	7.57	0.16	0.00	16.08	2.00	0.00	7.55	0.16	0.00
16.24	2.00	0.00	7.52	0.16	0.00	16.40	2.00	0.00	7.50	0.16	0.00
16.57	2.00	0.00	7.47	0.16	0.00	16.73	2.00	0.00	7.45	0.16	0.00
16.90	2.00	0.00	7.42	0.16	0.00	17.06	2.00	0.00	7.40	0.16	0.00
17.22	2.00	0.00	7.37	0.16	0.00	17.39	2.00	0.00	7.35	0.16	0.00
17.55	2.00	0.00	7.32	0.16	0.00	17.72	2.00	0.00	7.30	0.16	0.00
17.88	2.00	0.00	7.27	0.16	0.00	18.04	2.00	0.00	7.25	0.16	0.00
18.21	2.00	0.00	7.22	0.16	0.00	18.37	2.00	0.00	7.20	0.16	0.00
18.54	2.00	0.00	7.17	0.16	0.00	18.70	2.00	0.00	7.15	0.16	0.00
18.86	2.00	0.00	7.12	0.16	0.00	19.03	2.00	0.00	7.10	0.16	0.00
19.19	2.00	0.00	7.07	0.16	0.00	19.36	2.00	0.00	7.05	0.16	0.00
19.52	2.00	0.00	7.02	0.16	0.00	19.69	2.00	0.00	7.00	0.16	0.00
19.85	2.00	0.00	6.97	0.16	0.00	20.01	2.00	0.00	6.95	0.16	0.00
20.18	2.00	0.00	6.92	0.16	0.00	20.34	2.00	0.00	6.90	0.16	0.00
20.51	2.00	0.00	6.87	0.16	0.00	20.67	2.00	0.00	6.85	0.16	0.00
20.83	2.00	0.00	6.82	0.16	0.00	21.00	2.00	0.00	6.80	0.16	0.00
21.16	2.00	0.00	6.77	0.16	0.00	21.33	2.00	0.00	6.75	0.16	0.00
21.49	2.00	0.00	6.72	0.16	0.00	21.65	2.00	0.00	6.70	0.16	0.00
21.82	2.00	0.00	6.67	0.16	0.00	21.98	2.00	0.00	6.65	0.16	0.00
22.15	2.00	0.00	6.62	0.16	0.00	22.31	2.00	0.00	6.60	0.16	0.00
22.47	2.00	0.00	6.57	0.16	0.00	22.64	2.00	0.00	6.55	0.16	0.00
22.80	2.00	0.00	6.52	0.16	0.00	22.97	2.00	0.00	6.50	0.16	0.00
23.13	2.00	0.00	6.47	0.16	0.00	23.29	2.00	0.00	6.45	0.16	0.00
23.46	2.00	0.00	6.42	0.16	0.00	23.62	2.00	0.00	6.40	0.16	0.00
23.79	2.00	0.00	6.37	0.16	0.00	23.95	2.00	0.00	6.35	0.16	0.00
24.11	2.00	0.00	6.32	0.16	0.00	24.28	2.00	0.00	6.30	0.16	0.00
24.44	2.00	0.00	6.27	0.16	0.00	24.61	2.00	0.00	6.25	0.16	0.00
24.77	2.00	0.00	6.22	0.16	0.00	24.93	2.00	0.00	6.20	0.16	0.00
25.10	2.00	0.00	6.17	0.16	0.00	25.26	2.00	0.00	6.15	0.16	0.00
25.43	2.00	0.00	6.12	0.16	0.00	25.59	2.00	0.00	6.10	0.16	0.00
25.75	2.00	0.00	6.07	0.16	0.00	25.92	2.00	0.00	6.05	0.16	0.00
26.08	2.00	0.00	6.02	0.16	0.00	26.25	2.00	0.00	6.00	0.16	0.00
26.41	1.03	0.00	5.97	0.16	0.00	26.57	0.66	0.34	5.95	0.16	0.10
26.74	0.44	0.56	5.92	0.16	0.17	26.90	0.32	0.68	5.90	0.16	0.20
27.07	0.34	0.66	5.87	0.16	0.19	27.23	0.33	0.67	5.85	0.16	0.20
27.40	0.34	0.66	5.82	0.16	0.19	27.56	0.36	0.64	5.80	0.16	0.18
27.72	0.43	0.57	5.77	0.16	0.16	27.89	0.48	0.52	5.75	0.16	0.15
28.05	0.49	0.51	5.72	0.16	0.15	28.22	0.54	0.46	5.70	0.16	0.13
28.38	0.68	0.32	5.67	0.16	0.09	28.54	0.97	0.03	5.65	0.16	0.01
28.71	1.26	0.00	5.62	0.16	0.00	28.87	1.50	0.00	5.60	0.16	0.00
29.04	1.72	0.00	5.57	0.16	0.00	29.20	2.00	0.00	5.55	0.16	0.00
29.36	2.00	0.00	5.52	0.16	0.00	29.53	2.00	0.00	5.50	0.16	0.00
29.69	2.00	0.00	5.47	0.16	0.00	29.86	2.00	0.00	5.45	0.16	0.00
30.02	2.00	0.00	5.42	0.16	0.00	30.18	2.00	0.00	5.40	0.16	0.00
30.35	2.00	0.00	5.37	0.16	0.00	30.51	2.00	0.00	5.35	0.16	0.00
30.68	2.00	0.00	5.32	0.16	0.00	30.84	2.00	0.00	5.30	0.16	0.00
31.00	1.86	0.00	5.27	0.16	0.00	31.17	1.32	0.00	5.25	0.16	0.00
31.33	0.94	0.06	5.22	0.16	0.01	31.50	0.76	0.24	5.20	0.16	0.06

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
31.66	0.69	0.31	5.17	0.16	0.08	31.82	0.67	0.33	5.15	0.16	0.08
31.99	0.75	0.25	5.12	0.16	0.06	32.15	0.78	0.22	5.10	0.16	0.06
32.32	0.82	0.18	5.07	0.16	0.05	32.48	0.81	0.19	5.05	0.16	0.05
32.64	0.90	0.10	5.02	0.16	0.03	32.81	0.99	0.01	5.00	0.16	0.00
32.97	1.14	0.00	4.97	0.16	0.00	33.14	0.94	0.06	4.95	0.16	0.02
33.30	0.68	0.32	4.92	0.16	0.08	33.46	0.44	0.56	4.90	0.16	0.14
33.63	0.39	0.61	4.87	0.16	0.15	33.79	0.41	0.59	4.85	0.16	0.14
33.96	0.44	0.56	4.82	0.16	0.13	34.12	0.44	0.56	4.80	0.16	0.13
34.28	0.39	0.61	4.77	0.16	0.14	34.45	0.34	0.66	4.75	0.16	0.16
34.61	0.30	0.70	4.72	0.16	0.17	34.78	0.29	0.71	4.70	0.16	0.17
34.94	2.00	0.00	4.67	0.16	0.00	35.10	2.00	0.00	4.65	0.16	0.00
35.27	2.00	0.00	4.62	0.16	0.00	35.43	2.00	0.00	4.60	0.16	0.00
35.60	2.00	0.00	4.57	0.16	0.00	35.76	2.00	0.00	4.55	0.16	0.00
35.93	2.00	0.00	4.52	0.16	0.00	36.09	2.00	0.00	4.50	0.16	0.00
36.25	2.00	0.00	4.47	0.16	0.00	36.42	2.00	0.00	4.45	0.16	0.00
36.58	2.00	0.00	4.42	0.16	0.00	36.75	2.00	0.00	4.40	0.16	0.00
36.91	2.00	0.00	4.37	0.16	0.00	37.07	2.00	0.00	4.35	0.16	0.00
37.24	2.00	0.00	4.32	0.16	0.00	37.40	2.00	0.00	4.30	0.16	0.00
37.57	2.00	0.00	4.27	0.16	0.00	37.73	2.00	0.00	4.25	0.16	0.00
37.89	2.00	0.00	4.22	0.16	0.00	38.06	2.00	0.00	4.20	0.16	0.00
38.22	2.00	0.00	4.17	0.16	0.00	38.39	2.00	0.00	4.15	0.16	0.00
38.55	2.00	0.00	4.12	0.16	0.00	38.71	2.00	0.00	4.10	0.16	0.00
38.88	2.00	0.00	4.07	0.16	0.00	39.04	2.00	0.00	4.05	0.16	0.00
39.21	2.00	0.00	4.02	0.16	0.00	39.37	2.00	0.00	4.00	0.16	0.00
39.53	2.00	0.00	3.97	0.16	0.00	39.70	2.00	0.00	3.95	0.16	0.00
39.86	2.00	0.00	3.92	0.16	0.00	40.03	2.00	0.00	3.90	0.16	0.00
40.19	2.00	0.00	3.87	0.16	0.00	40.35	2.00	0.00	3.85	0.16	0.00
40.52	2.00	0.00	3.82	0.16	0.00	40.68	2.00	0.00	3.80	0.16	0.00
40.85	2.00	0.00	3.77	0.16	0.00	41.01	2.00	0.00	3.75	0.16	0.00
41.17	2.00	0.00	3.72	0.16	0.00	41.34	2.00	0.00	3.70	0.16	0.00
41.50	2.00	0.00	3.67	0.16	0.00	41.67	2.00	0.00	3.65	0.16	0.00
41.83	2.00	0.00	3.62	0.16	0.00	41.99	2.00	0.00	3.60	0.16	0.00
42.16	2.00	0.00	3.57	0.16	0.00	42.32	2.00	0.00	3.55	0.16	0.00
42.49	2.00	0.00	3.52	0.16	0.00	42.65	2.00	0.00	3.50	0.16	0.00
42.81	2.00	0.00	3.47	0.16	0.00	42.98	2.00	0.00	3.45	0.16	0.00
43.14	2.00	0.00	3.42	0.16	0.00	43.31	2.00	0.00	3.40	0.16	0.00
43.47	2.00	0.00	3.37	0.16	0.00	43.64	2.00	0.00	3.35	0.16	0.00
43.80	2.00	0.00	3.32	0.16	0.00	43.96	2.00	0.00	3.30	0.16	0.00
44.13	2.00	0.00	3.27	0.16	0.00	44.29	2.00	0.00	3.25	0.16	0.00
44.46	2.00	0.00	3.22	0.16	0.00	44.62	2.00	0.00	3.20	0.16	0.00
44.78	2.00	0.00	3.17	0.16	0.00	44.95	2.00	0.00	3.15	0.16	0.00
45.11	2.00	0.00	3.12	0.16	0.00	45.28	2.00	0.00	3.10	0.16	0.00
45.44	2.00	0.00	3.07	0.16	0.00	45.60	2.00	0.00	3.05	0.16	0.00
45.77	2.00	0.00	3.02	0.16	0.00	45.93	2.00	0.00	3.00	0.16	0.00
46.10	2.00	0.00	2.97	0.16	0.00	46.26	2.00	0.00	2.95	0.16	0.00
46.42	2.00	0.00	2.92	0.16	0.00	46.59	2.00	0.00	2.90	0.16	0.00
46.75	2.00	0.00	2.87	0.16	0.00	46.92	2.00	0.00	2.85	0.16	0.00
47.08	2.00	0.00	2.82	0.16	0.00	47.24	2.00	0.00	2.80	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
47.41	2.00	0.00	2.77	0.16	0.00	47.57	2.00	0.00	2.75	0.16	0.00
47.74	2.00	0.00	2.72	0.16	0.00	47.90	2.00	0.00	2.70	0.16	0.00
48.06	2.00	0.00	2.67	0.16	0.00	48.23	2.00	0.00	2.65	0.16	0.00
48.39	2.00	0.00	2.62	0.16	0.00	48.56	0.34	0.66	2.60	0.16	0.09
48.72	0.35	0.65	2.57	0.16	0.08	48.88	0.39	0.61	2.55	0.16	0.08
49.05	0.41	0.59	2.52	0.16	0.07	49.21	0.41	0.59	2.50	0.16	0.07
49.38	2.00	0.00	2.47	0.16	0.00	49.54	2.00	0.00	2.45	0.16	0.00
49.70	2.00	0.00	2.42	0.16	0.00	49.87	2.00	0.00	2.40	0.16	0.00
50.03	2.00	0.00	2.37	0.16	0.00	50.20	2.00	0.00	2.35	0.16	0.00
50.36	2.00	0.00	2.32	0.16	0.00	50.52	2.00	0.00	2.30	0.16	0.00
50.69	2.00	0.00	2.27	0.16	0.00	50.85	2.00	0.00	2.25	0.16	0.00
51.02	2.00	0.00	2.22	0.16	0.00	51.18	2.00	0.00	2.20	0.16	0.00
51.35	2.00	0.00	2.17	0.16	0.00	51.51	2.00	0.00	2.15	0.16	0.00
51.67	2.00	0.00	2.12	0.16	0.00	51.84	2.00	0.00	2.10	0.16	0.00
52.00	2.00	0.00	2.07	0.16	0.00	52.17	2.00	0.00	2.05	0.16	0.00
52.33	2.00	0.00	2.02	0.16	0.00	52.49	2.00	0.00	2.00	0.16	0.00
52.66	2.00	0.00	1.97	0.16	0.00	52.82	2.00	0.00	1.95	0.16	0.00
52.99	2.00	0.00	1.92	0.16	0.00	53.15	2.00	0.00	1.90	0.16	0.00
53.31	2.00	0.00	1.87	0.16	0.00	53.48	2.00	0.00	1.85	0.16	0.00
53.64	0.29	0.71	1.82	0.16	0.07	53.81	0.30	0.70	1.80	0.16	0.06
53.97	2.00	0.00	1.77	0.16	0.00	54.13	2.00	0.00	1.75	0.16	0.00
54.30	2.00	0.00	1.72	0.16	0.00	54.46	2.00	0.00	1.70	0.16	0.00
54.63	2.00	0.00	1.67	0.16	0.00	54.79	2.00	0.00	1.65	0.16	0.00
54.95	2.00	0.00	1.62	0.16	0.00	55.12	2.00	0.00	1.60	0.16	0.00
55.28	2.00	0.00	1.57	0.16	0.00	55.45	2.00	0.00	1.55	0.16	0.00
55.61	2.00	0.00	1.52	0.16	0.00	55.77	2.00	0.00	1.50	0.16	0.00
55.94	2.00	0.00	1.47	0.16	0.00	56.10	2.00	0.00	1.45	0.16	0.00
56.27	2.00	0.00	1.42	0.16	0.00	56.43	2.00	0.00	1.40	0.16	0.00
56.59	2.00	0.00	1.37	0.16	0.00	56.76	2.00	0.00	1.35	0.16	0.00
56.92	2.00	0.00	1.32	0.16	0.00	57.09	2.00	0.00	1.30	0.16	0.00
57.25	2.00	0.00	1.27	0.16	0.00	57.41	2.00	0.00	1.25	0.16	0.00
57.58	2.00	0.00	1.22	0.16	0.00	57.74	2.00	0.00	1.20	0.16	0.00
57.91	2.00	0.00	1.17	0.16	0.00	58.07	2.00	0.00	1.15	0.16	0.00
58.23	2.00	0.00	1.12	0.16	0.00	58.40	2.00	0.00	1.10	0.16	0.00
58.56	2.00	0.00	1.07	0.16	0.00	58.73	2.00	0.00	1.05	0.16	0.00
58.89	2.00	0.00	1.02	0.16	0.00	59.06	2.00	0.00	1.00	0.16	0.00
59.22	2.00	0.00	0.97	0.16	0.00	59.38	2.00	0.00	0.95	0.16	0.00
59.55	2.00	0.00	0.92	0.16	0.00	59.71	2.00	0.00	0.90	0.16	0.00
59.88	2.00	0.00	0.87	0.16	0.00	60.04	2.00	0.00	0.85	0.16	0.00
60.20	2.00	0.00	0.82	0.16	0.00	60.37	2.00	0.00	0.80	0.16	0.00
60.53	2.00	0.00	0.77	0.16	0.00	60.70	2.00	0.00	0.75	0.16	0.00
60.86	2.00	0.00	0.72	0.16	0.00	61.02	2.00	0.00	0.70	0.16	0.00
61.19	2.00	0.00	0.67	0.16	0.00	61.35	2.00	0.00	0.65	0.16	0.00
61.52	2.00	0.00	0.62	0.16	0.00	61.68	2.00	0.00	0.60	0.16	0.00
61.84	2.00	0.00	0.57	0.16	0.00	62.01	2.00	0.00	0.55	0.16	0.00
62.17	2.00	0.00	0.52	0.16	0.00	62.34	2.00	0.00	0.50	0.16	0.00
62.50	2.00	0.00	0.47	0.16	0.00	62.66	2.00	0.00	0.45	0.16	0.00
62.83	2.00	0.00	0.42	0.16	0.00	62.99	2.00	0.00	0.40	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
63.16	2.00	0.00	0.37	0.16	0.00	63.32	2.00	0.00	0.35	0.16	0.00
63.48	2.00	0.00	0.32	0.16	0.00	63.65	2.00	0.00	0.30	0.16	0.00
63.81	2.00	0.00	0.27	0.16	0.00	63.98	0.43	0.57	0.25	0.16	0.01
64.14	0.40	0.60	0.22	0.16	0.01	64.30	0.38	0.62	0.20	0.16	0.01
64.47	0.35	0.65	0.17	0.16	0.01	64.63	0.34	0.66	0.15	0.16	0.00
64.80	2.00	0.00	0.12	0.16	0.00	64.96	2.00	0.00	0.10	0.16	0.00
65.12	2.00	0.00	0.07	0.16	0.00	65.29	2.00	0.00	0.05	0.16	0.00
65.45	2.00	0.00	0.02	0.16	0.00	65.62	2.00	0.00	0.00	0.00	0.00
65.78	2.00	0.00	0.00	0.00	0.00	65.94	2.00	0.00	0.00	0.00	0.00
66.11	2.00	0.00	0.00	0.00	0.00	66.27	2.00	0.00	0.00	0.00	0.00
66.44	2.00	0.00	0.00	0.00	0.00	66.60	2.00	0.00	0.00	0.00	0.00
66.77	2.00	0.00	0.00	0.00	0.00	66.93	2.00	0.00	0.00	0.00	0.00
67.09	2.00	0.00	0.00	0.00	0.00	67.26	2.00	0.00	0.00	0.00	0.00
67.42	2.00	0.00	0.00	0.00	0.00	67.59	2.00	0.00	0.00	0.00	0.00
67.75	2.00	0.00	0.00	0.00	0.00	67.91	2.00	0.00	0.00	0.00	0.00
68.08	0.95	0.00	0.00	0.00	0.00	68.24	1.26	0.00	0.00	0.00	0.00
68.41	2.00	0.00	0.00	0.00	0.00	68.57	2.00	0.00	0.00	0.00	0.00
68.73	2.00	0.00	0.00	0.00	0.00	68.90	2.00	0.00	0.00	0.00	0.00
69.06	2.00	0.00	0.00	0.00	0.00	69.23	2.00	0.00	0.00	0.00	0.00
69.39	2.00	0.00	0.00	0.00	0.00	69.55	2.00	0.00	0.00	0.00	0.00
69.72	2.00	0.00	0.00	0.00	0.00	69.88	2.00	0.00	0.00	0.00	0.00
70.05	2.00	0.00	0.00	0.00	0.00	70.21	2.00	0.00	0.00	0.00	0.00

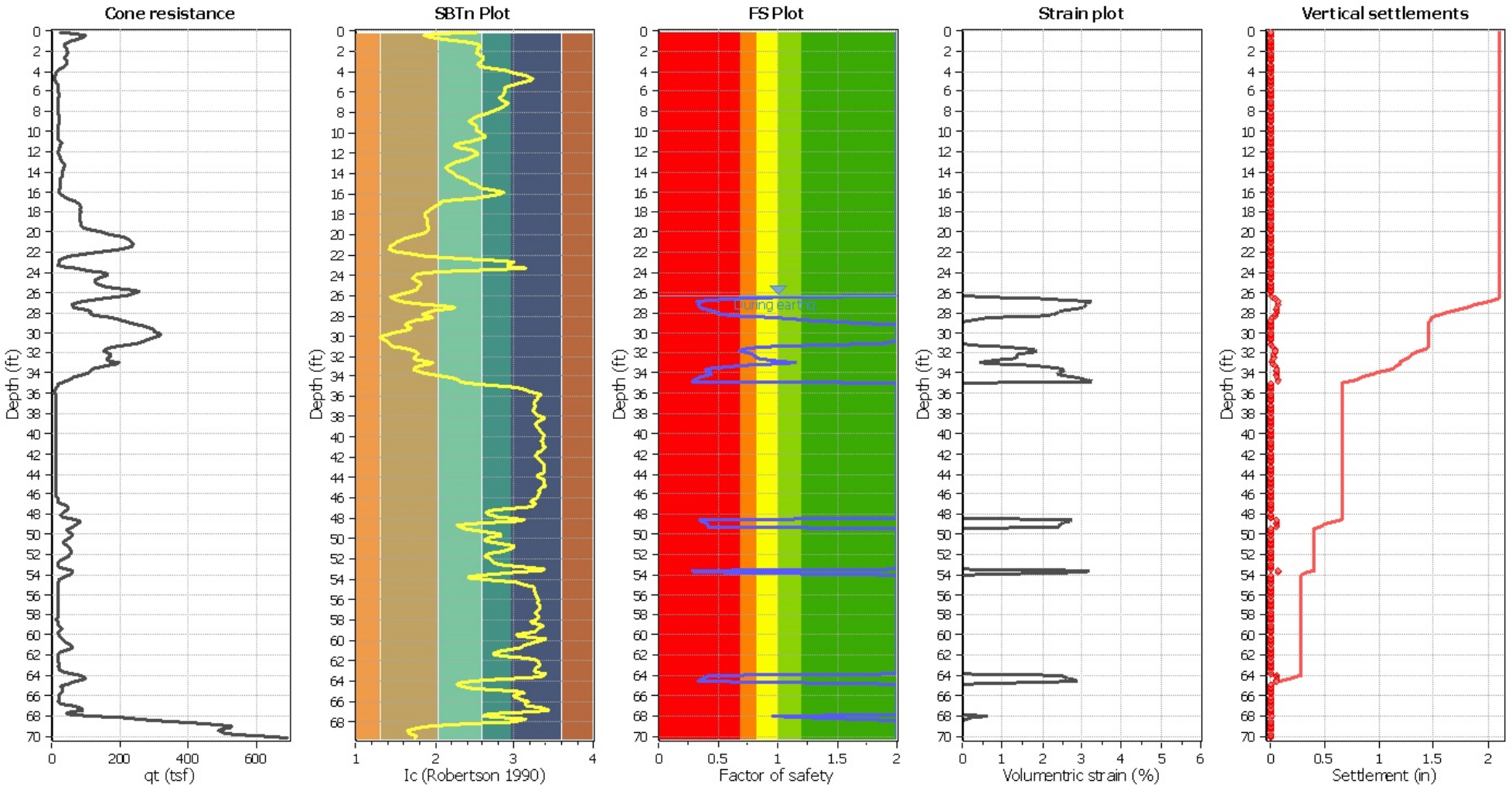
Overall liquefaction potential: 4.40

LPI = 0.00 - Liquefaction risk very low
LPI between 0.00 and 5.00 - Liquefaction risk low
LPI between 5.00 and 15.00 - Liquefaction risk high
LPI > 15.00 - Liquefaction risk very high

Abbreviations

FS: Calculated factor of safety for test point
F_L: 1 - FS
w_z: Function value of the extend of soil liquefaction according to depth
d_z: Layer thickness (ft)
LPI: Liquefaction potential index value for test point

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
26.41	141.42	1.03	0.64	1.00	0.01	26.57	114.99	0.66	2.02	1.00	0.04
26.74	89.57	0.44	2.56	1.00	0.05	26.90	66.77	0.32	3.25	1.00	0.06
27.07	71.41	0.34	3.08	1.00	0.06	27.23	70.41	0.33	3.12	1.00	0.06
27.40	72.38	0.34	3.05	1.00	0.06	27.56	77.47	0.36	2.88	1.00	0.06
27.72	89.46	0.43	2.56	1.00	0.05	27.89	96.48	0.48	2.41	1.00	0.05
28.05	97.97	0.49	2.38	1.00	0.05	28.22	104.23	0.54	2.26	1.00	0.04
28.38	118.32	0.68	1.94	1.00	0.04	28.54	139.88	0.97	0.65	1.00	0.01
28.71	156.84	1.26	0.21	1.00	0.00	28.87	168.26	1.50	0.00	1.00	0.00
29.04	177.62	1.72	0.00	1.00	0.00	29.20	194.23	2.00	0.00	1.00	0.00
29.36	209.87	2.00	0.00	1.00	0.00	29.53	217.14	2.00	0.00	1.00	0.00
29.69	224.14	2.00	0.00	1.00	0.00	29.86	228.91	2.00	0.00	1.00	0.00
30.02	237.57	2.00	0.00	1.00	0.00	30.18	241.54	2.00	0.00	1.00	0.00
30.35	232.80	2.00	0.00	1.00	0.00	30.51	222.34	2.00	0.00	1.00	0.00
30.68	210.19	2.00	0.00	1.00	0.00	30.84	204.26	2.00	0.00	1.00	0.00
31.00	185.15	1.86	0.00	1.00	0.00	31.17	162.11	1.32	0.21	1.00	0.00
31.33	141.19	0.94	0.94	1.00	0.02	31.50	127.91	0.76	1.42	1.00	0.03
31.66	122.46	0.69	1.84	1.00	0.04	31.82	121.20	0.67	1.87	1.00	0.04
31.99	127.49	0.75	1.74	1.00	0.03	32.15	130.36	0.78	1.38	1.00	0.03
32.32	133.15	0.82	1.34	1.00	0.03	32.48	132.80	0.81	1.34	1.00	0.03
32.64	139.13	0.90	0.96	1.00	0.02	32.81	145.50	0.99	0.62	1.00	0.01
32.97	154.36	1.14	0.42	1.00	0.01	33.14	141.98	0.94	0.93	1.00	0.02
33.30	122.49	0.68	1.84	1.00	0.04	33.46	96.32	0.44	2.41	1.00	0.05
33.63	89.41	0.39	2.56	1.00	0.05	33.79	91.47	0.41	2.51	1.00	0.05
33.96	96.88	0.44	2.40	1.00	0.05	34.12	97.04	0.44	2.40	1.00	0.05
34.28	89.86	0.39	2.55	1.00	0.05	34.45	79.54	0.34	2.82	1.00	0.06
34.61	70.00	0.30	3.13	1.00	0.06	34.78	66.61	0.29	3.26	1.00	0.06
34.94	62.58	2.00	0.00	1.00	0.00	35.10	56.95	2.00	0.00	1.00	0.00
35.27	51.31	2.00	0.00	1.00	0.00	35.43	47.10	2.00	0.00	1.00	0.00
35.60	43.34	2.00	0.00	1.00	0.00	35.76	41.36	2.00	0.00	1.00	0.00
35.93	41.21	2.00	0.00	1.00	0.00	36.09	42.25	2.00	0.00	1.00	0.00
36.25	42.64	2.00	0.00	1.00	0.00	36.42	43.12	2.00	0.00	1.00	0.00
36.58	43.31	2.00	0.00	1.00	0.00	36.75	43.73	2.00	0.00	1.00	0.00
36.91	43.90	2.00	0.00	1.00	0.00	37.07	43.96	2.00	0.00	1.00	0.00
37.24	43.91	2.00	0.00	1.00	0.00	37.40	42.62	2.00	0.00	1.00	0.00
37.57	41.72	2.00	0.00	1.00	0.00	37.73	41.56	2.00	0.00	1.00	0.00
37.89	43.21	2.00	0.00	1.00	0.00	38.06	45.45	2.00	0.00	1.00	0.00
38.22	48.16	2.00	0.00	1.00	0.00	38.39	50.29	2.00	0.00	1.00	0.00
38.55	50.57	2.00	0.00	1.00	0.00	38.71	49.76	2.00	0.00	1.00	0.00
38.88	48.39	2.00	0.00	1.00	0.00	39.04	47.63	2.00	0.00	1.00	0.00
39.21	46.42	2.00	0.00	1.00	0.00	39.37	45.02	2.00	0.00	1.00	0.00
39.53	43.69	2.00	0.00	1.00	0.00	39.70	42.89	2.00	0.00	1.00	0.00
39.86	44.10	2.00	0.00	1.00	0.00	40.03	45.21	2.00	0.00	1.00	0.00
40.19	45.98	2.00	0.00	1.00	0.00	40.35	44.79	2.00	0.00	1.00	0.00
40.52	43.10	2.00	0.00	1.00	0.00	40.68	41.36	2.00	0.00	1.00	0.00
40.85	41.16	2.00	0.00	1.00	0.00	41.01	43.93	2.00	0.00	1.00	0.00
41.17	47.56	2.00	0.00	1.00	0.00	41.34	51.54	2.00	0.00	1.00	0.00
41.50	53.55	2.00	0.00	1.00	0.00	41.67	53.77	2.00	0.00	1.00	0.00
41.83	51.41	2.00	0.00	1.00	0.00	41.99	47.98	2.00	0.00	1.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
42.16	45.24	2.00	0.00	1.00	0.00	42.32	43.40	2.00	0.00	1.00	0.00
42.49	42.22	2.00	0.00	1.00	0.00	42.65	41.91	2.00	0.00	1.00	0.00
42.81	41.77	2.00	0.00	1.00	0.00	42.98	42.11	2.00	0.00	1.00	0.00
43.14	43.52	2.00	0.00	1.00	0.00	43.31	44.94	2.00	0.00	1.00	0.00
43.47	46.37	2.00	0.00	1.00	0.00	43.64	46.27	2.00	0.00	1.00	0.00
43.80	46.63	2.00	0.00	1.00	0.00	43.96	48.44	2.00	0.00	1.00	0.00
44.13	50.16	2.00	0.00	1.00	0.00	44.29	50.76	2.00	0.00	1.00	0.00
44.46	48.75	2.00	0.00	1.00	0.00	44.62	46.30	2.00	0.00	1.00	0.00
44.78	43.60	2.00	0.00	1.00	0.00	44.95	42.47	2.00	0.00	1.00	0.00
45.11	41.11	2.00	0.00	1.00	0.00	45.28	40.68	2.00	0.00	1.00	0.00
45.44	40.05	2.00	0.00	1.00	0.00	45.60	39.95	2.00	0.00	1.00	0.00
45.77	41.30	2.00	0.00	1.00	0.00	45.93	42.36	2.00	0.00	1.00	0.00
46.10	44.84	2.00	0.00	1.00	0.00	46.26	46.62	2.00	0.00	1.00	0.00
46.42	50.40	2.00	0.00	1.00	0.00	46.59	56.22	2.00	0.00	1.00	0.00
46.75	66.22	2.00	0.00	1.00	0.00	46.92	78.02	2.00	0.00	1.00	0.00
47.08	82.09	2.00	0.00	1.00	0.00	47.24	84.90	2.00	0.00	1.00	0.00
47.41	83.07	2.00	0.00	1.00	0.00	47.57	81.45	2.00	0.00	1.00	0.00
47.74	78.07	2.00	0.00	1.00	0.00	47.90	77.80	2.00	0.00	1.00	0.00
48.06	84.23	2.00	0.00	1.00	0.00	48.23	89.54	2.00	0.00	1.00	0.00
48.39	86.84	2.00	0.00	1.00	0.00	48.56	82.73	0.34	2.73	1.00	0.05
48.72	84.18	0.35	2.69	1.00	0.05	48.88	91.20	0.39	2.52	1.00	0.05
49.05	94.37	0.41	2.45	1.00	0.05	49.21	95.26	0.41	2.43	1.00	0.05
49.38	97.07	2.00	0.00	1.00	0.00	49.54	98.38	2.00	0.00	1.00	0.00
49.70	100.62	2.00	0.00	1.00	0.00	49.87	101.85	2.00	0.00	1.00	0.00
50.03	102.49	2.00	0.00	1.00	0.00	50.20	101.56	2.00	0.00	1.00	0.00
50.36	97.22	2.00	0.00	1.00	0.00	50.52	94.96	2.00	0.00	1.00	0.00
50.69	94.51	2.00	0.00	1.00	0.00	50.85	97.60	2.00	0.00	1.00	0.00
51.02	97.39	2.00	0.00	1.00	0.00	51.18	96.11	2.00	0.00	1.00	0.00
51.35	92.19	2.00	0.00	1.00	0.00	51.51	90.61	2.00	0.00	1.00	0.00
51.67	91.21	2.00	0.00	1.00	0.00	51.84	93.33	2.00	0.00	1.00	0.00
52.00	94.26	2.00	0.00	1.00	0.00	52.17	91.01	2.00	0.00	1.00	0.00
52.33	83.93	2.00	0.00	1.00	0.00	52.49	74.10	2.00	0.00	1.00	0.00
52.66	64.61	2.00	0.00	1.00	0.00	52.82	59.39	2.00	0.00	1.00	0.00
52.99	61.81	2.00	0.00	1.00	0.00	53.15	68.18	2.00	0.00	1.00	0.00
53.31	70.81	2.00	0.00	1.00	0.00	53.48	67.65	2.00	0.00	1.00	0.00
53.64	68.14	0.29	3.20	1.00	0.06	53.81	71.75	0.30	3.07	1.00	0.06
53.97	75.15	2.00	0.00	1.00	0.00	54.13	74.68	2.00	0.00	1.00	0.00
54.30	73.47	2.00	0.00	1.00	0.00	54.46	68.60	2.00	0.00	1.00	0.00
54.63	62.48	2.00	0.00	1.00	0.00	54.79	57.94	2.00	0.00	1.00	0.00
54.95	56.82	2.00	0.00	1.00	0.00	55.12	56.24	2.00	0.00	1.00	0.00
55.28	55.94	2.00	0.00	1.00	0.00	55.45	56.24	2.00	0.00	1.00	0.00
55.61	57.03	2.00	0.00	1.00	0.00	55.77	57.58	2.00	0.00	1.00	0.00
55.94	57.43	2.00	0.00	1.00	0.00	56.10	56.58	2.00	0.00	1.00	0.00
56.27	54.38	2.00	0.00	1.00	0.00	56.43	51.79	2.00	0.00	1.00	0.00
56.59	49.72	2.00	0.00	1.00	0.00	56.76	48.83	2.00	0.00	1.00	0.00
56.92	48.88	2.00	0.00	1.00	0.00	57.09	49.03	2.00	0.00	1.00	0.00
57.25	49.12	2.00	0.00	1.00	0.00	57.41	48.97	2.00	0.00	1.00	0.00
57.58	49.52	2.00	0.00	1.00	0.00	57.74	49.64	2.00	0.00	1.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
57.91	48.99	2.00	0.00	1.00	0.00	58.07	46.82	2.00	0.00	1.00	0.00
58.23	45.50	2.00	0.00	1.00	0.00	58.40	46.48	2.00	0.00	1.00	0.00
58.56	48.13	2.00	0.00	1.00	0.00	58.73	52.91	2.00	0.00	1.00	0.00
58.89	62.32	2.00	0.00	1.00	0.00	59.06	70.87	2.00	0.00	1.00	0.00
59.22	76.21	2.00	0.00	1.00	0.00	59.38	72.16	2.00	0.00	1.00	0.00
59.55	67.99	2.00	0.00	1.00	0.00	59.71	65.08	2.00	0.00	1.00	0.00
59.88	63.64	2.00	0.00	1.00	0.00	60.04	72.74	2.00	0.00	1.00	0.00
60.20	79.31	2.00	0.00	1.00	0.00	60.37	86.74	2.00	0.00	1.00	0.00
60.53	92.10	2.00	0.00	1.00	0.00	60.70	102.14	2.00	0.00	1.00	0.00
60.86	110.58	2.00	0.00	1.00	0.00	61.02	110.09	2.00	0.00	1.00	0.00
61.19	101.92	2.00	0.00	1.00	0.00	61.35	89.85	2.00	0.00	1.00	0.00
61.52	79.15	2.00	0.00	1.00	0.00	61.68	69.65	2.00	0.00	1.00	0.00
61.84	61.14	2.00	0.00	1.00	0.00	62.01	56.98	2.00	0.00	1.00	0.00
62.17	55.77	2.00	0.00	1.00	0.00	62.34	55.91	2.00	0.00	1.00	0.00
62.50	56.97	2.00	0.00	1.00	0.00	62.66	57.95	2.00	0.00	1.00	0.00
62.83	57.97	2.00	0.00	1.00	0.00	62.99	56.76	2.00	0.00	1.00	0.00
63.16	58.35	2.00	0.00	1.00	0.00	63.32	68.94	2.00	0.00	1.00	0.00
63.48	82.85	2.00	0.00	1.00	0.00	63.65	95.87	2.00	0.00	1.00	0.00
63.81	97.33	2.00	0.00	1.00	0.00	63.98	94.33	0.43	2.45	1.00	0.05
64.14	88.95	0.40	2.57	1.00	0.05	64.30	86.08	0.38	2.64	1.00	0.05
64.47	80.08	0.35	2.80	1.00	0.06	64.63	77.14	0.34	2.89	1.00	0.06
64.80	73.89	2.00	0.00	1.00	0.00	64.96	72.18	2.00	0.00	1.00	0.00
65.12	69.80	2.00	0.00	1.00	0.00	65.29	67.13	2.00	0.00	1.00	0.00
65.45	64.55	2.00	0.00	1.00	0.00	65.62	62.21	2.00	0.00	1.00	0.00
65.78	58.39	2.00	0.00	1.00	0.00	65.94	53.25	2.00	0.00	1.00	0.00
66.11	49.40	2.00	0.00	1.00	0.00	66.27	47.79	2.00	0.00	1.00	0.00
66.44	48.96	2.00	0.00	1.00	0.00	66.60	59.05	2.00	0.00	1.00	0.00
66.77	73.20	2.00	0.00	1.00	0.00	66.93	99.25	2.00	0.00	1.00	0.00
67.09	121.03	2.00	0.00	1.00	0.00	67.26	127.52	2.00	0.00	1.00	0.00
67.42	122.58	2.00	0.00	1.00	0.00	67.59	111.55	2.00	0.00	1.00	0.00
67.75	114.32	2.00	0.00	1.00	0.00	67.91	125.45	2.00	0.00	1.00	0.00
68.08	141.80	0.95	0.64	1.00	0.01	68.24	159.26	1.26	0.21	1.00	0.00
68.41	195.03	2.00	0.00	1.00	0.00	68.57	225.52	2.00	0.00	1.00	0.00
68.73	261.09	2.00	0.00	1.00	0.00	68.90	291.27	2.00	0.00	1.00	0.00
69.06	315.71	2.00	0.00	1.00	0.00	69.23	317.85	2.00	0.00	1.00	0.00
69.39	304.60	2.00	0.00	1.00	0.00	69.55	296.65	2.00	0.00	1.00	0.00
69.72	-1.00	2.00	0.00	1.00	0.00	69.88	-1.00	2.00	0.00	1.00	0.00
70.05	-1.00	2.00	0.00	1.00	0.00	70.21	-1.00	2.00	0.00	1.00	0.00

Total estimated settlement: 2.11

Abbreviations

$Q_{tn,cs}$:	Equivalent clean sand normalized cone resistance
FS:	Factor of safety against liquefaction
e_v (%):	Post-liquefaction volumentric strain
DF:	e_v depth weighting factor
Settlement:	Calculated settlement

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Northbound Diagonal On-Ramp Pedestrian Overcrossing***
PROJECT NO. ***2016-146-NOC***
BORING NO. ***R-18-NO-001***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Silver Creek Fault
a_{max} (g)= 0.63
FAULT M_w = 6.9

GW DEPTH (ft)= 30

BOREHOLE DIA (in)= 3.3
HAMMER ENERGY = 78%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 30 (below OG)

MSF = 1.24

SOIL STRATA							LIQUEFACTION RESISTANCE ($CRR_{7.5}$)												CYCLIC STRESS RATIO (CSR)				F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka			POST-LIQ. SETTLEMENT	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	4.0	1	3	1	34	MC	22.1	1.3	0.75	1.0	1.00	21.5	345.0	1.7	36.6		36.6		345.0	345.0	1.0	0.4	1.0	1.0			
4.0	8.0	2	6	1	42	MC	27.3	1.3	0.80	1.0	1.00	28.4	700.0	1.7	48.0		48.0		700.0	700.0	1.0	0.4	1.0	1.0			
8.0	13.0	3	11	1	26	MC	16.9	1.3	0.85	1.0	1.00	18.7	1300.0	1.2	23.2		23.2		1300.0	1300.0	1.0	0.4	1.0	1.0			
13.0	18.0	4	16	1	20	MC	13.0	1.3	0.95	1.0	1.00	16.1	1900.0	1.0	16.5	25%	22.7		1900.0	1900.0	1.0	0.4	1.0	1.0			
18.0	21.5	5	21	1	15	MC	9.8	1.3	0.95	1.0	1.00	12.0	2500.0	0.9	10.8		10.8		2500.0	2500.0	1.0	0.4	0.9	1.0			
21.5	28.0	6	26	2	16	MC	10.4	1.3	1.00	1.0	1.00	13.5	3100.0	0.8	10.9												
28.0	33.0	7	31	2	10	MC	6.5	1.3	1.00	1.0	1.00	8.5	3637.6	0.7	6.3												
33.0	38.0	8	36	2	17	MC	11.1	1.3	1.00	1.0	1.00	14.4	3925.6	0.7	10.3												
38.0	43.0	9	41	2	16	MC	10.4	1.3	1.00	1.0	1.00	13.5	4213.6	0.7	9.3												
43.0	48.5	10	46	2	7	MC	4.6	1.3	1.00	1.0	1.00	5.9	4501.6	0.7	3.9												
48.5	53.5	11	51	2	8	MC	5.2	1.3	1.00	1.0	1.00	6.8	4789.6	0.6	4.4												
53.5	58.0	12	56	2	14	MC	9.1	1.3	1.00	1.0	1.00	11.8	5077.6	0.6	7.4												
58.0	65.0	13	61	2	16	MC	10.4	1.3	1.00	1.0	1.00	13.5	5365.6	0.6	8.3												
65.0	75.0	14	71	2	16	MC	10.4	1.3	1.00	1.0	1.00	13.5	5941.6	0.6	7.8												
75.0	81.5	15	81	2	42	MC	27.3	1.3	1.00	1.0	1.00	35.5	6517.6	0.6	19.7	86%												
81.5	95.0	16	91	1	48	SPT	48.0	1.3	1.00	1.2	1.00	74.9	7093.6	0.5	39.8		39.8		10900.00	7093.6	0.5	0.3	0.6	1.0	NON-LIQ.		
95.0	108.0	17	101	1	30	SPT	30.0	1.3	1.00	1.2	1.00	46.8	7669.6	0.5	23.9	12%	26.2	0.3	12100.00	7669.6	0.5	0.3	0.6	1.0	NON-LIQ.		
108.0	111.5	18	111	2	45	MC	29.3	1.3	1.00	1.0	1.00	38.0	8245.6	0.5	18.7												

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% a = $\exp(1.76-(190/FC^2))$, b = $(0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Northbound Diagonal On-Ramp Pedestrian Overcrossing***
PROJECT NO. ***2016-146-NOC***
BORING NO. ***R-18-NO-002***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Silver Creek Fault
a_{max} *(g)=* 0.63
FAULT M_w *=* 6.9

GW DEPTH (ft)= 25

BOREHOLE DIA (in)= 4.3
HAMMER ENERGY = 78%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 25 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	3.3	1A	3	2	26	MC	16.9	1.3	0.75	1.0	1.00	16.5	345.0	1.7	28.0												
3.3	4.5	1B	3.25	1	26	MC	16.9	1.3	0.75	1.0	1.00	16.5	373.8	1.7	28.0		28.0		373.8	373.8	1.0	0.4	1.0	1.0			
4.5	8.0	2	6	1	29	MC	18.9	1.3	0.80	1.0	1.00	19.6	703.8	1.7	33.0		33.0		703.8	703.8	1.0	0.4	1.0	1.0			
8.0	13.0	3	11	1	36	MC	23.4	1.3	0.85	1.0	1.00	25.9	1303.8	1.2	32.0		32.0		1303.8	1303.8	1.0	0.4	1.0	1.0			
13.0	19.0	4	16	2	18	MC	11.7	1.3	0.95	1.0	1.00	14.4	1903.8	1.0	14.8												
19.0	23.5	5	21	1	22	MC	14.3	1.3	0.95	1.0	1.00	17.7	2503.8	0.9	15.8		15.8		2503.8	2503.8	1.0	0.4	0.9	1.0			
23.5	28.5	6	26	2	12	SPT	12.0	1.3	1.00	1.2	1.00	18.7	3041.4	0.8	15.2	61%											
28.5	33.5	7	31	2	14	MC	9.1	1.3	1.00	1.0	1.00	11.8	3329.4	0.8	9.2												
33.5	38.5	8	36	2	19	MC	12.4	1.3	1.00	1.0	1.00	16.1	3617.4	0.7	11.9												
38.5	43.0	9	41	2	10	SPT	10.0	1.3	1.00	1.2	1.00	15.6	3905.4	0.7	11.2												
43.0	48.0	10	46	2	15	MC	9.8	1.3	1.00	1.0	1.00	12.7	4193.4	0.7	8.8	61%											
48.0	53.0	11	51	2	12	MC	7.8	1.3	1.00	1.0	1.00	10.1	4481.4	0.7	6.8												
53.0	58.5	12	56	2	13	MC	8.5	1.3	1.00	1.0	1.00	11.0	4769.4	0.6	7.1												
58.5	65.0	13	61	1	38	MC	24.7	1.3	1.00	1.0	1.00	32.1	5057.4	0.6	20.2	11%	21.9	0.2	7303.75	5057.4	0.7	0.4	0.7	1.0	(0.56)	1.31%	1.02
65.0	76.0	14	71	2	22	SPT	22.0	1.3	1.00	1.2	1.00	34.3	5633.4	0.6	20.4												
76.0	87.5	15	81	1	39	SPT	39.0	1.3	1.00	1.2	1.00	60.8	6209.4	0.6	34.5		34.5		9703.75	6209.4	0.5	0.3	0.6	1.0	NON-LIQ.		
87.5	100.0	16	91	1	90	SPT	90.0	1.3	1.00	1.2	1.00	140.4	6785.4	0.5	76.2		76.2		10903.75	6785.4	0.5	0.3	0.6	1.0	NON-LIQ.		
100.0	102.5	17	101	1	61	SPT	61.0	1.3	1.00	1.2	1.00	95.2	7361.4	0.5	49.6		49.6		12103.75	7361.4	0.5	0.3	0.6	1.0	NON-LIQ.		
102.5	104.5	18	104	1	100	SPT	100.0	1.3	1.00	1.2	1.00	156.0	7534.2	0.5	80.4		80.4		12463.75	7534.2	0.5	0.3	0.6	1.0	NON-LIQ.		

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Northbound Diagonal On-Ramp Pedestrian Overcrossing***
PROJECT NO. ***2016-146-NOC***
BORING NO. ***R-18-NO-003***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Silver Creek Fault
a_{max} *(g)=* 0.63
FAULT M_w *=* 6.9

GW DEPTH (ft)= 32

BOREHOLE DIA (in)= 3.3
HAMMER ENERGY = 78%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 32 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				$F.S.=(CRR_{7.5}/CSR)*MSF*Ks*Ka$			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	4.0	1	3	1	60	MC	39.0	1.3	0.75	1.0	1.00	38.0	345.0	1.7	64.6		64.6		345.0	345.0	1.0	0.4	1.0	1.0			
4.0	8.0	2	6	1	53	MC	34.5	1.3	0.80	1.0	1.00	35.8	700.0	1.7	60.6		60.6		700.0	700.0	1.0	0.4	1.0	1.0			
8.0	11.5	3	11	1	24	SPT	24.0	1.3	0.85	1.2	1.00	31.8	1300.0	1.2	39.5		39.5		1300.0	1300.0	1.0	0.4	1.0	1.0			
11.5	18.5	4	16	2	25	MC	16.3	1.3	0.95	1.0	1.00	20.1	1900.0	1.0	20.6	59%											
18.5	23.0	5	21	1	11	MC	7.2	1.3	0.95	1.0	1.00	8.8	2500.0	0.9	7.9		7.9		2500.0	2500.0	1.0	0.4	0.9	1.0			
23.0	29.0	6	26	2	17	MC	11.1	1.3	1.00	1.0	1.00	14.4	3100.0	0.8	11.5												
29.0	34.0	7	31	2	13	MC	8.5	1.3	1.00	1.0	1.00	11.0	3700.0	0.7	8.1												
34.0	38.0	8	36	1	4	SPT	4.0	1.3	1.00	1.2	1.00	6.2	4050.4	0.7	4.4		4.4	0.1	4300.0	4050.4	0.9	0.4	0.9	1.0	(0.19)	4.37%	2.10
38.0	43.0	9	41	1	9	SPT	9.0	1.3	1.00	1.2	1.00	14.0	4338.4	0.7	9.5		9.5	0.1	4900.00	4338.4	0.8	0.4	0.8	1.0	(0.29)	2.44%	1.46
43.0	48.5	10	46	1	12	MC	7.8	1.3	1.00	1.0	1.00	10.1	4626.4	0.7	6.7		6.7	0.1	5500.00	4626.4	0.8	0.4	0.8	1.0	(0.22)	3.19%	2.11
48.5	53.0	11	51	1	25	MC	16.3	1.3	1.00	1.0	1.00	21.1	4914.4	0.6	13.5	37%	21.2	0.2	6100.00	4914.4	0.7	0.4	0.8	1.0	(0.58)	1.34%	0.72
53.0	56.5	12	56	1	19	SPT	19.0	1.3	1.00	1.2	1.00	29.6	5202.4	0.6	18.4		18.4	0.2	6700.00	5202.4	0.7	0.4	0.7	1.0	(0.49)	1.49%	0.63
56.5	65.0	13	61	1	8	SPT	8.0	1.3	1.00	1.2	1.00	12.5	5490.4	0.6	7.5		7.5	0.1	7300.00	5490.4	0.7	0.4	0.8	1.0	(0.26)	2.91%	2.97
65.0	75.0	14	71	2	19	MC	12.4	1.3	1.00	1.0	1.00	16.1	6066.4	0.6	9.2												
75.0	85.0	15	81	1	31	SPT	31.0	1.3	1.00	1.2	1.00	48.4	6642.4	0.5	26.5		26.5	0.3	9700.00	6642.4	0.5	0.3	0.7	1.0	NON-LIQ.		
85.0	95.5	16	91	1	94	SPT	94.0	1.3	1.00	1.2	1.00	146.6	7218.4	0.5	77.2		77.2		10900.00	7218.4	0.5	0.3	0.6	1.0	NON-LIQ.		
95.5	106.0	17	101	1	69	SPT	69.0	1.3	1.00	1.2	1.00	107.6	7794.4	0.5	54.5		54.5		12100.00	7794.4	0.5	0.3	0.6	1.0	NON-LIQ.		
106.0	111.5	18	111	2	21	SPT	21.0	1.3	1.00	1.2	1.00	32.8	8370.4	0.5	16.0												

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Northbound Diagonal On-Ramp Pedestrian Overcrossing***
PROJECT NO. ***2016-146-RW1***
BORING NO. ***R-18-NO-101***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Silver Creek Fault
a_{max} *(g)=* 0.63
FAULT M_w *=* 6.9

GW DEPTH (ft)= 14

BOREHOLE DIA (in)= 3.3
HAMMER ENERGY = 78%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 14 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)												*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	4.0	1	3	1	31	SPT	31.0	1.3	0.75	1.2	1.00	36.3	345.0	1.7	61.7		61.7		345.0	345.0	1.0	0.4	1.0	1.0			
4.0	8.0	2	6	1	31	MC	20.2	1.3	0.80	1.0	1.00	21.0	700.0	1.7	35.4		35.4		700.0	700.0	1.0	0.4	1.0	1.0			
8.0	14.0	3	10	1	100	MC	65.0	1.3	0.85	1.0	1.00	71.8	1180.0	1.3	93.5		93.5		1180.0	1180.0	1.0	0.4	1.0	1.0			
14.0	19.0	4	16	2	7	SPT	7.0	1.3	0.95	1.2	1.00	10.4	1775.2	1.1	11.0												
19.0	23.0	5	21	2	8	SPT	8.0	1.3	0.95	1.2	1.00	11.9	2063.2	1.0	11.7												
23.0	27.5	6	26	1	14	MC	9.1	1.3	1.00	1.0	1.00	11.8	2351.2	0.9	10.9		10.9	0.1	3100.0	2351.2	0.9	0.5	1.0	1.0	(0.28)	2.21%	1.19
27.5	33.0	7	31	2	12	MC	7.8	1.3	1.00	1.0	1.00	10.1	2639.2	0.9	8.8												
33.0	39.0	8	36	2	14	MC	9.1	1.3	1.00	1.0	1.00	11.8	2927.2	0.8	9.8												
39.0	43.0	9	41	2	7	MC	4.6	1.3	1.00	1.0	1.00	5.9	3215.2	0.8	4.7												
43.0	50.0	10	44.5	2	6	MC	3.9	1.3	1.00	1.0	1.00	5.1	3416.8	0.8	3.9												
50.0	56.5	11	56	2	13	MC	8.5	1.3	1.00	1.0	1.00	11.0	4079.2	0.7	7.7												

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Northbound Diagonal On-Ramp Pedestrian Overcrossing***
PROJECT NO. ***2016-146-MSN***
BORING NO. ***R-18-NO-102***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Silver Creek Fault
a_{max} *(g)=* 0.63
FAULT M_w *=* 6.9

GW DEPTH (ft)= 28
BOREHOLE DIA (in)= 3.3
HAMMER ENERGY = 78%
CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 28 *(below OG)*
MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	4.5	1	3	1	28	SPT	28.0	1.3	0.75	1.2	1.00	32.8	345.0	1.7	55.7		55.7		345.0	345.0	1.0	0.4	1.0	1.0			
4.5	8.0	2	6	1	72	MC	46.8	1.3	0.80	1.0	1.00	48.7	697.5	1.7	82.4		82.4		697.5	697.5	1.0	0.4	1.0	1.0			
8.0	13.0	3	11	1	27	MC	17.6	1.3	0.85	1.0	1.00	19.4	1297.5	1.2	24.1		24.1		1297.5	1297.5	1.0	0.4	1.0	1.0			
13.0	18.0	4	16	2	22	MC	14.3	1.3	0.95	1.0	1.00	17.7	1897.5	1.0	18.1												
18.0	23.0	5	21	2	26	MC	16.9	1.3	0.95	1.0	1.00	20.9	2497.5	0.9	18.7												
23.0	28.0	6	26	2	27	MC	17.6	1.3	1.00	1.0	1.00	22.8	3097.5	0.8	18.3												
28.0	33.0	7	31	2	10	MC	6.5	1.3	1.00	1.0	1.00	8.5	3510.3	0.8	6.4												
33.0	38.5	8	36	2	8	MC	5.2	1.3	1.00	1.0	1.00	6.8	3798.3	0.7	4.9												
38.5	42.5	9	41	1	8	MC	5.2	1.3	1.00	1.0	1.00	6.8	4086.3	0.7	4.7		4.7	0.1	4897.50	4086.3	0.8	0.4	0.9	1.0	(0.18)	4.13%	1.98
42.5	47.0	10	44.5	2	9	MC	5.9	1.3	1.00	1.0	1.00	7.6	4287.9	0.7	5.2												
47.0	51.5	11	51.5	1	23	SPT	23.0	1.3	1.00	1.2	1.00	35.9	4691.1	0.7	23.4	10%	25.0	0.3	6157.50	4691.1	0.7	0.4	0.7	1.0	NON-LIQ.		

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Northbound Diagonal On-Ramp Pedestrian Overcrossing***
PROJECT NO. ***2016-146-MSN***
BORING NO. ***R-18-NO-103***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Silver Creek Fault
a_{max} *(g)=* 0.63
FAULT M_w *=* 6.9

GW DEPTH (ft)= 29

BOREHOLE DIA (in)= 3.3
HAMMER ENERGY = 78%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 29 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	4.5	1	3	1	35	MC	22.8	1.3	0.75	1.0	1.00	22.2	345.0	1.7	37.7		37.7		345.0	345.0	1.0	0.4	1.0	1.0			
4.5	8.0	2	6	1	20	MC	13.0	1.3	0.80	1.0	1.00	13.5	697.5	1.7	22.9		22.9		697.5	697.5	1.0	0.4	1.0	1.0			
8.0	13.0	3	11	2	14	MC	9.1	1.3	0.85	1.0	1.00	10.1	1297.5	1.2	12.5												
13.0	19.0	4	16	2	19	MC	12.4	1.3	0.95	1.0	1.00	15.3	1897.5	1.0	15.7												
19.0	23.0	5	21	1	42	MC	27.3	1.3	0.95	1.0	1.00	33.7	2497.5	0.9	30.2		30.2		2497.5	2497.5	1.0	0.4	0.9	1.0			
23.0	28.0	6	26	1	23	MC	15.0	1.3	1.00	1.0	1.00	19.4	3097.5	0.8	15.6	42%	23.7		3097.5	3097.5	0.9	0.4	0.9	1.0			
28.0	33.0	7	31	1	21	MC	13.7	1.3	1.00	1.0	1.00	17.7	3572.7	0.7	13.3	6%	13.4	0.1	3697.5	3572.7	0.9	0.4	0.8	1.0	(0.38)	1.89%	1.14
33.0	38.0	8	36	1	35	SPT	35.0	1.3	1.00	1.2	1.00	54.6	3860.7	0.7	39.3		39.3		4297.5	3860.7	0.9	0.4	0.8	1.0	NON-LIQ.		
38.0	44.0	9	41	1	29	SPT	29.0	1.3	1.00	1.2	1.00	45.2	4148.7	0.7	31.4		31.4		4897.50	4148.7	0.8	0.4	0.8	1.0	NON-LIQ.		
44.0	46.5	10	46	1	18	SPT	18.0	1.3	1.00	1.2	1.00	28.1	4436.7	0.7	18.9	38%	27.6	0.4	5497.50	4436.7	0.8	0.4	0.8	1.0	NON-LIQ.		

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
0.16	2.00	0.00	9.97	0.16	0.00	0.33	2.00	0.00	9.95	0.16	0.00
0.49	2.00	0.00	9.92	0.16	0.00	0.66	2.00	0.00	9.90	0.16	0.00
0.82	2.00	0.00	9.87	0.16	0.00	0.98	2.00	0.00	9.85	0.16	0.00
1.15	2.00	0.00	9.82	0.16	0.00	1.31	2.00	0.00	9.80	0.16	0.00
1.48	2.00	0.00	9.77	0.16	0.00	1.64	2.00	0.00	9.75	0.16	0.00
1.80	2.00	0.00	9.72	0.16	0.00	1.97	2.00	0.00	9.70	0.16	0.00
2.13	2.00	0.00	9.67	0.16	0.00	2.30	2.00	0.00	9.65	0.16	0.00
2.46	2.00	0.00	9.62	0.16	0.00	2.62	2.00	0.00	9.60	0.16	0.00
2.79	2.00	0.00	9.57	0.16	0.00	2.95	2.00	0.00	9.55	0.16	0.00
3.12	2.00	0.00	9.52	0.16	0.00	3.28	2.00	0.00	9.50	0.16	0.00
3.44	2.00	0.00	9.47	0.16	0.00	3.61	2.00	0.00	9.45	0.16	0.00
3.77	2.00	0.00	9.42	0.16	0.00	3.94	2.00	0.00	9.40	0.16	0.00
4.10	2.00	0.00	9.37	0.16	0.00	4.27	2.00	0.00	9.35	0.16	0.00
4.43	2.00	0.00	9.32	0.16	0.00	4.59	2.00	0.00	9.30	0.16	0.00
4.76	2.00	0.00	9.27	0.16	0.00	4.92	2.00	0.00	9.25	0.16	0.00
5.09	2.00	0.00	9.22	0.16	0.00	5.25	2.00	0.00	9.20	0.16	0.00
5.41	2.00	0.00	9.17	0.16	0.00	5.58	2.00	0.00	9.15	0.16	0.00
5.74	2.00	0.00	9.12	0.16	0.00	5.91	2.00	0.00	9.10	0.16	0.00
6.07	2.00	0.00	9.07	0.16	0.00	6.23	2.00	0.00	9.05	0.16	0.00
6.40	2.00	0.00	9.02	0.16	0.00	6.56	2.00	0.00	9.00	0.16	0.00
6.73	2.00	0.00	8.97	0.16	0.00	6.89	2.00	0.00	8.95	0.16	0.00
7.05	2.00	0.00	8.92	0.16	0.00	7.22	2.00	0.00	8.90	0.16	0.00
7.38	2.00	0.00	8.87	0.16	0.00	7.55	2.00	0.00	8.85	0.16	0.00
7.71	2.00	0.00	8.82	0.16	0.00	7.87	2.00	0.00	8.80	0.16	0.00
8.04	2.00	0.00	8.77	0.16	0.00	8.20	2.00	0.00	8.75	0.16	0.00
8.37	2.00	0.00	8.72	0.16	0.00	8.53	2.00	0.00	8.70	0.16	0.00
8.69	2.00	0.00	8.67	0.16	0.00	8.86	2.00	0.00	8.65	0.16	0.00
9.02	2.00	0.00	8.62	0.16	0.00	9.19	2.00	0.00	8.60	0.16	0.00
9.35	2.00	0.00	8.57	0.16	0.00	9.51	2.00	0.00	8.55	0.16	0.00
9.68	2.00	0.00	8.52	0.16	0.00	9.84	2.00	0.00	8.50	0.16	0.00
10.01	2.00	0.00	8.47	0.16	0.00	10.17	2.00	0.00	8.45	0.16	0.00
10.33	2.00	0.00	8.42	0.16	0.00	10.50	2.00	0.00	8.40	0.16	0.00
10.66	2.00	0.00	8.37	0.16	0.00	10.83	2.00	0.00	8.35	0.16	0.00
10.99	2.00	0.00	8.32	0.16	0.00	11.15	2.00	0.00	8.30	0.16	0.00
11.32	2.00	0.00	8.27	0.16	0.00	11.48	2.00	0.00	8.25	0.16	0.00
11.65	2.00	0.00	8.22	0.16	0.00	11.81	2.00	0.00	8.20	0.16	0.00
11.98	2.00	0.00	8.17	0.16	0.00	12.14	2.00	0.00	8.15	0.16	0.00
12.30	2.00	0.00	8.12	0.16	0.00	12.47	2.00	0.00	8.10	0.16	0.00
12.63	2.00	0.00	8.07	0.16	0.00	12.80	2.00	0.00	8.05	0.16	0.00
12.96	2.00	0.00	8.02	0.16	0.00	13.12	2.00	0.00	8.00	0.16	0.00
13.29	2.00	0.00	7.97	0.16	0.00	13.45	2.00	0.00	7.95	0.16	0.00
13.62	2.00	0.00	7.92	0.16	0.00	13.78	2.00	0.00	7.90	0.16	0.00
13.94	2.00	0.00	7.87	0.16	0.00	14.11	2.00	0.00	7.85	0.16	0.00
14.27	2.00	0.00	7.82	0.16	0.00	14.44	2.00	0.00	7.80	0.16	0.00
14.60	2.00	0.00	7.77	0.16	0.00	14.76	2.00	0.00	7.75	0.16	0.00
14.93	2.00	0.00	7.72	0.16	0.00	15.09	2.00	0.00	7.70	0.16	0.00
15.26	2.00	0.00	7.67	0.16	0.00	15.42	2.00	0.00	7.65	0.16	0.00
15.58	2.00	0.00	7.62	0.16	0.00	15.75	2.00	0.00	7.60	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
15.91	2.00	0.00	7.57	0.16	0.00	16.08	2.00	0.00	7.55	0.16	0.00
16.24	2.00	0.00	7.52	0.16	0.00	16.40	2.00	0.00	7.50	0.16	0.00
16.57	2.00	0.00	7.47	0.16	0.00	16.73	2.00	0.00	7.45	0.16	0.00
16.90	2.00	0.00	7.42	0.16	0.00	17.06	2.00	0.00	7.40	0.16	0.00
17.22	2.00	0.00	7.37	0.16	0.00	17.39	2.00	0.00	7.35	0.16	0.00
17.55	2.00	0.00	7.32	0.16	0.00	17.72	2.00	0.00	7.30	0.16	0.00
17.88	2.00	0.00	7.27	0.16	0.00	18.04	2.00	0.00	7.25	0.16	0.00
18.21	2.00	0.00	7.22	0.16	0.00	18.37	2.00	0.00	7.20	0.16	0.00
18.54	2.00	0.00	7.17	0.16	0.00	18.70	2.00	0.00	7.15	0.16	0.00
18.86	2.00	0.00	7.12	0.16	0.00	19.03	2.00	0.00	7.10	0.16	0.00
19.19	2.00	0.00	7.07	0.16	0.00	19.36	2.00	0.00	7.05	0.16	0.00
19.52	2.00	0.00	7.02	0.16	0.00	19.69	2.00	0.00	7.00	0.16	0.00
19.85	2.00	0.00	6.97	0.16	0.00	20.01	2.00	0.00	6.95	0.16	0.00
20.18	2.00	0.00	6.92	0.16	0.00	20.34	2.00	0.00	6.90	0.16	0.00
20.51	2.00	0.00	6.87	0.16	0.00	20.67	2.00	0.00	6.85	0.16	0.00
20.83	2.00	0.00	6.82	0.16	0.00	21.00	2.00	0.00	6.80	0.16	0.00
21.16	2.00	0.00	6.77	0.16	0.00	21.33	2.00	0.00	6.75	0.16	0.00
21.49	2.00	0.00	6.72	0.16	0.00	21.65	2.00	0.00	6.70	0.16	0.00
21.82	2.00	0.00	6.67	0.16	0.00	21.98	2.00	0.00	6.65	0.16	0.00
22.15	2.00	0.00	6.62	0.16	0.00	22.31	2.00	0.00	6.60	0.16	0.00
22.47	2.00	0.00	6.57	0.16	0.00	22.64	2.00	0.00	6.55	0.16	0.00
22.80	2.00	0.00	6.52	0.16	0.00	22.97	2.00	0.00	6.50	0.16	0.00
23.13	2.00	0.00	6.47	0.16	0.00	23.29	2.00	0.00	6.45	0.16	0.00
23.46	2.00	0.00	6.42	0.16	0.00	23.62	2.00	0.00	6.40	0.16	0.00
23.79	2.00	0.00	6.37	0.16	0.00	23.95	2.00	0.00	6.35	0.16	0.00
24.11	2.00	0.00	6.32	0.16	0.00	24.28	2.00	0.00	6.30	0.16	0.00
24.44	2.00	0.00	6.27	0.16	0.00	24.61	2.00	0.00	6.25	0.16	0.00
24.77	2.00	0.00	6.22	0.16	0.00	24.93	2.00	0.00	6.20	0.16	0.00
25.10	2.00	0.00	6.17	0.16	0.00	25.26	2.00	0.00	6.15	0.16	0.00
25.43	2.00	0.00	6.12	0.16	0.00	25.59	2.00	0.00	6.10	0.16	0.00
25.75	2.00	0.00	6.07	0.16	0.00	25.92	2.00	0.00	6.05	0.16	0.00
26.08	2.00	0.00	6.02	0.16	0.00	26.25	2.00	0.00	6.00	0.16	0.00
26.41	2.00	0.00	5.97	0.16	0.00	26.57	2.00	0.00	5.95	0.16	0.00
26.74	2.00	0.00	5.92	0.16	0.00	26.90	2.00	0.00	5.90	0.16	0.00
27.07	2.00	0.00	5.87	0.16	0.00	27.23	2.00	0.00	5.85	0.16	0.00
27.40	2.00	0.00	5.82	0.16	0.00	27.56	2.00	0.00	5.80	0.16	0.00
27.72	2.00	0.00	5.77	0.16	0.00	27.89	2.00	0.00	5.75	0.16	0.00
28.05	2.00	0.00	5.72	0.16	0.00	28.22	2.00	0.00	5.70	0.16	0.00
28.38	2.00	0.00	5.67	0.16	0.00	28.54	2.00	0.00	5.65	0.16	0.00
28.71	2.00	0.00	5.62	0.16	0.00	28.87	2.00	0.00	5.60	0.16	0.00
29.04	2.00	0.00	5.57	0.16	0.00	29.20	2.00	0.00	5.55	0.16	0.00
29.36	2.00	0.00	5.52	0.16	0.00	29.53	2.00	0.00	5.50	0.16	0.00
29.69	2.00	0.00	5.47	0.16	0.00	29.86	2.00	0.00	5.45	0.16	0.00
30.02	2.00	0.00	5.42	0.16	0.00	30.18	2.00	0.00	5.40	0.16	0.00
30.35	2.00	0.00	5.37	0.16	0.00	30.51	2.00	0.00	5.35	0.16	0.00
30.68	2.00	0.00	5.32	0.16	0.00	30.84	2.00	0.00	5.30	0.16	0.00
31.00	2.00	0.00	5.27	0.16	0.00	31.17	2.00	0.00	5.25	0.16	0.00
31.33	2.00	0.00	5.22	0.16	0.00	31.50	2.00	0.00	5.20	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
31.66	2.00	0.00	5.17	0.16	0.00	31.82	2.00	0.00	5.15	0.16	0.00
31.99	2.00	0.00	5.12	0.16	0.00	32.15	2.00	0.00	5.10	0.16	0.00
32.32	2.00	0.00	5.07	0.16	0.00	32.48	2.00	0.00	5.05	0.16	0.00
32.64	2.00	0.00	5.02	0.16	0.00	32.81	2.00	0.00	5.00	0.16	0.00
32.97	2.00	0.00	4.97	0.16	0.00	33.14	2.00	0.00	4.95	0.16	0.00
33.30	2.00	0.00	4.92	0.16	0.00	33.46	2.00	0.00	4.90	0.16	0.00
33.63	2.00	0.00	4.87	0.16	0.00	33.79	2.00	0.00	4.85	0.16	0.00
33.96	2.00	0.00	4.82	0.16	0.00	34.12	2.00	0.00	4.80	0.16	0.00
34.28	2.00	0.00	4.77	0.16	0.00	34.45	2.00	0.00	4.75	0.16	0.00
34.61	2.00	0.00	4.72	0.16	0.00	34.78	2.00	0.00	4.70	0.16	0.00
34.94	2.00	0.00	4.67	0.16	0.00	35.10	2.00	0.00	4.65	0.16	0.00
35.27	2.00	0.00	4.62	0.16	0.00	35.43	2.00	0.00	4.60	0.16	0.00
35.60	2.00	0.00	4.57	0.16	0.00	35.76	2.00	0.00	4.55	0.16	0.00
35.93	2.00	0.00	4.52	0.16	0.00	36.09	2.00	0.00	4.50	0.16	0.00
36.25	2.00	0.00	4.47	0.16	0.00	36.42	2.00	0.00	4.45	0.16	0.00
36.58	2.00	0.00	4.42	0.16	0.00	36.75	2.00	0.00	4.40	0.16	0.00
36.91	2.00	0.00	4.37	0.16	0.00	37.07	2.00	0.00	4.35	0.16	0.00
37.24	2.00	0.00	4.32	0.16	0.00	37.40	2.00	0.00	4.30	0.16	0.00
37.57	2.00	0.00	4.27	0.16	0.00	37.73	2.00	0.00	4.25	0.16	0.00
37.89	2.00	0.00	4.22	0.16	0.00	38.06	2.00	0.00	4.20	0.16	0.00
38.22	2.00	0.00	4.17	0.16	0.00	38.39	2.00	0.00	4.15	0.16	0.00
38.55	2.00	0.00	4.12	0.16	0.00	38.71	2.00	0.00	4.10	0.16	0.00
38.88	2.00	0.00	4.07	0.16	0.00	39.04	2.00	0.00	4.05	0.16	0.00
39.21	2.00	0.00	4.02	0.16	0.00	39.37	2.00	0.00	4.00	0.16	0.00
39.53	2.00	0.00	3.97	0.16	0.00	39.70	2.00	0.00	3.95	0.16	0.00
39.86	2.00	0.00	3.92	0.16	0.00	40.03	2.00	0.00	3.90	0.16	0.00
40.19	2.00	0.00	3.87	0.16	0.00	40.35	2.00	0.00	3.85	0.16	0.00
40.52	2.00	0.00	3.82	0.16	0.00	40.68	2.00	0.00	3.80	0.16	0.00
40.85	2.00	0.00	3.77	0.16	0.00	41.01	2.00	0.00	3.75	0.16	0.00
41.17	2.00	0.00	3.72	0.16	0.00	41.34	2.00	0.00	3.70	0.16	0.00
41.50	2.00	0.00	3.67	0.16	0.00	41.67	2.00	0.00	3.65	0.16	0.00
41.83	2.00	0.00	3.62	0.16	0.00	41.99	2.00	0.00	3.60	0.16	0.00
42.16	2.00	0.00	3.57	0.16	0.00	42.32	2.00	0.00	3.55	0.16	0.00
42.49	2.00	0.00	3.52	0.16	0.00	42.65	2.00	0.00	3.50	0.16	0.00
42.81	2.00	0.00	3.47	0.16	0.00	42.98	2.00	0.00	3.45	0.16	0.00
43.14	2.00	0.00	3.42	0.16	0.00	43.31	2.00	0.00	3.40	0.16	0.00
43.47	2.00	0.00	3.37	0.16	0.00	43.64	2.00	0.00	3.35	0.16	0.00
43.80	2.00	0.00	3.32	0.16	0.00	43.96	2.00	0.00	3.30	0.16	0.00
44.13	2.00	0.00	3.27	0.16	0.00	44.29	2.00	0.00	3.25	0.16	0.00
44.46	2.00	0.00	3.22	0.16	0.00	44.62	2.00	0.00	3.20	0.16	0.00
44.78	2.00	0.00	3.17	0.16	0.00	44.95	2.00	0.00	3.15	0.16	0.00
45.11	2.00	0.00	3.12	0.16	0.00	45.28	2.00	0.00	3.10	0.16	0.00
45.44	2.00	0.00	3.07	0.16	0.00	45.60	2.00	0.00	3.05	0.16	0.00
45.77	2.00	0.00	3.02	0.16	0.00	45.93	2.00	0.00	3.00	0.16	0.00
46.10	2.00	0.00	2.97	0.16	0.00	46.26	2.00	0.00	2.95	0.16	0.00
46.42	2.00	0.00	2.92	0.16	0.00	46.59	2.00	0.00	2.90	0.16	0.00
46.75	2.00	0.00	2.87	0.16	0.00	46.92	2.00	0.00	2.85	0.16	0.00
47.08	2.00	0.00	2.82	0.16	0.00	47.24	2.00	0.00	2.80	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
47.41	2.00	0.00	2.77	0.16	0.00	47.57	2.00	0.00	2.75	0.16	0.00
47.74	2.00	0.00	2.72	0.16	0.00	47.90	2.00	0.00	2.70	0.16	0.00
48.06	2.00	0.00	2.67	0.16	0.00	48.23	2.00	0.00	2.65	0.16	0.00
48.39	2.00	0.00	2.62	0.16	0.00	48.56	2.00	0.00	2.60	0.16	0.00
48.72	2.00	0.00	2.57	0.16	0.00	48.88	2.00	0.00	2.55	0.16	0.00
49.05	2.00	0.00	2.52	0.16	0.00	49.21	2.00	0.00	2.50	0.16	0.00
49.38	2.00	0.00	2.47	0.16	0.00	49.54	2.00	0.00	2.45	0.16	0.00
49.70	2.00	0.00	2.42	0.16	0.00	49.87	2.00	0.00	2.40	0.16	0.00
50.03	2.00	0.00	2.37	0.16	0.00	50.20	2.00	0.00	2.35	0.16	0.00
50.36	2.00	0.00	2.32	0.16	0.00	50.52	2.00	0.00	2.30	0.16	0.00
50.69	2.00	0.00	2.27	0.16	0.00	50.85	2.00	0.00	2.25	0.16	0.00
51.02	2.00	0.00	2.22	0.16	0.00	51.18	2.00	0.00	2.20	0.16	0.00
51.35	2.00	0.00	2.17	0.16	0.00	51.51	2.00	0.00	2.15	0.16	0.00
51.67	2.00	0.00	2.12	0.16	0.00	51.84	2.00	0.00	2.10	0.16	0.00
52.00	2.00	0.00	2.07	0.16	0.00	52.17	2.00	0.00	2.05	0.16	0.00
52.33	2.00	0.00	2.02	0.16	0.00	52.49	2.00	0.00	2.00	0.16	0.00
52.66	2.00	0.00	1.97	0.16	0.00	52.82	2.00	0.00	1.95	0.16	0.00
52.99	2.00	0.00	1.92	0.16	0.00	53.15	2.00	0.00	1.90	0.16	0.00
53.31	2.00	0.00	1.87	0.16	0.00	53.48	2.00	0.00	1.85	0.16	0.00
53.64	2.00	0.00	1.82	0.16	0.00	53.81	2.00	0.00	1.80	0.16	0.00
53.97	2.00	0.00	1.77	0.16	0.00	54.13	2.00	0.00	1.75	0.16	0.00
54.30	2.00	0.00	1.72	0.16	0.00	54.46	2.00	0.00	1.70	0.16	0.00
54.63	2.00	0.00	1.67	0.16	0.00	54.79	2.00	0.00	1.65	0.16	0.00
54.95	2.00	0.00	1.62	0.16	0.00	55.12	2.00	0.00	1.60	0.16	0.00
55.28	2.00	0.00	1.57	0.16	0.00	55.45	2.00	0.00	1.55	0.16	0.00
55.61	2.00	0.00	1.52	0.16	0.00	55.77	2.00	0.00	1.50	0.16	0.00
55.94	2.00	0.00	1.47	0.16	0.00	56.10	2.00	0.00	1.45	0.16	0.00
56.27	2.00	0.00	1.42	0.16	0.00	56.43	2.00	0.00	1.40	0.16	0.00
56.59	2.00	0.00	1.37	0.16	0.00	56.76	2.00	0.00	1.35	0.16	0.00
56.92	2.00	0.00	1.32	0.16	0.00	57.09	2.00	0.00	1.30	0.16	0.00
57.25	2.00	0.00	1.27	0.16	0.00	57.41	2.00	0.00	1.25	0.16	0.00
57.58	2.00	0.00	1.22	0.16	0.00	57.74	2.00	0.00	1.20	0.16	0.00
57.91	2.00	0.00	1.17	0.16	0.00	58.07	2.00	0.00	1.15	0.16	0.00
58.23	2.00	0.00	1.12	0.16	0.00	58.40	2.00	0.00	1.10	0.16	0.00
58.56	2.00	0.00	1.07	0.16	0.00	58.73	2.00	0.00	1.05	0.16	0.00
58.89	2.00	0.00	1.02	0.16	0.00	59.06	2.00	0.00	1.00	0.16	0.00
59.22	2.00	0.00	0.97	0.16	0.00	59.38	2.00	0.00	0.95	0.16	0.00
59.55	2.00	0.00	0.92	0.16	0.00	59.71	2.00	0.00	0.90	0.16	0.00
59.88	2.00	0.00	0.87	0.16	0.00	60.04	2.00	0.00	0.85	0.16	0.00
60.20	2.00	0.00	0.82	0.16	0.00	60.37	2.00	0.00	0.80	0.16	0.00
60.53	2.00	0.00	0.77	0.16	0.00						

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI

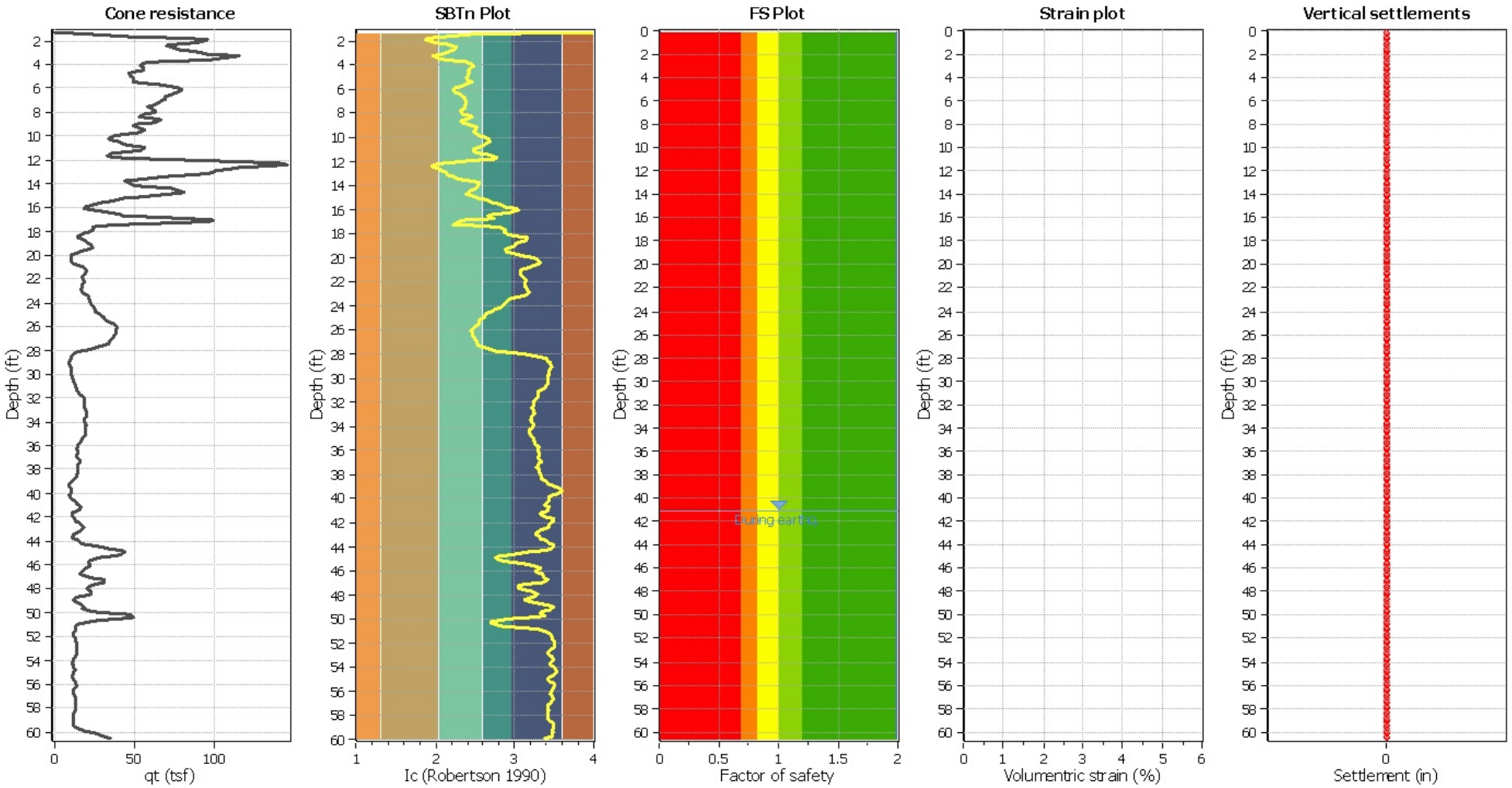
Overall liquefaction potential: 0.00

LPI = 0.00 - Liquefaction risk very low
LPI between 0.00 and 5.00 - Liquefaction risk low
LPI between 5.00 and 15.00 - Liquefaction risk high
LPI > 15.00 - Liquefaction risk very high

Abbreviations

FS: Calculated factor of safety for test point
F_L: 1 - FS
w_z: Function value of the extend of soil liquefaction according to depth
d_z: Layer thickness (ft)
LPI: Liquefaction potential index value for test point

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
41.17	65.94	2.00	0.00	1.00	0.00	41.34	61.55	2.00	0.00	1.00	0.00
41.50	55.31	2.00	0.00	1.00	0.00	41.67	49.80	2.00	0.00	1.00	0.00
41.83	47.99	2.00	0.00	1.00	0.00	41.99	49.27	2.00	0.00	1.00	0.00
42.16	51.75	2.00	0.00	1.00	0.00	42.32	55.93	2.00	0.00	1.00	0.00
42.49	61.26	2.00	0.00	1.00	0.00	42.65	64.78	2.00	0.00	1.00	0.00
42.81	64.92	2.00	0.00	1.00	0.00	42.98	62.11	2.00	0.00	1.00	0.00
43.14	56.76	2.00	0.00	1.00	0.00	43.31	50.71	2.00	0.00	1.00	0.00
43.47	45.26	2.00	0.00	1.00	0.00	43.64	45.30	2.00	0.00	1.00	0.00
43.80	51.74	2.00	0.00	1.00	0.00	43.96	63.76	2.00	0.00	1.00	0.00
44.13	74.42	2.00	0.00	1.00	0.00	44.29	81.36	2.00	0.00	1.00	0.00
44.46	84.10	2.00	0.00	1.00	0.00	44.62	78.28	2.00	0.00	1.00	0.00
44.78	76.32	2.00	0.00	1.00	0.00	44.95	76.35	2.00	0.00	1.00	0.00
45.11	79.13	2.00	0.00	1.00	0.00	45.28	78.40	2.00	0.00	1.00	0.00
45.44	77.31	2.00	0.00	1.00	0.00	45.60	77.18	2.00	0.00	1.00	0.00
45.77	77.67	2.00	0.00	1.00	0.00	45.93	77.76	2.00	0.00	1.00	0.00
46.10	75.64	2.00	0.00	1.00	0.00	46.26	71.18	2.00	0.00	1.00	0.00
46.42	67.71	2.00	0.00	1.00	0.00	46.59	64.12	2.00	0.00	1.00	0.00
46.75	62.63	2.00	0.00	1.00	0.00	46.92	64.91	2.00	0.00	1.00	0.00
47.08	72.12	2.00	0.00	1.00	0.00	47.24	77.59	2.00	0.00	1.00	0.00
47.41	78.87	2.00	0.00	1.00	0.00	47.57	75.67	2.00	0.00	1.00	0.00
47.74	71.35	2.00	0.00	1.00	0.00	47.90	69.78	2.00	0.00	1.00	0.00
48.06	71.01	2.00	0.00	1.00	0.00	48.23	69.48	2.00	0.00	1.00	0.00
48.39	62.80	2.00	0.00	1.00	0.00	48.56	54.18	2.00	0.00	1.00	0.00
48.72	46.71	2.00	0.00	1.00	0.00	48.88	45.70	2.00	0.00	1.00	0.00
49.05	50.57	2.00	0.00	1.00	0.00	49.21	56.62	2.00	0.00	1.00	0.00
49.38	63.10	2.00	0.00	1.00	0.00	49.54	65.67	2.00	0.00	1.00	0.00
49.70	66.25	2.00	0.00	1.00	0.00	49.87	67.72	2.00	0.00	1.00	0.00
50.03	68.68	2.00	0.00	1.00	0.00	50.20	72.52	2.00	0.00	1.00	0.00
50.36	74.98	2.00	0.00	1.00	0.00	50.52	73.40	2.00	0.00	1.00	0.00
50.69	65.38	2.00	0.00	1.00	0.00	50.85	55.92	2.00	0.00	1.00	0.00
51.02	49.45	2.00	0.00	1.00	0.00	51.18	47.42	2.00	0.00	1.00	0.00
51.35	46.81	2.00	0.00	1.00	0.00	51.51	46.21	2.00	0.00	1.00	0.00
51.67	45.92	2.00	0.00	1.00	0.00	51.84	46.07	2.00	0.00	1.00	0.00
52.00	46.95	2.00	0.00	1.00	0.00	52.17	48.68	2.00	0.00	1.00	0.00
52.33	50.43	2.00	0.00	1.00	0.00	52.49	51.39	2.00	0.00	1.00	0.00
52.66	50.72	2.00	0.00	1.00	0.00	52.82	48.91	2.00	0.00	1.00	0.00
52.99	48.36	2.00	0.00	1.00	0.00	53.15	50.05	2.00	0.00	1.00	0.00
53.31	51.96	2.00	0.00	1.00	0.00	53.48	51.71	2.00	0.00	1.00	0.00
53.64	47.90	2.00	0.00	1.00	0.00	53.81	43.72	2.00	0.00	1.00	0.00
53.97	41.07	2.00	0.00	1.00	0.00	54.13	41.19	2.00	0.00	1.00	0.00
54.30	42.02	2.00	0.00	1.00	0.00	54.46	43.06	2.00	0.00	1.00	0.00
54.63	43.19	2.00	0.00	1.00	0.00	54.79	42.54	2.00	0.00	1.00	0.00
54.95	41.14	2.00	0.00	1.00	0.00	55.12	39.71	2.00	0.00	1.00	0.00
55.28	39.41	2.00	0.00	1.00	0.00	55.45	40.01	2.00	0.00	1.00	0.00
55.61	42.48	2.00	0.00	1.00	0.00	55.77	45.44	2.00	0.00	1.00	0.00
55.94	47.41	2.00	0.00	1.00	0.00	56.10	47.62	2.00	0.00	1.00	0.00
56.27	45.09	2.00	0.00	1.00	0.00	56.43	42.22	2.00	0.00	1.00	0.00
56.59	40.23	2.00	0.00	1.00	0.00	56.76	40.55	2.00	0.00	1.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
56.92	41.48	2.00	0.00	1.00	0.00	57.09	41.97	2.00	0.00	1.00	0.00
57.25	41.76	2.00	0.00	1.00	0.00	57.41	41.43	2.00	0.00	1.00	0.00
57.58	41.23	2.00	0.00	1.00	0.00	57.74	41.08	2.00	0.00	1.00	0.00
57.91	40.96	2.00	0.00	1.00	0.00	58.07	40.74	2.00	0.00	1.00	0.00
58.23	40.21	2.00	0.00	1.00	0.00	58.40	39.52	2.00	0.00	1.00	0.00
58.56	39.08	2.00	0.00	1.00	0.00	58.73	38.93	2.00	0.00	1.00	0.00
58.89	38.87	2.00	0.00	1.00	0.00	59.06	38.52	2.00	0.00	1.00	0.00
59.22	38.37	2.00	0.00	1.00	0.00	59.38	38.47	2.00	0.00	1.00	0.00
59.55	41.06	2.00	0.00	1.00	0.00	59.71	48.35	2.00	0.00	1.00	0.00
59.88	58.93	2.00	0.00	1.00	0.00	60.04	-1.00	2.00	0.00	1.00	0.00
60.20	-1.00	2.00	0.00	1.00	0.00	60.37	-1.00	2.00	0.00	1.00	0.00
60.53	-1.00	2.00	0.00	1.00	0.00						

Total estimated settlement: 0.00

Abbreviations

$Q_{tn,cs}$: Equivalent clean sand normalized cone resistance
FS: Factor of safety against liquefaction
e_v (%): Post-liquefaction volumentric strain
DF: e_v depth weighting factor
Settlement: Calculated settlement

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
0.16	2.00	0.00	9.97	0.16	0.00	0.33	2.00	0.00	9.95	0.16	0.00
0.49	2.00	0.00	9.92	0.16	0.00	0.66	2.00	0.00	9.90	0.16	0.00
0.82	2.00	0.00	9.87	0.16	0.00	0.98	2.00	0.00	9.85	0.16	0.00
1.15	2.00	0.00	9.82	0.16	0.00	1.31	2.00	0.00	9.80	0.16	0.00
1.48	2.00	0.00	9.77	0.16	0.00	1.64	2.00	0.00	9.75	0.16	0.00
1.80	2.00	0.00	9.72	0.16	0.00	1.97	2.00	0.00	9.70	0.16	0.00
2.13	2.00	0.00	9.67	0.16	0.00	2.30	2.00	0.00	9.65	0.16	0.00
2.46	2.00	0.00	9.62	0.16	0.00	2.62	2.00	0.00	9.60	0.16	0.00
2.79	2.00	0.00	9.57	0.16	0.00	2.95	2.00	0.00	9.55	0.16	0.00
3.12	2.00	0.00	9.52	0.16	0.00	3.28	2.00	0.00	9.50	0.16	0.00
3.44	2.00	0.00	9.47	0.16	0.00	3.61	2.00	0.00	9.45	0.16	0.00
3.77	2.00	0.00	9.42	0.16	0.00	3.94	2.00	0.00	9.40	0.16	0.00
4.10	2.00	0.00	9.37	0.16	0.00	4.27	2.00	0.00	9.35	0.16	0.00
4.43	2.00	0.00	9.32	0.16	0.00	4.59	2.00	0.00	9.30	0.16	0.00
4.76	2.00	0.00	9.27	0.16	0.00	4.92	2.00	0.00	9.25	0.16	0.00
5.09	2.00	0.00	9.22	0.16	0.00	5.25	2.00	0.00	9.20	0.16	0.00
5.41	2.00	0.00	9.17	0.16	0.00	5.58	2.00	0.00	9.15	0.16	0.00
5.74	2.00	0.00	9.12	0.16	0.00	5.91	2.00	0.00	9.10	0.16	0.00
6.07	2.00	0.00	9.07	0.16	0.00	6.23	2.00	0.00	9.05	0.16	0.00
6.40	2.00	0.00	9.02	0.16	0.00	6.56	2.00	0.00	9.00	0.16	0.00
6.73	2.00	0.00	8.97	0.16	0.00	6.89	2.00	0.00	8.95	0.16	0.00
7.05	2.00	0.00	8.92	0.16	0.00	7.22	2.00	0.00	8.90	0.16	0.00
7.38	2.00	0.00	8.87	0.16	0.00	7.55	2.00	0.00	8.85	0.16	0.00
7.71	2.00	0.00	8.82	0.16	0.00	7.87	2.00	0.00	8.80	0.16	0.00
8.04	2.00	0.00	8.77	0.16	0.00	8.20	2.00	0.00	8.75	0.16	0.00
8.37	2.00	0.00	8.72	0.16	0.00	8.53	2.00	0.00	8.70	0.16	0.00
8.69	2.00	0.00	8.67	0.16	0.00	8.86	2.00	0.00	8.65	0.16	0.00
9.02	2.00	0.00	8.62	0.16	0.00	9.19	2.00	0.00	8.60	0.16	0.00
9.35	2.00	0.00	8.57	0.16	0.00	9.51	2.00	0.00	8.55	0.16	0.00
9.68	2.00	0.00	8.52	0.16	0.00	9.84	2.00	0.00	8.50	0.16	0.00
10.01	2.00	0.00	8.47	0.16	0.00	10.17	2.00	0.00	8.45	0.16	0.00
10.33	2.00	0.00	8.42	0.16	0.00	10.50	2.00	0.00	8.40	0.16	0.00
10.66	2.00	0.00	8.37	0.16	0.00	10.83	2.00	0.00	8.35	0.16	0.00
10.99	2.00	0.00	8.32	0.16	0.00	11.15	2.00	0.00	8.30	0.16	0.00
11.32	2.00	0.00	8.27	0.16	0.00	11.48	2.00	0.00	8.25	0.16	0.00
11.65	2.00	0.00	8.22	0.16	0.00	11.81	2.00	0.00	8.20	0.16	0.00
11.98	2.00	0.00	8.17	0.16	0.00	12.14	2.00	0.00	8.15	0.16	0.00
12.30	2.00	0.00	8.12	0.16	0.00	12.47	2.00	0.00	8.10	0.16	0.00
12.63	2.00	0.00	8.07	0.16	0.00	12.80	2.00	0.00	8.05	0.16	0.00
12.96	2.00	0.00	8.02	0.16	0.00	13.12	2.00	0.00	8.00	0.16	0.00
13.29	2.00	0.00	7.97	0.16	0.00	13.45	2.00	0.00	7.95	0.16	0.00
13.62	2.00	0.00	7.92	0.16	0.00	13.78	2.00	0.00	7.90	0.16	0.00
13.94	2.00	0.00	7.87	0.16	0.00	14.11	2.00	0.00	7.85	0.16	0.00
14.27	2.00	0.00	7.82	0.16	0.00	14.44	2.00	0.00	7.80	0.16	0.00
14.60	2.00	0.00	7.77	0.16	0.00	14.76	2.00	0.00	7.75	0.16	0.00
14.93	2.00	0.00	7.72	0.16	0.00	15.09	2.00	0.00	7.70	0.16	0.00
15.26	2.00	0.00	7.67	0.16	0.00	15.42	2.00	0.00	7.65	0.16	0.00
15.58	2.00	0.00	7.62	0.16	0.00	15.75	2.00	0.00	7.60	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
15.91	2.00	0.00	7.57	0.16	0.00	16.08	2.00	0.00	7.55	0.16	0.00
16.24	2.00	0.00	7.52	0.16	0.00	16.40	2.00	0.00	7.50	0.16	0.00
16.57	2.00	0.00	7.47	0.16	0.00	16.73	2.00	0.00	7.45	0.16	0.00
16.90	2.00	0.00	7.42	0.16	0.00	17.06	2.00	0.00	7.40	0.16	0.00
17.22	2.00	0.00	7.37	0.16	0.00	17.39	2.00	0.00	7.35	0.16	0.00
17.55	2.00	0.00	7.32	0.16	0.00	17.72	2.00	0.00	7.30	0.16	0.00
17.88	2.00	0.00	7.27	0.16	0.00	18.04	2.00	0.00	7.25	0.16	0.00
18.21	2.00	0.00	7.22	0.16	0.00	18.37	2.00	0.00	7.20	0.16	0.00
18.54	2.00	0.00	7.17	0.16	0.00	18.70	2.00	0.00	7.15	0.16	0.00
18.86	2.00	0.00	7.12	0.16	0.00	19.03	2.00	0.00	7.10	0.16	0.00
19.19	2.00	0.00	7.07	0.16	0.00	19.36	2.00	0.00	7.05	0.16	0.00
19.52	2.00	0.00	7.02	0.16	0.00	19.69	2.00	0.00	7.00	0.16	0.00
19.85	2.00	0.00	6.97	0.16	0.00	20.01	2.00	0.00	6.95	0.16	0.00
20.18	2.00	0.00	6.92	0.16	0.00	20.34	2.00	0.00	6.90	0.16	0.00
20.51	2.00	0.00	6.87	0.16	0.00	20.67	2.00	0.00	6.85	0.16	0.00
20.83	2.00	0.00	6.82	0.16	0.00	21.00	2.00	0.00	6.80	0.16	0.00
21.16	2.00	0.00	6.77	0.16	0.00	21.33	2.00	0.00	6.75	0.16	0.00
21.49	2.00	0.00	6.72	0.16	0.00	21.65	2.00	0.00	6.70	0.16	0.00
21.82	2.00	0.00	6.67	0.16	0.00	21.98	2.00	0.00	6.65	0.16	0.00
22.15	2.00	0.00	6.62	0.16	0.00	22.31	2.00	0.00	6.60	0.16	0.00
22.47	2.00	0.00	6.57	0.16	0.00	22.64	2.00	0.00	6.55	0.16	0.00
22.80	2.00	0.00	6.52	0.16	0.00	22.97	2.00	0.00	6.50	0.16	0.00
23.13	2.00	0.00	6.47	0.16	0.00	23.29	2.00	0.00	6.45	0.16	0.00
23.46	2.00	0.00	6.42	0.16	0.00	23.62	2.00	0.00	6.40	0.16	0.00
23.79	2.00	0.00	6.37	0.16	0.00	23.95	2.00	0.00	6.35	0.16	0.00
24.11	2.00	0.00	6.32	0.16	0.00	24.28	2.00	0.00	6.30	0.16	0.00
24.44	2.00	0.00	6.27	0.16	0.00	24.61	2.00	0.00	6.25	0.16	0.00
24.77	2.00	0.00	6.22	0.16	0.00	24.93	2.00	0.00	6.20	0.16	0.00
25.10	2.00	0.00	6.17	0.16	0.00	25.26	2.00	0.00	6.15	0.16	0.00
25.43	2.00	0.00	6.12	0.16	0.00	25.59	2.00	0.00	6.10	0.16	0.00
25.75	2.00	0.00	6.07	0.16	0.00	25.92	2.00	0.00	6.05	0.16	0.00
26.08	2.00	0.00	6.02	0.16	0.00	26.25	2.00	0.00	6.00	0.16	0.00
26.41	2.00	0.00	5.97	0.16	0.00	26.57	2.00	0.00	5.95	0.16	0.00
26.74	2.00	0.00	5.92	0.16	0.00	26.90	2.00	0.00	5.90	0.16	0.00
27.07	2.00	0.00	5.87	0.16	0.00	27.23	2.00	0.00	5.85	0.16	0.00
27.40	2.00	0.00	5.82	0.16	0.00	27.56	2.00	0.00	5.80	0.16	0.00
27.72	2.00	0.00	5.77	0.16	0.00	27.89	2.00	0.00	5.75	0.16	0.00
28.05	2.00	0.00	5.72	0.16	0.00	28.22	2.00	0.00	5.70	0.16	0.00
28.38	2.00	0.00	5.67	0.16	0.00	28.54	2.00	0.00	5.65	0.16	0.00
28.71	2.00	0.00	5.62	0.16	0.00	28.87	2.00	0.00	5.60	0.16	0.00
29.04	2.00	0.00	5.57	0.16	0.00	29.20	2.00	0.00	5.55	0.16	0.00
29.36	2.00	0.00	5.52	0.16	0.00	29.53	2.00	0.00	5.50	0.16	0.00
29.69	2.00	0.00	5.47	0.16	0.00	29.86	2.00	0.00	5.45	0.16	0.00
30.02	2.00	0.00	5.42	0.16	0.00	30.18	2.00	0.00	5.40	0.16	0.00
30.35	2.00	0.00	5.37	0.16	0.00	30.51	2.00	0.00	5.35	0.16	0.00
30.68	2.00	0.00	5.32	0.16	0.00	30.84	2.00	0.00	5.30	0.16	0.00
31.00	2.00	0.00	5.27	0.16	0.00	31.17	2.00	0.00	5.25	0.16	0.00
31.33	2.00	0.00	5.22	0.16	0.00	31.50	2.00	0.00	5.20	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
31.66	2.00	0.00	5.17	0.16	0.00	31.82	2.00	0.00	5.15	0.16	0.00
31.99	2.00	0.00	5.12	0.16	0.00	32.15	2.00	0.00	5.10	0.16	0.00
32.32	2.00	0.00	5.07	0.16	0.00	32.48	2.00	0.00	5.05	0.16	0.00
32.64	2.00	0.00	5.02	0.16	0.00	32.81	2.00	0.00	5.00	0.16	0.00
32.97	2.00	0.00	4.97	0.16	0.00	33.14	2.00	0.00	4.95	0.16	0.00
33.30	2.00	0.00	4.92	0.16	0.00	33.46	2.00	0.00	4.90	0.16	0.00
33.63	2.00	0.00	4.87	0.16	0.00	33.79	2.00	0.00	4.85	0.16	0.00
33.96	2.00	0.00	4.82	0.16	0.00	34.12	2.00	0.00	4.80	0.16	0.00
34.28	2.00	0.00	4.77	0.16	0.00	34.45	2.00	0.00	4.75	0.16	0.00
34.61	2.00	0.00	4.72	0.16	0.00	34.78	2.00	0.00	4.70	0.16	0.00
34.94	2.00	0.00	4.67	0.16	0.00	35.10	2.00	0.00	4.65	0.16	0.00
35.27	2.00	0.00	4.62	0.16	0.00	35.43	2.00	0.00	4.60	0.16	0.00
35.60	2.00	0.00	4.57	0.16	0.00	35.76	2.00	0.00	4.55	0.16	0.00
35.93	2.00	0.00	4.52	0.16	0.00	36.09	2.00	0.00	4.50	0.16	0.00
36.25	2.00	0.00	4.47	0.16	0.00	36.42	2.00	0.00	4.45	0.16	0.00
36.58	2.00	0.00	4.42	0.16	0.00	36.75	2.00	0.00	4.40	0.16	0.00
36.91	2.00	0.00	4.37	0.16	0.00	37.07	2.00	0.00	4.35	0.16	0.00
37.24	2.00	0.00	4.32	0.16	0.00	37.40	2.00	0.00	4.30	0.16	0.00
37.57	2.00	0.00	4.27	0.16	0.00	37.73	2.00	0.00	4.25	0.16	0.00
37.89	2.00	0.00	4.22	0.16	0.00	38.06	2.00	0.00	4.20	0.16	0.00
38.22	2.00	0.00	4.17	0.16	0.00	38.39	2.00	0.00	4.15	0.16	0.00
38.55	2.00	0.00	4.12	0.16	0.00	38.71	2.00	0.00	4.10	0.16	0.00
38.88	2.00	0.00	4.07	0.16	0.00	39.04	2.00	0.00	4.05	0.16	0.00
39.21	2.00	0.00	4.02	0.16	0.00	39.37	2.00	0.00	4.00	0.16	0.00
39.53	2.00	0.00	3.97	0.16	0.00	39.70	2.00	0.00	3.95	0.16	0.00
39.86	2.00	0.00	3.92	0.16	0.00	40.03	2.00	0.00	3.90	0.16	0.00
40.19	2.00	0.00	3.87	0.16	0.00	40.35	2.00	0.00	3.85	0.16	0.00
40.52	2.00	0.00	3.82	0.16	0.00	40.68	2.00	0.00	3.80	0.16	0.00
40.85	2.00	0.00	3.77	0.16	0.00	41.01	2.00	0.00	3.75	0.16	0.00
41.17	2.00	0.00	3.72	0.16	0.00	41.34	2.00	0.00	3.70	0.16	0.00
41.50	2.00	0.00	3.67	0.16	0.00	41.67	2.00	0.00	3.65	0.16	0.00
41.83	2.00	0.00	3.62	0.16	0.00	41.99	2.00	0.00	3.60	0.16	0.00
42.16	2.00	0.00	3.57	0.16	0.00	42.32	2.00	0.00	3.55	0.16	0.00
42.49	2.00	0.00	3.52	0.16	0.00	42.65	2.00	0.00	3.50	0.16	0.00
42.81	2.00	0.00	3.47	0.16	0.00	42.98	2.00	0.00	3.45	0.16	0.00
43.14	2.00	0.00	3.42	0.16	0.00	43.31	2.00	0.00	3.40	0.16	0.00
43.47	2.00	0.00	3.37	0.16	0.00	43.64	2.00	0.00	3.35	0.16	0.00
43.80	0.31	0.69	3.32	0.16	0.12	43.96	0.31	0.69	3.30	0.16	0.11
44.13	2.00	0.00	3.27	0.16	0.00	44.29	2.00	0.00	3.25	0.16	0.00
44.46	2.00	0.00	3.22	0.16	0.00	44.62	2.00	0.00	3.20	0.16	0.00
44.78	2.00	0.00	3.17	0.16	0.00	44.95	2.00	0.00	3.15	0.16	0.00
45.11	2.00	0.00	3.12	0.16	0.00	45.28	2.00	0.00	3.10	0.16	0.00
45.44	2.00	0.00	3.07	0.16	0.00	45.60	2.00	0.00	3.05	0.16	0.00
45.77	2.00	0.00	3.02	0.16	0.00	45.93	2.00	0.00	3.00	0.16	0.00
46.10	2.00	0.00	2.97	0.16	0.00	46.26	2.00	0.00	2.95	0.16	0.00
46.42	2.00	0.00	2.92	0.16	0.00	46.59	2.00	0.00	2.90	0.16	0.00
46.75	2.00	0.00	2.87	0.16	0.00	46.92	2.00	0.00	2.85	0.16	0.00
47.08	2.00	0.00	2.82	0.16	0.00	47.24	2.00	0.00	2.80	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
47.41	2.00	0.00	2.77	0.16	0.00	47.57	2.00	0.00	2.75	0.16	0.00
47.74	2.00	0.00	2.72	0.16	0.00	47.90	2.00	0.00	2.70	0.16	0.00
48.06	2.00	0.00	2.67	0.16	0.00	48.23	2.00	0.00	2.65	0.16	0.00
48.39	2.00	0.00	2.62	0.16	0.00	48.56	2.00	0.00	2.60	0.16	0.00
48.72	2.00	0.00	2.57	0.16	0.00	48.88	2.00	0.00	2.55	0.16	0.00
49.05	2.00	0.00	2.52	0.16	0.00	49.21	2.00	0.00	2.50	0.16	0.00
49.38	2.00	0.00	2.47	0.16	0.00	49.54	2.00	0.00	2.45	0.16	0.00
49.70	2.00	0.00	2.42	0.16	0.00	49.87	2.00	0.00	2.40	0.16	0.00
50.03	2.00	0.00	2.37	0.16	0.00	50.20	2.00	0.00	2.35	0.16	0.00
50.36	2.00	0.00	2.32	0.16	0.00	50.52	2.00	0.00	2.30	0.16	0.00
50.69	2.00	0.00	2.27	0.16	0.00	50.85	2.00	0.00	2.25	0.16	0.00
51.02	2.00	0.00	2.22	0.16	0.00	51.18	2.00	0.00	2.20	0.16	0.00
51.35	2.00	0.00	2.17	0.16	0.00	51.51	2.00	0.00	2.15	0.16	0.00
51.67	2.00	0.00	2.12	0.16	0.00	51.84	2.00	0.00	2.10	0.16	0.00
52.00	0.40	0.60	2.07	0.16	0.06	52.17	0.36	0.64	2.05	0.16	0.07
52.33	0.34	0.66	2.02	0.16	0.07	52.49	0.38	0.62	2.00	0.16	0.06
52.66	0.45	0.55	1.97	0.16	0.05	52.82	0.42	0.58	1.95	0.16	0.06
52.99	0.38	0.62	1.92	0.16	0.06	53.15	0.36	0.64	1.90	0.16	0.06
53.31	0.35	0.65	1.87	0.16	0.06	53.48	0.36	0.64	1.85	0.16	0.06
53.64	0.38	0.62	1.82	0.16	0.06	53.81	0.43	0.57	1.80	0.16	0.05
53.97	0.50	0.50	1.77	0.16	0.04	54.13	0.55	0.45	1.75	0.16	0.04
54.30	0.52	0.48	1.72	0.16	0.04	54.46	0.50	0.50	1.70	0.16	0.04
54.63	0.49	0.51	1.67	0.16	0.04	54.79	0.47	0.53	1.65	0.16	0.04
54.95	0.38	0.62	1.62	0.16	0.05	55.12	0.37	0.63	1.60	0.16	0.05
55.28	0.34	0.66	1.57	0.16	0.05	55.45	0.35	0.65	1.55	0.16	0.05
55.61	0.35	0.65	1.52	0.16	0.05	55.77	0.42	0.58	1.50	0.16	0.04
55.94	0.44	0.56	1.47	0.16	0.04	56.10	0.46	0.54	1.45	0.16	0.04
56.27	0.44	0.56	1.42	0.16	0.04	56.43	0.43	0.57	1.40	0.16	0.04
56.59	0.35	0.65	1.37	0.16	0.04	56.76	0.34	0.66	1.35	0.16	0.04
56.92	0.36	0.64	1.32	0.16	0.04	57.09	0.34	0.66	1.30	0.16	0.04
57.25	0.34	0.66	1.27	0.16	0.04	57.41	0.35	0.65	1.25	0.16	0.04
57.58	0.37	0.63	1.22	0.16	0.04	57.74	0.39	0.61	1.20	0.16	0.04
57.91	0.39	0.61	1.17	0.16	0.04	58.07	0.41	0.59	1.15	0.16	0.03
58.23	0.47	0.53	1.12	0.16	0.03	58.40	0.55	0.45	1.10	0.16	0.02
58.56	0.54	0.46	1.07	0.16	0.02	58.73	0.53	0.47	1.05	0.16	0.02
58.89	0.49	0.51	1.02	0.16	0.03	59.06	0.52	0.48	1.00	0.16	0.02
59.22	2.00	0.00	0.97	0.16	0.00	59.38	2.00	0.00	0.95	0.16	0.00
59.55	2.00	0.00	0.92	0.16	0.00	59.71	2.00	0.00	0.90	0.16	0.00
59.88	0.49	0.51	0.87	0.16	0.02	60.04	0.48	0.52	0.85	0.16	0.02
60.20	0.63	0.37	0.82	0.16	0.02	60.37	0.97	0.03	0.80	0.16	0.00
60.53	1.42	0.00	0.77	0.16	0.00	60.70	1.71	0.00	0.75	0.16	0.00
60.86	1.69	0.00	0.72	0.16	0.00	61.02	1.25	0.00	0.70	0.16	0.00
61.19	0.89	0.11	0.67	0.16	0.00	61.35	0.72	0.28	0.65	0.16	0.01
61.52	0.66	0.34	0.62	0.16	0.01	61.68	2.00	0.00	0.60	0.16	0.00
61.84	2.00	0.00	0.57	0.16	0.00	62.01	2.00	0.00	0.55	0.16	0.00
62.17	2.00	0.00	0.52	0.16	0.00	62.34	2.00	0.00	0.50	0.16	0.00
62.50	2.00	0.00	0.47	0.16	0.00	62.66	2.00	0.00	0.45	0.16	0.00
62.83	2.00	0.00	0.42	0.16	0.00	62.99	2.00	0.00	0.40	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
63.16	2.00	0.00	0.37	0.16	0.00	63.32	2.00	0.00	0.35	0.16	0.00
63.48	2.00	0.00	0.32	0.16	0.00	63.65	2.00	0.00	0.30	0.16	0.00
63.81	2.00	0.00	0.27	0.16	0.00	63.98	2.00	0.00	0.25	0.16	0.00
64.14	2.00	0.00	0.22	0.16	0.00	64.30	2.00	0.00	0.20	0.16	0.00
64.47	2.00	0.00	0.17	0.16	0.00	64.63	2.00	0.00	0.15	0.16	0.00
64.80	2.00	0.00	0.12	0.16	0.00	64.96	2.00	0.00	0.10	0.16	0.00
65.12	2.00	0.00	0.07	0.16	0.00	65.29	2.00	0.00	0.05	0.16	0.00
65.45	2.00	0.00	0.02	0.16	0.00	65.62	2.00	0.00	0.00	0.00	0.00
65.78	2.00	0.00	0.00	0.00	0.00	65.94	2.00	0.00	0.00	0.00	0.00
66.11	2.00	0.00	0.00	0.00	0.00	66.27	2.00	0.00	0.00	0.00	0.00
66.44	2.00	0.00	0.00	0.00	0.00	66.60	2.00	0.00	0.00	0.00	0.00
66.77	2.00	0.00	0.00	0.00	0.00	66.93	2.00	0.00	0.00	0.00	0.00
67.09	2.00	0.00	0.00	0.00	0.00	67.26	2.00	0.00	0.00	0.00	0.00
67.42	2.00	0.00	0.00	0.00	0.00	67.59	2.00	0.00	0.00	0.00	0.00
67.75	2.00	0.00	0.00	0.00	0.00	67.91	2.00	0.00	0.00	0.00	0.00
68.08	2.00	0.00	0.00	0.00	0.00	68.24	2.00	0.00	0.00	0.00	0.00
68.41	2.00	0.00	0.00	0.00	0.00	68.57	2.00	0.00	0.00	0.00	0.00
68.73	2.00	0.00	0.00	0.00	0.00	68.90	2.00	0.00	0.00	0.00	0.00
69.06	2.00	0.00	0.00	0.00	0.00	69.23	2.00	0.00	0.00	0.00	0.00
69.39	2.00	0.00	0.00	0.00	0.00	69.55	2.00	0.00	0.00	0.00	0.00
69.72	2.00	0.00	0.00	0.00	0.00	69.88	2.00	0.00	0.00	0.00	0.00
70.05	2.00	0.00	0.00	0.00	0.00	70.21	2.00	0.00	0.00	0.00	0.00
70.37	2.00	0.00	0.00	0.00	0.00	70.54	2.00	0.00	0.00	0.00	0.00
70.70	2.00	0.00	0.00	0.00	0.00	70.87	2.00	0.00	0.00	0.00	0.00
71.03	2.00	0.00	0.00	0.00	0.00	71.19	2.00	0.00	0.00	0.00	0.00
71.36	2.00	0.00	0.00	0.00	0.00	71.52	2.00	0.00	0.00	0.00	0.00
71.69	2.00	0.00	0.00	0.00	0.00	71.85	2.00	0.00	0.00	0.00	0.00
72.01	2.00	0.00	0.00	0.00	0.00						

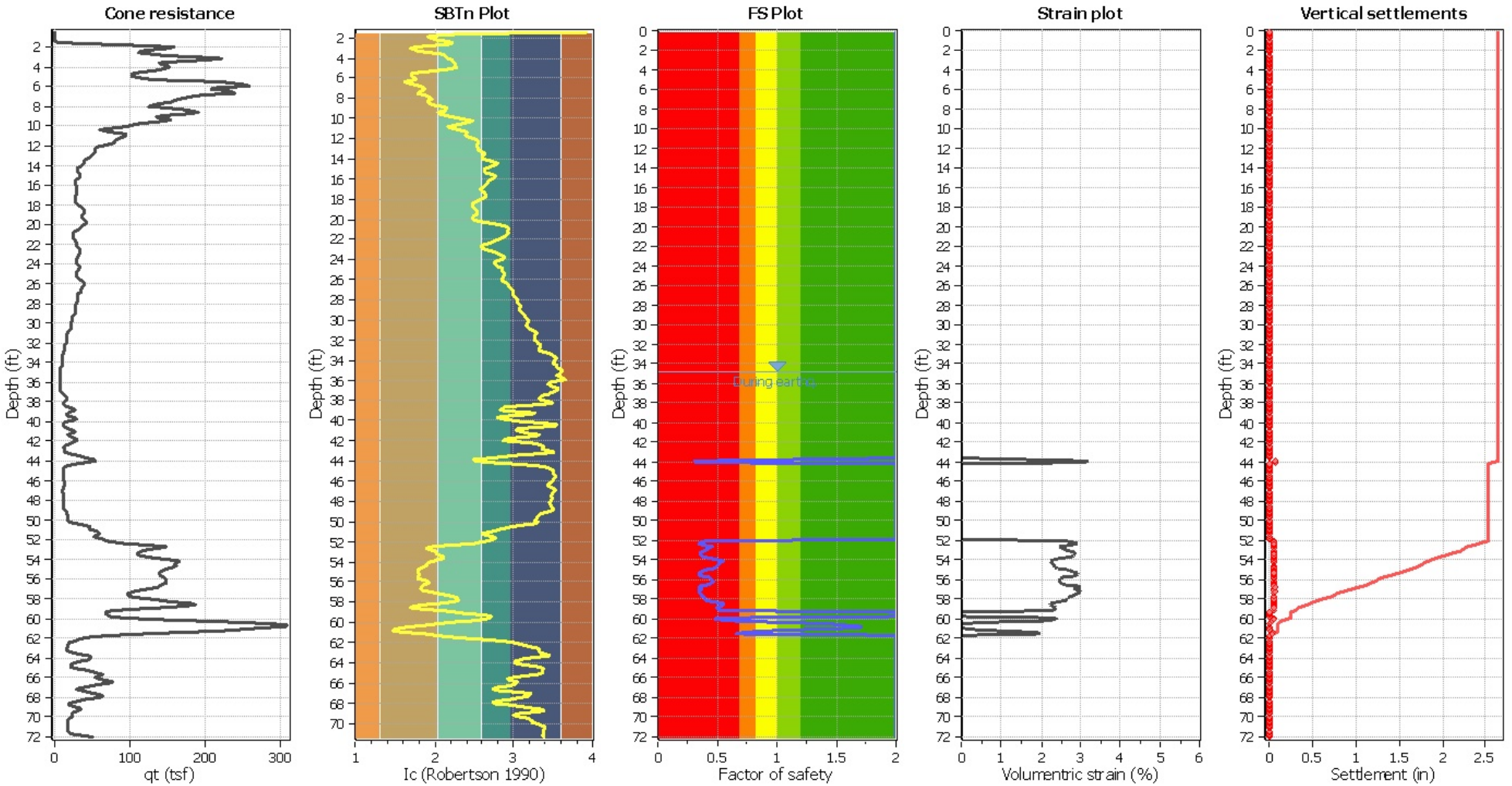
Overall liquefaction potential: 2.29

LPI = 0.00 - Liquefaction risk very low
LPI between 0.00 and 5.00 - Liquefaction risk low
LPI between 5.00 and 15.00 - Liquefaction risk high
LPI > 15.00 - Liquefaction risk very high

Abbreviations

FS: Calculated factor of safety for test point
F_L: 1 - FS
w_z: Function value of the extend of soil liquefaction according to depth
d_z: Layer thickness (ft)
LPI: Liquefaction potential index value for test point

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
34.94	41.53	2.00	0.00	1.00	0.00	35.10	41.47	2.00	0.00	1.00	0.00
35.27	43.00	2.00	0.00	1.00	0.00	35.43	43.87	2.00	0.00	1.00	0.00
35.60	46.09	2.00	0.00	1.00	0.00	35.76	47.09	2.00	0.00	1.00	0.00
35.93	44.91	2.00	0.00	1.00	0.00	36.09	41.95	2.00	0.00	1.00	0.00
36.25	37.29	2.00	0.00	1.00	0.00	36.42	36.84	2.00	0.00	1.00	0.00
36.58	36.08	2.00	0.00	1.00	0.00	36.75	38.56	2.00	0.00	1.00	0.00
36.91	43.95	2.00	0.00	1.00	0.00	37.07	54.42	2.00	0.00	1.00	0.00
37.24	62.88	2.00	0.00	1.00	0.00	37.40	67.68	2.00	0.00	1.00	0.00
37.57	67.47	2.00	0.00	1.00	0.00	37.73	64.24	2.00	0.00	1.00	0.00
37.89	59.29	2.00	0.00	1.00	0.00	38.06	55.15	2.00	0.00	1.00	0.00
38.22	54.19	2.00	0.00	1.00	0.00	38.39	57.71	2.00	0.00	1.00	0.00
38.55	61.13	2.00	0.00	1.00	0.00	38.71	59.70	2.00	0.00	1.00	0.00
38.88	58.65	2.00	0.00	1.00	0.00	39.04	61.00	2.00	0.00	1.00	0.00
39.21	62.25	2.00	0.00	1.00	0.00	39.37	62.77	2.00	0.00	1.00	0.00
39.53	60.46	2.00	0.00	1.00	0.00	39.70	56.44	2.00	0.00	1.00	0.00
39.86	52.80	2.00	0.00	1.00	0.00	40.03	47.94	2.00	0.00	1.00	0.00
40.19	49.66	2.00	0.00	1.00	0.00	40.35	55.42	2.00	0.00	1.00	0.00
40.52	62.13	2.00	0.00	1.00	0.00	40.68	71.08	2.00	0.00	1.00	0.00
40.85	73.38	2.00	0.00	1.00	0.00	41.01	74.98	2.00	0.00	1.00	0.00
41.17	74.83	2.00	0.00	1.00	0.00	41.34	74.08	2.00	0.00	1.00	0.00
41.50	73.35	2.00	0.00	1.00	0.00	41.67	71.77	2.00	0.00	1.00	0.00
41.83	66.84	2.00	0.00	1.00	0.00	41.99	63.79	2.00	0.00	1.00	0.00
42.16	60.42	2.00	0.00	1.00	0.00	42.32	56.13	2.00	0.00	1.00	0.00
42.49	52.05	2.00	0.00	1.00	0.00	42.65	49.74	2.00	0.00	1.00	0.00
42.81	50.98	2.00	0.00	1.00	0.00	42.98	56.84	2.00	0.00	1.00	0.00
43.14	67.98	2.00	0.00	1.00	0.00	43.31	81.38	2.00	0.00	1.00	0.00
43.47	83.75	2.00	0.00	1.00	0.00	43.64	76.59	2.00	0.00	1.00	0.00
43.80	68.43	0.31	3.19	1.00	0.06	43.96	69.80	0.31	3.14	1.00	0.06
44.13	72.62	2.00	0.00	1.00	0.00	44.29	71.77	2.00	0.00	1.00	0.00
44.46	66.28	2.00	0.00	1.00	0.00	44.62	58.98	2.00	0.00	1.00	0.00
44.78	54.10	2.00	0.00	1.00	0.00	44.95	52.65	2.00	0.00	1.00	0.00
45.11	52.54	2.00	0.00	1.00	0.00	45.28	52.17	2.00	0.00	1.00	0.00
45.44	52.23	2.00	0.00	1.00	0.00	45.60	52.01	2.00	0.00	1.00	0.00
45.77	52.89	2.00	0.00	1.00	0.00	45.93	53.61	2.00	0.00	1.00	0.00
46.10	54.97	2.00	0.00	1.00	0.00	46.26	54.30	2.00	0.00	1.00	0.00
46.42	52.72	2.00	0.00	1.00	0.00	46.59	50.65	2.00	0.00	1.00	0.00
46.75	47.50	2.00	0.00	1.00	0.00	46.92	45.66	2.00	0.00	1.00	0.00
47.08	44.07	2.00	0.00	1.00	0.00	47.24	44.70	2.00	0.00	1.00	0.00
47.41	44.98	2.00	0.00	1.00	0.00	47.57	45.99	2.00	0.00	1.00	0.00
47.74	48.52	2.00	0.00	1.00	0.00	47.90	51.14	2.00	0.00	1.00	0.00
48.06	51.76	2.00	0.00	1.00	0.00	48.23	49.58	2.00	0.00	1.00	0.00
48.39	46.69	2.00	0.00	1.00	0.00	48.56	44.99	2.00	0.00	1.00	0.00
48.72	45.96	2.00	0.00	1.00	0.00	48.88	47.96	2.00	0.00	1.00	0.00
49.05	51.65	2.00	0.00	1.00	0.00	49.21	55.84	2.00	0.00	1.00	0.00
49.38	59.75	2.00	0.00	1.00	0.00	49.54	61.88	2.00	0.00	1.00	0.00
49.70	62.00	2.00	0.00	1.00	0.00	49.87	61.82	2.00	0.00	1.00	0.00
50.03	64.29	2.00	0.00	1.00	0.00	50.20	72.58	2.00	0.00	1.00	0.00
50.36	81.95	2.00	0.00	1.00	0.00	50.52	87.35	2.00	0.00	1.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
50.69	87.18	2.00	0.00	1.00	0.00	50.85	83.64	2.00	0.00	1.00	0.00
51.02	82.83	2.00	0.00	1.00	0.00	51.18	84.24	2.00	0.00	1.00	0.00
51.35	88.85	2.00	0.00	1.00	0.00	51.51	91.27	2.00	0.00	1.00	0.00
51.67	92.71	2.00	0.00	1.00	0.00	51.84	92.46	2.00	0.00	1.00	0.00
52.00	87.29	0.40	2.61	1.00	0.05	52.17	79.25	0.36	2.83	1.00	0.06
52.33	75.49	0.34	2.94	1.00	0.06	52.49	82.98	0.38	2.72	1.00	0.05
52.66	95.03	0.45	2.44	1.00	0.05	52.82	90.86	0.42	2.53	1.00	0.05
52.99	83.55	0.38	2.71	1.00	0.05	53.15	78.80	0.36	2.84	1.00	0.06
53.31	78.04	0.35	2.86	1.00	0.06	53.48	80.17	0.36	2.80	1.00	0.06
53.64	82.44	0.38	2.74	1.00	0.05	53.81	92.08	0.43	2.50	1.00	0.05
53.97	101.41	0.50	2.31	1.00	0.05	54.13	106.64	0.55	2.22	1.00	0.04
54.30	102.95	0.52	2.28	1.00	0.04	54.46	100.47	0.50	2.33	1.00	0.05
54.63	99.72	0.49	2.34	1.00	0.05	54.79	96.52	0.47	2.41	1.00	0.05
54.95	83.82	0.38	2.70	1.00	0.05	55.12	80.45	0.37	2.79	1.00	0.05
55.28	75.90	0.34	2.93	1.00	0.06	55.45	76.14	0.35	2.92	1.00	0.06
55.61	77.70	0.35	2.87	1.00	0.06	55.77	89.87	0.42	2.55	1.00	0.05
55.94	92.67	0.44	2.49	1.00	0.05	56.10	95.01	0.46	2.44	1.00	0.05
56.27	92.80	0.44	2.48	1.00	0.05	56.43	90.42	0.43	2.54	1.00	0.05
56.59	77.24	0.35	2.89	1.00	0.06	56.76	73.38	0.34	3.01	1.00	0.06
56.92	79.27	0.36	2.83	1.00	0.06	57.09	75.38	0.34	2.95	1.00	0.06
57.25	74.28	0.34	2.98	1.00	0.06	57.41	76.52	0.35	2.91	1.00	0.06
57.58	80.65	0.37	2.79	1.00	0.05	57.74	84.58	0.39	2.68	1.00	0.05
57.91	84.31	0.39	2.69	1.00	0.05	58.07	86.65	0.41	2.63	1.00	0.05
58.23	95.96	0.47	2.42	1.00	0.05	58.40	106.01	0.55	2.23	1.00	0.04
58.56	105.06	0.54	2.24	1.00	0.04	58.73	103.72	0.53	2.27	1.00	0.04
58.89	98.39	0.49	2.37	1.00	0.05	59.06	101.90	0.52	2.30	1.00	0.05
59.22	105.23	2.00	0.00	1.00	0.00	59.38	102.52	2.00	0.00	1.00	0.00
59.55	99.89	2.00	0.00	1.00	0.00	59.71	99.47	2.00	0.00	1.00	0.00
59.88	98.34	0.49	2.37	1.00	0.05	60.04	96.98	0.48	2.40	1.00	0.05
60.20	113.49	0.63	2.11	1.00	0.04	60.37	139.72	0.97	0.65	1.00	0.01
60.53	163.69	1.42	0.00	1.00	0.00	60.70	175.98	1.71	0.00	1.00	0.00
60.86	174.97	1.69	0.00	1.00	0.00	61.02	155.10	1.25	0.30	1.00	0.01
61.19	134.12	0.89	1.02	1.00	0.02	61.35	121.22	0.72	1.87	1.00	0.04
61.52	116.02	0.66	1.99	1.00	0.04	61.68	106.85	2.00	0.00	1.00	0.00
61.84	91.05	2.00	0.00	1.00	0.00	62.01	78.59	2.00	0.00	1.00	0.00
62.17	72.62	2.00	0.00	1.00	0.00	62.34	66.20	2.00	0.00	1.00	0.00
62.50	57.22	2.00	0.00	1.00	0.00	62.66	51.07	2.00	0.00	1.00	0.00
62.83	48.30	2.00	0.00	1.00	0.00	62.99	47.21	2.00	0.00	1.00	0.00
63.16	50.32	2.00	0.00	1.00	0.00	63.32	61.00	2.00	0.00	1.00	0.00
63.48	75.67	2.00	0.00	1.00	0.00	63.65	87.42	2.00	0.00	1.00	0.00
63.81	97.52	2.00	0.00	1.00	0.00	63.98	103.83	2.00	0.00	1.00	0.00
64.14	104.05	2.00	0.00	1.00	0.00	64.30	93.05	2.00	0.00	1.00	0.00
64.47	78.32	2.00	0.00	1.00	0.00	64.63	68.35	2.00	0.00	1.00	0.00
64.80	65.66	2.00	0.00	1.00	0.00	64.96	71.98	2.00	0.00	1.00	0.00
65.12	87.35	2.00	0.00	1.00	0.00	65.29	107.46	2.00	0.00	1.00	0.00
65.45	117.29	2.00	0.00	1.00	0.00	65.62	119.66	2.00	0.00	1.00	0.00
65.78	117.74	2.00	0.00	1.00	0.00	65.94	121.64	2.00	0.00	1.00	0.00
66.11	125.96	2.00	0.00	1.00	0.00	66.27	126.84	2.00	0.00	1.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
66.44	119.87	2.00	0.00	1.00	0.00	66.60	103.41	2.00	0.00	1.00	0.00
66.77	85.83	2.00	0.00	1.00	0.00	66.93	76.04	2.00	0.00	1.00	0.00
67.09	79.74	2.00	0.00	1.00	0.00	67.26	90.38	2.00	0.00	1.00	0.00
67.42	97.36	2.00	0.00	1.00	0.00	67.59	100.25	2.00	0.00	1.00	0.00
67.75	96.96	2.00	0.00	1.00	0.00	67.91	91.97	2.00	0.00	1.00	0.00
68.08	84.24	2.00	0.00	1.00	0.00	68.24	74.64	2.00	0.00	1.00	0.00
68.41	64.10	2.00	0.00	1.00	0.00	68.57	58.48	2.00	0.00	1.00	0.00
68.73	60.04	2.00	0.00	1.00	0.00	68.90	64.55	2.00	0.00	1.00	0.00
69.06	66.73	2.00	0.00	1.00	0.00	69.23	65.15	2.00	0.00	1.00	0.00
69.39	64.64	2.00	0.00	1.00	0.00	69.55	62.77	2.00	0.00	1.00	0.00
69.72	60.51	2.00	0.00	1.00	0.00	69.88	57.73	2.00	0.00	1.00	0.00
70.05	53.60	2.00	0.00	1.00	0.00	70.21	51.35	2.00	0.00	1.00	0.00
70.37	49.83	2.00	0.00	1.00	0.00	70.54	47.73	2.00	0.00	1.00	0.00
70.70	46.84	2.00	0.00	1.00	0.00	70.87	46.63	2.00	0.00	1.00	0.00
71.03	47.91	2.00	0.00	1.00	0.00	71.19	48.56	2.00	0.00	1.00	0.00
71.36	51.88	2.00	0.00	1.00	0.00	71.52	-1.00	2.00	0.00	1.00	0.00
71.69	-1.00	2.00	0.00	1.00	0.00	71.85	-1.00	2.00	0.00	1.00	0.00
72.01	-1.00	2.00	0.00	1.00	0.00						

Total estimated settlement: 2.64

Abbreviations

$Q_{tn,cs}$: Equivalent clean sand normalized cone resistance
FS: Factor of safety against liquefaction
e_v (%): Post-liquefaction volumentric strain
DF: e_v depth weighting factor
Settlement: Calculated settlement

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Northbound Diagonal On-Ramp Pedestrian Overcrossing***
PROJECT NO. ***2016-146-OUC***
BORING NO. ***R-18-SO-001***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Silver Creek Fault
a_{max} *(g)=* 0.63
FAULT M_w = 6.9

GW DEPTH (ft)= 32.5
BOREHOLE DIA (in)= 3.3
HAMMER ENERGY = 78%
CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 32.5 *(below OG)*
MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	4.0	1	3	1	48	SPT	48.0	1.3	0.75	1.2	1.00	56.2	345.0	1.7	95.5		95.5		345.0	345.0	1.0	0.4	1.0	1.0			
4.0	8.5	2	6	1	25	SPT	25.0	1.3	0.80	1.2	1.00	31.2	700.0	1.7	52.7		52.7		700.0	700.0	1.0	0.4	1.0	1.0			
8.5	16.0	3	11	2	12	SPT	12.0	1.3	0.85	1.2	1.00	15.9	1300.0	1.2	19.7												
16.0	18.0	4	16	2	24	MC	15.6	1.3	0.95	1.0	1.00	19.3	1900.0	1.0	19.8												
18.0	23.0	5	21	2	48	MC	31.2	1.3	0.95	1.0	1.00	38.5	2500.0	0.9	34.5												
23.0	28.0	6	26	2	22	MC	14.3	1.3	1.00	1.0	1.00	18.6	3100.0	0.8	14.9												
28.0	33.5	7	31	2	28	MC	18.2	1.3	1.00	1.0	1.00	23.7	3700.0	0.7	17.4												
33.5	39.0	8	36	1	36	MC	23.4	1.3	1.00	1.0	1.00	30.4	4081.6	0.7	21.3	8%	21.8	0.2	4300.0	4081.6	0.9	0.4	0.8	1.0	(0.60)	1.31%	0.87
39.0	43.0	9	41	1	13	SPT	13.0	1.3	1.00	1.2	1.00	20.3	4369.6	0.7	13.7	18%	17.7	0.2	4900.00	4369.6	0.8	0.4	0.8	1.0	(0.48)	1.53%	0.74
43.0	48.0	10	46	1	26	SPT	26.0	1.3	1.00	1.2	1.00	40.6	4657.6	0.7	26.6		26.6	0.3	5500.00	4657.6	0.8	0.4	0.7	1.0	NON-LIQ.		
48.0	53.0	11	51	1	33	SPT	33.0	1.3	1.00	1.2	1.00	51.5	4945.6	0.6	32.7		32.7		6100.00	4945.6	0.7	0.4	0.7	1.0	NON-LIQ.		
53.0	56.5	12	56	1	18	SPT	18.0	1.3	1.00	1.2	1.00	28.1	5233.6	0.6	17.4		17.4	0.2	6700.00	5233.6	0.7	0.4	0.7	1.0	(0.47)	1.56%	0.65
56.5	71.0	13	61	2	9	SPT	9.0	1.3	1.00	1.2	1.00	14.0	5521.6	0.6	8.4												
71.0	76.0	14	71	2	25	MC	16.3	1.3	1.00	1.0	1.00	21.1	6097.6	0.6	12.1	83%											
76.0	85.0	15	81	2	20	MC	13.0	1.3	1.00	1.0	1.00	16.9	6673.6	0.5	9.3												
85.0	98.5	16	91	1	63	SPT	63.0	1.3	1.00	1.2	1.00	98.3	7249.6	0.5	51.6		51.6		10900.00	7249.6	0.5	0.3	0.6	1.0	NON-LIQ.		
98.5	101.5	17	101	1	95	SPT	95.0	1.3	1.00	1.2	1.00	148.2	7825.6	0.5	74.9		74.9		12100.00	7825.6	0.5	0.3	0.6	1.0	NON-LIQ.		

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Northbound Diagonal On-Ramp Pedestrian Overcrossing***
PROJECT NO. ***2016-146-LUC***
BORING NO. ***R-18-SO-002***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Silver Creek Fault
a_{max} *(g)=* 0.63
FAULT M_w = 6.9

GW DEPTH (ft)= 22

BOREHOLE DIA (in)= 3.3
HAMMER ENERGY = 78%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 22 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)												*CYCLIC STRESS RATIO (CSR)*				*F.S.=($CRR_{7.5}$/CSR)*MSF*Ks*Ka*			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq.}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	4.5	1	3	1	57	MC	37.1	1.3	0.75	1.0	1.00	36.1	345.0	1.7	61.4		61.4		345.0	345.0	1.0	0.4	1.0	1.0			
4.5	10.0	2	6	1	41	MC	26.7	1.3	0.80	1.0	1.00	27.7	697.5	1.7	46.9		46.9		697.5	697.5	1.0	0.4	1.0	1.0			
10.0	14.0	3	11	2	11	SPT	11.0	1.3	0.85	1.2	1.00	14.6	1297.5	1.2	18.1												
14.0	18.0	4	16	2	31	MC	20.2	1.3	0.95	1.0	1.00	24.9	1897.5	1.0	25.5												
18.0	22.0	5	21	2	51	MC	33.2	1.3	0.95	1.0	1.00	40.9	2497.5	0.9	36.6												
22.0	26.5	6	26	1	51	SPT	51.0	1.3	1.00	1.2	1.00	79.6	2847.9	0.8	66.7		66.7		3097.5	2847.9	0.9	0.4	0.9	1.0	NON-LIQ.		
26.5	33.0	7	31	2	16	MC	10.4	1.3	1.00	1.0	1.00	13.5	3135.9	0.8	10.8	79%											
33.0	38.5	8	36	2	25	MC	16.3	1.3	1.00	1.0	1.00	21.1	3423.9	0.8	16.1												
38.5	43.5	9	41	1	30	SPT	30.0	1.3	1.00	1.2	1.00	46.8	3711.9	0.7	34.4		34.4		4897.50	3711.9	0.8	0.5	0.8	1.0	NON-LIQ.		
43.5	48.5	10	46	1	25	SPT	25.0	1.3	1.00	1.2	1.00	39.0	3999.9	0.7	27.6		27.6	0.4	5497.50	3999.9	0.8	0.4	0.8	1.0	NON-LIQ.		
48.5	53.0	11	51	1	24	SPT	24.0	1.3	1.00	1.2	1.00	37.4	4287.9	0.7	25.6	7%	26.0	0.3	6097.50	4287.9	0.7	0.4	0.8	1.0	NON-LIQ.		
53.0	61.0	12	56	1	39	SPT	39.0	1.3	1.00	1.2	1.00	60.8	4575.9	0.7	40.2		40.2		6697.50	4575.9	0.7	0.4	0.7	1.0	NON-LIQ.		
61.0	64.5	13	61	1	11	SPT	11.0	1.3	1.00	1.2	1.00	17.2	4863.9	0.6	11.0	36%	18.2	0.2	7297.50	4863.9	0.7	0.4	0.8	1.0	(0.48)	1.50%	0.63
64.5	76.0	14	71	2	13	MC	8.5	1.3	1.00	1.0	1.00	11.0	5439.9	0.6	6.7												
76.0	85.0	15	81	2	28	MC	18.2	1.3	1.00	1.0	1.00	23.7	6015.9	0.6	13.6												
85.0	96.0	16	91	1	44	SPT	44.0	1.3	1.00	1.2	1.00	68.6	6591.9	0.6	37.8		37.8		10897.50	6591.9	0.5	0.3	0.6	1.0	NON-LIQ.		
96.0	106.0	17	101	1	48	SPT	48.0	1.3	1.00	1.2	1.00	74.9	7167.9	0.5	39.6	12%	42.2		12097.50	7167.9	0.5	0.3	0.6	1.0	NON-LIQ.		
106.0	116.0	18	111	1	69	SPT	69.0	1.3	1.00	1.2	1.00	107.6	7743.9	0.5	54.7		54.7		13297.50	7743.9	0.5	0.3	0.6	1.0	NON-LIQ.		
116.0	121.5	19	121	1	41	SPT	41.0	1.3	1.00	1.2	1.00	64.0	8319.9	0.5	31.4		31.4		14497.50	8319.9	0.5	0.3	0.6	1.0	NON-LIQ.		

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% $a = \exp(1.76-(190/FC^2))$, $b = (0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

LIQUEFACTION POTENTIAL ANALYSIS (SPT procedures per Youd et al, 2001)

PROJECT NAME ***Northbound Diagonal On-Ramp Pedestrian Overcrossing***
PROJECT NO. ***2016-146-LUC***
BORING NO. ***R-18-SO-003***

SOIL GROUPS
1. GRAVELS, SANDS AND NONPLASTIC SILTS
2. CLAYS AND PLASTIC SILTS

FAULT INFO
Silver Creek Fault
a_{max} *(g)=* 0.63
FAULT M_w = 6.9

GW DEPTH (ft)= 25

BOREHOLE DIA (in)= 3.3
HAMMER ENERGY = 78%

CUT(-)/FILL(+) (ft) = 0
DESIGN GW DEPTH (ft)= 25 *(below OG)*

MSF = 1.24

SOIL STRATA							*LIQUEFACTION RESISTANCE* ($CRR_{7.5}$)											*CYCLIC STRESS RATIO (CSR)*				$F.S.=(CRR_{7.5}/CSR)*MSF*Ks*Ka$			*POST-LIQ. SETTLEMENT*	
Layer Thickness from	to	Sample No	Depth (ft)	Soil Type	Blow Count	Sampler Type	$SPT\text{-}N_{eq}$	C_E	C_R	C_S	C_B	N_{60}	σ_v' (psf)	C_N	$(N_1)_{60}$	F.C.	$(N_1)_{60,CS}$	$CRR_{7.5}$	σ_v (psf)	σ_v' (psf)	r_d	CSR	Ks	Ka	F.S.	Vol. Strain (%)	ΔD (in)
0	4.0	1	3	1	52	MC	33.8	1.3	0.75	1.0	1.00	33.0	345.0	1.7	56.0		56.0		345.0	345.0	1.0	0.4	1.0	1.0			
4.0	8.0	2	6	1	56	MC	36.4	1.3	0.80	1.0	1.00	37.9	700.0	1.7	64.0		64.0		700.0	700.0	1.0	0.4	1.0	1.0			
8.0	13.0	3	11	1	44	MC	28.6	1.3	0.85	1.0	1.00	31.6	1300.0	1.2	39.2		39.2		1300.0	1300.0	1.0	0.4	1.0	1.0			
13.0	16.5	4	16	1	38	MC	24.7	1.3	0.95	1.0	1.00	30.5	1900.0	1.0	31.3		31.3		1900.0	1900.0	1.0	0.4	1.0	1.0			
16.5	23.0	5	21	2	24	MC	15.6	1.3	0.95	1.0	1.00	19.3	2500.0	0.9	17.2												
23.0	28.0	6	26	1	60	MC	39.0	1.3	1.00	1.0	1.00	50.7	3037.6	0.8	41.1	14%	45.1		3100.0	3037.6	0.9	0.4	0.8	1.0	NON-LIQ.		
28.0	33.5	7	31	1	24	MC	15.6	1.3	1.00	1.0	1.00	20.3	3325.6	0.8	15.7	19%	20.4	0.2	3700.0	3325.6	0.9	0.4	0.8	1.0	(0.56)	1.38%	0.91
33.5	38.5	8	36	1	15	SPT	15.0	1.3	1.00	1.2	1.00	23.4	3613.6	0.7	17.4	7%	17.7	0.2	4300.0	3613.6	0.9	0.4	0.8	1.0	(0.45)	1.53%	0.92
38.5	44.0	9	41	1	42	SPT	42.0	1.3	1.00	1.2	1.00	65.5	3901.6	0.7	46.9		46.9		4900.00	3901.6	0.8	0.4	0.8	1.0	NON-LIQ.		
44.0	48.0	10	46	1	15	SPT	15.0	1.3	1.00	1.2	1.00	23.4	4189.6	0.7	16.2	15%	19.6	0.2	5500.00	4189.6	0.8	0.4	0.8	1.0	(0.49)	1.42%	0.68
48.0	53.0	11	51	1	32	SPT	32.0	1.3	1.00	1.2	1.00	49.9	4477.6	0.7	33.4		33.4		6100.00	4477.6	0.7	0.4	0.7	1.0	NON-LIQ.		
53.0	58.0	12	56	2	14	SPT	14.0	1.3	1.00	1.2	1.00	21.8	4765.6	0.6	14.1												
58.0	65.0	13	61	2	15	MC	9.8	1.3	1.00	1.0	1.00	12.7	5053.6	0.6	8.0												
65.0	75.0	14	71	1	15	SPT	15.0	1.3	1.00	1.2	1.00	23.4	5629.6	0.6	13.9	37%	21.7	0.2	8500.00	5629.6	0.6	0.4	0.7	1.0	(0.61)	1.32%	1.58
75.0	85.0	15	81	2	16	MC	10.4	1.3	1.00	1.0	1.00	13.5	6205.6	0.6	7.7												
85.0	95.0	16	91	1	55	SPT	55.0	1.3	1.00	1.2	1.00	85.8	6781.6	0.5	46.6		46.6		10900.00	6781.6	0.5	0.3	0.6	1.0	NON-LIQ.		
95.0	105.0	17	101	1	57	SPT	57.0	1.3	1.00	1.2	1.00	88.9	7357.6	0.5	46.4	10%	48.0		12100.00	7357.6	0.5	0.3	0.6	1.0	NON-LIQ.		
105.0	111.5	18	111	1	65	SPT	65.0	1.3	1.00	1.2	1.00	101.4	7933.6	0.5	50.9		50.9		13300.00	7933.6	0.5	0.3	0.6	1.0	NON-LIQ.		

Notes:
1. The correction factors C_E (Energy Ratio), C_B (Borehole Diameter), C_R (Rod Length) and C_S (Sampling Method-liner) are per Youd et al. (2001).
2. For correction of overburden, $C_N = (1/\sigma_v')^{0.5}$ with a maximum value of 1.7.
3. The influence of Fines Contents are expressed by the following correction: $(N_1)_{60cs} = a + b\,(N_1)_{60}$
   where a and b = coefficients determined from the following relationships
   for FC $\leq$ 5% a = 0, b = 1.0
   for 5% < FC < 35% a = $\exp(1.76-(190/FC^2))$, b = $(0.99+(FC^{1.5}/1000))$
   for FC $\geq$ 35% a = 5.0, b = 1.2
4. For $(N_1)_{60,cs}$ greater than 30, clean granular soils are too dense to liquefy and are classed as non-liquefiable.

Reference:
Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER Workshops on Evaluation of Liquefaction Resistance of Soils, Youd, et al., ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001, Vol. 127 No. 10

SETTLEMENT ANALYSES

SETTLEMENT ANALYSIS

PROJECT NAME ***RETAINING WALL NO. 2***
PROJECT NO. ***2016-146-MSE***
STRUCTURE ***MSE WALL***
REFERENCE BORII ***R-18-NO-103***
Hammer Energy = 78%
GW Level (ft)= 29

Footing Depth (ft) = 2.5
Fill Height (ft)= 14.25
Base Width, B (ft)= 12
Side Slope (XH:1V)= -
Effective Width, B' (ft)= 12
Length, L (ft)= -
Plane Strain? (Y/N) Y
Contact Pressure (psf)= 1853

Cr/Cc= 25.0%

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Depth from FG		Soil	BLOW	SAMPLER	AVG	γ_T	γ'	ω	σ_v'	$\Delta\sigma_v'$	Su	Lab Su	Pp	OCR	E	$Cr/1+e_0$	$Cc/1+e_0$	C'	Settlements (in)				
From	To	Type	COUNT	TYPE	SPT-N_{60}	(pcf)	(pcf)		(psf)	(psf)	(psf)	(psf)	(psf)		(psf)			(Hough Method)	Elastic	OC	NC	SAND	Sum
0	2.5	1	35	MC	30	125.0	125.0	9.8%	156														
2.5	8	1	35	MC	30	125.0	125.0	9.8%	656	1507.1								118				0.290	0.290
4.5	8	1	20	MC	17	125.0	125.0	9.7%	1219	1411.4								62				0.226	0.226
8	13	2	14	MC	12	125.0	125.0	8.7%	1750	1111.5	1479		1800	1.0		0.0100	0.1400			0.007	1.691		1.698
13	19	3	19	MC	16	125.0	125.0	3.0%	2438	871.8	2007		8028	3.3	702406				0.089				0.089
19	23	1	42	MC	35	125.0	125.0	5.8%	3063	728.9								99				0.045	0.045
23	28	1	23	MC	19	125.0	125.0	9.7%	3625	635.1								65				0.065	0.065
28	33	1	21	MC	18	125.0	62.6	8.1%	4094	555.8								60				0.055	0.055
33	38	1	35	SPT	46	125.0	62.6	6.6%	4407	494.0								105				0.026	0.026
38	44	1	29	SPT	38	125.0	62.6	21.7%	4751	440.2								88				0.031	0.031
44	46.5	1	18	SPT	23	125.0	62.6	121.7%	5017	406.0								50				0.020	0.020

Estimated Settlement (in)= *0.1* *0.0* *1.7* *0.8* *2.5*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. Cr/Cc ratio of 25% was estimated based on the previous project experience.
3. OCR is calculated based on Su correlations.
4. Clays with OCR>=2.5 is considered as settling elasticly.
5. Soil profile starts from finish grade.

SETTLEMENT ANALYSIS

PROJECT NAME	***Blossom Hill Road IC Improvement Project***
PROJECT NO.	***2016-146-GDR***
BORING	***R-18-SC-001***
STRUCTURE	***Bike Path Embankment***
Hammer Energy =	78%
GW Level (ft)=	30

Footing Depth (ft) =	0
Fill Height (ft)=	15
Base Width, B (ft)=	50
Side Slope (XH:1V)=	-
Effective Width, B' (ft)=	50
Length, L (ft)=	-
Plane Strain? (Y/N)	Y
Contact Pressure (psf)=	1875

GROUPS
1. SANDS, GRAVELS AND NON-PLASTIC SILT
2. SATURATED CLAYS AND PLASTIC SILTS
3. OC CLAYS, NON-SATURATED CLAYS, AND NON-SATURATED PLASTIC SILTS

Cr/Cc= 15.0%

Depth from FG From	To	Soil Type	BLOW COUNT	SAMPLER TYPE	AVG SPT-N_{60}	γ_T (pcf)	γ' (pcf)	ω	σ_v' (psf)	$\Delta\sigma_v'$ (psf)	Su (psf)	Lab Su (psf)	Pp (psf)	OCR	E (psf)	Cr/1+e_0	Cc/1+e_0	C' (Hough Method)
0	4	1	28	MC	24	125.0	125.0	23.0%	250	1802.9								97
4	8	1	27	MC	23	125.0	125.0	30.0%	750	1674.1								91
8	13	3	23	MC	19	125.0	125.0	26.0%	1313	1549.6	2429		9717.5	7.4	850281			
13	18	3	22	MC	19	125.0	125.0	22.0%	1938	1431.3	2324	2600	10400.0	5.4	813313			
18	23	3	11	SPT	14	125.0	125.0	25.0%	2563	1329.8	1788		7150.0	2.8	625625			
23	28	1	25	MC	21	125.0	125.0	29.0%	3188	1241.7								54
28	33.5	1	16	MC	14	125.0	62.6	11.0%	3672	1161.0								42
33.5	38.5	**2**	11	MC	9	125.0	62.6	18.0%	4001	1090.1	1162	950	3800.0	0.9		0.0184	0.1227	
38.5	43	**2**	6	MC	5	125.0	62.6	19.0%	4298	1033.1	634		4298.2	1.0		0.0150	0.1000	
43	48	1	34	SPT	44	125.0	62.6	7.0%	4596	981.7								75
48	53	1	50	SPT	65	125.0	62.6	8.0%	4909	932.8								99
53	58	1	64	SPT	83	125.0	62.6	12.0%	5222	888.6								120
58	65	1	31	SPT	40	125.0	62.6	13.0%	5597	840.8								66
65	76	1	10	MC	8	125.0	62.6	27.0%	6161	778.0								34
76	81	**2**	34	MC	29	125.0	62.6	16.0%	6661	729.6	3591		14365.0	2.2		0.0214	0.1426	
81	86.5	1	34	MC	29	125.0	62.6	27.0%	6990	700.9								74
86.5	95	**2**	25	MC	21	125.0	62.6	23.0%	7428	666.1	2641	2120	8480.0	1.1		0.0150	0.1000	
95	106	**2**	43	MC	36	125.0	62.6	8.0%	8039	622.9	4542	2400	9600.0	1.2		0.0199	0.1327	
106	115	1	34	SPT	44	125.0	62.6	23.0%	8665	584.1								44
115	125	**2**	43	MC	36	125.0	62.6	15.0%	9259	551.5	4542		18167.5	2.0		0.0150	0.1000	

	Settlements (in)				
	Elastic	OC	NC	SAND	Sum
	0.109				0.109
	0.106				0.106
	0.128				0.128
				0.160	0.160
				0.185	0.185
			0.770		0.770
			0.505		0.505
				0.067	0.067
				0.046	0.046
				0.034	0.034
				0.077	0.077
				0.199	0.199
		0.058			0.058
				0.037	0.037
		0.057			0.057
		0.085			0.085
				0.070	0.070
		0.045			0.045
Estimated Settlement (in)=	*0.3*	*0.2*	*1.3*	*1.6*	*3.5*

Note:
1. Cc is estiamted using empirical equation from "Soil Mechanics" by T. William lambe and Robert V. Whitman, unless there is existing consolidation lab results for Cc and Cr, which is in red font and applied in settlement calculation if soil type falls in Group 2, saturated clays and plastic silts.
2. OCR is calculated based on Su correlations
3. Clays with OCR>=2.5 is considered as settling elasticly

PARIKH
Practicing in the Geosciences

PROJECT NO. 2016-146-MSE
PROJECT NAME Blossom Hill
CALCULATED BY EO DATE 1/31/19
CHECKED BY DZ DATE 2/1/19
VERIFIED BY _____ DATE _____
BACK CHECKED BY _____ DATE _____

SUBJECT MSE Wall Settlement (NC)

Per Boring R-18-NO-103

Based on consol $c_v = 0.008\ in^2/min = 0.08\ ft^2/day$

Assume 86% consolidation : 1.8 in reduced to 0.25 in or less

$T_v \cong 0.65$ from Fig 9.5(a) Intro to Geotech Eng. Holtz, Kovacs

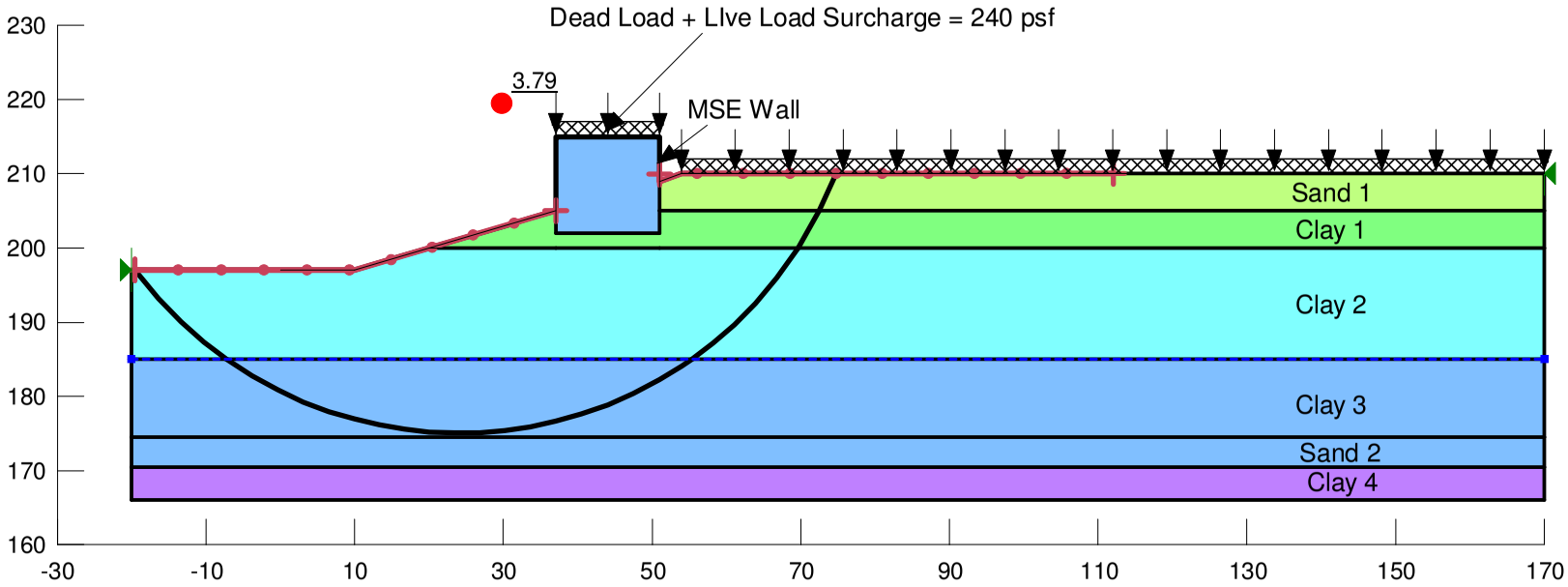
$t = T_v \cdot (H_{dr})^2 / c_v = 0.65 \times (5/2)^2 / 0.08$

$t \cong 51$ days

*Same waiting period can be conservatively used for Bike Path Embankment (for the clay soil between depths of 33.5 and 38.5 feet). The soil at depths of 38.5 to 43 feet is silty clay and considered to have higher c_v, therefore is not considered to govern the waiting period.

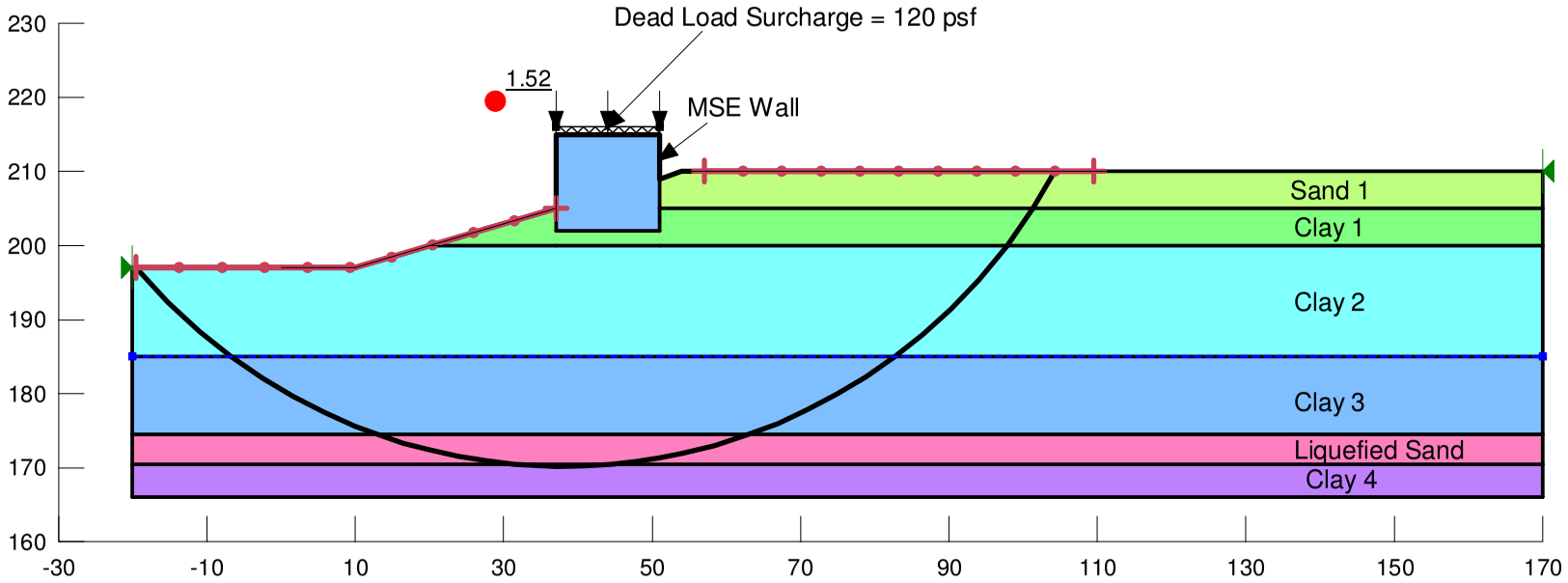
GLOBAL STABILITY ANALYSES

Blossom Hill Road Interchange Improvement Project
NB Diagonal On-Ramp POC East Approach - Global Stability
Station "A1" 64+52 to "A1" 67+10
(ref. Boring R-18-NO-102)
Static Analysis



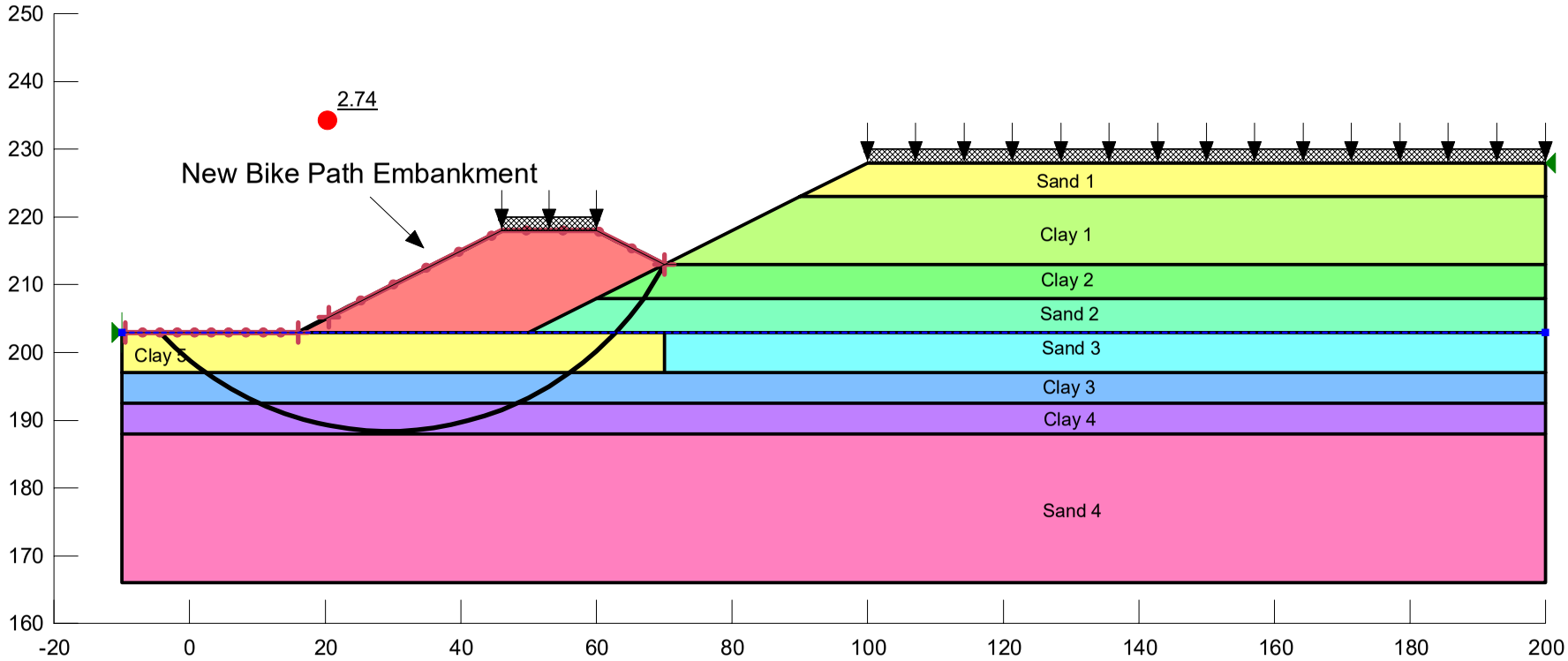
Name: Sand 1 Unit Weight: 125 pcf Cohesion': 0 psf Phi': 36 °
Name: Clay 1 Unit Weight: 125 pcf Cohesion': 1,500 psf Phi': 0 °
Name: Clay 2 Unit Weight: 125 pcf Cohesion': 2,000 psf Phi': 0 °
Name: MSE Wall Unit Weight: 125 pcf
Name: Clay 3 Unit Weight: 125 pcf Cohesion': 1,000 psf Phi': 0 °
Name: Sand 2 Unit Weight: 125 pcf Cohesion': 0 psf Phi': 30 °
Name: Clay 4 Unit Weight: 125 pcf Cohesion': 900 psf Phi': 0 °

Blossom Hill Road Interchange Improvement Project
NB Diagonal On-Ramp POC East Approach - Global Stability
Station "A1" 64+52 to "A1" 67+10
(ref. Boring R-18-NO-102)
Pseudo-Static Analysis (Kh=0.21)



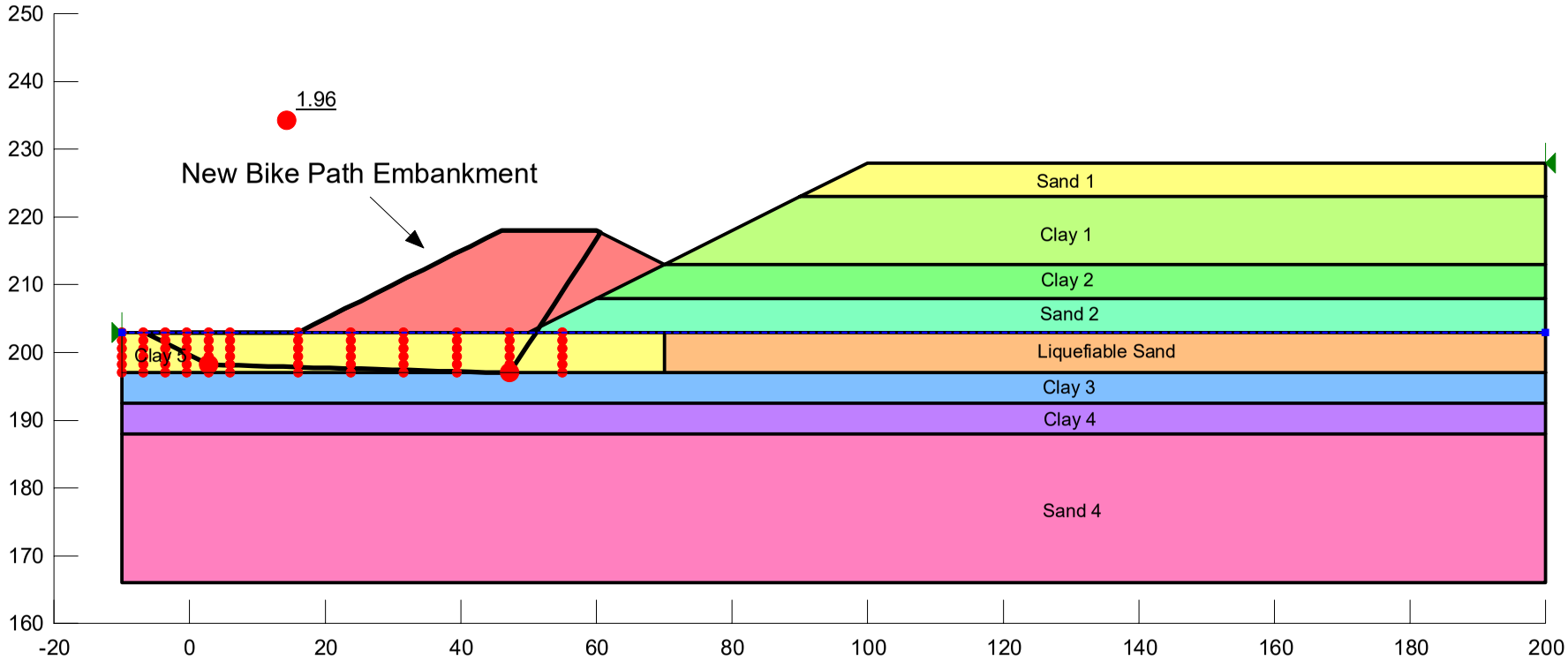
Name: Sand 1 Unit Weight: 125 pcf Cohesion': 0 psf Phi': 36 °
Name: Clay 1 Unit Weight: 125 pcf Cohesion': 1,500 psf Phi': 0 °
Name: Clay 2 Unit Weight: 125 pcf Cohesion': 2,000 psf Phi': 0 °
Name: MSE Wall Unit Weight: 125 pcf
Name: Clay 3 Unit Weight: 125 pcf Cohesion': 1,000 psf Phi': 0 °
Name: Clay 4 Unit Weight: 125 pcf Cohesion': 900 psf Phi': 0 °
Name: Liquefied Sand Unit Weight: 125 pcf Cohesion': 200 psf Phi': 0 °

Blossom Hill Road Interchange Improvement Project
Path between Blossom Hill Rd and SB Loop On-Ramp PUC - Global Stability
Station "A1" 50+50 to "A1" 56+98
(ref. Borings R-18-SC-001 & 03-BL-01)
Static Analysis



Name: Sand 1 Unit Weight: 125 pcf Cohesion': 0 psf Phi': 34 °
Name: Clay 1 Unit Weight: 125 pcf Cohesion': 2,500 psf Phi': 0 °
Name: Clay 2 Unit Weight: 125 pcf Cohesion': 1,750 psf Phi': 0 °
Name: Sand 2 Unit Weight: 125 pcf Cohesion': 0 psf Phi': 34 °
Name: Sand 3 Unit Weight: 125 pcf Cohesion': 0 psf Phi': 32 °
Name: Clay 3 Unit Weight: 125 pcf Cohesion': 900 psf Phi': 0 °
Name: Clay 4 Unit Weight: 125 pcf Cohesion': 600 psf Phi': 0 °
Name: Sand 4 Unit Weight: 125 pcf Cohesion': 0 psf Phi': 35 °
Name: Fill Unit Weight: 125 pcf Cohesion': 1,500 psf Phi': 0 °
Name: Clay 5 Unit Weight: 125 pcf Cohesion': 1,250 psf Phi': 0 °

Blossom Hill Road Interchange Improvement Project
Path between Blossom Hill Rd and SB Loop On-Ramp PUC - Global Stability
Station "A1" 50+50 to "A1" 56+98
(ref. Borings R-18-SC-001 & 03-BL-01)
Pseudo-Static Analysis (kh= 0.21)



Name: Sand 1 Unit Weight: 125 pcf Cohesion': 0 psf Phi': 34 °
Name: Clay 1 Unit Weight: 125 pcf Cohesion': 2,500 psf Phi': 0 °
Name: Clay 2 Unit Weight: 125 pcf Cohesion': 1,750 psf Phi': 0 °
Name: Sand 2 Unit Weight: 125 pcf Cohesion': 0 psf Phi': 34 °
Name: Clay 3 Unit Weight: 125 pcf Cohesion': 900 psf Phi': 0 °
Name: Clay 4 Unit Weight: 125 pcf Cohesion': 600 psf Phi': 0 °
Name: Sand 4 Unit Weight: 125 pcf Cohesion': 0 psf Phi': 35 °
Name: Fill Unit Weight: 125 pcf Cohesion': 1,500 psf Phi': 0 °
Name: Liq sand Unit Weight: 125 pcf Cohesion': 400 psf Phi': 0 °
Name: Clay 5 Unit Weight: 125 pcf Cohesion': 1,250 psf Phi': 0 °

STRUCTURAL PAVEMENT DESIGN

PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

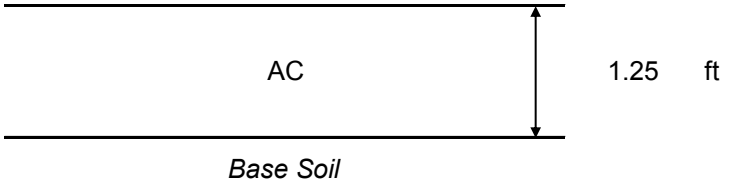
PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: Full depth AC

Design TI= ***10.0*** ***Blossom Hill Rd A-1 (Widening)***
R_{BS}= ***10***

$GE_{AC} = 0.0032*TI*(100-R_{BS}) =$		2.88	
=>	GE'_{AC}=	2.98	(add 0.1 ft safety factor)
=>	AC Thickness=	1.25	
=>	AC Thickness=	**1.25**	ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB

Design TI= ***10.0*** ***Blossom Hill Rd A-1 (Widening)***
R_{BS}= ***10***
R_{AB}= 78

$GE_{AC+AB} = 0.0032*TI*(100-R_{BS}) =$ 2.88

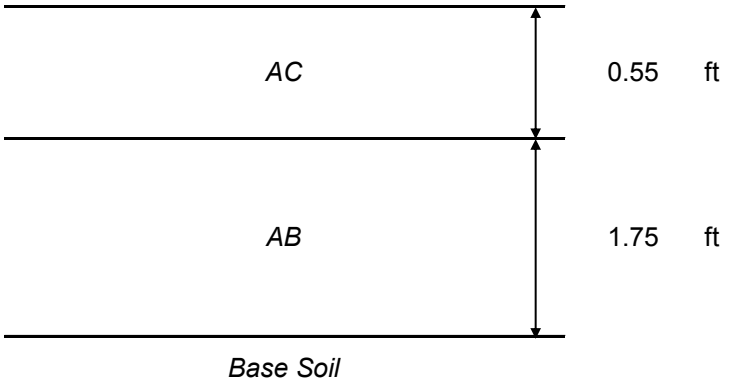
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$ 0.70
=> $GE'_{AC} =$ 0.90 (add 0.2 ft safety factor)
AC Thickness = 0.51 ft

=> AC Thickness = **0.55** ft (round up to the nearest 0.05 ft)
$G_{f, AC} =$ 1.81
$GE_{AC} =$ 1.00

$GE_{AB} = GE_{AC+AB} - GE_{AC} =$ 1.88
AB thickness= 1.71 ft

=> AB Thickness= **1.75** ft (round up to the nearest 0.05 ft)
GE_{AB}= 1.93 $G_{f, AB}$=1.1

Design Section:



PAVEMENT DESIGN

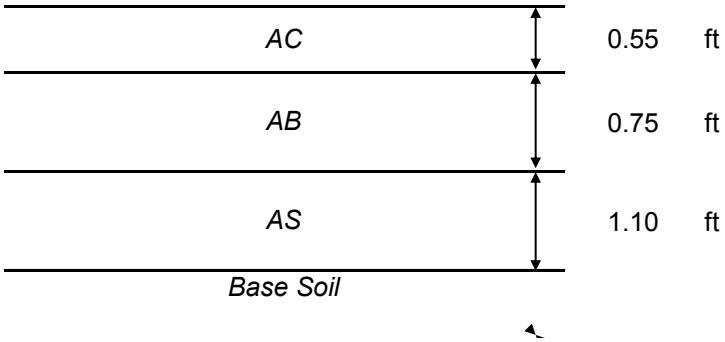
PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB over AS

Design TI=	***10.0***	***Blossom Hill Rd A-1 (Widening)***	
R_{BS}=	***10***		
R_{AB}=	78		
R_{AS}=	50		
$GE_{TOTAL} = 0..0032*TI*(100-R_{BS}) =$		2.88	
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$		0.70	
=>	GE'_{AC} =	0.90	(add 0.2 ft safety factor)
	AC thickness =	0.51	ft
=>	AC Thickness=	**0.55**	ft (round up to the nearest 0.05 ft)
	$G_{f, AC}$=	1.81	
	GE_{AC}=	1.00	
$GE_{AB+AC} = 0.0032*TI*(100-R_{AS}) =$		1.60	
=>	GE_{AC+AB}=	1.80	(add 0.2 ft safety factor)
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$		0.80	
=>	AB thickness=	0.73	
=>	AB Thickness=	**0.75**	ft (round up to the nearest 0.05 ft)
	GE_{AB}=	0.83	$G_{f, AB}$=1.1
$GE_{AS} = GE_{TOTAL} - GE_{AB} - GE_{AC} =$		1.06	
=>	AS Thickness=	**1.10**	ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

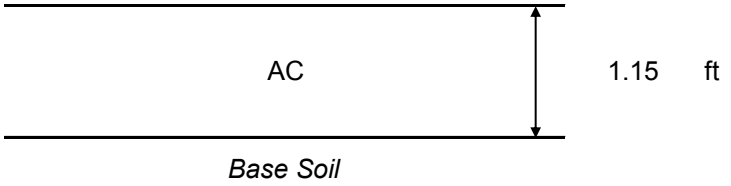
PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: Full depth AC

Design TI= ***10.0*** ***Connector to Monterey Rd X and Y Line (Widening).***
R_{BS}= ***20***

$GE_{AC} = 0.0032*TI*(100-R_{BS}) =$		2.56	
=>	GE'_{AC}=	2.66	(add 0.1 ft safety factor)
=>	AC Thickness=	1.15	
=>	AC Thickness=	**1.15**	ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB

Design TI= ***10.0*** ***Connector to Monterey Rd X and Y Line (Widening).***
R_{BS}= ***20***
R_{AB}= 78

$GE_{AC+AB} = 0.0032*TI*(100-R_{BS}) =$ 2.56

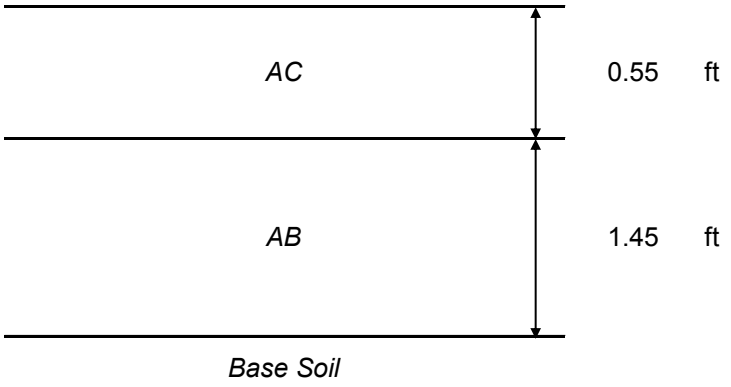
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$ 0.70
=> GE'_{AC} = 0.90 (add 0.2 ft safety factor)
AC Thickness = 0.51 ft

=> AC Thickness = **0.55** ft (round up to the nearest 0.05 ft)
$G_{f, AC}$ = 1.81
GE_{AC} = 1.00

$GE_{AB} = GE_{AC+AB} - GE_{AC} =$ 1.56
AB thickness= 1.42 ft

=> AB Thickness= **1.45** ft (round up to the nearest 0.05 ft)
GE_{AB}= 1.60 $G_{f, AB}$=1.1

Design Section:



PAVEMENT DESIGN

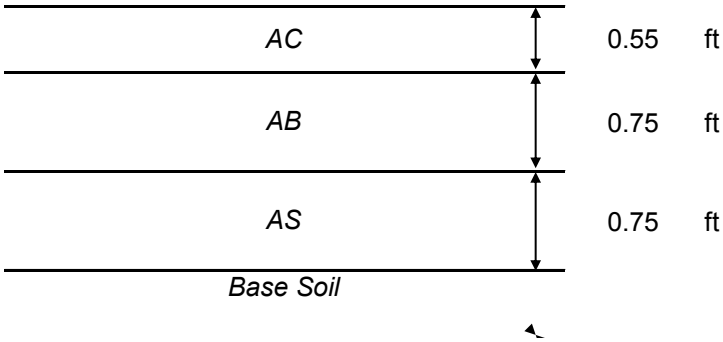
PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB over AS

Design TI=	***10.0***	***Connector to Monterey Rd X and Y Line (Widening).***	
R_{BS}=	***20***		
R_{AB}=	78		
R_{AS}=	50		
$GE_{TOTAL} = 0..0032*TI*(100-R_{BS}) =$		2.56	
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$		0.70	
=>	GE'_{AC} =	0.90	(add 0.2 ft safety factor)
	AC thickness =	0.51	ft
=>	AC Thickness=	**0.55**	ft (round up to the nearest 0.05 ft)
	$G_{f, AC}$=	1.81	
	GE_{AC}=	1.00	
$GE_{AB+AC} = 0.0032*TI*(100-R_{AS}) =$		1.60	
=>	GE_{AC+AB}=	1.80	(add 0.2 ft safety factor)
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$		0.80	
=>	AB thickness=	0.73	
=>	AB Thickness=	**0.75**	ft (round up to the nearest 0.05 ft)
	GE_{AB}=	0.83	$G_{f, AB}$=1.1
$GE_{AS} = GE_{TOTAL} - GE_{AB} - GE_{AC} =$		0.74	
=>	AS Thickness=	**0.75**	ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

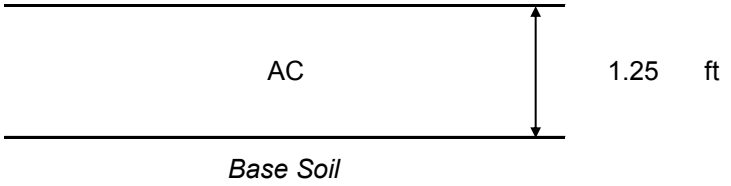
PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: Full depth AC

Design TI= ***10.0*** ***NB Diagonal On-Ramp AR-1***
R_{BS}= ***10***

$GE_{AC} = 0.0032*TI*(100-R_{BS}) =$		2.88	
=>	GE'_{AC}=	2.98	(add 0.1 ft safety factor)
=>	AC Thickness=	1.25	
=>	AC Thickness=	**1.25**	ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

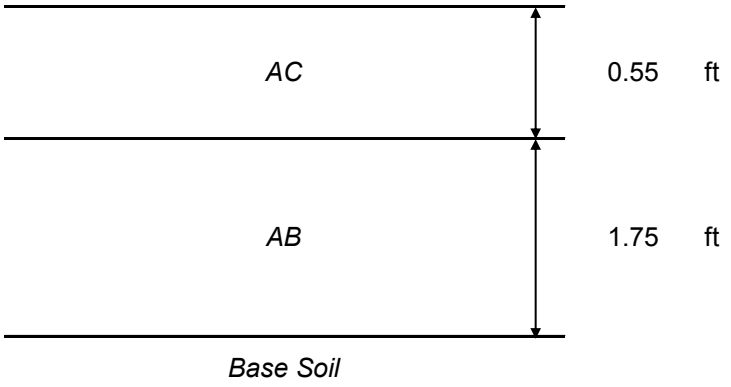
PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB

Design TI=	***10.0***	***NB Diagonal On-Ramp AR-1***	
R_{BS}=	***10***		
R_{AB}=	78		
$GE_{AC+AB} = 0.0032*TI*(100-R_{BS}) =$		2.88	
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$		0.70	
=>	GE'_{AC} =	0.90	(add 0.2 ft safety factor)
	AC Thickness =	0.51	ft
=>	AC Thickness =	**0.55**	ft (round up to the nearest 0.05 ft)
	$G_{f, AC}$ =	1.81	
	GE_{AC} =	1.00	
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$		1.88	
	AB thickness=	1.71	ft
=>	AB Thickness=	**1.75**	ft (round up to the nearest 0.05 ft)
	GE_{AB}=	1.93	$G_{f, AB}$=1.1

Design Section:



PAVEMENT DESIGN

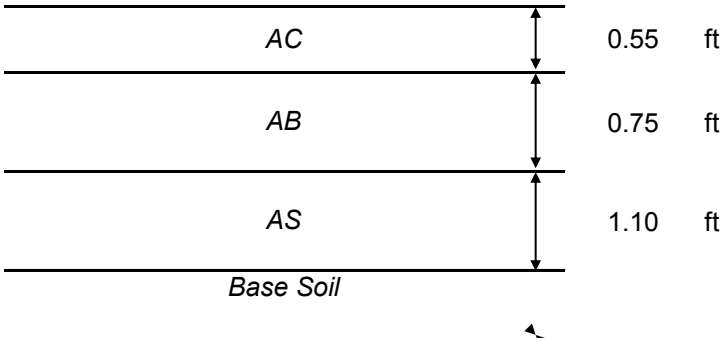
PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB over AS

Design TI=	***10.0***	***NB Diagonal On-Ramp AR-1***	
R_{BS}=	***10***		
R_{AB}=	78		
R_{AS}=	50		
$GE_{TOTAL} = 0..0032*TI*(100-R_{BS}) =$		2.88	
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$		0.70	
=>	GE'_{AC} =	0.90	(add 0.2 ft safety factor)
	AC thickness =	0.51	ft
=>	AC Thickness=	**0.55**	ft (round up to the nearest 0.05 ft)
	$G_{f, AC}$=	1.81	
	GE_{AC}=	1.00	
$GE_{AB+AC} = 0.0032*TI*(100-R_{AS}) =$		1.60	
=>	GE_{AC+AB}=	1.80	(add 0.2 ft safety factor)
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$		0.80	
=>	AB thickness=	0.73	
=>	AB Thickness=	**0.75**	ft (round up to the nearest 0.05 ft)
	GE_{AB}=	0.83	$G_{f, AB}$=1.1
$GE_{AS} = GE_{TOTAL} - GE_{AB} - GE_{AC} =$		1.06	
=>	AS Thickness=	**1.10**	ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

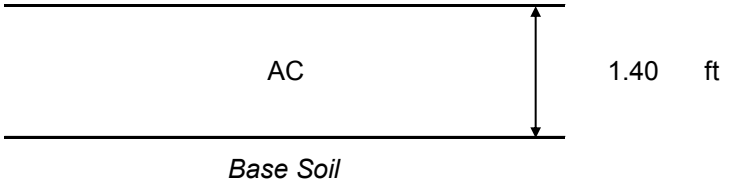
PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: Full depth AC

Design TI= ***11.0*** ***NB Diagonal On-Ramp AR-1 (40-Year Design Life)***
R_{BS}= ***10***

$GE_{AC} = 0.0032*TI*(100-R_{BS}) =$		3.17	
=>	GE'_{AC}=	3.27	(add 0.1 ft safety factor)
=>	AC Thickness=	1.39	
=>	AC Thickness=	**1.40**	ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

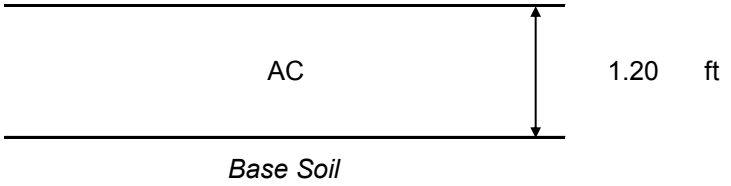
PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: Full depth AC

Design TI= ***10.0*** ***NB Off-Ramp AR-2 (widening medium trucks)***
R_{BS}= ***15***

$GE_{AC} = 0.0032*TI*(100-R_{BS}) =$		2.72	
=>	GE'_{AC}=	2.82	(add 0.1 ft safety factor)
=>	AC Thickness=	1.20	
=>	AC Thickness=	**1.20**	ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

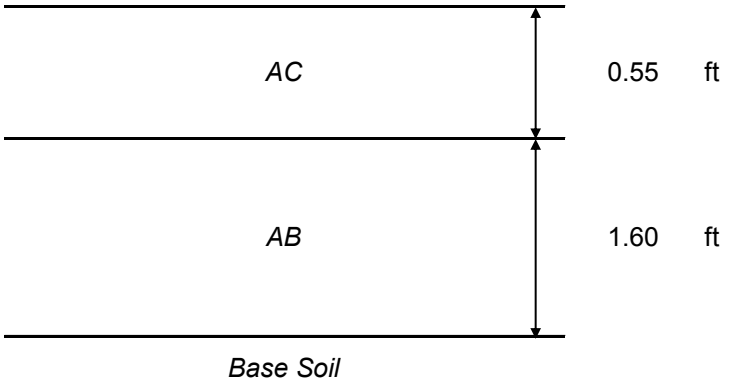
PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB

Design TI=	***10.0***	***NB Off-Ramp AR-2 (widening medium trucks)***	
R_{BS}=	***15***		
R_{AB}=	78		
$GE_{AC+AB} = 0.0032*TI*(100-R_{BS}) =$		2.72	
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$		0.70	
=>	GE'_{AC} =	0.90	(add 0.2 ft safety factor)
	AC Thickness =	0.51	ft
=>	AC Thickness =	**0.55**	ft (round up to the nearest 0.05 ft)
	$G_{f, AC}$ =	1.81	
	GE_{AC} =	1.00	
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$		1.72	
	AB thickness=	1.57	ft
=>	AB Thickness=	**1.60**	ft (round up to the nearest 0.05 ft)
	GE_{AB}=	1.76	$G_{f, AB}$=1.1

Design Section:



PAVEMENT DESIGN

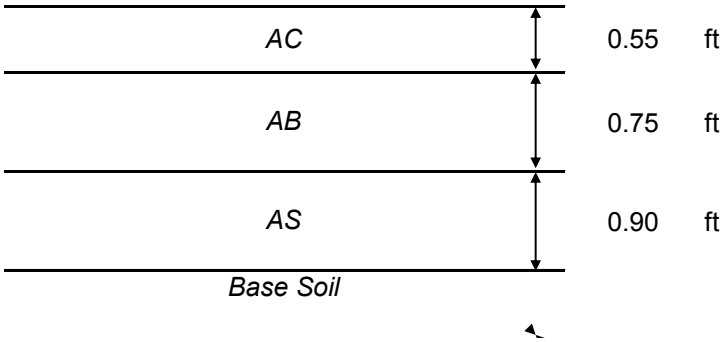
PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB over AS

Design TI=	***10.0***	***NB Off-Ramp AR-2 (widening medium trucks)***	
R_{BS}=	***15***		
R_{AB}=	78		
R_{AS}=	50		
$GE_{TOTAL} = 0..0032*TI*(100-R_{BS}) =$	2.72		
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$	0.70		
=> GE'_{AC} =	0.90	(add 0.2 ft safety factor)	
AC thickness =	0.51	ft	
=> AC Thickness=	**0.55**	ft (round up to the nearest 0.05 ft)	
$G_{f, AC}$=	1.81		
GE_{AC}=	1.00		
$GE_{AB+AC} = 0.0032*TI*(100-R_{AS}) =$	1.60		
=> GE_{AC+AB}=	1.80	(add 0.2 ft safety factor)	
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$	0.80		
=> AB thickness=	0.73		
=> AB Thickness=	**0.75**	ft (round up to the nearest 0.05 ft)	
GE_{AB}=	0.83	$G_{f, AB}$=1.1	
$GE_{AS} = GE_{TOTAL} - GE_{AB} - GE_{AC} =$	0.90		
=> AS Thickness=	**0.90**	ft (round up to the nearest 0.05 ft)	

Design Section:



PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

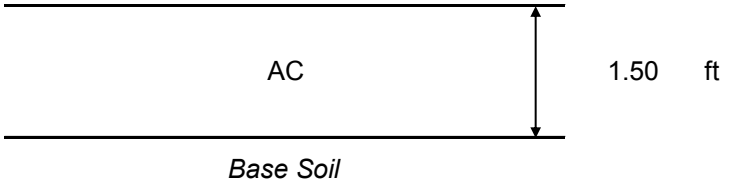
PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: Full depth AC

Design TI= ***12.0*** ***NB Off-Ramp AR-2 (widening heavy trucks)***
R_{BS}= ***15***

$GE_{AC} = 0.0032*TI*(100-R_{BS}) =$		3.26	
=>	GE'_{AC}=	3.36	(add 0.1 ft safety factor)
=>	AC Thickness=	1.47	
=>	AC Thickness=	**1.50**	ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

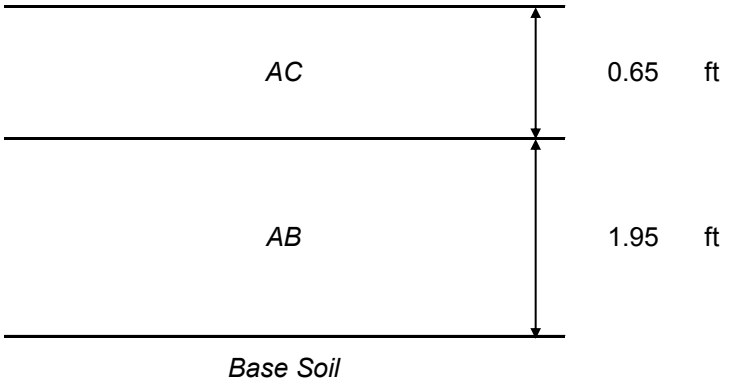
PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB

Design TI=	***12.0***	***NB Off-Ramp AR-2 (widening heavy trucks)***	
R_{BS}=	***15***		
R_{AB}=	78		
$GE_{AC+AB} = 0.0032*TI*(100-R_{BS}) =$		3.26	
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$		0.84	
=>	GE'_{AC} =	1.04	(add 0.2 ft safety factor)
	AC Thickness =	0.61	ft
=>	AC Thickness =	**0.65**	ft (round up to the nearest 0.05 ft)
	$G_{f, AC}$ =	1.75	
	GE_{AC} =	1.14	
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$		2.13	
	AB thickness=	1.93	ft
=>	AB Thickness=	**1.95**	ft (round up to the nearest 0.05 ft)
	GE_{AB}=	2.15	$G_{f, AB}$=1.1

Design Section:



PAVEMENT DESIGN

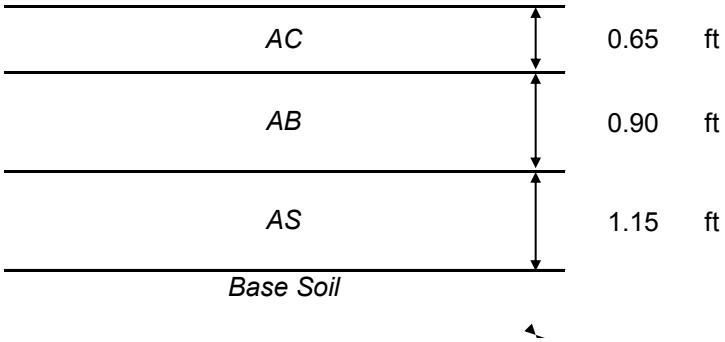
PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB over AS

Design TI=	***12.0***	***NB Off-Ramp AR-2 (widening heavy trucks)***	
R_{BS}=	***15***		
R_{AB}=	78		
R_{AS}=	50		
$GE_{TOTAL} = 0..0032*TI*(100-R_{BS}) =$		3.26	
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$		0.84	
=>	GE'_{AC} =	1.04	(add 0.2 ft safety factor)
	AC thickness =	0.61	ft
=>	AC Thickness=	**0.65**	ft (round up to the nearest 0.05 ft)
	$G_{f, AC}$=	1.75	
	GE_{AC}=	1.14	
$GE_{AB+AC} = 0.0032*TI*(100-R_{AS}) =$		1.92	
=>	GE_{AC+AB}=	2.12	(add 0.2 ft safety factor)
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$		0.98	
=>	AB thickness=	0.89	
=>	AB Thickness=	**0.90**	ft (round up to the nearest 0.05 ft)
	GE_{AB}=	0.99	$G_{f, AB}$=1.1
$GE_{AS} = GE_{TOTAL} - GE_{AB} - GE_{AC} =$		1.14	
=>	AS Thickness=	**1.15**	ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

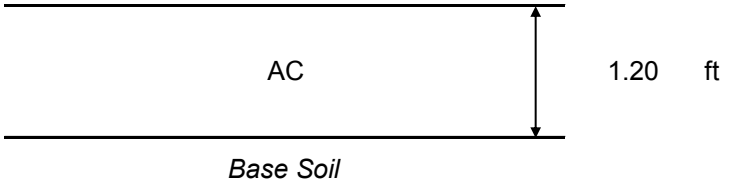
PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: Full depth AC

Design TI= ***10.0*** ***SB Off-Ramp AR-4 (widening medium trucks)***
R_{BS}= ***15***

$GE_{AC} = 0.0032*TI*(100-R_{BS}) =$		2.72	
=>	GE'_{AC}=	2.82	(add 0.1 ft safety factor)
=>	AC Thickness=	1.20	
=>	AC Thickness=	**1.20**	ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

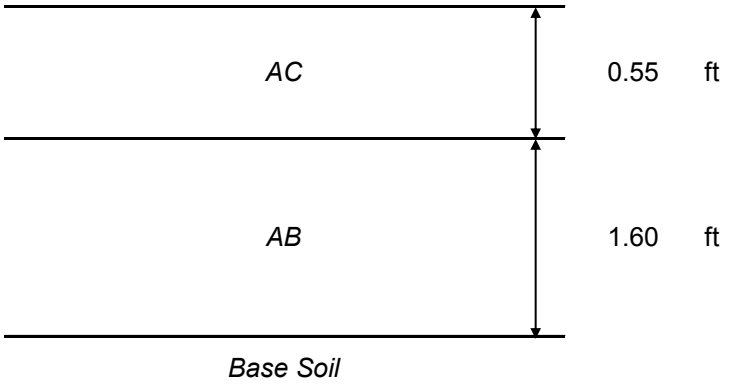
PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB

Design TI=	***10.0***	***SB Off-Ramp AR-4 (widening medium trucks)***	
R_{BS}=	***15***		
R_{AB}=	78		
$GE_{AC+AB} = 0.0032*TI*(100-R_{BS}) =$		2.72	
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$		0.70	
=>	GE'_{AC} =	0.90	(add 0.2 ft safety factor)
	AC Thickness =	0.51	ft
=>	AC Thickness =	**0.55**	ft (round up to the nearest 0.05 ft)
	$G_{f, AC}$ =	1.81	
	GE_{AC} =	1.00	
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$		1.72	
	AB thickness=	1.57	ft
=>	AB Thickness=	**1.60**	ft (round up to the nearest 0.05 ft)
	GE_{AB}=	1.76	$G_{f, AB}$=1.1

Design Section:



PAVEMENT DESIGN

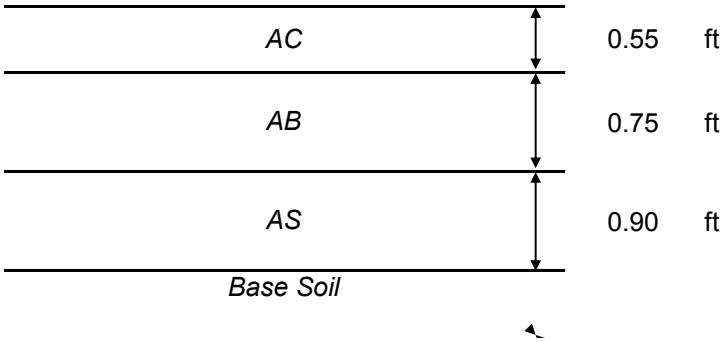
PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB over AS

Design TI=	***10.0***	***SB Off-Ramp AR-4 (widening medium trucks)***	
R_{BS}=	***15***		
R_{AB}=	78		
R_{AS}=	50		
$GE_{TOTAL} = 0..0032*TI*(100-R_{BS}) =$		2.72	
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$		0.70	
=>	GE'_{AC} =	0.90	(add 0.2 ft safety factor)
	AC thickness =	0.51	ft
=>	AC Thickness=	**0.55**	ft (round up to the nearest 0.05 ft)
	$G_{f, AC}$=	1.81	
	GE_{AC}=	1.00	
$GE_{AB+AC} = 0.0032*TI*(100-R_{AS}) =$		1.60	
=>	GE_{AC+AB}=	1.80	(add 0.2 ft safety factor)
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$		0.80	
=>	AB thickness=	0.73	
=>	AB Thickness=	**0.75**	ft (round up to the nearest 0.05 ft)
	GE_{AB}=	0.83	$G_{f, AB}$=1.1
$GE_{AS} = GE_{TOTAL} - GE_{AB} - GE_{AC} =$		0.90	
=>	AS Thickness=	**0.90**	ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

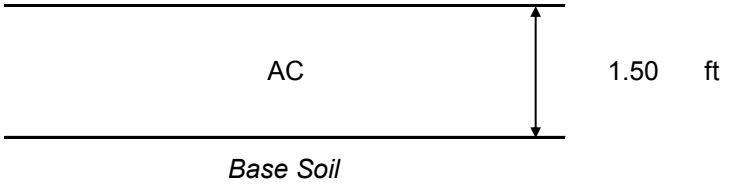
PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: Full depth AC

Design TI= ***12.0*** ***SB Off-Ramp AR-4 (widening heavy trucks)***
R_{BS}= ***15***

$GE_{AC} = 0.0032*TI*(100-R_{BS}) =$		3.26	
=>	GE'_{AC}=	3.36	(add 0.1 ft safety factor)
=>	AC Thickness=	1.47	
=>	AC Thickness=	**1.50**	ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB

Design TI= ***12.0*** ***SB Off-Ramp AR-4 (widening heavy trucks)***
R_{BS}= ***15***
R_{AB}= 78

$GE_{AC+AB} = 0.0032*TI*(100-R_{BS}) =$ 3.26

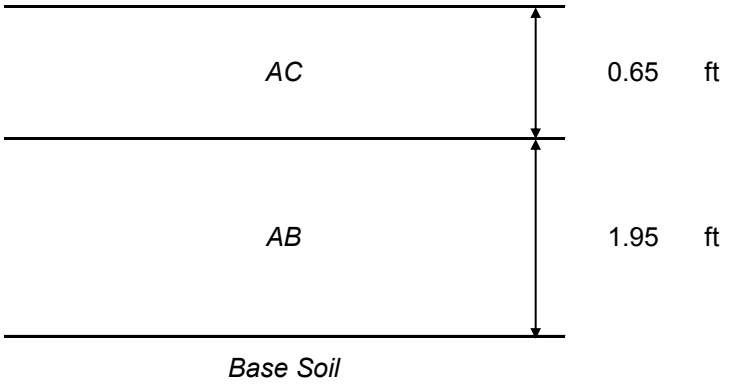
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$ 0.84
=> GE'_{AC} = 1.04 (add 0.2 ft safety factor)
AC Thickness = 0.61 ft

=> AC Thickness = **0.65** ft (round up to the nearest 0.05 ft)
$G_{f, AC}$ = 1.75
GE_{AC} = 1.14

$GE_{AB} = GE_{AC+AB} - GE_{AC} =$ 2.13
AB thickness= 1.93 ft

=> AB Thickness= **1.95** ft (round up to the nearest 0.05 ft)
GE_{AB}= 2.15 $G_{f, AB}$=1.1

Design Section:



PAVEMENT DESIGN

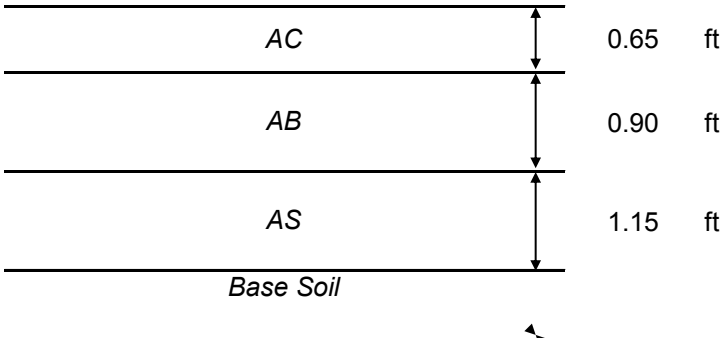
PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB over AS

Design TI=	***12.0***	***SB Off-Ramp AR-4 (widening heavy trucks)***	
R_{BS}=	***15***		
R_{AB}=	78		
R_{AS}=	50		
$GE_{TOTAL} = 0..0032*TI*(100-R_{BS}) =$		3.26	
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$		0.84	
=>	GE'_{AC} =	1.04	(add 0.2 ft safety factor)
	AC thickness =	0.61	ft
=>	AC Thickness=	**0.65**	ft (round up to the nearest 0.05 ft)
	$G_{f, AC}$=	1.75	
	GE_{AC}=	1.14	
$GE_{AB+AC} = 0.0032*TI*(100-R_{AS}) =$		1.92	
=>	GE_{AC+AB}=	2.12	(add 0.2 ft safety factor)
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$		0.98	
=>	AB thickness=	0.89	
=>	AB Thickness=	**0.90**	ft (round up to the nearest 0.05 ft)
	GE_{AB}=	0.99	$G_{f, AB}$=1.1
$GE_{AS} = GE_{TOTAL} - GE_{AB} - GE_{AC} =$		1.14	
=>	AS Thickness=	**1.15**	ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

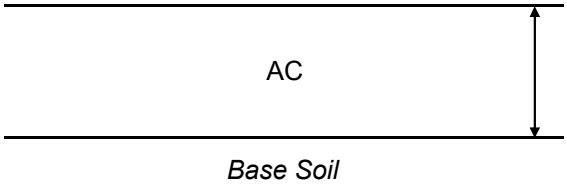
Design Case: Full depth AC

Design TI= ***8.5*** ***US 101 Insde Widening***
R_{BS}= ***10***

$GE_{AC} = 0.0032*TI*(100-R_{BS}) =$ 2.45
=> GE'_{AC}= 2.55 (add 0.1 ft safety factor)
=> AC Thickness= 1.05

=> AC Thickness= **1.05** ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

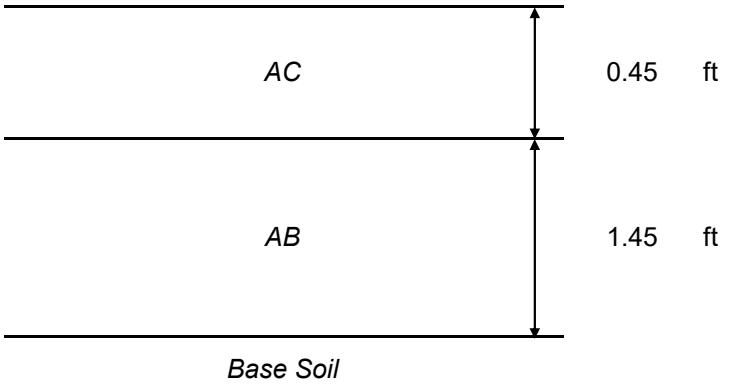
PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB

Design TI=	***8.5***	***US 101 Insde Widening***	
R_{BS}=	***10***		
R_{AB}=	78		
$GE_{AC+AB} = 0.0032*TI*(100-R_{BS}) =$		2.45	
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$		0.60	
=>	GE'_{AC} =	0.80	(add 0.2 ft safety factor)
	AC Thickness =	0.41	ft
=>	AC Thickness =	**0.45**	ft (round up to the nearest 0.05 ft)
	$G_{f, AC}$ =	1.94	
	GE_{AC} =	0.88	
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$		1.57	
	AB thickness=	1.43	ft
=>	AB Thickness=	**1.45**	ft (round up to the nearest 0.05 ft)
	GE_{AB}=	1.60	$G_{f, AB}$=1.1

Design Section:



PAVEMENT DESIGN

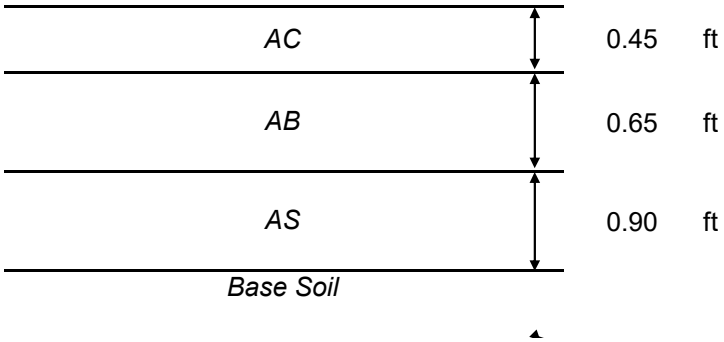
PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB over AS

Design TI=	***8.5***	***US 101 Insde Widening***	
R_{BS}=	***10***		
R_{AB}=	78		
R_{AS}=	50		
$GE_{TOTAL} = 0..0032*TI*(100-R_{BS}) =$		2.45	
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$		0.60	
=>	GE'_{AC} =	0.80	(add 0.2 ft safety factor)
	AC thickness =	0.41	ft
=>	AC Thickness=	**0.45**	ft (round up to the nearest 0.05 ft)
	$G_{f, AC}$=	1.94	
	GE_{AC}=	0.88	
$GE_{AB+AC} = 0.0032*TI*(100-R_{AS}) =$		1.36	
=>	GE_{AC+AB}=	1.56	(add 0.2 ft safety factor)
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$		0.68	
=>	AB thickness=	0.62	
=>	AB Thickness=	**0.65**	ft (round up to the nearest 0.05 ft)
	GE_{AB}=	0.72	$G_{f, AB}$=1.1
$GE_{AS} = GE_{TOTAL} - GE_{AB} - GE_{AC} =$		0.86	
=>	AS Thickness=	**0.90**	ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

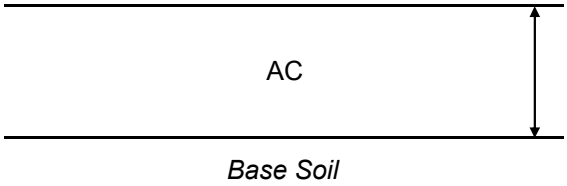
PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: Full depth AC

Design TI= ***10.0*** ***SB Loop On-Ramp AR-4 (widening medium trucks)***
R_{BS}= ***15***

$GE_{AC} = 0.0032*TI*(100-R_{BS}) =$		2.72	
=>	GE'_{AC}=	2.82	(add 0.1 ft safety factor)
=>	AC Thickness=	1.20	
=>	AC Thickness=	**1.20**	ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB

Design TI= ***10.0*** ***SB Loop On-Ramp AR-4 (widening medium trucks)***
R_{BS}= ***15***
R_{AB}= 78

$GE_{AC+AB} = 0.0032*TI*(100-R_{BS}) =$ 2.72

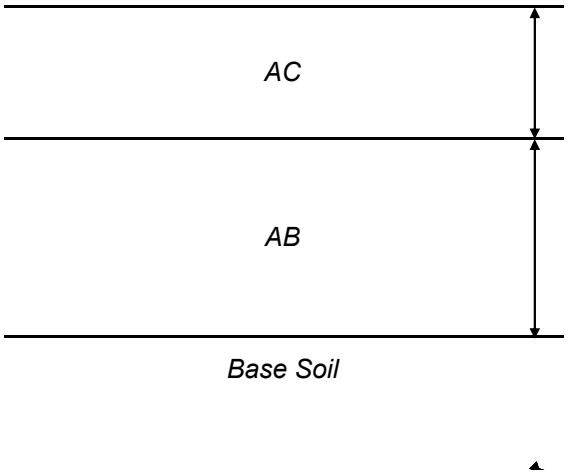
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$ 0.70
=> $GE'_{AC} =$ 0.90 (add 0.2 ft safety factor)
AC Thickness = 0.51 ft

=> AC Thickness = **0.55** ft (round up to the nearest 0.05 ft)
$G_{f, AC} =$ 1.81
$GE_{AC} =$ 1.00

$GE_{AB} = GE_{AC+AB} - GE_{AC} =$ 1.72
AB thickness= 1.57 ft

=> AB Thickness= **1.60** ft (round up to the nearest 0.05 ft)
GE_{AB}= 1.76 $G_{f, AB}$=1.1

Design Section:



PAVEMENT DESIGN

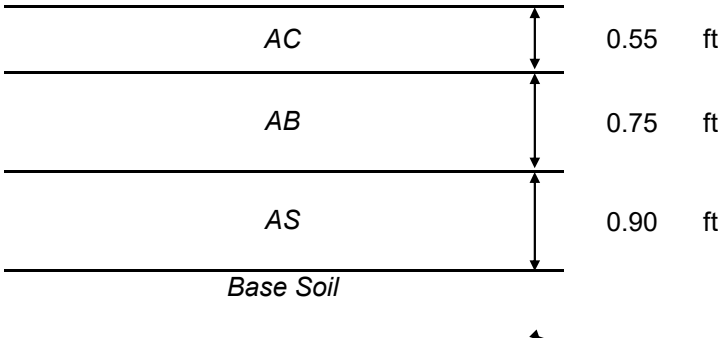
PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB over AS

Design TI=	***10.0***	***SB Loop On-Ramp AR-4 (widening medium trucks)***	
R_{BS}=	***15***		
R_{AB}=	78		
R_{AS}=	50		
$GE_{TOTAL} = 0..0032*TI*(100-R_{BS}) =$		2.72	
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$		0.70	
=>	GE'_{AC} =	0.90	(add 0.2 ft safety factor)
	AC thickness =	0.51	ft
=>	AC Thickness=	**0.55**	ft (round up to the nearest 0.05 ft)
	$G_{f, AC}$=	1.81	
	GE_{AC}=	1.00	
$GE_{AB+AC} = 0.0032*TI*(100-R_{AS}) =$		1.60	
=>	GE_{AC+AB}=	1.80	(add 0.2 ft safety factor)
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$		0.80	
=>	AB thickness=	0.73	
=>	AB Thickness=	**0.75**	ft (round up to the nearest 0.05 ft)
	GE_{AB}=	0.83	$G_{f, AB}$=1.1
$GE_{AS} = GE_{TOTAL} - GE_{AB} - GE_{AC} =$		0.90	
=>	AS Thickness=	**0.90**	ft (round up to the nearest 0.05 ft)

Design Section:



PAVEMENT DESIGN

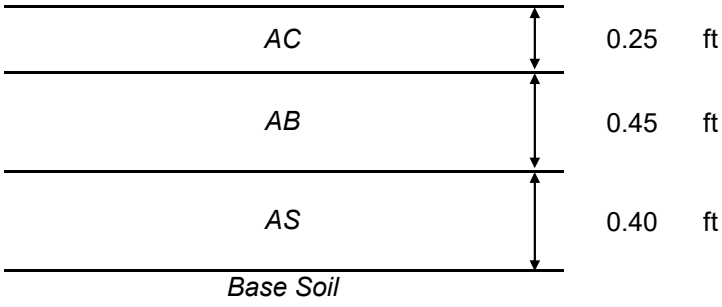
PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *US 101/Blossom Hill Rd IC Improvement Project, San Jose*
PROJECT NO.: *2016-146-GDR*

Design Case: AC over AB over AS

Design TI=	***5.5***	***MVP along Exisitng On-Ramp***	
R_{BS}=	***15***		
R_{AB}=	78		
R_{AS}=	50		
$GE_{TOTAL} = 0..0032*TI*(100-R_{BS}) =$		1.50	
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$		0.39	
=>	GE'_{AC} =	0.59	(add 0.2 ft safety factor)
	AC thickness =	0.24	ft
=>	AC Thickness=	**0.25**	ft (round up to the nearest 0.05 ft)
	$G_{f, AC}$=	2.42	
	GE_{AC}=	0.60	
$GE_{AB+AC} = 0.0032*TI*(100-R_{AS}) =$		0.88	
=>	GE_{AC+AB}=	1.08	(add 0.2 ft safety factor)
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$		0.48	
=>	AB thickness=	0.43	
=>	AB Thickness=	**0.45**	ft (round up to the nearest 0.05 ft)
	GE_{AB}=	0.50	$G_{f, AB}$=1.1
$GE_{AS} = GE_{TOTAL} - GE_{AB} - GE_{AC} =$		0.40	
=>	AS Thickness=	**0.40**	ft (round up to the nearest 0.05 ft)

Design Section:



0.25 ft

0.45 ft

0.40 ft

MEMO ON STRUCTURAL SECTION RECOMMENDATIONS AND TRAFFIC INDICES
by HMH

MEMORANDUM

To:	Alston Lam, Parikh	**Date:**	April 8, 2019 Rev. Sept. 18, 2019
From:	Bill Wagner, HMH	**HMH Job No.:**	4605.00
Subject:	US 101 Blossom Hill Road I/C - 04-1K280 Structural Section Recommendations and Traffic Indices (TI)		

The following summarizes information used in determining recommended structural sections, including traffic indices (TI) where applicable.

1. Structural Section 1 is used for pavement widening along Blossom Hill Road (A1 line). The City of San Jose typically uses a TI of 10.0 for major arterials. The attached calculations show that a TI of 10.0 is appropriate, based upon the attached Equivalent Single Axle Loads (ESAL) calculation.

2. Structural Section 2 is used for reconstruction of the northbound diagonal on-ramp (AR1 line). Table 613.5A of the HDM provides TI for ramps with light, medium and heavy truck traffic classifications and different design lives. The as-built plans indicate that this on-ramp was originally constructed for medium truck traffic. The attached ESAL calculations indicate that the medium truck traffic classification with a 20-year TI of 10.0 or a 40-year TI of 11.0 is appropriate for this ramp. Since this on-ramp is being reconstructed and due to restricted width for future pavement rehabilitation, 40-year TI of 11.0 is recommended.

3. Structural Section 3 is used for pavement widening along the southbound off-ramp (AR4 line) and northbound off-ramp (AR2 line). The as-built plans indicate that these off-ramps were originally constructed for heavy truck traffic. However, the widening of each ramp will be used for left turn lanes, and truck traffic on these left lanes is not expected to be in the heavy truck traffic classification. Therefore, the structural section is based upon medium truck traffic and a 20-year TI of 10.0 is recommended for the widening per the HDM.

4. Structural Section 4 is used for pavement widening along the westbound and eastbound connectors from Blossom Hill Road to Monterey Road which are entirely within City of San Jose right-of-way. Since each of these connectors are a single lane connecting with Monterey Road, they are based upon a TI of 10.0 similar to Structural Section 1.

5. Structural Section 5 is used for the Class I bicycle/pedestrian facility (BP line) which will be maintained by City of San Jose. Truck axle loads are expected to be limited to

occasional light maintenance vehicles or emergency vehicles. Structural Section 5 is based upon a TI of 4.0.

6. Structural Section 6 is used for PCC surfacing such as City of San Jose sidewalks, median maintenance bands and contrast paving in gore areas. The structural section matches City standards and details used on other projects, and is not based on a TI.

7. Structural Section 7 is used for maintenance vehicle pullouts (MVP) that are not adjacent to new structural sections. It is not based on a TI.

8. Structural Section 8 is used for repaving part of the US 101 left shoulders (E4 line) within the median after backfilling excavations for new and retrofitted structure footings. It is intended to match the structural section of the existing shoulder, since matching the adjacent travel lane is not required where shoulder width is greater than 5 feet and median width is greater than 14 feet per HDM 613.5 (2) Shoulders. The gravel equivalent of the existing section is approximately 2.5 feet, and the calculated TI for this gravel equivalent is approximately 8.5. (See the attached calculations.) This complies with HDM 613.5 (2) "Shoulders" that requires a TI of not less than 5.0 or greater than 9.0.

9. Structural Section 9 is a full depth HMA section used in narrow pavement widening areas along Blossom Hill Road. This section is equivalent to Structural Section 1, and is based upon a TI of 10.0

10. Structural Section 10 is used for resurfacing of Blossom Hill Road which is maintained by the City of San Jose both in City right-of-way and in Caltrans right-of-way. It is based upon the City's pavement management system and field reviews with City of San Jose maintenance staff. The City's pavement management system indicates that the section of Blossom Hill Road east of US 101 was last slurry-sealed by the City in 2004 and that pavement management indices (PMI) in this section are 62 for the eastbound lanes and 53 for the westbound lanes. For Blossom Hill Road west of US 101, the roadway was last slurry-sealed by the City in 2010 and the PMI are 59 for the eastbound lanes and 69 for the westbound lanes. After consideration of these PMI's, and the additional deterioration and construction impacts predicted over the 2-½ to 3-year timeframe before resurfacing will be done, the City's pavement management maintenance staff recommends cold-planing 0.15 feet and overlaying with 0.15 feet of HMA or RHMA-G. This structural section is not based on a TI.

11. Structural Section 11 is Structural Section 10 plus a leveling course below the 0.15-foot surface course. It is used at locations where variable depth overlays are needed to achieve adequate cross slopes and accommodate ADA requirements for curb ramps and crosswalks. It is not based on a TI.

US 101 BLOSSOM HILL ROAD INTERCHANGE **04-1K280**
STRUCTURAL SECTION 1 **4/8/2019**

LOCATION: WIDENING OF BLOSSOM HILL ROAD

USE HIGHEST PEAK HOUR (2040 5-6 PM) OF 2848 WB VEHICLES AT SCREENLINE BETWEEN SB OFF-RAMP AND MONTEREY ROAD
DETERMINE AADT BY MULTIPLYING PEAK HOUR BY RATIO OF DAILY TRAFFIC DIVIDED BY PEAK HOUR FROM COUNT DATA
IN CALTRANS 24-HR CENSUS FOR SCL COUNTY (ATTACHED)

RATIO=12.9 2848 X 12.9 = 36739

SINCE THIS SECTION OF BLOSSOM HILL ROAD WAS RT. 82 PRIOR TO RELINQUISHMENT IN 2013:
USE TRUCK PERCENTAGE OF 3.0% FROM 2010 TRUCK AADT FOR RT. 82 (THIS IS CONSISTENT WITH THE TOAR
WHICH SHOWS 4% TRUCKS IN AM PEAK AND 1% IN PM PEAK)
USE TRUCK AXLE DISTRIBUTION BASED UPON 2010 TRUCK AADT FOR RT. 82 (ATTACHED)

TI CALCULATION

1-WAY AADT	**TRUCK %**	**MAX LDF**	**1-WAY AADTT (# OF TRUCKS)**
36739	3.00%	0.8	882

	PERCENT	**20-YR CONSTANT**	**40-YR CONSTANT**	**20-YR ESAL**	**40-YR ESAL**
2-AXLE TRUCKS OR BUSES	70.8%	1380	2760	861,491	1,722,983
3-AXLE TRUCKS OR BUSES	14.4%	3680	7360	467,250	934,499
4-AXLE TRUCKS	4.7%	5880	11760	243,677	487,353
5 OR MORE-AXLE TRUCKS	10.1%	13780	27560	1,227,183	2,454,365
2-AXLE BUSES	0.0%	2760	5520	-	-
3-AXLE BUSES	0.0%	13616	27232	-	-
	100.0%			2,799,600	5,599,200

PER TABLE 613.3C OF THE HDM, USE TI = 10.0 FOR 20-YEAR ESAL BETWEEN 1,980,000 AND 3,020,000

RAMPS

TO DETERMINE AADT BASED UPON PEAK HOUR, CALCULATE TYPICAL RATIO OF 24-HR AADT DIVIDED BY PM PEAK HOUR

Traffic Volumes Counts in 2013

Dist	Cnty	Rte	PM	Leg	Dir	Description	Day	24 hour Period Hourly Counts 0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24	24hr total	Ratio of 24 Hr. total / 17-18 Peak
4	SCL	101	28.19	F	N	NB OFF TO 82/BLOSSOM HILL	TUE	21	17	14	25	46	93	248	499	505	225	189	159	173	209	246	262	227	315	226	164	128	107	75	35	4,226.00	
4	SCL	101	28.19	F	N	NB OFF TO 82/BLOSSOM HILL	MON	28	8	11	19	36	79	213	482	438	236	158	155	186	167	201	241	227	280	217	185	126	107	76	48	3,924.00	
4	SCL	101	28.19	F	N	NB OFF TO 82/BLOSSOM HILL	SUN	44	31	24	10	2	13	40	53	87	128	140	168	193	213	226	203	205	216	217	181	174	129	92	51	2,840.00	
4	SCL	101	28.19	F	N	NB OFF TO 82/BLOSSOM HILL	SAT	37	29	23	11	25	44	64	91	173	145	177	218	240	223	235	231	246	235	205	216	157	160	128	77	3,390.00	
4	SCL	101	28.19	F	N	NB OFF TO 82/BLOSSOM HILL	FRI	27	15	6	10	39	84	210	357	430	229	163	160	191	180	211	267	265	326	237	210	157	144	91	71	4,080.00	12.5
4	SCL	101	28.19	F	N	NB OFF TO 82/BLOSSOM HILL	THU	24	12	8	10	39	89	293	420	506	216	153	166	175	182	208	239	265	295	207	166	167	119	67	46	4,072.00	13.8
4	SCL	101	28.19	F	N	NB OFF TO 82/BLOSSOM HILL	WED	21	14	9	12	48	86	455	804	526	210	159	172	169	150	217	228	247	289	231	184	151	119	66	37	4,604.00	15.9
4	SCL	101	28.19	F	N	NB OFF TO 82/BLOSSOM HILL	TUE	17	15	16	12	42	92	325	613	589	258	189	159	173	209	264	262	227	315	226	164	128	107	75	35	4,512.00	14.3
4	SCL	101	28.19	F	N	NB OFF TO 82/BLOSSOM HILL	MON	19	21	7	16	37	92	214	473	456	201	160	160	164	177	229	219	249	279	247	155	116	96	56	32	3,875.00	13.9
4	SCL	101	28.19	F	N	NB OFF TO 82/BLOSSOM HILL	SUN	47	30	25	17	11	24	28	60	106	130	184	197	192	220	214	205	238	231	150	172	168	106	73	54	2,882.00	
4	SCL	101	28.19	F	N	NB OFF TO 82/BLOSSOM HILL	SAT	71	42	21	17	30	45	88	135	153	163	168	179	231	260	232	235	253	227	202	194	178	137	128	90	3,479.00	
4	SCL	101	28.19	F	N	NB OFF TO 82/BLOSSOM HILL	FRI	38	15	9	16	42	82	285	471	423	233	158	179	203	197	215	257	285	306	280	216	218	243	148	92	4,638.00	
4	SCL	101	28.19	F	N	NB OFF TO 82/BLOSSOM HILL	THU												183	191	185	252	249	235	289	250	180	143	135	76	50	2,418.00	
4	SCL	101	28.44	N	S	SB ON FR SB RTE 82 (EB)	WED	25	11	13	18	22	76	144	203	199	163	153	146	173	187	205	211	221	199	207	156	142	116	71	38	3,099.00	15.6
4	SCL	101	28.44	N	S	SB ON FR SB RTE 82 (EB)	TUE	21	11	8	13	28	63	157	200	206	187	142	141	157	169	193	210	206	235	193	146	11	98	57	51	3,003.00	12.8
4	SCL	101	28.44	N	S	SB ON FR SB RTE 82 (EB)	MON	25	13	6	10	16	83	148	205	192	163	129	151	182	161	161	194	215	226	199	143	116	93	59	45	2,935.00	13.0
4	SCL	101	28.44	N	S	SB ON FR SB RTE 82 (EB)	SUN	44	18	18	11	19	26	56	74	154	179	203	212	210	215	180	170	150	136	125	113	98	96	60	32	2,569.00	
4	SCL	101	28.44	N	S	SB ON FR SB RTE 82 (EB)	SAT	40	26	20	22	27	49	81	130	164	211	264	207	210	212	190	175	186	180	157	119	118	102	89	56	3,035.00	
4	SCL	101	28.44	N	S	SB ON FR SB RTE 82 (EB)	FRI	23	17	12	16	27	80	146	195	236	198	192	158	219	181	193	202	196	197	221	203	136	112	76	59	3,295.00	16.7
4	SCL	101	28.44	N	S	SB ON FR SB RTE 82 (EB)	THU	23	21	9	16	18	75	153	181	221	181	135	165	182	160	189	178	207	211	210	171	131	100	63	35	3,035.00	14.4
4	SCL	101	28.44	N	S	SB ON FR SB RTE 82 (EB)	WED	25	14	9	15	24	87	150	209	199	163	153	146	173	187	205	211	221	199	207	156	142	116	71	38	3,120.00	
4	SCL	101	28.44	N	S	SB ON FR SB RTE 82 (EB)	TUE											134	149	160	179	192	205	220	226	177	148	120	85	63	49	2,107.00	
4	SCL	101	28.5	N	N	NB ON FR EB BLOSSOM HILL RD	MON	132	80	51	81	197	480	541	531	759	861	786	764	728	730	756	807	836	927	812	719	542	458	339	218	13,135.00	14.2
4	SCL	101	28.5	N	N	NB ON FR EB BLOSSOM HILL RD	SUN	196	133	106	54	58	119	174	297	467	717	914	837	920	990	988	897	810	758	747	756	708	589	386	268	12,889.00	
4	SCL	101	28.5	N	N	NB ON FR EB BLOSSOM HILL RD	SAT	174	149	98	69	112	187	276	487	693	874	893	922	910	851	849	855	873	869	849	734	627	619	464	347	13,781.00	
4	SCL	101	28.5	N	N	NB ON FR EB BLOSSOM HILL RD	FRI	143	89	72	111	187	485	566	570	780	854	815	832	786	760	818	897	908	998	962	837	638	595	530	377	14,610.00	14.6
4	SCL	101	28.5	N	N	NB ON FR EB BLOSSOM HILL RD	THU	112	88	65	95	224	547	498	192	267	823	742	762	673	698	800	943	950	992	934	795	586	539	382	287	12,994.00	13.1
4	SCL	101	28.5	N	N	NB ON FR EB BLOSSOM HILL RD	WED	109	63	60	83	211	552	482	312	414	813	733	763	746	707	821	907	905	968	902	728	604	468	397	243	12,991.00	13.4
4	SCL	101	28.5	N	N	NB ON FR EB BLOSSOM HILL RD	THU	113	68	58	96	226	539	522	355	528	850	739	703	655	718	839	914	852	997	846	757	563	503	335	230	13,006.00	13.0
4	SCL	101	28.5	N	N	NB ON FR EB BLOSSOM HILL RD	MON												88	79	82	69	90	87	94	81	65	50	38	31	12	866. 00	
4	SCL	101	28.67	N	S	SB ON FR NB RTE 82 (WB)	WED	16	7	2	5	12	41	106	216	200	205	163	197	152	169	148	175	182	273	206	115	99	85	38	28	2,840.00	10.4
4	SCL	101	28.67	N	S	SB ON FR NB RTE 82 (WB)	TUE	15	2	7	3	13	40	96	230	215	190	156	177	177	155	164	187	209	302	176	115	94	60	58	21	2,862.00	9.5
4	SCL	101	28.67	N	S	SB ON FR NB RTE 82 (WB)	MON	18	12	2	2	17	37	81	210	226	165	147	154	157	153	150	209	187	254	185	117	67	66	30	10	2,656.00	10.5
4	SCL	101	28.67	N	S	SB ON FR NB RTE 82 (WB)	SUN	13	11	6	4	9	20	34	43	88	140	176	167	181	127	124	125	130	110	84	96	83	78	43	18	1,910.00	
4	SCL	101	28.67	N	S	SB ON FR NB RTE 82 (WB)	SAT	9	11	7	10	15	13	41	72	112	162	201	195	154	167	161	152	153	150	113	105	80	60	75	43	2,261.00	
4	SCL	101	28.67	N	S	SB ON FR NB RTE 82 (WB)	FRI	16	11	7	2	22	32	92	201	198	180	186	184	190	169	183	202	206	234	190	137	83	63	61	36	2,885.00	
4	SCL	101	28.67	N	S	SB ON FR NB RTE 82 (WB)	THU	22	5	4	7	12	37	103	204	215	196	151	197	159	161	154	180	224	268	195	138	94	55	54	42	2,877.00	10.7
4	SCL	101	28.67	N	S	SB ON FR NB RTE 82 (WB)	WED	11	7	4	6	15	39	103	216	200	205	163	197	152	169	148	175	182	273	206	115	99	85	38	28	2,836.00	10.4
4	SCL	101	28.67	N	S	SB ON FR NB RTE 82 (WB)	TUE											162	178	155	160	143	197	204	247	204	131	113	71	49	38	2,052.00	
4	SCL	101	28.79	N	N	NB ON FR WB BLOSSOM HILL	SUN	27	11	14	7	3	19	34	48	98	135	151	216	162	162	159	135	136	116	107	11	98	85	56	36	2,126.00	
4	SCL	101	28.79	N	N	NB ON FR WB BLOSSOM HILL	SAT	23	20	13	9	16	39	44	103	165	163	161	171	181	188	168	145	150	158	130	109	82	83	76	69	2,466.00	
4	SCL	101	28.79	N	N	NB ON FR WB BLOSSOM HILL	FRI	22	10	11	10	27	114	250	512	394	284	208	231	197	171	264	326	261	401	268	184	140	92	80	54	4,511.00	11.2
4	SCL	101	28.79	N	N	NB ON FR WB BLOSSOM HILL	THU	7	4	16	14	37	125	261	552	477	244	215	236	186	148	246	282	263	422	291	183	117	86	57	43	4,512.00	10.7
4	SCL	101	28.79	N	N	NB ON FR WB BLOSSOM HILL	WED	14	13	14	8	32	120	253	552	479	248	213	242	191	177	241	315	290	398	311	170	118	70	57	35	4,561.00	11.5
4	SCL	101	28.79	N	N	NB ON FR WB BLOSSOM HILL	THU	16	7	13	11	39	117	260	630	475	245	188	197	178	187	251	301	268	393	269	170	107	78	76	27	4,503.00	11.5
4	SCL	101	28.79	N	N	NB ON FR WB BLOSSOM HILL	MON	16	9	7	8	27	122	214	614	430	236	202	224	188	190	250	295	256	380	281	160	98	90	68	28	4,393.00	11.6
4	SCL	101	28.79	N	N	NB ON FR WB BLOSSOM HILL	SUN	41	17	16	10	12	14	28	45	97	126	184	198	185	182	173	123	99	131	98	110	100	91	64	47	2,191.00	
4	SCL	101	28.79	N	N	NB ON FR WB BLOSSOM HILL	SAT	35	14	10	12	12	33	46	92	148	175	189	160	159	157	182	188	135	173	152	123	99	95	79	42	2,510.00	
4	SCL	101	28.79	N	N	NB ON FR WB BLOSSOM HILL	FRI	28	16	5	14	33	102	240	554	366	269	220	242	211	190	271	323	265	385	239	162	130	86	83	62	4,496.00	
4	SCL	101	28.91	F	S	SB OFF TO RTE 82/BLOSSOM HILL	SUN	482	294	196	113	97	139	220	369	512	709	871	947	1126	1210	1162	1124									9,571.00	
4	SCL	101	28.91	F	S	SB OFF TO RTE 82/BLOSSOM HILL	SAT	444	264	206	110	130	155	354	494	749	940	967	1024	1296	1275	1260	1305	1263	1297	1232	1112	901	818	890	0.7	19,124.00	
4	SCL	101	28.91	F	S	SB OFF TO RTE 82/BLOSSOM HILL	FRI	254	143	144	77	131	396	803	1243	1508	1128	864	928	1012	1191	1470	1375	1510	1608	1594	1387	1123	919	790	626	22,224.00	13.8
4	SCL	101	28.91	F	S	SB OFF TO RTE 82/BLOSSOM HILL	THU	258	123	102	76	121	383	798	1327	1515	1102	878	827	969	1191	1421	1362	1491	1636	1569	1347	1116	848	657	407	21,524.00	13.2
4	SCL	101	28.91	F	S	SB OFF TO RTE 82/BLOSSOM HILL	WED	225	109	84	61	142	404	899	1271	1581	1142	935	891	951	1198	1412	1376	1679	1630	1571	1349	1030	890	608	409	21,847.00	13.4
4	SCL	101	28.91	F	S	SB OFF TO RTE 82/BLOSSOM HILL	THU	208	113	72	8	109	416	853	1334	1555	1135	979	916	1074	1265	1376	1456	1552	1661	1587	1370	975	850	559	366	21,861.00	13.2
4	SCL	101	28.91	F	S	SB OFF TO RTE 82/BLOSSOM HILL	MON	227	136	70	66	105	365	790	1359	1519	1107	935	1005	1103	1272	1346	1493	1539	1588	1441	1255	928	764	592	368	21,373.00	13.5
4	SCL	101	28.91	F	S	SB OFF TO RTE 82/BLOSSOM HILL	SUN	451	263	209	130	84	121	259	379	523	690	895	894	1062	1122	1146	1223	1139	1142	1160	1106	881	666	479	341	16,362.00	
4	SCL	101	28.91	F	S	SB OFF TO RTE 82/BLOSSOM HILL	SAT	448	251	170	101	89	160	320	492	715	911	1010	1112	1205	1219	1299	1306	1292	1333	1245	1070	961	925	734	591	18,959.00	
4	SCL	101	28.91	F	S	SB OFF TO RTE 82/BLOSSOM HILL	FRI												949	1049	1264	1402	1435	1471	1512	1418	1358	1072	975	767	585	15,257.00	

AVERAGE RATIO OF 24-HR AADT DIVIDED BY PM PEAK HOUR = 12.9

Route	Route Suffix	District	County	Postmile Prefix	Postmile	Leg	AADT Total	Total Trucks	Total Truck %	2 Axle Volume	2 Axle Percent	3 Axle Volume	3 Axle Percent	4 Axle Volume	4 Axle Percent	5 Axle Volume	5 Axle Percent	Description	Year Verified/ Estimate
80		3	NEV	R	59.54	B	24,000	5,160	21.5	1,431	27.73	194	3.76	74	1.43	3,461	67.08	JCT. RTE. 20 West	00E
80		3	NEV	R	59.54	A	25,500	4,802	18.83	1,231	25.64	202	4.21	71	1.47	3,298	68.68	JCT. RTE. 20 West	00E
80		3	NEV		14.164	A	33,500	5,919	17.67	1,493	25.22	192	3.25	79	1.33	4,155	70.2	TRUCKEE, JCT. RTE. 89 SOUTH	04E
80		3	NEV		14.164	B	28,000	5,018	17.92	1,307	26.05	187	3.72	70	1.4	3,454	68.84	TRUCKEE, JCT. RTE. 89 SOUTH	00E
80		3	NEV		16.285	A	26,500	4,918	18.56	1,240	25.22	160	3.25	65	1.33	3,452	70.2	JCT. RTE. 89 NORTH, JCT. RTE. 267 SOUTH	04E
80		3	NEV		20.225	B	20,001	4,475	17.55	847	18.93	138	3.08	48	1.07	3,442	76.92	UNION HILLS BR OH	10V
80		3	SIE		1.593	B	27,000	5,011	18.56	1,264	25.22	163	3.25	67	1.33	3,518	70.2	NEVADA STATE LINE	04E
82		4	SCL	R	0	A	55,000	1,650	3	1,168	70.8	238	14.4	78	4.7	167	10.1	SAN JOSE, JCT. RTE. 101	01E
82		4	SCL		6.06	A	22,700	851	3.75	656	77.11	95	11.12	6	0.74	94	11.03	SAN JOSE, ALMA AVENUE	00V
82		4	SCL		6.9	B	15,600	577	3.7	463	80.3	84	14.5	6	1	24	4.2	SAN JOSE, JCT. RTE. 280	01E
82		4	SCL	R	7.717	B	14,800	488	3.3	441	90.3	46	9.4	1	0.3	0	0	SAN JOSE, JCT. RTE. 87	01E
82		4	SCL		9.904	A	28,500	909	3.19	646	71.1	163	17.97	51	5.63	48	5.3	SAN JOSE, JCT. RTE. 880	03V
82		4	SCL		9.904	B	27,000	994	3.68	481	48.38	143	14.38	115	11.52	256	25.71	SAN JOSE, JCT. RTE. 880	03V
82		4	SCL		10.343	O	23,800	952	4	636	66.8	164	17.2	20	2.1	132	13.9	SAN JOSE/SANTA CLARA CITY LIMITS	01E
82		4	SCL	R	11.141	B	18,700	1,201	6.42	801	66.71	128	10.67	19	1.56	253	21.05	SANTA CLARA, BENTON ROAD	00V
82		4	SCL		17.035	B	31,500	759	2.41	625	82.3	61	8	6	0.85	67	8.85	MATHILDA AVENUE	00V
82		4	SCL		18.841	B	44,000	1,175	2.67	949	80.79	114	9.67	47	4.02	65	5.52	MOUNTAIN VIEW, JCT. RTE. 85	00V
82		4	SCL		18.841	A	48,500	1,077	2.22	839	77.86	103	9.61	38	3.51	97	9.02	MOUNTAIN VIEW, JCT. RTE. 85	00V
82		4	SCL		19.134	A	45,000	1,157	2.57	901	77.88	201	17.34	9	0.8	46	3.98	MOUNTAIN VIEW, JCT. RTE. 237 EAST	00V
82		4	SCL		25.45	A	37,500	1,181	3.15	977	82.72	123	10.42	21	1.74	61	5.13	PALO ALTO, EMBARCADERO ROAD	00V
82		4	SCL		26.37	B	30,000	1,368	4.56	1,012	74	273	19.94	12	0.9	71	5.16	SANTA CLARA/SAN MATEO COUNTY LINE	00V
82		4	SM		3.435	B	47,500	1,563	3.29	1,113	71.22	191	12.22	48	3.1	211	13.47	JCT. RTE. 84	03V
82		4	SM		3.435	A	36,500	836	2.29	600	71.8	114	13.63	64	7.6	58	6.97	JCT. RTE. 84	03V
82		4	SM		5.15	B	26,000	699	2.69	551	78.81	77	11.07	22	3.1	49	7.02	REDWOOD CITY/SAN CARLOS CITY LIMITS	00V
82		4	SM		10.554	A	49,000	676	1.38	550	81.31	76	11.19	14	2.05	37	5.46	SAN MATEO, JCT. RTE. 92	03V
82		4	SM		10.554	B	39,500	521	1.32	406	77.87	73	14.02	8	1.52	34	6.59	SAN MATEO, JCT. RTE. 92	03V
82		4	SM		16.844	A	21,100	612	2.9	442	72.26	79	12.85	22	3.61	69	11.29	MILLBRAE, CENTER STREET	03V
82		4	SM		17.99	A	29,000	452	1.56	288	63.78	115	25.41	22	4.86	27	5.95	SAN BRUNO, TAYLOR/SAN MATEO AVENUE	00V
82		4	SM		18.6	A	36,000	706	1.96	552	78.24	86	12.19	18	2.62	49	6.95	SAN BRUNO, SAN BRUNO AVENUE	03V
82		4	SM		18.963	B	36,000	526	1.46	375	71.23	75	14.21	12	2.25	65	12.31	SAN BRUNO, JCT. RTE. 380	03V
82		4	SM		21.91	B	25,000	495	1.98	348	70.3	52	10.51	14	2.83	81	16.36	SOUTH SAN FRANCISCO, HICKEY BOULEVARD	03V
82		4	SF	R	0.208	B	22,700	161	0.71	121	74.88	26	16.43	2	0.97	12	7.73	SAN FRANCISCO, JCT. RTE. 280	00V

SINCE RT. 82 INCLUDED BLOSSOM HILL ROAD TO US 101 PRIOR TO RELINQUISHMENT IN 2013, USE ONLY PERCENTAGES ABOVE FROM 2010 TRUCK AADTS FOR TI CALCULATION ON BLOSSOM HILL ROAD.

US 101 BLOSSOM HILL ROAD INTERCHANGE **04-1K280**
STRUCTURAL SECTION 2 **4/8/2019**

LOCATION: RECONSTRUCTION OF NB DIAGONAL ON-RAMP

AS-BUILTS FOR 04-11734 SHOW EXISTING AR-1 ON-RAMP WAS DESIGNED FOR MEDIUM TRUCKS
HDM TABLE 613.5A REQUIRES: *20-YR* *40-YR*
FOR MEDIUM TRUCKS: *TI=10* *TI=11*
FOR HEAVY TRUCKS: *TI=12* *TI=14*
CONFIRM THAT ESAL CALCS SUPPORT DESIGN FOR MEDIUM TRUCKS

PER CALTRANS 24-HR CENSUS FOR SCL COUNTY (ATTACHED), AADT ON AR-1 = 3877 IN 2013.
PER TOAR (ATTACHED), PEAK PERIOD GROWTH FROM 2013 TO 2040 IS 804 / 712 = 1.13
DETERMINE DESIGN YEAR AADT BY MULTIPLYING 2013 AADT BY GROWTH FACTOR: 3877 X 1.13 = 4381 IN 2040

TRUCK PERCENTAGE ON BLOSSOM HILL ROAD IS 2.5% OR 3.0 % BASED UPON TOAR OR 2010 TRUCK COUNTS,
BUT FREEWAY BOUND TRAFFIC WILL HAVE A HIGHER TRUCK PERCENTAGE, SO USE 8% TO MATCH 101 MAINLINE
(NOTE THAT THIS IS A VERY CONSERVATIVE ASSUMPTION)
USE TRUCK AXLE DISTRIBUTION BASED UPON 2010 TRUCK AADT FOR RT. 82 SINCE THIS SECTION OF BLOSSOM HILL ROAD WAS RT. 82 PRIOR TO RELINQUISHMENT IN 2013

TI CALCULATION

1-WAY AADT	**TRUCK %**	**MAX LDF**	**1-WAY AADTT (# OF TRUCKS)**
4381	8.00%	1.0	350

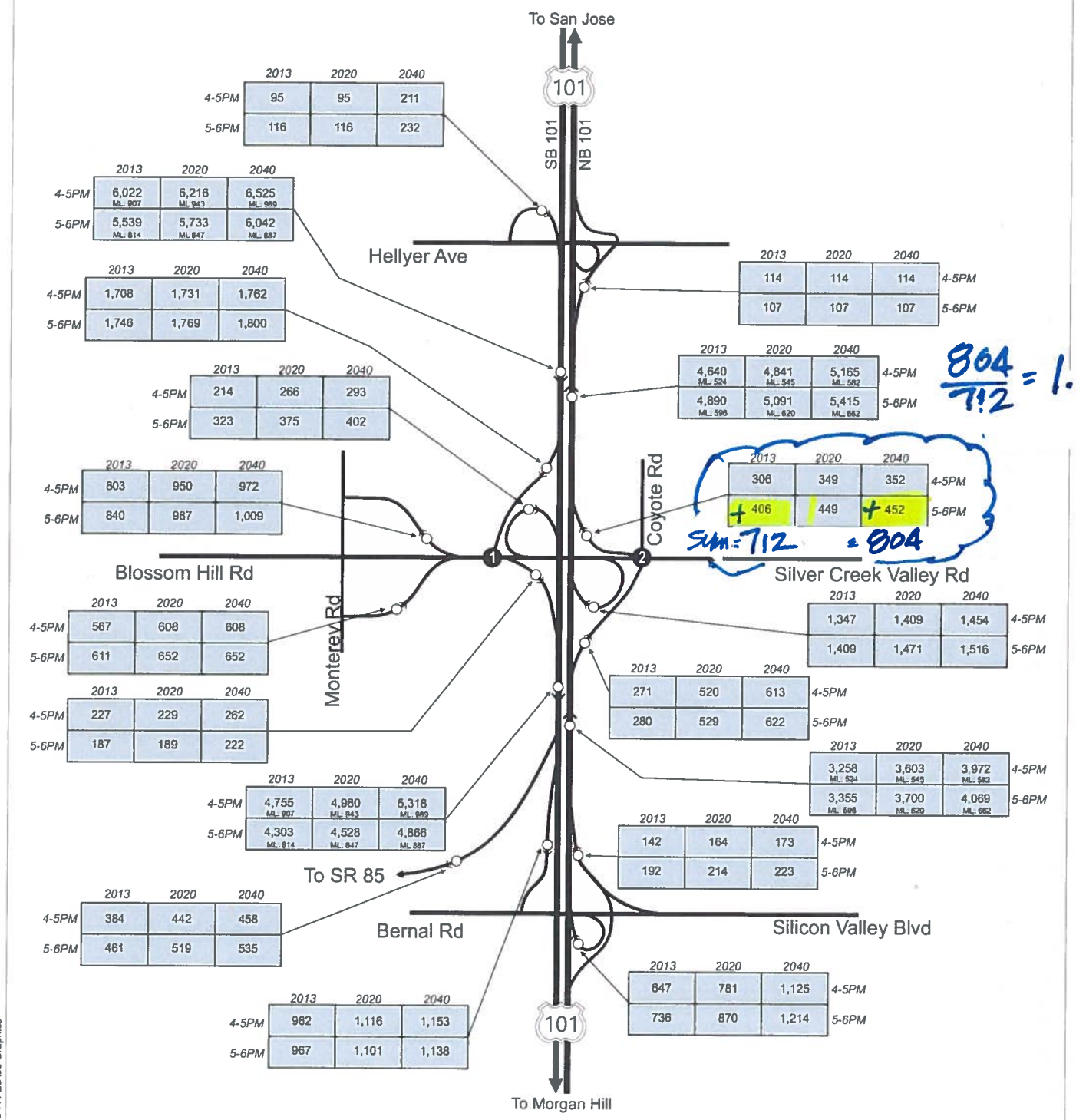
	PERCENT	**20-YR CONSTANT**	**40-YR CONSTANT**	**20-YR ESAL**	**40-YR ESAL**
2-AXLE TRUCKS OR BUSES	70.8%	1380	2760	342,433	684,866
3-AXLE TRUCKS OR BUSES	14.4%	3680	7360	185,726	371,453
4-AXLE TRUCKS	4.7%	5880	11760	96,859	193,717
5 OR MORE-AXLE TRUCKS	10.1%	13780	27560	487,791	975,582
2-AXLE BUSES	0.0%	2760	5520	-	-
3-AXLE BUSES	0.0%	13616	27232	-	-
	100.0%			1,112,809	2,225,618
PER TABLE 613.3C OF THE HDM, THESE ESALS RESULT IN THE FOLLOWING TI:				9.0	10.0

BOTH THESE RESULTS ARE LESS THAN MEDIUM TRUCKS PER HDM TABLE 613.5A,
SO USE MEDIUM TRUCKS: TI = 10.0 FOR 20-YR AND TI = 11.0 FOR 40-YR

Traffic Volumes Counts

Dist	Cnty	Rte	Pre	PM	Lec	Dir	Description	Date	Day	24 hour Period Hourly Counts																								24hr total
										0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24	
4	SCL	101	R	28.67	N	S	SB ON FR NB RTE 82 (WB)	07/31/2013	WED	16 A	7 A	2 A	5 A	12 A	41 A	106 A	216 C	200 C	205 C	163 C	197 C	152 C	169 C	148 C	175 C	182 C	273 C	206 C	115 C	99 C	85 C	38 C	28 C	2,840.00
4	SCL	101	R	28.67	N	S	SB ON FR NB RTE 82 (WB)	07/30/2013	TUE	15 A	2 A	7 A	3 A	13 A	40 A	96 A	230 A	215 A	190 A	156 A	177 A	177 A	155 A	164 A	187 A	209 A	302 A	176 A	115 A	94 A	60 A	58 A	21 A	2,862.00
4	SCL	101	R	28.67	N	S	SB ON FR NB RTE 82 (WB)	07/29/2013	MON	18 A	12 A	2 A	2 A	17 A	37 A	81 A	210 A	226 A	165 A	147 A	154 A	157 A	153 A	150 A	209 A	187 A	254 A	185 A	117 A	67 A	66 A	30 A	10 A	2,656.00
4	SCL	101	R	28.67	N	S	SB ON FR NB RTE 82 (WB)	07/28/2013	SUN	13 A	11 A	6 A	4 A	9 A	20 A	34 A	43 A	88 A	140 A	176 A	167 A	181 A	127 A	124 A	125 A	130 A	110 A	84 A	96 A	83 A	78 A	43 A	18 A	1,910.00
4	SCL	101	R	28.67	N	S	SB ON FR NB RTE 82 (WB)	07/27/2013	SAT	9 A	11 A	7 A	10 A	15 A	13 A	41 A	72 A	112 A	162 A	201 A	195 A	154 A	167 A	161 A	152 A	153 A	150 A	113 A	105 A	80 A	60 A	75 A	43 A	2,261.00
4	SCL	101	R	28.67	N	S	SB ON FR NB RTE 82 (WB)	07/26/2013	FRI	16 A	11 A	7 A	2 A	22 A	32 A	92 A	201 A	198 A	180 A	186 A	184 A	190 A	169 A	183 A	202 A	206 A	234 A	190 A	137 A	83 A	63 A	61 A	36 A	2,885.00
4	SCL	101	R	28.67	N	S	SB ON FR NB RTE 82 (WB)	07/25/2013	THU	22 A	5 A	4 A	7 A	12 A	37 A	103 A	204 A	215 A	196 A	151 A	197 A	159 A	161 A	154 A	180 A	224 A	268 A	195 A	138 A	94 A	55 A	54 A	42 A	2,877.00
4	SCL	101	R	28.67	N	S	SB ON FR NB RTE 82 (WB)	07/24/2013	WED	11 A	7 A	4 A	6 A	15 A	39 A	103 A	216 A	200 A	205 A	163 A	197 A	152 A	169 A	148 A	175 A	182 A	273 A	206 A	115 A	99 A	85 A	38 A	28 A	2,836.00
4	SCL	101	R	28.67	N	S	SB ON FR NB RTE 82 (WB)	07/23/2013	TUE											162 A	178 A	155 A	160 A	143 A	197 A	204 A	247 A	204 A	131 A	113 A	71 A	49 A	38 A	2,052.00
4	SCL	101	R	28.79	N	N	NB ON FR WB BLOSSOM HILL	04/21/2013	SUN	27 A	11 A	14 A	7 A	3 A	19 A	34 A	48 A	98 A	135 A	151 A	216 A	162 A	162 A	159 A	135 A	136 A	116 A	107 A	111 A	98 A	85 A	56 A	36 A	2,126.00
4	SCL	101	R	28.79	N	N	NB ON FR WB BLOSSOM HILL	04/20/2013	SAT	23 A	20 A	13 A	9 A	16 A	39 A	44 A	103 A	165 A	163 A	161 A	171 A	181 A	188 A	168 A	145 A	150 A	158 A	130 A	109 A	82 A	83 A	76 A	69 A	2,466.00
4	SCL	101	R	28.79	N	N	NB ON FR WB BLOSSOM HILL	04/19/2013	FRI	22 A	10 A	11 A	10 A	27 A	114 A	250 A	512 A	394 A	284 A	208 A	231 A	197 A	171 A	264 A	326 A	261 A	401 A	268 A	184 A	140 A	92 A	80 A	54 A	4,511.00
4	SCL	101	R	28.79	N	N	NB ON FR WB BLOSSOM HILL	04/18/2013	THU	7 A	4 A	16 A	14 A	37 A	125 A	261 A	552 A	477 A	244 A	215 A	236 A	186 A	148 A	246 A	282 A	263 A	422 A	291 A	183 A	117 A	86 A	57 A	43 A	4,512.00
4	SCL	101	R	28.79	N	N	NB ON FR WB BLOSSOM HILL	04/17/2013	WED	14 A	13 A	14 A	8 A	32 A	120 A	253 A	552 A	479 A	248 A	213 A	242 A	191 A	177 A	241 A	315 A	290 A	398 A	311 A	170 A	118 A	70 A	57 A	35 A	4,561.00
4	SCL	101	R	28.79	N	N	NB ON FR WB BLOSSOM HILL	04/16/2013	TUE	16 A	7 A	13 A	11 A	39 A	117 A	260 A	630 A	475 A	245 A	188 A	197 A	178 A	187 A	251 A	301 A	268 A	393 A	269 A	170 A	107 A	78 A	76 A	27 A	4,503.00
4	SCL	101	R	28.79	N	N	NB ON FR WB BLOSSOM HILL	04/15/2013	MON	16 A	9 A	7 A	8 A	27 A	122 A	214 A	614 A	430 A	236 A	202 A	224 A	188 A	190 A	250 A	295 A	256 A	380 A	281 A	160 A	98 A	90 A	68 A	28 A	4,393.00
4	SCL	101	R	28.79	N	N	NB ON FR WB BLOSSOM HILL	04/14/2013	SUN	41 A	17 A	16 A	10 A	12 A	14 A	28 A	45 A	97 A	126 A	184 A	198 A	185 A	182 A	173 A	123 A	99 A	131 A	98 A	110 A	100 A	91 A	64 A	47 A	2,191.00
4	SCL	101	R	28.79	N	N	NB ON FR WB BLOSSOM HILL	04/13/2013	SAT	35 A	14 A	10 A	12 A	12 A	33 A	46 A	92 A	148 A	175 A	189 A	160 A	159 A	157 A	182 A	188 A	135 A	173 A	152 A	123 A	99 A	95 A	79 A	42 A	2,510.00
4	SCL	101	R	28.79	N	N	NB ON FR WB BLOSSOM HILL	04/12/2013	FRI	28 A	16 A	5 A	14 A	33 A	102 A	240 A	554 A	366 A	269 A	220 A	242 A	211 A	190 A	271 A	323 A	265 A	385 A	239 A	162 A	130 A	86 A	83 A	62 A	4,496.00
4	SCL	101	R	28.91	F	S	SB OFF TO RTE 82/BLOSSOM	10/06/2013	SUN	482 A	294 A	196 A	113 A	97 A	139 A	220 A	369 A	512 A	709 A	871 A	947 A	1126 A	1210 A	1162 A	1124 A									9,571.00
4	SCL	101	R	28.91	F	S	SB OFF TO RTE 82/BLOSSOM	10/05/2013	SAT	444 A	264 A	206 A	110 A	130 A	155 A	354 A	494 A	749 A	940 A	967 A	1024 A	1296 A	1275 A	1260 A	1305 A	1263 A	1297 A	1232 A	1112 A	901 A	818 A	890 A	638 A	19,124.00
4	SCL	101	R	28.91	F	S	SB OFF TO RTE 82/BLOSSOM	10/04/2013	FRI	254 A	143 A	144 A	77 A	131 A	396 A	803 A	1243 A	1508 A	1128 A	864 A	928 A	1012 A	1191 A	1470 A	1375 A	1510 A	1608 A	1594 A	1387 A	1123 A	919 A	790 A	626 A	22,224.00
4	SCL	101	R	28.91	F	S	SB OFF TO RTE 82/BLOSSOM	10/03/2013	THU	258 A	123 A	102 A	76 A	121 A	383 A	798 A	1327 A	1515 A	1102 A	878 A	827 A	969 A	1191 A	1421 A	1362 A	1491 A	1636 A	1569 A	1347 A	1116 A	848 A	657 A	407 A	21,524.00
4	SCL	101	R	28.91	F	S	SB OFF TO RTE 82/BLOSSOM	10/02/2013	WED	225 A	109 A	84 A	61 A	142 A	404 A	899 A	1271 A	1581 A	1142 A	935 A	891 A	951 A	1198 A	1412 A	1376 A	1679 A	1630 A	1571 A	1349 A	1030 A	890 A	605 A	409 A	21,847.00
4	SCL	101	R	28.91	F	S	SB OFF TO RTE 82/BLOSSOM	10/01/2013	TUE	208 A	113 A	72 A	80 A	109 A	416 A	853 A	1334 A	1555 A	1135 A	979 A	916 A	1074 A	1265 A	1376 A	1456 A	1552 A	1661 A	1587 A	1370 A	975 A	850 A	659 A	366 A	21,861.00
4	SCL	101	R	28.91	F	S	SB OFF TO RTE 82/BLOSSOM	09/30/2013	MON	227 A	136 A	70 A	66 A	105 A	365 A	790 A	1359 A	1519 A	1107 A	935 A	1005 A	1103 A	1272 A	1346 A	1493 A	1539 A	1588 A	1441 A	1255 A	928 A	764 A	592 A	368 A	21,373.00
4	SCL	101	R	28.91	F	S	SB OFF TO RTE 82/BLOSSOM	09/29/2013	SUN	451 A	263 A	209 A	130 A	84 A	121 A	259 A	376 A	523 A	690 A	895 A	894 A	1062 A	1122 A	1146 A	1223 A	1139 A	1142 A	1160 A	1106 A	881 A	666 A	479 A	341 A	16,362.00
4	SCL	101	R	28.91	F	S	SB OFF TO RTE 82/BLOSSOM	09/28/2013	SAT	448 A	251 A	170 A	101 A	89 A	160 A	320 A	492 A	715 A	911 A	1010 A	1112 A	1205 A	1219 A	1299 A	1306 A	1292 A	1333 A	1245 A	1070 A	961 A	925 A	734 A	591 A	18,959.00
4	SCL	101	R	28.91	F	S	SB OFF TO RTE 82/BLOSSOM	09/27/2013	FRI												949 A	1049 A	1264 A	1402 A	1435 A	1471 A	1512 A	1418 A	1358 A	1072 A	975 A	767 A	585 A	15,257.00

7-day volume on AR-1 = 27,137
2013 AADT = 27,137 / 7 = 3877



LEGEND

00 - Study Intersection

4-5PM	2013	2020	2040
5-6PM	2013	2020	2040

ML: Managed Lane

DKS

Figure 8

US 101 / Blossom Hill Interchange
PM Peak Period Traffic Forecasts

P:\P116\16012-000 San Jose 101-Blossom Hill IC PA-ED\06 Graphics

US 101 BLOSSOM HILL ROAD INTERCHANGE **04-1K280**
STRUCTURAL SECTION FOR SB LOOP ON-RAMP (AL-4) AUXILIARY LANE **9/12/2019**

PER CALTRANS 24-HR CENSUS FOR SCL COUNTY (ATTACHED), AADT ON AL-4 = 2613 IN 2013.
PER TOAR (ATTACHED), PEAK PERIOD GROWTH FROM 2013 TO 2040 IS 804 / 712 = 1.13
DETERMINE DESIGN YEAR AADT BY MULTIPLYING 2013 AADT BY GROWTH FACTOR: 2613 X 1.13 = 2953 IN 2040

TRUCK PERCENTAGE ON BLOSSOM HILL ROAD IS 2.5% OR 3.0 % BASED UPON TOAR OR 2010 TRUCK COUNTS,
BUT FREEWAY BOUND TRAFFIC WILL HAVE A HIGHER TRUCK PERCENTAGE, SO USE 8% TO MATCH 101 MAINLINE

USE TRUCK AXLE DISTRIBUTION BASED UPON 2010 TRUCK AADT FOR RT. 82 SINCE THIS SECTION OF BLOSSOM HILL ROAI
WAS RT. 82 PRIOR TO RELINQUISHMENT IN 2013

TI CALCULATION

1-WAY AADT	**TRUCK %**	**MAX LDF**	**1-WAY AADTT (# OF TRUCKS)**
2953	8.00%	1.0	236

	AXLE TYPE PERCENT	**20-YR CONSTANT**	**40-YR CONSTANT**	**20-YR ESAL**	**40-YR ESAL**
2-AXLE TRUCKS OR BUSES	70.8%	1380	2760	230,816	461,632
3-AXLE TRUCKS OR BUSES	14.4%	3680	7360	125,188	250,377
4-AXLE TRUCKS	4.7%	5880	11760	65,287	130,575
5 OR MORE-AXLE TRUCKS	10.1%	13780	27560	328,794	657,588
2-AXLE BUSES	0.0%	2760	5520	-	-
3-AXLE BUSES	0.0%	13616	27232	-	-
	100.0%			750,086	1,500,171
PER TABLE 613.3C OF THE HDM, THESE ESALS RESULT IN THE FOLLOWING TI:				8.5	9.5

BOTH THESE RESULTS ARE LESS THAN MEDIUM TRUCKS PER HDM TABLE 613.5A, THEREFORE USE TI = 10.0 FOR LANE

FOR SHOULDER STRUCTURAL SECTION, TI IS NO LESS THAN 2% OF ESAL OR 5.0 WHICHEVER IS GREATER

			20-YR ESAL
	2%	750,086	15,002
PER TABLE 613.3C OF THE HDM, THIS ESAL RESULTS IN THE FOLLOWING TI:			5.5

THIS RESULT IS GREATER THAN 5.0, THEREFORE USE TI = 5.5 FOR SHOULDERS

RAMPS — TO DETERMINE ADT FOR SB LOOP ON-RAMP AL-4

Traffic Volumes Counts in 2013

Dist	Cnty	Rte	PM	Leg	Dir	Description	Day	24 hour Period Hourly Counts 0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24	24hr total
4	SCL	101	28.67	N	S	SB ON FR NB RTE 82 (WB)	WED	16	7	2	5	12	41	106	216	200	205	163	197	152	169	148	175	182	273	206	115	99	85	38	28	2,840.00
4	SCL	101	28.67	N	S	SB ON FR NB RTE 82 (WB)	TUE	15	2	7	3	13	40	96	230	215	190	156	177	177	155	164	187	209	302	176	115	94	60	58	21	2,862.00
4	SCL	101	28.67	N	S	SB ON FR NB RTE 82 (WB)	MON	18	12	2	2	17	37	81	210	226	165	147	154	157	153	150	209	187	254	185	117	67	66	30	10	2,656.00
4	SCL	101	28.67	N	S	SB ON FR NB RTE 82 (WB)	SUN	13	11	6	4	9	20	34	43	88	140	176	167	181	127	124	125	130	110	84	96	83	78	43	18	1,910.00
4	SCL	101	28.67	N	S	SB ON FR NB RTE 82 (WB)	SAT	9	11	7	10	15	13	41	72	112	162	201	195	154	167	161	152	153	150	113	105	80	60	75	43	2,261.00
4	SCL	101	28.67	N	S	SB ON FR NB RTE 82 (WB)	FRI	16	11	7	2	22	32	92	201	198	180	186	184	190	169	183	202	206	234	190	137	83	63	61	36	2,885.00
4	SCL	101	28.67	N	S	SB ON FR NB RTE 82 (WB)	THU	22	5	4	7	12	37	103	204	215	196	151	197	159	161	154	180	224	268	195	138	94	55	54	42	2,877.00
4	SCL	101	28.67	N	S	SB ON FR NB RTE 82 (WB)	WED	11	7	4	6	15	39	103	216	200	205	163	197	152	169	148	175	182	273	206	115	99	85	38	28	2,836.00
4	SCL	101	28.67	N	S	SB ON FR NB RTE 82 (WB)	TUE											162	178	155	160	143	197	204	247	204	131	113	71	49	38	2,052.00

Sum of 7-day 24 Hr. total	18,291
Divide by 7 to Determine Average Daily Traffic	2613

APPENDIX D

Comment and Response Form-CALTRANS

Document Type : 95% PS&E Plans for US 101/Blossom Hill Rd Interchange Improvement
Co: SCL____ Rte: 101_____ KP(PM): R28.4/28.9_____ Unit: 0712_____ EA: 1K280_____ Proj Id: 0416000224_____FA:_____AO:_____
MSA: PS&E_____ Proj Engr: Srilatha Raavi_____ Proj Mgr. : Fariba Zohoury_____Dgn/Oversight Senior: Hassan Nikzad_____

CODE: A-Will Comply; B-Caltrans to Evaluate; C-Will Not Incorporate; D-Agency (City of San Jose) to Evaluate; E- No Action Required; F- Will Incorporate at a Later Phase)

	Reviewer's Name and Branch/Unit	Comments/Questions Please reference document section (e.g., paragraph, page #, etc.)	Resp. Code	Response to Comments/Questions (provide CODE and explanation)	JRT Code	JRT Disposition (provide CODE and explanation)	Final Code
153	Materials	Sheet X-1 Pavement Structural Sections: On section #'s 1 through 11 the proposed amount of HMA Type A to be used on this project is more than 1000 tons. Per HDM section 630 and per our department policy it is mandated to use maximum of 0.20' of RHMA-G. In addition to this; why 0.10' RHMA-O has been used in section #2 only and not on other sections? Please clarify and make the necessary corrections.	A	Will include 0.2 RHMA-G in sections #2, 3 and 8. Will add 0.15 or 0.2 RHMA in sections #1, 4, 5, 9, 10 and 11 if acceptable to the City who either owns or maintains these pavement locations. RHMA-O is not used on sections owned or maintained by the City, because they use slurry seal or microsurfacing as rehab techniques. RHMA-O is only used in section #2 on the fully rebuilt NB diagonal on-ramp, and has not been used in #3 on widened areas of two off-ramps where the downslope surface layer is not open graded and a "bathtub" would be created. .		Caltrans Materials: Our comments covers only the work within the state right-of-way. In some of the consulting group response it indicates that City of San Jose owns the properties within Caltrans right of way? We appreciate the City of San Jose if they maintain the state properties but the design of the state roads and properties shall be according to the state policy and Caltrans design policy. HMH: Based upon the City's concurrence, RHMA-G has been included as the top lift on all structural sections except minor areas like bikepath and MVP's.	
154	Materials	Sheet X-1: We understand that the detail(s) for pavement structural section #8 is added on sheet C-11. However; A) Per HDM 0.20' maximum RHMA-G should be used as mentioned above. B) Per our department policy we cannot accept your response to this comment that "the calculation has been done by contract project EA:437391 and no calculations have been done for it". Any design and calculations for this project shall be within this project. please provide the required calculations for this pavement structural section including the R-value used.	A E	A) 0.2' RHMA-G will be included in section #8 B) The last page of Appendix C indcates that section #8 is designed for TI=8.5 and R=10, as well as matching the existing shoulder section in EA 437391.		Caltrans Materials: Please provide us with latest GDMR which also includes the calculations of section #8 pavement structural section. HMH: Structural section #8 will be added to Table 17 of the GDMR at next submittal (100% PS&E).	
155	Materials	Sheet X-8 & HMH Memorandum from GDMR for Pavement Structural Section # 7: The report indicates that this section is for Maintenance Vehicle Pullouts that are not adjacent to new structural sections and is not based on a T.I. However; sheet X-8 Coyote Road detail shows that section 7 is next to the edge of shoulder and new pavement structural section #9 thus; we recommend that the section #7 to be designed based on the T.I. and R-value used on the adjacent shoulder and the travel way. Please clarify.	A	Will revise MVP and adjacent widening to section #1		Caltrans Materials: No comments.	A

Comment and Response Form-CALTRANS

Document Type : 95% PS&E Plans for US 101/Blossom Hill Rd Interchange Improvement
Co: SCL Rte: 101 KP(PM): R28.4/28.9 Unit: 0712 EA: 1K280 Proj Id: 0416000224 FA: AO:
MSA: PS&E Proj Engr: Srilatha Raavi Proj Mgr. : Fariba Zohoury Dgn/Oversight Senior: Hassan Nikzad

CODE: A-Will Comply; B-Caltrans to Evaluate; C-Will Not Incorporate; D-Agency (City of San Jose) to Evaluate; E- No Action Required; F- Will Incorporate at a Later Phase)

	Reviewer's Name and Branch/Unit	Comments/Questions	Resp.	Response to Comments/Questions	JRT	JRT Disposition	
156	Materials	Sheet X-1, X-8, & HMH Memorandum from GDMR for Pavement Structural Section # 9: The report indicates that this section is equivalent to structural section #1 for a full depth HMA with a T.I. equal to 10 and R-value of 10. A) As mentioned on the first comment maximum 0.20' RHMA-G shall be used. B) We recommend minimum 4" of aggregate base Class-2 as a working platform to be placed beneath the full depth HMA. Please make a correction.		A) Will revise per response to comment 153 above. B) This section is maintained by CSJ, and CSJ regularlay uses FDHMA wihout a working platform. Generally, the subgrade is dry and the working platform is not consideered necessary. This section is used in narrow areas and areas where the Contractor is expected to perform the work in night-time closures where the additonal 4" layer adds difficulty .		Caltrans Materials: Based on our department policy it is required to add 4" Aggregate base class 2 or aggregate subbase class 2 underneath the full depth HMA. It is also understood that it is a narrow strip that heavy compactor machines cannot roll on that narrow strip. In such narrow strips the contactor always does the compaction manually to meet the Caltrans standard specifications. In addition to this; For pavement structural section #9 the depth of proposed HMA is 1.25' over our recommendation of 4" aggregate. They cannot place 1.25' HMA in one layer, it is required to do it in two to three layers to meet the proposed full depth HMA. So, additional 4" aggregate base beneath HMA shall not be a problem to place. HMH: Will comply.	A
157	Materials	Sheet X-1, X-5, X-6, X-8, & HMH Memorandum from GDMR for Pavement Structural Section # 11: Based on the report we understand that cold planing has been recommended for this section of the proposed project. However; we recommend if there are any distressed areas on the existing pavement which requires leveling and dig-outs, the dig-outs shall be up to maximum of 6" or to the bottom of the existing HMA layer whichever is less and paved with HMA Type A.	A	Will comply. An $150,000 allowance has been included in the BEES under supplemental work for additional HMA to accomplish this work.		Caltrans Materials: No comments.	A
158	Materials	Sheet U-1 to U3 & DD-2: On your response comment you noted that "the utilities will be relocated by utility owner prior to construction through encroachment permit and trench backfill detail for storm drain will be added." However; in either case you should use the trench backfill details attached to this Memo. Case 1 is for T.I. less than or equal to 12. Case 2 is for T.I. greater than 12. Both cases are for dry condition- i.e., no groundwater is encountered in the trench during excavation.	A	Will Comply		Caltrans Materials: No comments.	A
159	Materials	Specifications: The use of asphalt binder for type "G" RHMA shall be PG 64-16 per HDM table 632.1 Flexible Pavement. Your specification indicates PG64-10 as shown below. **"26. Use to specify the grade of asphalt binder for RHMA-G or RHMA-G(BWC). Insert binder grade. Add to section 39-2.03B(3)(a):The grade of asphalt binder for RHMA-G must be PG 64-10."** Please verify and make the necessary correction.	A	Will Comply		Caltrans Materials: No comments.	A

Comment and Response Form-CALTRANS

Document Type : 100% PS&E Plans for US 101/Blossom Hill Rd Interchange Improvement
Co: SCL____ Rte: 101_____ KP(PM): R28.4/28.9_____ Unit: 0712_____ EA: 1K280_____ Proj Id: 0416000224_____FA:_____AO:_____
MSA: PS&E_____ Proj Engr: Kelly Ma_____ Proj Mgr. : Fariba Zohoury/Srilatha Raavi_____Dgn/Oversight Senior: Hassan Nikzad_____

CODE: A-Will Comply; B-Caltrans to Evaluate; C-Will Not Incorporate; D-Agency (City of San Jose) to Evaluate; E- No Action Required; F- Will Incorporate at a Later Phase)

	Reviewer's Name and Branch/Unit	Comments/Questions Please reference document section (e.g., paragraph, page #, etc.)	Resp. Code	Response to Comments/Questions (provide CODE and explanation)	JRT Code	JRT Disposition (provide CODE and explanation)	Final Code
2	Samuel Awad, Geotechnical Design	We have reviewed the 100% PS&E submittal for the above referenced project, all our comments have been addressed and we have no comments.	E	Acknowledged		Acknowledged	
14	Ahmad Shahmirza, Materials	General: Has 40-year design and LCCA been considered? Please clarify.	E	The widening of off-ramps and Blossom Hill Road have been designed for a 20-yr pavement life and TI, consistent with HDM 612.3. These existing pavement sections are over 35 years old and are not expected to have a remaining service life of more than 20 years. The stuctural section for the re-aligned NB diagonal on-ramp AR-1 is designed for a 40-yr pavement life and TI, since it is confined by structures and future rehabilitation is expected to be difficult. Since the project involves mostly widening of existing pavements, an LCCA was not prepared.	E	No additional comments from CT Materials 12-9-19	E
15	Ahmad Shahmirza, Materials	General: Please consider reusing the existing pavement materials in the new pavement as the base/subbase as deem fit.	A	The specs will allow the Contractor to reuse existing pavement materials if they meet spec for new AS or AB.	A	No additional comments from CT Materials 12-9-19	A
16	Ahmad Shahmirza, Materials	General: Has stabilizing the existing soft subgrade been considered? Please clarify.	A	Subgrade Enhancement Geotextile (Class B-2) is included in most sections.	A	No additional comments from CT Materials 12-9-19	A
17	Ahmad Shahmirza, Materials	GDMR: Section 8.6 Culvert Design: Please provide corrosion recommendations for culvert design.	A	Per Section 8.5 of the GDMR, the project site is considered non-corrosive.	A	No additional comments from CT Materials 12-9-19	A
18	Ahmad Shahmirza, Materials	GDMR: Section 9.0 Structural Pavement Table 17 A through Table I 7J: Replace assumed R-value with Design R-value.	A	Will Comply	A	No additional comments from CT Materials 12-9-19	A
19	Ahmad Shahmirza, Materials	Plans: Sheet X-1: Pavement design parameter such as Traffic Index shall be included.	A	Will Comply	A	No additional comments from CT Materials 12-9-19	A
20	Ahmad Shahmirza, Materials	Plans: Sheet X-1, C-6, C-9 & HMH Memorandum from GDMR for Pavement Structural Section# 7: The report indicates that this section is for Maintenance Vehicle Pullouts that are not adjacent to new structural sections and is not based on a T.I. However; sheet C-6 and C-9 show MVP on Blossom Hill Road and Coyote Road are both adjacent to travel lane. We recommend that the section #7 to be designed based on the T.L and R-value used on the adjacent shoulder and/or the travel lane. In addition to this, please show the pavement section detail(s) for the MVP on the typical cross sections sheet(s). Please clarify and refer to our memo to your office dated 06/05/2019.	A	Will Comply Will use Struct Section 12 (ramp shoulder section) for MVP and CHP area on AL-4. Will use Struct Section 9 and 10 (on exist pvmt) for MVP along BH Rd. shown on sheet C-6. Plans currrently show Struct Section 1 for MVP along Coyote Rd. shown on sheet C-9. On sheet X-1, Struct Section 7 will be revised to NOT USED. Since each of these MVP sections is different, we prefer not showing on the typical cross section sheet.	A	HMH concurs with CT Materials 12-9-19: They shall show each typical cross section of each MVP, if they are not similar. They do not necessarily have to show on typical cross section details sheets but shall be on plans for construction proposes.	A

Comment and Response Form-CALTRANS

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	Reviewer's Name and Branch/Unit	Comments/Questions	Resp.	Response to Comments/Questions	JRT	JRT Disposition	Final
21	Ahmad Shahmirza, Materials	Plans: Sheet X-2 Pavement Structural Sections #12 on auxiliary lane at 101 southbound loop on-ramp from Blossom Hill Road. It is understood that this section covers the pavement from 2 feet away from edge of travel way to edge of shoulder line. We recommend section #3 continues to edge of shoulder line and the proposed section #12 to be eliminated. In addition to this, existing pavement should not be shown in solid lines.	C A	Use of a lesser shoulder Struct Section #12 rather than the Struct Section #3 was confirmed with D4 Design in e-mail dated 9-11-19, in consideration that there are no plans to widen Route 101 at this location. Will change drafting linework for existing pavement.	A A	HMH concurs with CT Materials 12-9-19: On the last comment response conversation with the consulting group pavement structural sections #12 was not on the picture yet. They just added to this round of the review which does not look like to be structurally adequate. However; Based on the TI value of 10 and the R value of 15 for pavement structural section #12, this section layers shall be as following: 0.20' RHMA-G\0.35' HMA (A)\0.85' AB CLASS 2\ 0.95' AS CLASS 2 For a full depth HMA of this section the layer is as following: 1.25' HMA (A)\ 0.33' AB CLASS 2	A A
22	Ahmad Shahmirza, Materials	Plans: Sheet DD-1 Drainage Details: For storm drain culvert detail #4 please indicate Tack Coat on the detail, it is used on minor concrete before placing HMA. In addition to this, the minimum depth from top of the pipe to the bottom of the concrete cap shall be 9 inches. Also, the concrete cap thickness shall be 12 inches and the rebar clearance from bottom of the concrete cap is 2 inches minimum. Please make the necessary corrections.	A	Will Comply	A	No additional comments from CT Materials 12-9-19	A
23	Ahmad Shahmirza, Materials	Plans: Sheet DD-2 Drainage details: For trench backfill details #6 and #28 the concrete cap depth shall be 12 inches and additional 3 inches for HMA or RHMA-G. Please make the necessary corrections.	A	Will Comply	A	No additional comments from CT Materials 12-9-19	A

PARIKH
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Geotechnical ■
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Materials Testing ■
Construction Inspection ■

Biggs Cardosa Associates
865 The Alameda
San Jose, CA 95126

January 17, 2020
Job No. 2016-146-BOC

Attn: Mr. Greg Kenning, PE.

Subject: US 101/Blossom Hill Road Interchange Project
Blossom Hill Road OC (Widen) Foundation Report Revised Table 13 Pile Data Table

Mr. Greg Kenning, PE.:

Attached is the excerpt of the "Blossom Hill Road OC (Widen) Foundation Report with the revised Table 13 Pile Data Table". The compression and tension values of Bent 2 have been revised to incorporate Caltrans' review comments and consistent with the "Pile Data Table" in the "Foundation Plan".

Respectfully submitted,
Parikh Consultants, Inc.

Alston Lam, P.E., G.E. 2605
Senior Engineer

Attachment: Blossom Hill Road OC (Widen) Foundation Report Revise Page 21

TABLE 12 - FOUNDATION RECOMMENDATIONS

Location	Cut-off Elev. Or Bottom of Footing Elev. (ft)	Service-I Limit State Load per Support (kips)		Total Permissible Support Settlement (inches)	Nominal Resistance[iii), (iv)] (kips)				Design Tip Elev.[i] (ft)	Specified Tip Elev. (ft)	Required Nominal Driving Resistance (kips)[ii]
					Strength Limit (φ_{qs}&φ_{qp} = 0.7)		Extreme Event (φ_{qs}&φ_{qp} = 1.0)				
		Total	Permanent		Comp.	Tension	Comp.	Tension			
Abut 1	215.8 to 216.3	1,800	1,500	1	430	N/A	234(v)	N/A	141.0 (a-I) 159.5 (a-II) 176.0 (c), 180.0 (d)	141.0	540
Bent 2	192.80	4,500	3,900	1	320	N/A	350	150	135.0 (a-I) 130.0 (a-II) 149.0 (b-II) 143.0 (c), 167.0 (d)	130.0	470
Abut 3	210.3 to 212.8	1,800	1,500	1	430	N/A	N/A	N/A	131.0 (a-I) 163.0 (c), 175.0 (d)	131.0	550

(i) Design tip elevations are controlled by (a-I) Compression (Strength Limit), (a-II) Compression (Extreme Event), (b-II) Tension (Extreme Event), (c) Settlement, (d) Lateral Load.
(ii) The nominal driving resistance required is equal to the nominal resistance needed to support the factored load plus driving resistance from the penetrated soil layers, if any, which do not contribute to the design resistance.
(iii) Column heading modified from *Required Factored Nominal Resistance* to **Nominal Resistance**
(iv) *Resistance* factor for φ_{qs} is for skin friction and φ_{qp} is for end bearing.
(v) The additional downdrag induced load of 14 kips was assumed in the analysis for Abutment 1 for Extreme Event Limit State.
(vi) Lateral Pile Capacity Analysis was performed by the structural designer.

TABLE 13 – PILE DATA TABLE

Location	Pile Type	Cut-off Elev. or Bottom of Footing Elev. (ft)	Nominal Resistance (kips)		Design Tip Elev. (ft)	Specified Tip Elev. (ft)
			Compression	Tension		
Abut 1	Class 200 Alt. W	215.8 to 216.3[1]	430	0	141.0 (a) 176.0 (c), 180 (d)	141.0
Bent 2	Class 200 Alt. W	192.80	350	150	130.0 (a), 149.0 (b) 143.0 (c), 167.0 (d)	130.0
Abut 3	Class 200 Alt. W	210.3 to 212.8[1]	430	0	131.0 (a) 163.0 (c), 175.0 (d)	131.0

(i) Design tip elevations for Abutments and Bents are controlled by: (a) Compression (b) Tension (c) Settlement (d) Lateral Load
(ii) Lateral Pile Capacity Analysis was performed by the structural designer.

The pile capacities for the Alternate "W" piles were calculated based on guidelines by American Petroleum Institute (API) publication "Recommended Practice for Planning, Designing and Constructing Fixed Offshore Platforms – Working Stress Design" (API RP 2A-WSD, 2002). The pile capacities were derived both from frictional resistance along the pile shaft and end bearing resistance under compression. For soil layers above liquefiable zone, downdrag load is considered as additional ultimate structural demands (Factor of Safety = 1.0)

PREPARED FOR:
HMH ENGINEERS
1570 OAKLAND ROAD
SAN JOSE, CA 95131

PREPARED BY:
GEOCON CONSULTANTS, INC.
6671 BRISA STREET
LIVERMORE, CA 94550

GEOCON

GEOCON PROJECT NO. E9080-02-01
SCL-101, PM R24.4-R28.9
EA 04-1K280

OCTOBER 2018

APPROVED AUGUST 16, 2019

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PRELIMINARY SITE INVESTIGATION REPORT Page

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(Continued)

REPORT LIMITATIONS

This report has been prepared exclusively for the HMH Engineers. 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. Geocon Consultants, Inc. 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.

The contents of this report reflect the views of the author who is responsible for the facts and accuracy of the data presented herein. This report does not constitute a standard, specification, or regulation.

GEOCON CONSULTANTS, INC.

Luann Beadle
Project Scientist

Richard Day, CEG, CHG
Senior Geologist

PRELIMINARY SITE INVESTIGATION REPORT

1.0 INTRODUCTION

This *Preliminary Site Investigation Report* for the United States Highway 101 (US-101)/Blossom Hill Road Interchange Improvement Project in the City of San Jose in Santa Clara County, California was prepared by Geocon for HMH Engineers.

1.1 Project Description and Proposed Improvements

The City of San Jose proposes to modify the US 101/ Blossom Hill Road Interchange to improve traffic operations and connectivity for pedestrians and bicyclists along Blossom Hill Road. The project will be implemented as a locally-funded project with the City of San Jose performing advertisement, award and administration (AAA) of the construction contract through a Caltrans encroachment permit.

The proposed project improvements will occur along Blossom Hill Road from east of the Monterey Road/Blossom Hill Road grade separation to the US 101 Northbound Off-Ramp/Coyote Road intersection. All improvements will be constructed within existing Caltrans and City of San Jose rights-of-way.

The southbound and northbound off-ramps from US 101 will be widened to add a turning lane, and the intersection signals will be modified to accommodate the future traffic needs. A ramp meter will be added to the southbound loop on-ramp and the ramp meter at the northbound diagonal on-ramp will be modified.

The proposed improvements on Blossom Hill Road include widening the existing four lanes within the median to provide an additional lane in each direction, plus a fourth eastbound lane which will become an exit-only lane onto the northbound loop on-ramp. This work includes widening the overcrossing between the two existing overcrossing structures over US 101 and seismic retrofit of the existing overcrossings. The connector from Monterey Road to eastbound Blossom Hill Road will be realigned and the weaving length between the connector and the southbound diagonal on-ramp to US 101 will be increased.

In addition, the existing 5-foot sidewalk on the north side of Blossom Hill Road will be replaced with a 10-foot to 12-foot wide Class I Bike/Pedestrian path. The path will begin at Monterey Road near the Xanders Crossing pedestrian overcrossing, cross under the southbound off-ramp and the southbound loop on-ramp with two short span undercrossing structures and connect to the north side of the existing overcrossing. Concrete slope paving with architectural treatment will be constructed at the undercrossing structures. The Class I Bike/Pedestrian path will cross over the northbound diagonal on-ramp by constructing a truss type pedestrian overcrossing (POC), with an easterly approach consisting of a short

span concrete slab bridge and mechanically stabilized embankment (MSE) walls, and will connect to the existing sidewalk and bike lanes at the US 101 / Northbound Off-Ramp / Coyote Road intersection. Approximately 200 feet of existing soundwall will be replaced at a revised alignment to accommodate the POC construction. The northbound diagonal on-ramp will be reconstructed at a lower profile to accommodate the POC crossing over it and a soil nail wall with architectural treatment will be constructed between Blossom Hill Road and this on-ramp.

The project also includes modifications to existing drainage systems, erosion control, pavement delineation and signing, and a fiber optic communication duct will be relocated by the utility company. Approximately 120 trees of various sizes will be removed, and replacement planting and irrigation will be included in the construction contract.

The project location is depicted on the Vicinity Map, Figure 1.

1.2 General Objectives

The purpose of the site investigation was to evaluate concentrations of California Assessment Manual 17 (CAM 17) metals, including aerially deposited lead (ADL), total petroleum hydrocarbons as diesel (TPHd), as motor oil (TPHmo), and as gasoline (TPHg), benzene, toluene, ethylbenzene, total xylenes (BTEX), methyl tert-butyl ether (MTBE), pesticides, and naturally-occurring asbestos (NOA) in soil, and metals, TPHd, TPHmo, TPHg, and volatile organic compounds (VOCs) in groundwater within the project limits.

The information obtained from this investigation will be used by HMH Engineers to evaluate soil and groundwater handling practices, disposal options, worker health and safety, and soil reuse options.

An asbestos-containing material (ACM) and lead-containing paint (LCP) survey was also performed on the existing Blossom Hill Road bridge structure and reported under separate cover.

2.0 BACKGROUND

2.1 Hazardous Waste Determination Criteria

Regulatory criteria to classify a waste as California hazardous for handling and disposal purposes are contained in the 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), Section 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 has the potential of exceeding the STLC when the waste's total metal content is greater than or equal to 10 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 10 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 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 other criteria. Waste that is classified as either California hazardous or RCRA hazardous requires management as a hazardous waste.

2.2 Soil Management Agreement for ADL-Contaminated Soils

On June 29, 2016, the Department of Toxic Substances Control (DTSC) and Caltrans entered into the *Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils* (DTSC Agreement) for the management of aerially deposited lead (ADL)-contaminated soils generated by Caltrans in the course of State highway projects, in all Caltrans districts, statewide.

"Clean soil" is defined as soil, based on a 95 percent upper confidence limit (95% UCL), containing total lead less than or equal to 80 milligrams per kilogram (mg/kg) and soluble WET lead less than 5 milligrams per liter (mg/l), and not containing other constituents at concentrations that pose an unacceptable threat to human health or the environment.

"ADL-contaminated soil" is defined in the DTSC Agreement as excavated soil, based on a 95% UCL, that contains total lead greater than 80 mg/kg and/or soluble WET lead greater than or equal to 5 mg/l. ADL-contaminated soil reused under the DTSC Agreement must always be at least five feet above the highest groundwater elevation and, depending on lead concentrations, may need to be covered with at least one foot of clean soil or a pavement structure. ADL-contaminated 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. Additionally, ADL-contaminated soil shall not be placed in or covered by soil with a pH less than 5.0. ADL-contaminated soil having a pH less than or equal to 5.0 may not be reused and must be properly disposed of.

The DTSC Agreement conditions regarding the reuse and management of soil for construction and maintenance operations are summarized in Table 1, and a copy of the DTSC Agreement is presented in Appendix A.

2.3 Environmental Screening Levels

The San Francisco Bay Regional Water Quality Control Board (SFRWQCB) has prepared a technical report entitled *User's Guide: Derivation and Application of Environmental Screening Levels, Interim Final 2016* (updated February 2016), which presents Environmental Screening Levels (ESLs) for over 100 commonly found contaminants in soil, groundwater, soil gas, and surface water, to assist in evaluating sites impacted by releases of hazardous chemicals. "If used correctly, ESLs are considered to be protective for typical bay area sites. Under most circumstances, …the presence of a chemical in soil, soil gas, or groundwater at concentrations below the corresponding ESL can be assumed to not pose a significant threat to human health, water resources, or the environment." (SFRWQCB, February 2016).

ESLs are commonly used by contractors, soil trucking companies, and private and commercial land owners as default acceptance criteria to evaluate suitability of import soil material. The respective ESLs are listed at the end of Tables 4 to 6 and 8 to 9 for comparative purposes.

3.0 SCOPE OF SERVICES

The scope of services included the following:

3.1 Pre-field Activities

- Prepared a Site Investigation Workplan in August 2018.
- Notified Underground Service Alert (USA) at least 72 hours prior to drilling activities.
- Retained the services of Statewide Traffic and Safety to provide traffic control during field activities.
- Retained the services of GPRS to perform utility clearance services during field activities.
- Retained the services of Advanced Technology Laboratories (ATL) in Signal Hill, California, a Caltrans-approved and California-certified analytical laboratory, to perform the chemical analyses of soil and groundwater samples.
- Retained the services of EMSL Laboratories in San Leandro, California to perform asbestos analysis of soil samples.

3.2 Field Activities

Our field investigation was performed on September 6 and 7, 2018. Forty-eight borings were advanced using direct-push and hand-auger drilling techniques to a maximum depth of 30 feet. All samples were transported to ATL and EMSL for analysis under standard chain-of-custody (COC) documentation.

4.0 INVESTIGATIVE METHODS

4.1 Sampling Procedures

Soil samples were collected using hand-auger and direct-push drilling techniques advanced in soil along the roadway shoulders. Boring B36 was advanced to groundwater to enable groundwater sample collection. Boring coordinates are presented on Table 2. The Site Map, Figures 2a and 2b, shows the boring locations.

Soil samples were collected into acetate sleeves or stainless steel tubes and capped with Teflon tape and plastic end caps (metals and organics analyses), or in resealable plastic bags (total lead and NOA analysis only). Groundwater samples were collected by inserting temporary screened casing into the open borehole and pumping groundwater using plastic tubing fitted with a check valve into appropriate laboratory containers. Sample containers were labeled, placed in a chest cooled with ice as necessary, and transported to Caltrans-approved, certified environmental laboratories using standard COC documentation. Boring B36 was backfilled with neat cement. The remaining shallow soil borings were backfilled with soil cuttings.

4.2 Laboratory Analyses

Laboratory analyses were performed by ATL and EMSL under standard turnaround times. The laboratory reports and COC documentation are included in Appendix B.

The samples were analyzed as follows:

Soil Samples

- 31 samples for CAM 17 metals using EPA Test Methods 6010 ICAP and 7471.
- 25 samples were further analyzed for WET chromium using EPA Test Method 6010B.
- 20 samples were further analyzed for WET nickel using EPA Test Method 6010B.
- 95 samples for total lead using EPA Test Method 6010 ICAP.
- Three samples were further analyzed for WET lead using EPA Test Method 6010B.
- 46 samples for TPHd using EPA Test Method 8015B.
- 46 samples for TPHmo using EPA Test Method 8015B.
- 46 samples for TPHg using EPA Test Method 8015B.
- 46 samples for BTEX/MTBE using EPA Test Method 8021.
- 42 samples for pesticides using EPA Test Method 8081.
- 25 samples for NOA by CARB 435 with 0.25% analytical sensitivity.

Groundwater Sample

- Total CAM 17 metals using EPA Test Methods 6010B and 7470A.
- TPHd using EPA Test Method 8015B.
- TPHmo using EPA Test Method 8015B.
- TPHg using EPA Test Method 8260B.
- VOCs using EPA Test Method 8260B.

4.3 Laboratory QA/QC

QA/QC procedures were performed for each method of analysis with specificity for each analyte listed in the test method's QA/QC. The laboratory QA/QC procedures included the following:

- One method blank for every 10 samples, batch of samples or type of matrix, whichever was more frequent.
- One sample analyzed in duplicate for every 10 samples, batch of samples or type of matrix, whichever was more frequent.
- One spiked sample for every 10 samples, batch of samples or type of matrix; whichever was more frequent, with the spike made at 10 times the detection limit or at the analyte level.

Prior to submitting the samples to the laboratories, the COC documentation was reviewed for accuracy and completeness.

5.0 INVESTIGATIVE RESULTS

5.1 Subsurface Conditions

Borings were completed using a direct-push drill rig or hand-auger. Soil consisted predominately of dry, dense, light yellowish-brown sandy gravel with silt to a depth of 1 foot, underlain by dry, stiff, light yellowish brown sandy silt to 2.5 feet. Dry, medium yellow to brown, sandy silt was present to 14 feet in boring B36 with moist, soft, medium yellow sandy silt to 24 feet, and soft, wet, loose, medium yellow brown sandy silt between 24 and 30 feet. Groundwater was encountered at a depth of approximately 26 feet in boring B36. Borings B10 and B45 were met with refusal when asphalt was encountered at depths of 0.5 foot and 1 foot, respectively. Borings B5, B9, B11, B13, B15, B37, B38, and B39 were met with refusal at a depth of 1.5 feet. Boring B26 was met with refusal at a depth of 3 feet. Boring B26 was also scheduled to be advanced to groundwater, however, refusal was met at a depth of 3 feet after multiple attempts when serpentine rock was encountered in the area. A boring log for boring B36 is included as Appendix C.

5.2 Laboratory Analytical Results

The analytical results are presented in Tables 3 through 9 and summarized below:

Soil Sample Results:

- The following metals were not detected above their respective laboratory reporting limits: beryllium, cadmium, selenium, silver, and thallium.
- Total chromium was reported at concentrations ranging from 37 mg/kg to 430 mg/kg.
- WET chromium was not detected at or above the reporting limit of 1.0 mg/l.
- Total lead was reported at concentrations ranging from not detected (laboratory reporting limit of 1.0 mg/kg) to 120 mg/kg.
- WET lead was reported at concentrations ranging from not detected (laboratory reporting limit of 1.0 mg/l) to 4.4 mg/l.
- Total nickel was reported at concentrations ranging from 65 mg/kg to 1,700 mg/kg.
- WET nickel was reported at concentrations ranging from not detected (laboratory reporting limit of 1.0 mg/l) to 10 mg/l.
- Remaining CAM 17 metals were reported in the samples at total concentrations below 10 times their respective STLCs.
- TPHd was reported at concentrations ranging from 2.8 mg/kg to 260 mg/kg.
- TPHmo was reported at concentrations ranging from 1.9 mg/kg to 830 mg/kg.
- TPHg was not detected at or above the laboratory reporting limit of 1.0 mg/kg.
- MTBE was reported at concentrations ranging from not detected (laboratory reporting limit of 0.005 mg/kg) to 0.0085 mg/kg.
- BTEX compounds were not detected at or above the laboratory reporting limits.
- Organochlorine pesticides 4,4'-DDE, 4,4'-DDT, alpha-Chlordane, Chlordane, Dieldrin, gamma-Chlordane, and Endrin were reported at concentrations of up to 0.230 mg/kg.
- Remaining organochlorine pesticides were not detected at or above the laboratory reporting limits.
- NOA was observed in 14 of 25 samples at up to 0.50% Chrysotile.

Groundwater Sample Results:

- Total CAM 17 metals were reported at concentrations ranging from not detected to 5.9 mg/l.
- TPHd was reported at a concentration of 0.16 mg/l.
- TPHmo was not detected at or above the reporting limit of 0.05 mg/l.
- TPHg was not detected at or above the laboratory reporting limit of 0.05 mg/l.
- VOCs were not detected at or above the laboratory reporting limits.

5.3 Laboratory Quality Assurance/Quality Control

We reviewed the QA/QC results provided with the laboratory analytical reports (Appendix B). Based on this limited data review, no additional qualifications of the soil data are 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 the upper confidence limits (UCLs) of the arithmetic means of the total lead concentrations for each sampling depth. The upper one-sided 95% UCL of the arithmetic mean is defined as the value that, when calculated repeatedly for randomly drawn subsets of site data, equals or exceeds the true mean 95% of the time. Statistical confidence limits are the classical tool for addressing uncertainties of a distribution mean. The UCLs of the arithmetic mean concentration are used as the 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.

ProUCL (ver 5.1.002) was used to calculate the 95% UCLs. The ProUCL output is included in Appendix D. The following tables present the calculated UCLs and statistics for the site:

Group 1 – Monterey Road EB Connector to Blossom Hill Road (borings B1 to B4)

Sample Interval (feet)	Recommended 95% Total Lead UCL (mg/kg)	Total Lead Mean (mg/kg)	Total Lead Minimum (mg/kg)	Total Lead Maximum (mg/kg)
0 to 0.5	25.15	15.43	8.7	26
1 to 1.5	11.05	6.95	4.1	12
2 to 2.5	8.51	5.9	3.7	8.6

Group 2 – Blossom Hill Road Median West of US-101 and Gore Point to SB US-101 by Depth (B5 to B13)

Sample Interval (feet)	Recommended 95% Total Lead UCL (mg/kg)	Total Lead Mean (mg/kg)	Total Lead Minimum (mg/kg)	Total Lead Maximum (mg/kg)
0 to 0.5	33.74	24.9	9.1	50
1 to 1.5	13.1	7.85	0.5	25
2 to 2.5	6.6	4.35	3.0	7.1

Group 3 – Monterey Road/Blossom Hill Road Connector Median by Depth (borings B14 to B17)

Sample Interval (feet)	Recommended 95% Total Lead UCL (mg/kg)	Total Lead Mean (mg/kg)	Total Lead Minimum (mg/kg)	Total Lead Maximum (mg/kg)
0 to 0.5	115	51.38	0.5	120
1 to 1.5	6.27	2.6	0.5	7.1
2 to 2.5	10.45	5.13	1.5	7.2

Group 3 – All Depths Combined (non-weighted)

Sample Interval (feet)	Recommended 95% Total Lead UCL (mg/kg)	Total Lead Mean (mg/kg)	Total Lead Minimum (mg/kg)	Total Lead Maximum (mg/kg)
0 to 2.5	72.95	21.03	0.5	120

Group 4 – Blossom Hill Road WB Connector to Monterey Road by Depth (borings B18 to B22)

Sample Interval (feet)	Recommended 95% Total Lead UCL (mg/kg)	Total Lead Mean (mg/kg)	Total Lead Minimum (mg/kg)	Total Lead Maximum (mg/kg)
0 to 0.5	36.82	19.74	0.5	39
1 to 1.5	69.32	12.88	2.5	49
2 to 2.5	12.87	8.18	5.5	14

Group 5 – SB US-101 Off-ramp to Blossom Hill Road by Depth (borings B23 to B27)

Sample Interval (feet)	Recommended 95% Total Lead UCL (mg/kg)	Total Lead Mean (mg/kg)	Total Lead Minimum (mg/kg)	Total Lead Maximum (mg/kg)
0 to 0.5	16.7	9.53	4.5	17
1 to 1.5	20.15	9.23	3.4	23
2 to 2.5	9.57	3.7	0.5	11

Group 6 – WB Blossom Hill Road Loop On-ramp to SB US-101 by Depth (borings B28 to B31)

Sample Interval (feet)	Recommended 95% Total Lead UCL (mg/kg)	Total Lead Mean (mg/kg)	Total Lead Minimum (mg/kg)	Total Lead Maximum (mg/kg)
0 to 0.5	6.51	2.03	0.5	5.1
1 to 1.5	12.91	3.67	0.5	10
2 to 2.5	6.38	2.0	0.5	5.0
4.5 to 5	NC	13	13	13
11.5 to 12	NC	6.0	6.0	6.0

NC = Not calculated due to insufficient sample population

Group 7 – WB Blossom Hill Road Diagonal On-ramp to NB US-101 by Depth (borings B32 to B36)

Sample Interval (feet)	Recommended 95% Total Lead UCL (mg/kg)	Total Lead Mean (mg/kg)	Total Lead Minimum (mg/kg)	Total Lead Maximum (mg/kg)
0 to 0.5	16.13	10.13	6.1	17
1 to 1.5	5.46	2.78	0.5	5.8
2 to 2.5	NC	1.48	0.5	4.4
4.5 to 5	NC	6.4	6.4	6.4
11.5 to 12	NC	4.5	4.5	4.5

NC = Not calculated due to insufficient sample population

Group 8 – Blossom Hill Road Median East of US-101 by Depth (borings B37 to B40)

Sample Interval (feet)	Recommended 95% Total Lead UCL (mg/kg)	Total Lead Mean (mg/kg)	Total Lead Minimum (mg/kg)	Total Lead Maximum (mg/kg)
0 to 0.5	18.53	8.73	2.4	21
1 to 1.5	7.97	5.1	3.0	8.2
2 to 2.5	NC	4.8	4.8	4.8

NC = Not calculated due to insufficient sample population

Group 9 – WB Blossom Hill Road Shoulder by Depth (borings B41 to B43)

Sample Interval (feet)	Recommended 95% Total Lead UCL (mg/kg)	Total Lead Mean (mg/kg)	Total Lead Minimum (mg/kg)	Total Lead Maximum (mg/kg)
0 to 0.5	19.74	10.8	5.4	16
1 to 1.5	7.13	3.1	0.5	5.2
2 to 2.5	22.61	8.03	2.5	18

Group 10 – NB Coyote Road Shoulder by Depth (borings B44 and B45)

Sample Interval (feet)	Recommended 95% Total Lead UCL (mg/kg)	Total Lead Mean (mg/kg)	Total Lead Minimum (mg/kg)	Total Lead Maximum (mg/kg)
0 to 0.5	NC	14.2	4.4	24
1 to 1.5	NC	7.1	7.1	7.1
2 to 2.5	NC	7.6	7.6	7.6

NC = Not calculated due to insufficient sample population

Group 11 – SB Coyote Road Shoulder by Depth (borings B46 to B48)

Sample Interval (feet)	Recommended 95% Total Lead UCL (mg/kg)	Total Lead Mean (mg/kg)	Total Lead Minimum (mg/kg)	Total Lead Maximum (mg/kg)
0 to 0.5	18.18	8.43	4.1	15
1 to 1.5	6.13	4.93	4.3	5.7
2 to 2.5	8.39	4.63	3.2	7.2

6.0 CONCLUSIONS

6.1 Lead in Soil

6.1.1 Group 1 - Monterey Road EB Connector to Blossom Hill Road (borings B1 to B4)

Soil in this part of the site excavated to a depth of 2.5 feet would be classified as non-hazardous based on lead content because the maximum total lead concentration of 26 mg/kg is less than the TTLC of 1,000 mg/kg and less than 50 mg/kg (less than 10 times the STLC of 5.0 mg/l). Soil excavated to a depth of 2.5 feet in this area would qualify for unrestricted use according to the DTSC Agreement because the maximum total lead concentration is less than 80 mg/kg.

6.1.2 Group 2 - Blossom Hill Road Median West of US-101 and Gore Point to SB US-101 (B5 to B13)

Soil in the area of the site excavated to a depth of 2.5 feet would be classified as non-hazardous based on lead content because the maximum total lead concentration of 50 mg/kg is less than the TTLC of 1,000 mg/kg and WET lead was not detected at or above the reporting limit of 1.0 mg/l, below the STLC of 5.0 mg/l. Soil excavated to a depth of 2.5 feet in this area would qualify for unrestricted use according to the DTSC Agreement because the maximum total lead concentration is less than 80 mg/kg and the maximum WET lead concentration is less than 5 mg/l.

6.1.3 Group 3 - Monterey Road/Blossom Hill Road Connector Median (borings B14 to B17)

Soil in the area of the site excavated to a depth of 2.5 feet would be classified as non-hazardous based on lead content because the maximum total lead concentration of 120 mg/kg is less than the TTLC of 1,000 mg/kg and WET lead was reported at a maximum concentration of 4.4 mg/l, below the STLC of 5.0 mg/l. Soil excavated to a depth of 2.5 feet in this area would qualify for unrestricted use if managed as a unit according to the DTSC Agreement because the 95% total lead UCL concentration of 72.95 mg/kg is less than 80 mg/kg and the maximum WET lead concentration is less than 5 mg/l.

6.1.4 Group 4 - Blossom Hill Road WB Connector to Monterey Road (borings B18 to B22)

Soil in this part of the site excavated to a depth of 2.5 feet would be classified as non-hazardous based on lead content because the maximum total lead concentration of 49 mg/kg is less than the TTLC of 1,000 mg/kg and less than 50 mg/kg (less than 10 times the STLC of 5.0 mg/l). Soil excavated to a depth of 2.5 feet in this area would qualify for unrestricted use according to the DTSC Agreement because the maximum total lead concentration is less than 80 mg/kg.

6.1.5 Group 5 - SB US-101 Off-ramp to Blossom Hill Road (borings B23 to B27)

Soil in this part of the site excavated to a depth of 2.5 feet would be classified as non-hazardous based on lead content because the maximum total lead concentration of 23 mg/kg is less than the TTLC of 1,000 mg/kg and less than 50 mg/kg (less than 10 times the STLC of 5.0 mg/l). Soil excavated to a depth of 2.5 feet in this area would qualify for unrestricted use according to the DTSC Agreement because the maximum total lead concentration is less than 80 mg/kg.

6.1.6 Group 6 - WB Blossom Hill Road Loop On-ramp to SB US-101 (borings B28 to B31)

Soil in this part of the site excavated to a depth of 12 feet would be classified as non-hazardous based on lead content because the maximum total lead concentration of 13 mg/kg is less than the TTLC of 1,000 mg/kg and less than 50 mg/kg (less than 10 times the STLC of 5.0 mg/l). Soil excavated to a depth of 12 feet in this area would qualify for unrestricted use according to the DTSC Agreement because the maximum total lead concentration is less than 80 mg/kg.

6.1.7 Group 7 - WB Blossom Hill Road Diagonal On-ramp to NB US-101 (borings B32 to B36)

Soil in this part of the site excavated to a depth of 12 feet would be classified as non-hazardous based on lead content because the maximum total lead concentration of 17 mg/kg is less than the TTLC of 1,000 mg/kg and less than 50 mg/kg (less than 10 times the STLC of 5.0 mg/l). Soil excavated to a depth of 12 feet in this area would qualify for unrestricted use according to the DTSC Agreement because the maximum total lead concentration is less than 80 mg/kg.

6.1.8 Group 8 - Blossom Hill Road Median East of US-101 (borings B37 to B40)

Soil in this part of the site excavated to a depth of 2.5 feet would be classified as non-hazardous based on lead content because the maximum total lead concentration of 21 mg/kg is less than the TTLC of 1,000 mg/kg and less than 50 mg/kg (less than 10 times the STLC of 5.0 mg/l). Soil excavated to a depth of 2.5 feet in this area would qualify for unrestricted use according to the DTSC Agreement because the maximum total lead concentration is less than 80 mg/kg.

6.1.9 Group 9 - WB Blossom Hill Road Shoulder (borings B41 to B43)

Soil in this part of the site excavated to a depth of 2.5 feet would be classified as non-hazardous based on lead content because the maximum total lead concentration of 18 mg/kg is less than the TTLC of 1,000 mg/kg and less than 50 mg/kg (less than 10 times the STLC of 5.0 mg/l). Soil excavated to a depth of 2.5 feet in this area would qualify for unrestricted use according to the DTSC Agreement because the maximum total lead concentration is less than 80 mg/kg.

6.1.10 Group 10 - NB Coyote Road Shoulder (borings B44 and B45)

Soil in this part of the site excavated to a depth of 2.5 feet would be classified as non-hazardous based on lead content because the maximum total lead concentration of 24 mg/kg is less than the TTLC of 1,000 mg/kg and less than 50 mg/kg (less than 10 times the STLC of 5.0 mg/l). Soil excavated to a depth of 2.5 feet in this area would qualify for unrestricted use according to the DTSC Agreement because the maximum total lead concentration is less than 80 mg/kg.

6.1.11 Group 11 - SB Coyote Road Shoulder (borings B46 to B48)

Soil in this part of the site excavated to a depth of 2.5 feet would be classified as non-hazardous based on lead content because the maximum total lead concentration of 15 mg/kg is less than the TTLC of 1,000 mg/kg and less than 50 mg/kg (less than 10 times the STLC of 5.0 mg/l). Soil excavated to a depth of 2.5 feet in this area would qualify for unrestricted use according to the DTSC Agreement because the maximum total lead concentration is less than 80 mg/kg.

6.2 CAM 17 Metals in Soil

With the exceptions of chromium and nickel, CAM 17 metals other than lead were reported in the samples at total concentrations below 10 times their respective STLCs. WET chromium was not detected at or above the reporting limit of 1.0 mg/l, below its STLC of 5.0 mg/l. WET nickel was reported at a maximum concentration of 10 mg/l, below the STLC of 20 mg/l. Accordingly, soil would be classified as non-hazardous based on CAM 17 metals.

The CAM 17 metals concentrations in site soil were compared to ESLs. Arsenic, cobalt, lead, and nickel were reported at concentrations greater than one or more ESL value. Because concentrations of arsenic, cobalt, lead, and nickel exceeded one or more ESL, statistical methods were used to calculate the 95% UCL for total arsenic, cobalt, lead, and nickel. The test results are included in Appendix D. ESLs, UCLs, and published background concentrations for arsenic, cobalt, lead, and nickel are summarized in the following table.

Metal	Maximum	95% UCL	Tier 1 ESL	Shallow Soil Residential ESL	Shallow Soil Commercial/ Industrial ESL	Worker Direct Exposure ESL	Published Background Mean[1]	Published Background Range[1]
Arsenic	6.2	3.23	0.067	0.067	0.31	0.98	3.5	0.6 to 11
Cobalt	79	33.65	23	23	350	28	14.9	2.7 to 46.9
Lead	120	15.8	80	80	320	160	23.9	12.4 to 97.1
Nickel	1,700	606	86	820	11,000	86	57	9.0 to 509

Concentrations reported in mg/kg

[1] Kearney Foundation of Soil Science, March 1996

Based on the maximum and/or the 95% UCL concentrations for arsenic, cobalt, lead, and nickel, reuse or disposal of excavated soil may be restricted, depending on proposed use.

Metals results for soil samples are summarized in Table 4.

6.3 Organic Compounds in Soil

TPHg was not detected in the samples at or above the laboratory reporting limit of 1.0 mg/kg.

BTEX compounds were not detected at or above the laboratory reporting limits.

MTBE was reported in 3 samples at a maximum concentration of 0.0085 mg/kg, below the ESLs.

TPHd was reported at concentrations ranging from 2.8 mg/kg to 260 mg/kg, above the Tier 1 and residential exposure ESLs of 230 mg/kg, but below the commercial/industrial exposure ESL of 1,100 mg/kg. TPHd has a calculated 95% UCL of 69.78 mg/kg.

TPHmo was reported at concentrations ranging from 1.9 mg/kg to 830 mg/kg, below the ESLs.

A summary of organic compounds concentrations in site soil is presented in Table 5.

6.4 Organochlorine Pesticides in Soil

Organochlorine pesticides were reported at concentrations ranging from not detected (laboratory reporting limit of 0.0010 mg/kg) to 0.230 mg/kg.

Dieldrin and Endrin were each reported at concentrations exceeding their respective Tier 1 ESLs in one of 42 samples. Dieldrin was reported at a concentration of 0.036 mg/kg in sample B42-2, exceeding the Tier 1 ESL of 0.017 mg/kg. Endrin was reported at a concentration of 0.0084 mg/kg in sample B1-0, exceeding the Tier 1 ESL of 0.00065 mg/kg. These concentrations are less than the respective residential and commercial/industrial ESLs. Remaining organochlorine pesticides in these samples were reported at concentrations below the ESLs, and the remaining 40 samples reported concentrations below all ESLs.

Reuse or disposal of excavated soil may be restricted based on Dieldrin and/or Endrin content.

A summary of organochlorine pesticide concentrations in site soil is presented in Table 6.

6.5 Naturally-Occurring Asbestos

Twenty-five soil samples were analyzed for asbestos by CARB Test Method 435 using polarized light microscopy (PLM) and at a target sensitivity of 0.25% asbestos. Chrysotile asbestos was reported in

one sample at a concentration of 0.50% and Trace amounts (<0.25% Chrysotile) were observed in 13 samples. Asbestos fibers were not observed in the remaining 11 samples.

CCR Title 17, § 93105 sets forth measures to be followed for the investigation and control of naturally occurring asbestos for construction sites. Areas with NOA at concentrations equal to or greater than 0.25% are above the regulatory threshold. CCR Title 17, § 93106 allows for the averaging of analytical results from a soil mass in order to determine the average asbestos content. When averaging results, conservative convention is to use one-half of the reporting or detection limit as the assumed contaminant content for soils when results are reported at trace levels (<0.25%) or not detected. This method results in the average of the 25 samples collected to be 0.140%, below the 0.25% regulatory threshold.

It is recommended that a contractor have an asbestos compliance plan in place on projects where personnel may be in contact with materials known to contain NOA and that wet methods be employed to minimize the potential for airborne asbestos.

If soil known to contain NOA at less than 0.25% is disposed of offsite, we recommend that the receiver be notified that the material contains NOA at less than 0.25%.

A summary of NOA results is included in Table 7.

6.6 CAM 17 Metals in Groundwater

A grab-groundwater sample was collected from boring B36 and analyzed for total (unfiltered) CAM 17 metals. Antimony, beryllium, cadmium, molybdenum, selenium, silver, and thallium were not detected in the samples at or above the laboratory reporting limits. Arsenic, barium, chromium, cobalt, copper, lead, mercury, nickel, vanadium, and zinc were reported at concentrations equal to or exceeding one or more ESL.

A summary of CAM 17 metals concentrations in groundwater is presented in Table 8.

Based on the reported CAM 17 total metals concentrations, groundwater generated during construction may require treatment to reduce turbidity (i.e., sediment load) and resulting metal content prior to discharge or disposal.

6.7 Organic Compounds in Groundwater

The groundwater sample collected from boring B36 was analyzed for TPHd, TPHmo, TPHg, and VOCs.

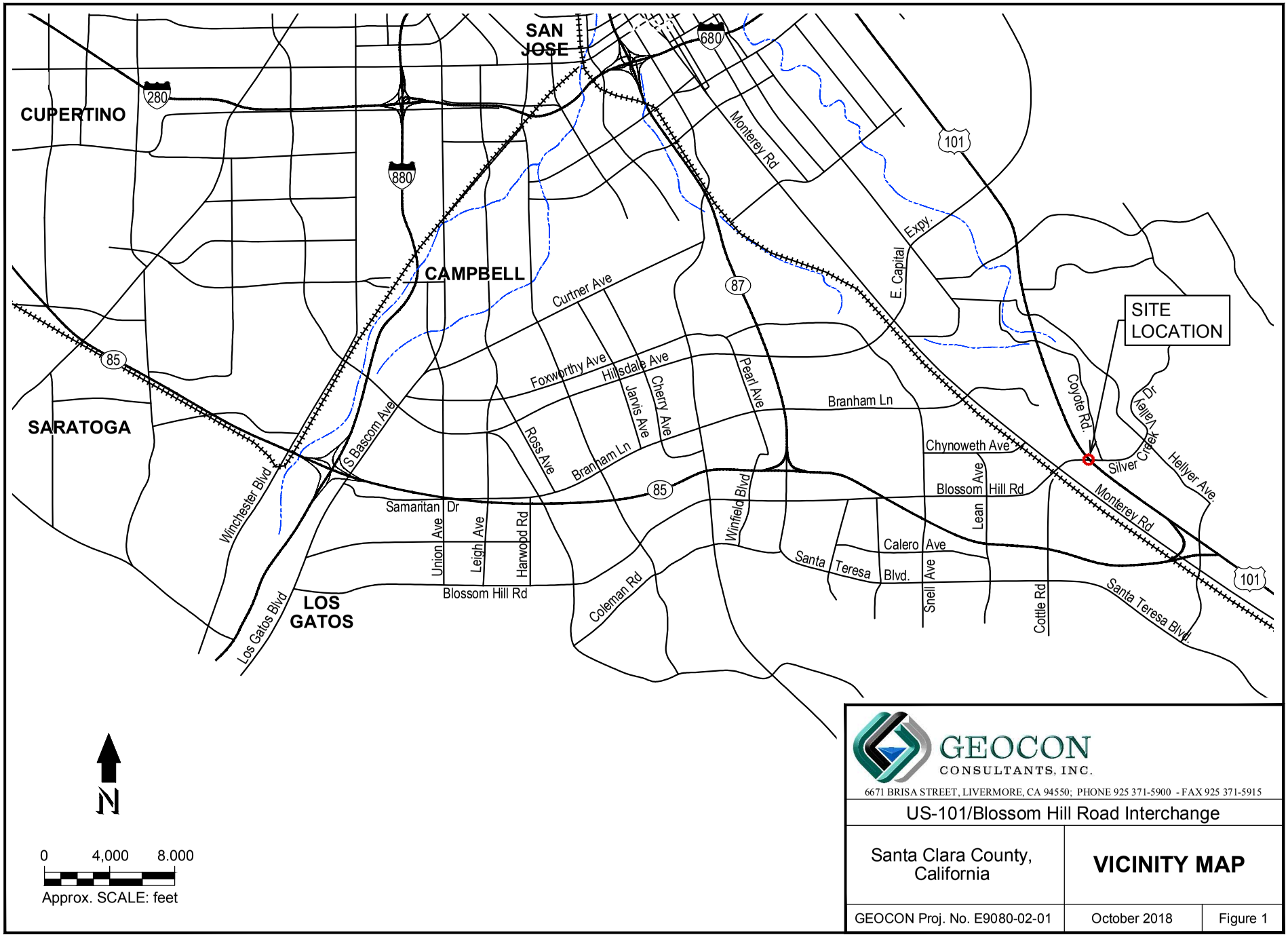
TPHg, TPHmo, and VOCs were not detected at or above the laboratory reporting limits.

TPHd was reported at a concentration of 0.16 mg/l, above the MCL and direct exposure ESLs, but below the fresh and salt water ecological aquatic habitat ESLs. Accordingly, groundwater generated during construction from these areas may require treatment to reduce TPHd content prior to discharge or disposal.

A summary of organic compound concentrations for the groundwater sample is presented in Table 9.

6.8 Worker Protection

The contractor(s) should prepare a project-specific health and safety plan to prevent or minimize worker exposure to metals, TPHd, and organochlorine pesticides in soil and metals and TPHd in groundwater. 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 soil and groundwater.



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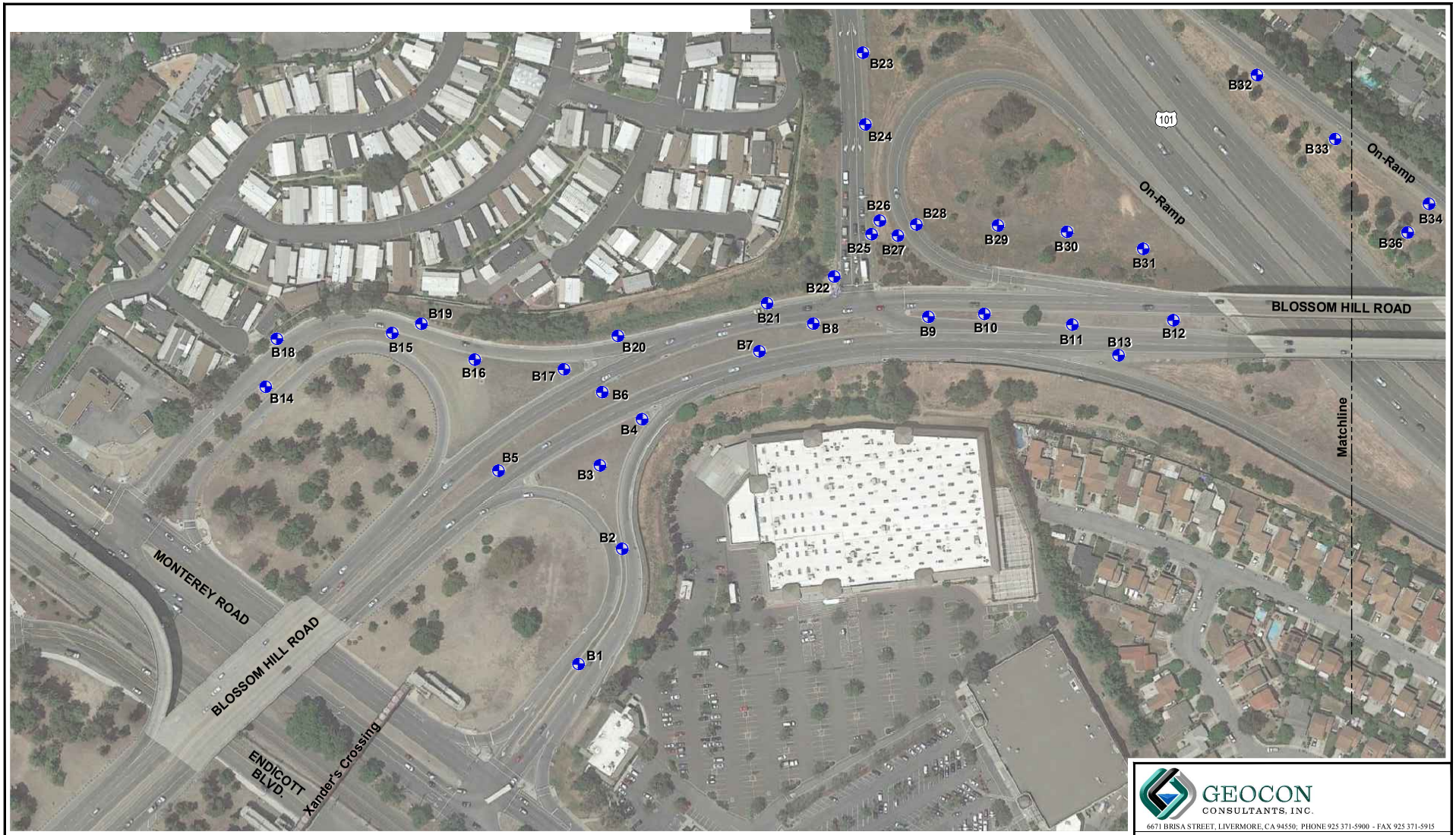
US-101/Blossom Hill Road Interchange

Santa Clara County, California

VICINITY MAP

GEOCON Proj. No. E9080-02-01 | October 2018 | Figure 1

SITE0918a.DWG



LEGEND:
Boring Location

N

0 80 160
Approx. SCALE: feet

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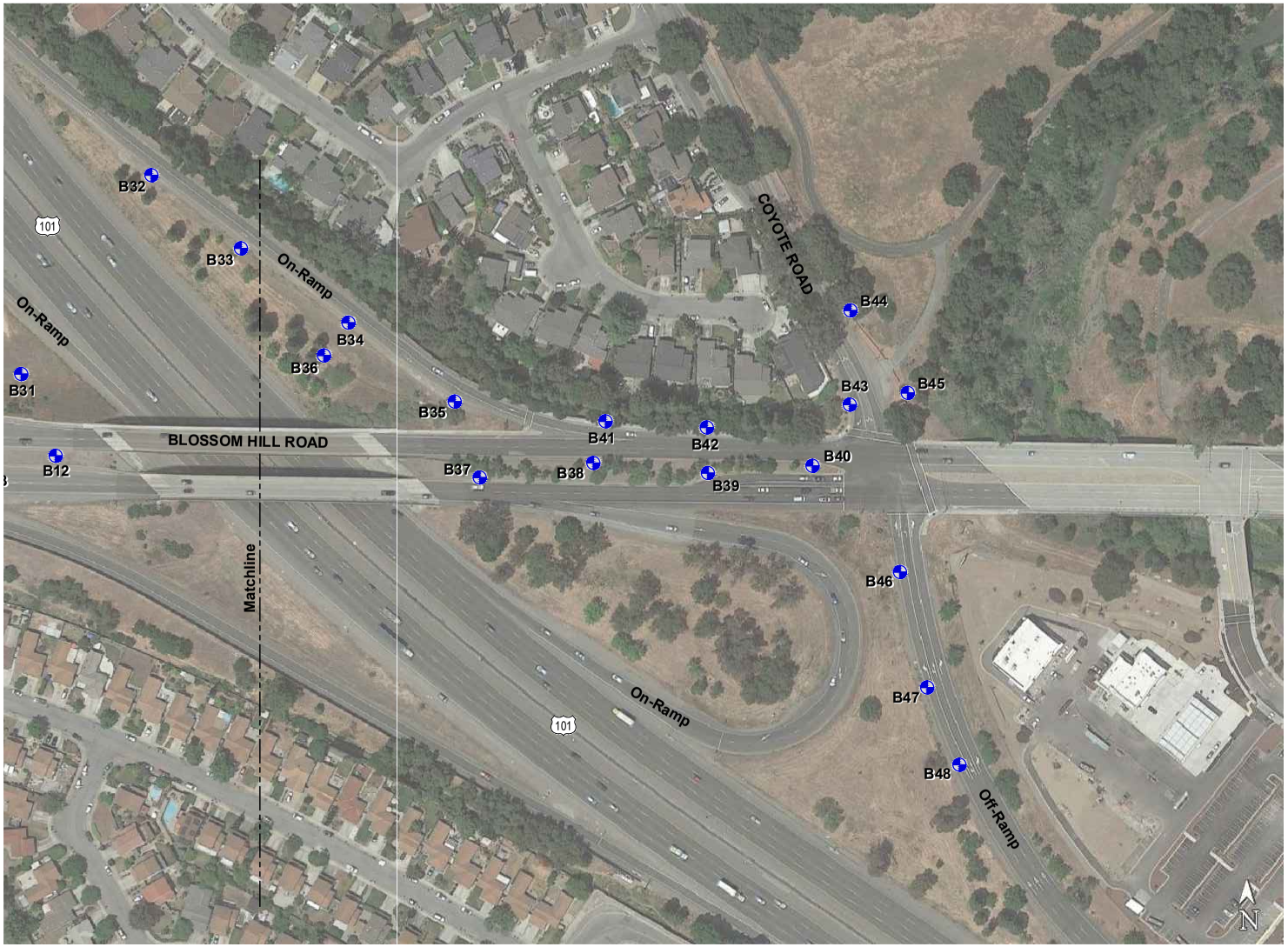
US-101/Blossom Hill Road Interchange

Santa Clara County, California

SITE PLAN

GEOCON Proj. No. E9080-02-01 | October 2018 | Figure 2a

SITE0918a.DWG



LEGEND:
Boring Location

N

0 80 160
Approx. SCALE: feet

GEOCON
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US-101/Blossom Hill Road Interchange

Santa Clara County, California

SITE PLAN

GEOCON Proj. No. E9080-02-01 | October 2018 | Figure 2b

SITE0918a.DWG

TABLE 1
Summary of DTSC Agreement Conditions for Soil Reuse and Management

Material Type	WET Lead (mg/l)		Total Lead (mg/kg)		TCLP Lead (mg/l)		DI-WET Lead (mg/l)	Description
	<5.0	and	≤80	and	<5.0			Non-regulated material for unrestricted use.
Com	<5.0	and	>80 and ≤320	and	<5.0			Regulated material that may be used within Caltrans ROW with no cover requirement. May also be disposed 1) at an appropriately permitted California Class II or California Class III disposal facility, or 2) on a commercial/industrial property by submitting to DTSC a completed agreement between a contractor and a real property owner for disposing of construction-related material on property owner's property.
R-1	≥5.0	or	>320 and ≤1,600	and	<5.0	and	≤1.5	Regulated material that may be used within Caltrans ROW if placed at least 5 feet above maximum historical water table elevation, covered with at least 1 foot of Type Com or non-regulated material or pavement, and in compliance with the ADL Agreement.
R-2	≥5.0	or	>1,600 and ≤3,200	and	<5.0	and	≤150	Regulated material that may be used within Caltrans ROW if placed at least 5 feet above maximum historical water table elevation, covered with pavement, and in compliance with the ADL Agreement.
Z-0	<5.0	and	>320 and <1,000	and	<5.0			Regulated surplus material that must be transported to and disposed of at an appropriately permitted California Class II or California Class III disposal facility.
Z-2	≥5.0	or	≥1,000	and	<5.0			Caltrans-generated California hazardous waste that must be transported to and disposed of at a California Class I disposal facility.
Z-2			>3,200	and	<5.0	or	>150	Caltrans-generated California hazardous waste that must be transported to and disposed of at a California Class I disposal facility.
Z-3					≥5.0			Caltrans-generated Federal hazardous waste that must be transported to and disposed of at a California Class I disposal facility.

Notes: ADL-contaminated soil shall not be placed in or covered by soil with pH less than 5.0.
ADL-contaminated soil having a pH less than or equal to 5.0 may not be reused and must be properly disposed of.

TABLE 2
Boring Coordinates
US-101/Blossom Hill Road Interchange
San Jose, California

Boring	Figure Number	Latitude	Longitude
B1	2a	37.255681765	-121.800797785
B2	2a	37.256215681	-121.800547386
B3	2a	37.256600209	-121.800676919
B4	2a	37.256811041	-121.800432467
B5	2a	37.256572987	-121.801263274
B6	2a	37.256938679	-121.800658425
B7	2a	37.257122995	-121.799752826
B8	2a	37.257249103	-121.799440119
B9	2a	37.257284055	-121.798769636
B10	2a	37.257298712	-121.798448454
B11	2a	37.257247009	-121.797938217
B12	2a and 2b	37.257268801	-121.797352281
B13	2a	37.257103934	-121.797668661
B14	2a	37.256962146	-121.802613380
B15	2a	37.257206522	-121.801883629
B16	2a	37.257087222	-121.801403853
B17	2a	37.257040749	-121.800879392
B18	2a	37.257181359	-121.802546265
B19	2a	37.257256922	-121.801706207
B20	2a	37.257195291	-121.800572823
B21	2a	37.257347836	-121.799710205
B22	2a	37.257467536	-121.799317882
B23	2a	37.258498599	-121.799152143
B24	2a	37.258173393	-121.799135127
B25	2a	37.257662801	-121.799104888
B26	2a	37.257725532	-121.799054435
B27	2a	37.257657281	-121.798947201
B28	2a	37.257704432	-121.798840374
B29	2a	37.257704606	-121.798373660
B30	2a	37.257673055	-121.797969485
B31	2a and 2b	37.257596804	-121.797526867
B32	2a and 2b	37.258398197	-121.796867543
B33	2a and 2b	37.258102554	-121.796413841
B34	2a and 2b	37.257802180	-121.795869810
B35	2b	37.257489486	-121.795340368
B36	2a and 2b	37.257671645	-121.795996097
B37	2b	37.257183374	-121.795214927
B38	2b	37.257238201	-121.794640093
B39	2b	37.257202755	-121.794062347
B40	2b	37.257227822	-121.793531361

TABLE 2
Boring Coordinates
US-101/Blossom Hill Road Interchange
San Jose, California

Boring	Figure Number	Latitude	Longitude
B41	2b	37.257410410	-121.794581309
B42	2b	37.257388134	-121.794070684
B43	2b	37.257477047	-121.793343618
B44	2b	37.257854777	-121.793342183
B45	2b	37.257526803	-121.793052810
B46	2b	37.256800538	-121.793092559
B47	2b	37.256338093	-121.792952976
B48	2b	37.256025830	-121.792787675

TABLE 3
Summary of Lead - Soil
US-101/Blossom Hill Road Interchange
San Jose, California

Group Number	Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)
1	B1-0	0 to 0.5	9.0	---
1	B1-1	1 to 1.5	12	---
1	B1-2	2 to 2.5	8.6	---
1	B2-0	0 to 0.5	26	---
1	B2-1	1 to 1.5	4.1	---
1	B2-2	2 to 2.5	3.7	---
1	B3-0	0 to 0.5	8.7	---
1	B3-1	1 to 1.5	6.3	---
1	B3-2	2 to 2.5	5.1	---
1	B4-0	0 to 0.5	18	---
1	B4-1	1 to 1.5	5.4	---
1	B4-2	2 to 2.5	6.7	---
2	B5-0	0 to 0.5	46	---
2	B5-1	1 to 1.5	25	---
2	B6-0	0 to 0.5	50	<1.0
2	B6-1	1 to 1.5	4.2	---
2	B6-2	2 to 2.5	4.2	---
2	B7-0	0 to 0.5	15	---
2	B7-1	1 to 1.5	6.7	---
2	B7-2	2 to 2.5	7.1	---
2	B8-0	0 to 0.5	27	---
2	B8-1	1 to 1.5	10	---
2	B8-2	2 to 2.5	3.1	---
2	B9-0	0 to 0.5	24	---
2	B9-1	1 to 1.5	11	---
2	B10-0	0 to 0.5	9.1	---
2	B11-0	0 to 0.5	23	---
2	B11-1	1 to 1.5	<1.0	---
2	B12-0	0 to 0.5	15	---
2	B12-1	1 to 1.5	2.5	---
2	B12-2	2 to 2.5	3.0	---

TABLE 3
Summary of Lead - Soil
US-101/Blossom Hill Road Interchange
San Jose, California

Group Number	Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)
2	B13-0	0 to 0.5	15	---
2	B13-1	1 to 1.5	2.9	---
3	B14-0	0 to 0.5	120	4.4
3	B14-1	1 to 1.5	7.1	---
3	B14-2	2 to 2.5	1.5	---
3	B15-0	0 to 0.5	68	1.7
3	B15-1	1 to 1.5	<1.0	---
3	B16-0	0 to 0.5	17	---
3	B16-1	1 to 1.5	2.3	---
3	B16-2	2 to 2.5	6.7	---
3	B17-0	0 to 0.5	<1.0	---
3	B17-1	1 to 1.5	<1.0	---
3	B17-2	2 to 2.5	7.2	---
4	B18-0	0 to 0.5	37	---
4	B18-1	1 to 1.5	49	---
4	B18-2	2 to 2.5	14	---
4	B19-0	0 to 0.5	<1.0	---
4	B19-1	1 to 1.5	<5.0	---
4	B20-0	0 to 0.5	39	---
4	B20-1	1 to 1.5	4.1	---
4	B20-2	2 to 2.5	7.5	---
4	B21-0	0 to 0.5	18	---
4	B21-1	1 to 1.5	3.9	---
4	B21-2	2 to 2.5	5.7	---
4	B22-0	0 to 0.5	4.2	---
4	B22-1	1 to 1.5	4.9	---
4	B22-2	2 to 2.5	5.5	---
5	B23-0	0 to 0.5	17	---
5	B23-1	1 to 1.5	4.0	---
5	B23-2	2 to 2.5	2.8	---

TABLE 3
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US-101/Blossom Hill Road Interchange
San Jose, California

Group Number	Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)
5	B24-0	0 to 0.5	4.5	---
5	B24-1	1 to 1.5	23	---
5	B24-2	2 to 2.5	11	---
5	B25-0	0 to 0.5	4.6	---
5	B25-1	1 to 1.5	3.4	---
5	B26-2.5	2.5 to 3	<1.0	---
5	B27-0	0 to 0.5	12	---
5	B27-1	1 to 1.5	6.5	---
5	B27-2	2 to 2.5	<1.0	---
6	B28-0	0 to 0.5	5.1	---
6	B28-1	1 to 1.5	<20	---
6	B28-2	2 to 2.5	5.0	---
6	B29-0	0 to 0.5	<1.0	---
6	B29-1	1 to 1.5	<1.0	---
6	B29-2	2 to 2.5	<1.0	---
6	B30-0	0 to 0.5	<1.0	---
6	B30-1	1 to 1.5	<1.0	---
6	B30-2	2 to 2.5	<1.0	---
6	B31-4.5	4.5 to 5	13	---
6	B31-11.5	11.5 to 12	6.0	---
7	B32-0	0 to 0.5	11	---
7	B32-1	1 to 1.5	<1.0	---
7	B32-2	2 to 2.5	<1.0	---
7	B33-0	0 to 0.5	6.4	---
7	B33-1	1 to 1.5	1.7	---
7	B33-2	2 to 2.5	<1.0	---
7	B34-0	0 to 0.5	6.1	---
7	B34-1	1 to 1.5	3.1	---
7	B34-2	2 to 2.5	4.4	---
7	B35-0	0 to 0.5	17	---
7	B35-1	1 to 1.5	5.8	---
7	B35-2	2 to 2.5	<1.0	---

TABLE 3
Summary of Lead - Soil
US-101/Blossom Hill Road Interchange
San Jose, California

Group Number	Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)
7	B36-4.5	4.5 to 5	6.4	---
7	B36-11.5	11.5 to 12	4.5	---
8	B37-0	0 to 0.5	5.7	---
8	B37-1	1 to 1.5	3.3	---
8	B38-0	0 to 0.5	2.4	---
8	B38-1	1 to 1.5	3.0	---
8	B39-0	0 to 0.5	5.8	---
8	B39-1	1 to 1.5	5.9	---
8	B40-0	0 to 0.5	21	---
8	B40-1	1 to 1.5	8.2	---
8	B40-2	2 to 2.5	4.8	---
9	B41-0	0 to 0.5	5.4	---
9	B41-1	1 to 1.5	<1.0	---
9	B41-2	2 to 2.5	18	---
9	B42-0	0 to 0.5	11	---
9	B42-1	1 to 1.5	3.6	---
9	B42-2	2 to 2.5	2.5	---
9	B43-0	0 to 0.5	16	---
9	B43-1	1 to 1.5	5.2	---
9	B43-2	2 to 2.5	3.6	---
10	B44-0	0 to 0.5	24	---
10	B44-1	1 to 1.5	7.1	---
10	B44-2	2 to 2.5	7.6	---
10	B45-0	0 to 0.5	4.4	---
11	B46-0	0 to 0.5	15	---
11	B46-1	1 to 1.5	5.7	---
11	B46-2	2 to 2.5	7.2	---
11	B47-0	0 to 0.5	6.2	---
11	B47-1	1 to 1.5	4.3	---
11	B47-2	2 to 2.5	3.5	---

TABLE 3
Summary of Lead - Soil
US-101/Blossom Hill Road Interchange
San Jose, California

Group Number	Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)
11	B48-0	0 to 0.5	4.1	---
11	B48-1	1 to 1.5	4.8	---
11	B48-2	2 to 2.5	3.2	---
		Hazardous Waste Criteria		
		TTLC (mg/kg)	1,000	---
		STLC (mg/l)	---	5.0
		TCLP (mg/l)	---	---

mg/kg = Milligrams per kilogram
mg/l = Milligrams per liter
WET = Waste Extraction Test using citric acid as the extraction fluid
TCLP = Toxicity leaching procedure
STLC = Soluble Threshold Limit Concentration
TTLC = Total Threshold Limit Concentration

Table 4
Summary of CAM 17 Metals Results - Soil
US-101/Blossom Hill Road Interchange
San Jose, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
B1-0	0 to 0.5	<2.0	3.3	110	<1.0	<1.0	110 *<1.0*	25	34	9.0	<0.10	<1.0	340 *1.2*	<1.0	<1.0	<1.0	27	46
B2-2	2 to 2.5	2.1	1.5	120	<1.0	<1.0	160 *<1.0*	28	25	3.7	0.11	<1.0	380 *5.1*	<1.0	<1.0	<1.0	32	38
B4-1	1 to 1.5	<2.0	5.2	92	<1.0	<1.0	37	11	27	5.4	<0.10	<1.0	95	<1.0	<1.0	<1.0	31	49
B6-0	0 to 0.5	<2.0	5.4	200	<1.0	<1.0	70 *<1.0*	16	41	50	<0.10	<1.0	140	<1.0	<1.0	<1.0	34	160
B7-2	2 to 2.5	<2.0	3.4	160	<1.0	<1.0	79 *<1.0*	18	27	7.1	<0.10	<1.0	180	<1.0	<1.0	<1.0	30	57
B9-1	1 to 1.5	<2.0	<1.0	77	<1.0	<1.0	230 *<1.0*	53	18	11	<0.10	<1.0	900 *9.5*	<1.0	<1.0	<1.0	23	38
B11-0	0 to 0.5	3.4	<1.0	47	<1.0	<1.0	240 *<1.0*	35	19	23	<0.10	<1.0	660 *5.7*	<1.0	<1.0	<1.0	17	78
B12-2	2 to 2.5	<2.0	<1.0	71	<1.0	<1.0	130 *<1.0*	38	18	3.0	<0.10	<1.0	740 *6.6*	<1.0	<1.0	<1.0	23	40
B14-0	0 to 0.5	---	---	---	---	---	*<1.0*	---	---	---	---	---	---	---	---	---	---	---
B14-1	1 to 1.5	<2.0	2.0	110	<1.0	<1.0	120 *<1.0*	25	31	7.1	<0.10	<1.0	370 *2.4*	<1.0	<1.0	<1.0	26	44
B15-0	0 to 0.5	---	---	---	---	---	*<1.0*	---	---	---	---	---	---	---	---	---	---	---
B16-0	0 to 0.5	<2.0	2.1	77	<1.0	<1.0	80 *<1.0*	24	23	17	<0.10	<1.0	410 *2.3*	<1.0	<1.0	<1.0	21	120

Table 4
Summary of CAM 17 Metals Results - Soil
US-101/Blossom Hill Road Interchange
San Jose, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
B17-2	2 to 2.5	<2.0	2.0	110	<1.0	<1.0	140 *<1.0*	32	22	7.2	<0.10	<1.0	540 *6.1*	<1.0	<1.0	<1.0	27	43
B19-1	1 to 1.5	<10	<5.0	<5.0	<5.0	<5.0	290 *<1.0*	70	<10	<5.0	<0.10	<5.0	1,400 *6.7*	<5.0	<5.0	<5.0	6.3	19
B21-0	0 to 0.5	<2.0	3.3	85	<1.0	<1.0	38	8.2	58	18	0.12	<1.0	81	<1.0	<1.0	<1.0	24	120
B22-2	2 to 2.5	<2.0	3.4	120	<1.0	<1.0	110 *<1.0*	22	24	5.5	0.69	<1.0	290 *3.9*	<1.0	<1.0	<1.0	31	46
B24-1	1 to 1.5	<4.0	<2.0	43	<2.0	<2.0	240 *<1.0*	49	13	23	<0.10	<2.0	830 *8.3*	<2.0	<2.0	<2.0	17	32
B26-2.5	2.5 to 3	6.1	<1.0	<1.0	<1.0	<1.0	430 *<1.0*	79	7.2	<1.0	<0.10	<1.0	1,700 *10*	<1.0	<1.0	<1.0	22	22
B27-0	0 to 0.5	<2.0	2.9	130	<1.0	<1.0	120 *<1.0*	25	30	12	<0.10	<1.0	390 *3.6*	<1.0	<1.0	<1.0	31	88
B28-2	2 to 2.5	<2.0	<1.0	48	<1.0	<1.0	180 *<1.0*	53	15	5.0	<0.10	<1.0	1,000 *7.2*	<1.0	<1.0	<1.0	17	31
B30-1	1 to 1.5	3.8	<1.0	26	<1.0	<1.0	280 *<1.0*	44	13	<1.0	<0.10	<1.0	920 *7.2*	<1.0	<1.0	<1.0	15	27
B31-4.5	4.5 to 5	<2.0	5.7	170	<1.0	<1.0	41	12	27	13	<0.10	<1.0	71	<1.0	<1.0	<1.0	29	55
B31-11.5	11.5 to 12	<2.0	4.5	130	<1.0	<1.0	44	12	25	6.0	<0.10	<1.0	82	<1.0	<1.0	<1.0	28	48
B33-0	0 to 0.5	<2.0	<1.0	71	<1.0	<1.0	97 *<1.0*	29	19	6.4	<0.10	<1.0	520 *6.0*	<1.0	<1.0	<1.0	25	49

Table 4
Summary of CAM 17 Metals Results - Soil
US-101/Blossom Hill Road Interchange
San Jose, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
B34-2	2 to 2.5	<2.0	<1.0	100	<1.0	<1.0	85 *<1.0*	20	24	4.4	<0.10	<1.0	270 *2.5*	<1.0	<1.0	<1.0	27	46
B36-4.5	4.5 to 5	<2.0	5.3	160	<1.0	<1.0	43	12	28	6.4	<0.10	<1.0	73	<1.0	<1.0	<1.0	29	56
B36-11.5	11.5 to 12	<2.0	3.4	83	<1.0	<1.0	110 *<1.0*	23	21	4.5	<0.10	<1.0	380 *<1.0*	<1.0	<1.0	<1.0	24	47
B37-1	1 to 1.5	<2.0	2.1	72	<1.0	<1.0	71 *<1.0*	16	14	3.3	<0.10	<1.0	230 *1.6*	<1.0	<1.0	<1.0	29	28
B39-0	0 to 0.5	<2.0	6.2	130	<1.0	<1.0	43	11	28	5.8	0.11	<1.0	76	<1.0	<1.0	<1.0	31	50
B40-2	2 to 2.5	<2.0	4.2	140	<1.0	<1.0	37	9.7	24	4.8	<0.10	<1.0	65	<1.0	<1.0	<1.0	30	41
B42-1	1 to 1.5	<2.0	2.4	80	<1.0	<1.0	110 *<1.0*	27	20	3.6	<0.10	<1.0	460 *6.4*	<1.0	<1.0	<1.0	23	45
B44-0	0 to 0.5	<2.0	1.8	130	<1.0	<1.0	74 *<1.0*	13	49	24	<0.10	<1.0	130	<1.0	<1.0	<1.0	35	130
B47-1	1 to 1.5	<2.0	5.1	88	<1.0	<1.0	37	9.6	24	4.3	<0.10	<1.0	83	<1.0	<1.0	<1.0	26	42
Hazardous Waste Criteria																		
TTLC (mg/kg)		500	500	10,000	75	100	2,500	8,000	2,500	1,000	20	3,500	2,000	100	500	700	2,400	5,000
STLC (mg/l)		15	5.0	100	0.75	1.0	5.0	80	25	5.0	0.2	350	20	1.0	5.0	7.0	24	250
TCLP (mg/l)		---	5.0	100	---	1.0	6.0	---	---	5.0	0.2	---	---	1.0	5.0	---	---	---
February 2016 ESLs (Rev 3)																		
Tier 1		31	0.067	3,000	42	39	120,000	23	3,100	80	13	390	86	390	390	0.78	390	23,000
Residential Direct Exposure		31	0.067	15,000	150	39	120,000	23	3,100	80	13	390	820	390	390	0.78	390	23,000
Commercial/Industrial Direct Exposure		470	0.31	220,000	2,200	580	1,800,000	350	47,000	320	190	5,800	11,000	5,800	5,800	12	5,800	350,000

Table 4
Summary of CAM 17 Metals Results - Soil
US-101/Blossom Hill Road Interchange
San Jose, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Background Concentrations [1]																		
	Minimum	0.15	0.6	133	0.25	0.05	23	2.7	9.1	12.4	0.10	0.1	9.0	0.015	0.10	0.17	39	88
	Mean	0.60	3.5	509	1.28	0.36	122	14.9	28.7	23.9	0.26	1.3	57	0.058	0.80	0.56	112	149
	Maximum	1.95	11	1,400	2.70	1.70	1,579	46.9	96.4	97.1	0.90	9.6	509	0.430	8.30	1.10	288	236

Notes:

Results are shown in milligrams per kilogram (mg/kg)

< = not detected at or above laboratory reporting limit

Results shown in italics are soluble results in milligrams per liter (mg/l)

[1] = Background Concentrations of Trace and Major Elements in California Soils (Kearney Foundation of Soil Science, Division of Agricultural and Natural Resources, University of California, March 1996)

ESLs = Environmental Screening Levels, SFRWQCB, February 2016 (Rev 3)

TTLC = Total Threshold Limit Concentration

STLC = Soluble Threshold Limit Concentration

TCLP = Toxicity Characteristic Leaching Procedure

TABLE 5
Summary of Organic Compounds Results - Soil
US-101/Blossom Hill Road Interchange
San Jose, California

Sample ID	Sample Depth (ft)	TPHd (mg/kg)	TPHmo (mg/kg)	TPHg (mg/kg)	BTEX/MTBE (mg/kg)
B1-0	0 to 0.5	54	180	<1.0	MTBE = 0.0051
B2-1	1 to 1.5	6.3	5.1	<1.0	ND
B3-2	2 to 2.5	8.7	14	<1.0	ND
B4-0	0 to 0.5	16	49	<1.0	ND
B5-1	1 to 1.5	35	110	<1.0	ND
B6-2	2 to 2.5	7.0	6.3	<1.0	ND
B7-0	0 to 0.5	16	40	<1.0	ND
B8-1	1 to 1.5	8.9	17	<1.0	MTBE = 0.0085
B10-0	0 to 0.5	80	80	<1.0	ND
B11-1	1 to 1.5	3.7	3.8	<1.0	ND
B12-2	2 to 2.5	7.7	13	<1.0	ND
B13-0	0 to 0.5	200	740	<1.0	ND
B14-1	1 to 1.5	11	22	<1.0	ND
B16-0	0 to 0.5	19	63	<1.0	ND
B17-0	0 to 0.5	16	52	<1.0	ND
B18-2	2 to 2.5	12	31	<1.0	ND
B19-0	0 to 0.5	8.2	9.8	<1.0	ND
B20-1	1 to 1.5	7.7	6.2	<1.0	ND
B21-2	2 to 2.5	260	810	<1.0	ND
B22-0	0 to 0.5	40	120	<1.0	ND
B23-1	1 to 1.5	9.2	12	<1.0	ND
B24-2	2 to 2.5	16	42	<1.0	ND

TABLE 5
Summary of Organic Compounds Results - Soil
US-101/Blossom Hill Road Interchange
San Jose, California

Sample ID	Sample Depth (ft)	TPHd (mg/kg)	TPHmo (mg/kg)	TPHg (mg/kg)	BTEX/MTBE (mg/kg)
B25-0	0 to 0.5	25	83	<1.0	ND
B26-2.5	2.5 to 3	8.7	11	<1.0	ND
B27-1	1 to 1.5	9.2	18	<1.0	ND
B28-2	2 to 2.5	7.3	9.3	<1.0	ND
B29-0	0 to 0.5	13	13	<1.0	ND
B30-1	1 to 1.5	7.0	4.7	<1.0	ND
B31-4.5	4.5 to 5	3.1	1.9	<1.0	ND
B31-11.5	11.5 to 12	5.2	3.1	<1.0	ND
B32-2	2 to 2.5	4.1	3.0	<1.0	ND
B33-0	0 to 0.5	9.0	8.0	<1.0	ND
B34-1	1 to 1.5	3.9	3.6	<1.0	ND
B35-2	2 to 2.5	2.8	3.3	<1.0	ND
B36-4.5	4.5 to 5	7.4	8.5	<1.0	ND
B36-11.5	11.5 to 12	13	19	<1.0	ND
B37-0	0 to 0.5	210	830	<1.0	ND
B38-1	1 to 1.5	170	650	<1.0	MTBE = 0.0062
B40-0	0 to 0.5	56	180	<1.0	ND
B41-1	1 to 1.5	7.2	15	<1.0	ND
B42-2	2 to 2.5	5.6	7.1	<1.0	ND
B43-0	0 to 0.5	19	56	<1.0	ND
B44-1	1 to 1.5	4.7	7.2	<1.0	ND
B46-0	0 to 0.5	37	130	<1.0	ND
B47-1	1 to 1.5	6.5	6.9	<1.0	ND

TABLE 5
Summary of Organic Compounds Results - Soil
US-101/Blossom Hill Road Interchange
San Jose, California

Sample ID	Sample Depth (ft)	TPHd (mg/kg)	TPHmo (mg/kg)	TPHg (mg/kg)	BTEX/MTBE (mg/kg)
B48-2	2 to 2.5	5.6	5.3	<1.0	ND
February 2016 ESLs (Rev 3)					
Tier 1		230	5,100	100	0.023
Residential Direct Exposure		230	11,000	740	42
Commercial/Industrial Direct Exposure		1,100	140,000	3,900	180
Construction Worker Direct Exposure		880	32,000	2,800	3,700

Notes:
mg/kg = Milligrams per kilogram
µg/kg = micrograms per kilogram
TPHd = Total petroleum hydrocarbons as diesel
TPHmo = Total petroleum hydrocarbons as motor oil
TPHg = Total petroleum hydrocarbons as gasoline
VOCs = Volatile organic compounds
* = 1.3/1.4 denotes primary/duplicate analyses
ESLs = Environmental Screening Levels, SFRWQCB, February 2016 (Rev 3)

TABLE 6
Summary of Organochlorine Pesticide Results - Soil
US-101/Blossom Hill Road Interchange
San Jose, California

Sample ID	Sample Interval (ft)	4,4´-DDE	4,4´-DDT	alpha-Chlordane	Chlordane	Dieldrin	gamma-Chlordane	Endrin	Other Pesticides
B1-0	0 to 0.5	0.230	0.080	0.0038	0.042	0.0096	0.0041	0.0084	ND
B2-1	1 to 1.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B3-2	2 to 2.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B4-0	0 to 0.5	0.016	0.0096	<0.0010	0.0089	<0.0020	<0.0010	<0.0020	ND
B5-1	1 to 1.5	<0.0020	<0.0020	<0.0010	0.0098	<0.0020	0.0011	<0.0020	ND
B6-2	2 to 2.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B7-0	0 to 0.5	<0.0040	<0.0040	<0.0020	<0.017	<0.0040	<0.0020	<0.0040	ND
B8-1	1 to 1.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B10-0	0 to 0.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B11-1	1 to 1.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B12-2	2 to 2.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B13-0	0 to 0.5	<0.020	<0.020	<0.010	<0.085	<0.020	<0.010	<0.020	ND
B14-1	1 to 1.5	0.027	0.016	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND

TABLE 6
Summary of Organochlorine Pesticide Results - Soil
US-101/Blossom Hill Road Interchange
San Jose, California

Sample ID	Sample Interval (ft)	4,4´-DDE	4,4´-DDT	alpha-Chlordane	Chlordane	Dieldrin	gamma-Chlordane	Endrin	Other Pesticides
B16-0	0 to 0.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B17-0	0 to 0.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B18-2	2 to 2.5	0.0045	0.0035	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B19-0	0 to 0.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B20-1	1 to 1.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B21-2	2 to 2.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B22-0	0 to 0.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B23-1	1 to 1.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B24-2	2 to 2.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B25-0	0 to 0.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B27-1	1 to 1.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B28-2	2 to 2.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B29-0	0 to 0.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND

TABLE 6
Summary of Organochlorine Pesticide Results - Soil
US-101/Blossom Hill Road Interchange
San Jose, California

Sample ID	Sample Interval (ft)	4,4´-DDE	4,4´-DDT	alpha-Chlordane	Chlordane	Dieldrin	gamma-Chlordane	Endrin	Other Pesticides
B30-1	1 to 1.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B32-2	2 to 2.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B33-0	0 to 0.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B34-1	1 to 1.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B35-2	2 to 2.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B36-4.5	4.5 to 5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B37-0	0 to 0.5	<0.010	<0.010	<0.0050	<0.042	<0.010	<0.0050	<0.010	ND
B38-1	1 to 1.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B40-0	0 to 0.5	0.0073	0.014	<0.0010	0.0093	0.0055	0.0011	<0.0020	ND
B41-1	1 to 1.5	<0.0020	0.0078	<0.0010	<0.0085	0.0022	<0.0010	<0.0020	ND
B42-2	2 to 2.5	0.011	0.039	<0.0010	<0.0085	0.036	<0.0010	<0.0020	ND
B43-0	0 to 0.5	<0.0040	0.0080	<0.0020	<0.017	<0.0040	<0.0020	<0.0040	ND
B44-1	1 to 1.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND

TABLE 6
Summary of Organochlorine Pesticide Results - Soil
US-101/Blossom Hill Road Interchange
San Jose, California

Sample ID	Sample Interval (ft)	4,4´-DDE	4,4´-DDT	alpha-Chlordane	Chlordane	Dieldrin	gamma-Chlordane	Endrin	Other Pesticides
B46-0	0 to 0.5	0.012	0.011	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B47-1	1 to 1.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
B48-2	2 to 2.5	<0.0020	<0.0020	<0.0010	<0.0085	<0.0020	<0.0010	<0.0020	ND
February 2016 ESLs									
Tier 1		1.9	1.9	---	0.48	0.017	---	0.00065	---
Residential Shallow Soil Exposure		1.9	1.9	---	0.48	0.038	---	21	---
Commercial/Industrial Shallow Soil Exposure		8.5	8.5	---	2.2	0.17	---	290	---
Construction Worker Soil Exposure		57	57	---	14	1.1	---	74	---

Notes:
Results shown in micrograms per kilogram (mg/kg)
ND = None detected above laboratory reporting limits
ESL = Environmental Screening Level, SFRWQCB, February 2016

TABLE 7
Summary of NOA Results - Soil
US-101/Blossom Hill Road Interchange
San Jose, California

Sample ID	Sample Interval (feet)	Asbestos Content
B1-0	0 to 0.5	None Detected
B3-1	1 to 1.5	<0.25% Chrysotile
B7-0	0 to 0.5	<0.25% Chrysotile
B9-1	1 to 1.5	<0.25% Chrysotile
B11-2	2 to 2.5	<0.25% Chrysotile
B13-0	0 to 0.5	None Detected
B17-0	0 to 0.5	0.50% Chrysotile
B19-0	0 to 0.5	<0.25% Chrysotile
B21-1	1 to 1.5	None Detected
B23-2	2 to 2.5	<0.25% Chrysotile
B25-0	0 to 0.5	<0.25% Chrysotile
B26-2.5	2.5 to 3	<0.25% Chrysotile
B28-1	1 to 1.5	<0.25% Chrysotile
B30-2	2 to 2.5	<0.25% Chrysotile
B31-4.5	4.5 to 5	None Detected
B31-11.5	11.5 to 12	None Detected
B33-0	0 to 0.5	<0.25% Chrysotile
B35-1	1 to 1.5	<0.25% Chrysotile
B36-4.5	4.5 to 5	None Detected
B36-11.5	11.5 to 12	None Detected
B40-0	0 to 0.5	None Detected
B42-1	1 to 1.5	<0.25% Chrysotile
B44-2	2 to 2.5	None Detected
B46-0	0 to 0.5	None Detected
B48-1	1 to 1.5	None Detected

ND - None Detected at a target analytical sensitivity of 0.25%.

TABLE 8
Summary of CAM 17 Metals Results - Groundwater
US-101/Blossom Hill Road Interchange
San Jose, California

Sample ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
B36-GW (Total)	<0.050	0.055	5.9	<0.015	<0.015	0.78	0.51	0.52	0.051	0.00091	<0.025	2.6	<0.050	<0.015	<0.075	0.52	1.2
February 2016 ESLs (Rev 3) [1]																	
MCL	0.006	0.01	1.0	0.004	0.005	22	0.006	1.0	0.015	0.002	0.1	0.1	0.05	0.1	0.002	0.05	5.0
Direct Exposure Human Health	0.0078	4E-06	2.0	0.001	0.00004	22	0.006	0.3	0.0002	0.0012	0.1	0.012	0.03	0.094	0.0001	0.05	6.0
Fresh Water Ecological Aquatic Habitat	0.03	0.15	---	0.0027	0.00025	0.18	0.003	0.009	0.0025	0.00077	0.24	0.052	0.005	0.00034	0.02	0.019	0.12
Saltwater Ecological Aquatic Habitat	0.5	0.036	---	---	0.0093	1.0	---	0.0031	0.0081	0.00094	---	0.0082	0.071	0.00019	0.21	---	0.081
Gross Contamination	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50

Notes:

Results shown in milligrams per liter (mg/l)

Total metals analysis performed without filtration (total) and with filtration (dissolved)

< = Not detected above the stated laboratory reporting limit

ESLs = Environmental Screening Levels, SFRWQCB, February 2016, (Rev 3)

[1] = ESL values shown for chromium are for Chromium III

TABLE 9
Summary of Organic Compounds Results - Groundwater
US-101/Blossom Hill Road Interchange
San Jose, California

Sample ID	TPHd (mg/l)	TPHmo (mg/l)	TPHg (mg/l)	VOCs (µg/l)
B36-GW	0.16	<0.05	<0.05	ND
February 2016 ESLs (Rev 3)				
MCL	0.15	See Note (1)	0.22	---
Direct Exposure Human Health	0.15	See Note (1)	0.22	---
resh Water Ecological Aquatic Habitat	0.64	---	0.44	---
Saltwater Ecological Aquatic Habitat	0.64	---	3.7	---

Notes:
mg/l = milligrams per liter
µg/l = micrograms per liter
TPHd = Total petroleum hydrocarbons as diesel
TPHmo = Total petroleum hydrocarbons as motor oil
TPHg = Total petroleum hydrocarbons as gasoline
VOCs = Volatile organic compounds
--- = Not analyzed or no standard
< = Not detected above the stated laboratory reporting limit
ESLs = Environmental Screening Levels, (SFRWQCB, February 2016)
MCL = Maximum Contaminant Level
(1) = TPHmo is not soluble and detections in groundwater are most likely petroleum degradates. If detections are degradates, add TPHd and TPHmo results and compare to TPHd criterion.

APPENDIX A

STATE OF CALIFORNIA
ENVIRONMENTAL PROTECTION AGENCY
DEPARTMENT OF TOXIC SUBSTANCES CONTROL

In the Matter of: Aerially Deposited Lead Contaminated Soils in State Highway Rights-of-Way Project Proponent: California Department of Transportation Division of Environmental Analysis P.O. Box 94284, MS-27 Sacramento, California 94723-0001	Docket No. ESPO-SMA 15/16-001 Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils Health and Safety Code Section 25187(b)(5)

I. INTRODUCTION

1.1 Parties. The California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) enters into this Soil Management for Aerially Deposited Lead-Contaminated Soils Agreement (Agreement) with the California Department of Transportation (Caltrans).

1.2 Jurisdiction. This Agreement is entered into by DTSC and Caltrans pursuant to Health and Safety Code (H&SC) section 25187(b)(5), as Caltrans may generate ADL-contaminated soil in the course of future activities for State highway projects.

1.3 Purpose. This Agreement applies to the future management of aerially deposited lead (ADL)-contaminated soil generated by Caltrans in the course of State highway projects, in all Caltrans districts, statewide. The future management activities to which this Agreement generally applies are the stockpiling, disposal, tracking, transportation and final placement of ADL-contaminated soil. Subject to Section 3.23, this Agreement is not a corrective action order based on Caltrans' past ADL-contaminated soil management practices.

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II.BACKGROUND

2.1 History. Refiners in the United States started adding lead compounds to gasoline in the 1920s in order to boost octane levels and improve engine performance by reducing engine 'knock' and allowing higher engine compression. Tailpipe emissions from automobiles using leaded gasoline contained lead and resulted in ADL being deposited in and along roadways throughout the State. The phasedown of lead in gasoline began in 1974 when, under the authority of the Clean Air Act Amendments of 1970, the U.S. Environmental Protection Agency (EPA) introduced rules requiring the use of unleaded gasoline in new cars equipped with catalytic converters. The introduction of catalytic converters for control of hydrocarbon (HC), nitrous oxide (NOx) and carbon monoxide (CO) emissions required that motorists use unleaded gasoline because lead destroys the emissions control capacity of catalytic converters. By the early1980s gasoline lead levels had declined about 80% as a result of both the regulations and fleet turnover. Beginning in 1992, lead was banned as a fuel additive in California.

ADL-contaminated soil still exists along roadsides and medians and can also be found underneath some existing road surfaces due to past construction activities. The highest lead concentrations are usually found within 10 feet of the edge of the pavement and within the top six inches of the soil. In some cases, lead is as deep as two to three feet below the surface and can extend 20 feet or more from the edge of pavement. Transportation of such soil to hazardous waste landfills challenges the State's limited hazardous waste landfill capacity and increases air pollution due to trucking. The alternative of transporting the soil out of state for disposal is State-resource-intensive, and contrary to Caltrans policy. Caltrans, by managing the soil in accordance with this Agreement, would be reducing hazards, preserving landfill capacity, and reducing the air quality impacts inherent in transporting the soil many miles to landfills, while still protecting human health and the environment.

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Various lines of evidence indicate the potential for lead leaching into groundwater is low. Most important are soil data collected from actual sites in California where Caltrans has conducted construction operations. Measurements of Partitioning Coefficients (Kd) from 595 ADL-contaminated soil samples indicate that lead, while prevalent, is so tightly bound to the soil that it does not pose a serious threat of leaching into the groundwater. The calculated mean Kd of 333 liters per kilogram (L/kg) from northern California soils was the lowest of the groups in the dataset but is still far above the recognized threshold of Kd = 20 for chemicals that are considered immobile and not a threat of leaching to groundwater. However, for soil having pH less than 5; the solubility of lead increases greatly.

Surface water is protected through implementation of Caltrans Stormwater Management Plan (SWMP) which addresses stormwater pollution control related to Caltrans activities, including planning, design, construction, maintenance, and operation of roadways and facilities as required in the Caltrans Statewide Storm Water Permit (State Water Resources Control Board Order 2012-0011-DWQ, as amended by Orders WQ 2014-0006-EXEC, WQ 2014-0077-DWQ & WQ 2015-0036-EXEC). Caltrans submitted a proposed SWMP on November 23, 2015, which must be approved by the State Water Resources Control Board, and as specified in the Permit approved terms of the SWMP are fully enforceable by the State Water Board and nine Regional Water Boards. Surface water is afforded additional protections if there are potential impacts from projects that fall under the jurisdiction of the Coastal Commission (or designees) and/or the California Department of Fish and Wildlife (DFW). Caltrans has partnering agreements with these agencies and they are engaged early in the transportation project development process. The Coastal Commission is a Certified Regulatory Program under CEQA and DFW is a trustee agency under CEQA. As regulatory agencies, both are required under CEQA to review projects within their jurisdiction. Whenever a transportation project is proposed within the California Coastal Zone, the California Coastal Act (Section 30600) states that any activity meeting the definition of

development requires a coastal development permit or verification of an exemption or waiver. Sections 30230 - 30232 of the act specifically address water quality and water quality protection requirements may be added to permits. Whenever a project is proposed within the jurisdiction of the DFW, Caltrans coordinates with DFW on project development pursuant to Sections 1600, 2050, and 2081 of the Fish and Game Code. Section 1600 of the Fish and Game Code regulates impacts to lakes and streambeds. Sections 2050 and 2081 (California Endangered Species Act) regulate impacts to endangered species. Caltrans coordinates with DFW throughout the project delivery process to identify impacts to areas within their jurisdiction and address those impacts. Caltrans standard practice on all projects is to protect water quality by incorporating permanent stormwater pollution prevention Best Management Practices (BMPs) in highway drainage design. These site specific permanent BMPs, which are appropriate for the flow rates, prevent erosion and any associated discharge of pollutants.

2.2 Previous Actions Taken.

In 1995, pursuant to Health and Safety Code 25143, DTSC granted certain Caltrans' districts a Variance from the hazardous waste management requirements 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 for aerially deposited lead-contaminated soils, as defined in the Variance (Variance). The Variance substituted alternative management standards which allowed Caltrans road construction projects to reuse ADL-contaminated soils with hazardous waste levels of lead on project sites while maintaining protection of human health and the environment. Although the level of lead found in some areas is higher than that which is considered to be hazardous waste, it was determined that Caltrans could reuse the soil along the freeways and roads under construction without posing an unacceptable risk to human health or the environment. Keeping these soils in defined areas in which people spend little, if any, time prevents contact with the lead.

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In addition, Caltrans incorporated specifications in its contracts with construction contractors that require contractors to handle hazardous waste level ADL-contaminated soils consistent with the requirements of the Variance. For example, soil found to contain hazardous waste levels of lead is to be kept separate from non-hazardous soil and the contractor takes dust control and security measures to keep people from coming into contact with the soil until it is reused. The hazardous waste level ADL-contaminated soil would stay in place (beneath the road, highway, freeways, or a layer of clean soil, etc.) for the life of the highway. Additional upgrades and widening are much more likely than abandoning old highways. Therefore, the hazardous waste level ADL-contaminated soil would remain secure, and human health and the environment would remain protected long term.

DTSC has issued new variances incorporating additional and more protective provisions approximately every five years since the first Variance in 1995. Additional Caltrans' districts were also added over time. The current Variance includes all Caltrans' districts and has been in effect since 2009. In June 2015, DTSC made the decision to transition from a Variance to this Agreement. This Agreement is intended to control Caltrans future activities to manage ADL contaminated soil. Subject to 3.23, this Agreement is not a corrective action order based on any specific incidents of Caltrans past ADL-contaminated soil management. Existing projects that have implemented the Variance and have completed the Project Approval and Environmental Document milestone prior to July 1, 2016 shall continue to meet all requirements of the Variance set forth in the Transition Plan.

III. AGREEMENT

3.0 IT IS HEREBY AGREED THAT DTSC shall provide oversight of the activities conducted by Caltrans related to soils containing elevated concentrations of aerially deposited lead from car exhaust in State owned highway rights-of-way. Caltrans shall conduct the activities in the manner specified herein. All work, as appropriate, shall be performed consistent with Health and Safety Code, section 25100

et seq., as amended; the National Contingency Plan (40 Code of Federal Regulations (CFR)) Part 300, as amended; DTSC and U.S. EPA RCRA and Superfund guidance documents regarding site investigation and soil management.

3.1 Definitions

3.1.1 **ADL-Contaminated Soil.** For purposes of this Agreement, ADL-contaminated soil is defined as excavated soil whose only constituent of concern that poses an unacceptable risk to human health or the environment is lead, primarily from exhaust emissions from the operation of motor vehicles, in concentrations greater than considered appropriate for unrestricted use by DTSC (currently 80 milligrams per kilogram [mg/kg] total lead based on a 95 percent upper confidence limit [UCL]) and/or 5 mg/l extractable lead based on a 95 percent UCL, as determined by the CA Waste Extraction Test (CA-WET).

3.1.2 **Clean Soil.** For purposes of this agreement, clean soil is defined as soil not containing total lead over 80 mg/kg based on a 95 percent UCL or soluble lead over 5 mg/l based on a 95 percent UCL as determined by the CA-WET and not containing other constituents at levels that would pose an unacceptable risk to human health or the environment or be unacceptable to the Regional Water Quality Control Board with jurisdiction.

3.1.3 **Project Defined Construction Corridor**. For purposes of this agreement, project defined construction corridor is defined as a specified route restricted to the State highway system that connects a Caltrans project where ADL-contaminated soil is excavated to another Caltrans project that accepts the ADL-contaminated soil for reuse. Project defined construction corridors shall be identified in the Project Notification, if determined at the time of submittal, or in the Start of Construction Notification. A project defined construction corridor shall not exceed 150 miles unless DTSC provides prior approval. DTSC shall respond to a corridor evaluation request within 5 days of submittal.

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3.1.4 **Shelved.** For purposes of this agreement, a project is considered shelved when funding is not available for the project to proceed and the project has to be put on hold.

3.2 Scope of Work and DTSC Oversight. This Agreement applies to the management of ADL-contaminated soil excavated from or imported to the State highway system in the course of highway projects, in all Caltrans districts statewide. The management activities to which this Agreement applies are the stockpiling, disposal, tracking, transportation and final placement of ADL-contaminated soil. The ADL-contaminated soil management procedures defined in this Agreement may also be used by Caltrans on joint projects between Caltrans and local government entities, provided it is only used within State-owned highway rights-of-way and Caltrans performs quality assurance and oversight of all phases of the project including environmental assessment, design, contracting, and construction, as well as operation, and maintenance of the project segments within Caltrans' right-of-way. For such joint projects, Caltrans and the local government entity shall each retain joint and severable liability for any noncompliance with the provisions of this Agreement. DTSC shall provide oversight of response activities related to ADL-contaminated soil.

3.3 Additional Activities. Additional activities may be conducted and DTSC oversight provided by amendment to this Agreement or Exhibits hereto in accordance with Paragraph 3.15.

3.4 Agreement Managers. Daniel Ward, P.E., Chief, Engineering and Special Projects Office, is designated by DTSC as its Manager for this Agreement. Shaila Chowdhury, P.E., Chief, Hazardous Waste, Air, Noise and Paleontology Office, is assigned by Caltrans as Manager for this Agreement. Each Party to this Agreement shall provide at least ten (10) days advance written notice to the other of any change in its designated manager.

3.5 Notices and Submittals. All notices, documents and communications required to be given under this Agreement, unless otherwise specified herein, shall be

sent to the respective parties at the following addresses in a manner that produces a record of the sending of the notice, document or communication such as certified mail, overnight delivery service, facsimile transmission, electronic mail, or courier hand delivery service:

3.5.1 To DTSC:
Perry Myers, P.E., Project Manager
Department of Toxic Substances Control
Engineering and Special Projects Office
8800 Cal Center Drive
Sacramento, California 95826
ADL@dtsc.ca.gov

3.5.2 To Caltrans:
Kim Christmann, Senior Engineering Geologist (Agreement Coordinator)
California Department of Transportation
Division of Environmental Analysis
PO Box 942874, MS27
Sacramento, California 94271-0001
ADL@dot.ca.gov

3.6 Communications. All of DTSC's approvals and decisions, when required, made regarding submittals and notifications shall be communicated to Caltrans in writing by DTSC's Agreement Manager or his/her designee. No informal advice, guidance, plans, specifications, schedules or any other writings by DTSC shall be constructed to relieve Caltrans of the obligation to obtain such written approvals.

3.7 Endangerment During Implementation. In the event DTSC determines that any activity within their jurisdiction (whether or not pursued in compliance with this Agreement) may pose an imminent or substantial endangerment to public health or to the environment, DTSC may order Caltrans to stop further implementation for such period of time as may be needed to abate the endangerment.

3.8 Payment. Reimbursement for DTSC's costs related to this agreement, not to exceed $150,000 annually (comprised of no more than 1760 hours plus contract support costs) shall be made through the existing interagency agreement (identified as Caltrans 43A0310 and DTSC 12-T0106) and its successors.

3.9 **Coordinators**. Caltrans shall designate an Agreement Coordinator, with expertise in hazardous waste and hazardous substance handling/management to establish policies and procedures consistent with this Agreement. Additionally, Caltrans shall designate at least one District Coordinator for each Caltrans district in the State. These District Coordinators shall be the primary point of contact for information flowing to or received from DTSC, regarding any matter or submission under this Agreement. Caltrans shall submit the names and addresses of the Coordinators to DTSC. Caltrans shall promptly notify DTSC of any change in the identity of the Coordinators.

3.10 **Access.** After scheduling access with the Caltrans project Resident Engineer, Caltrans shall provide DTSC's employees, and its authorized representatives, access to individual project areas to which access is necessary to implement this Agreement. Such access shall be subject to the Caltrans project Resident Engineer's safety requirements. Nothing in this paragraph is intended or shall be construed to limit in any way the right of entry or inspections that DTSC or any other agency may otherwise have by operation of any law. After scheduling access with the Caltrans project Resident Engineer 24 hours prior to arrival, DTSC's employees and its authorized representatives shall have the authority to enter, and move freely about all property associated with a project area in accordance with the Caltrans project Resident Engineer's safety requirements at all reasonable times for purposes including, but not limited to: inspecting records, operations logs, sampling and analytic data, and contracts relating to activities under this Agreement; reviewing the progress of Caltrans in carrying out the terms of this Agreement; conducting such tests as DTSC may deem necessary; and verifying the data submitted to DTSC by Caltrans.

3.11 **Sampling and Analysis.** Caltrans shall submit to DTSC a sampling and analysis summary that describes sampling activities and analytical methods typically used to characterize potential contamination at highway projects within 60 days of the Effective Date of the Agreement.

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3.12 Sampling, Data and Document Availability. When requested by DTSC, Caltrans shall make available to DTSC and shall provide copies of, all data and information concerning ADL contamination on a project job site, including technical records, ADL sampling and monitoring information and photographs and maps, whether or not such data and information was developed pursuant to this Agreement.

3.13 Notification of Environmental Conditions. Caltrans shall notify DTSC's Agreement Manager immediately upon learning of any condition posing a significant threat to human health or the environment pertaining to ADL-contaminated soil. Within seven (7) days of the onset of such a condition, Caltrans shall furnish a report to DTSC, signed by the Caltrans' Agreement Manager, setting forth the events which occurred and the measures taken in the response thereto.

3.14 Preservation of Documentation. Caltrans shall maintain a repository of the data, reports, and other documents prepared pursuant to Section 4 of this Agreement. All such data, reports and other documents shall be preserved by Caltrans for a minimum of six (6) years after the conclusion of all activities carried out under this Agreement. If DTSC requests that some or all these documents be preserved for a longer period to time, Caltrans shall either comply with that request, deliver the documents to DTSC, or permit DTSC to copy the documents prior to destruction. Caltrans shall notify DTSC in writing at least ninety (90) days prior to the expiration of the six-year minimum retention period before destroying any documents prepared pursuant to this Agreement. If any litigation, claim, negotiation, audit or other actions involving the records have been started before the expiration of the six-year period, the related records shall be retained until the completion and resolution of all issues arising therefrom or until the end of the six-year period, whichever is later.

3.15 Amendments. This Agreement may be amended or modified solely upon written consent of all parties. Such amendments or modifications may be proposed by either party and shall be effective the third business day following the day

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the last party signing the amendment or modification sends its notification of signing to the other party. The parties may agree to a different effective date. The Parties shall review the Agreement every five (5) years for the purpose of determining whether amendments are warranted.

3.16 Integration. This Agreement constitutes the entire Agreement between the parties and may not be amended, supplemented, or modified, except as provided in this Agreement.

3.17 California Environmental Quality Act (CEQA). Consistent with the California Environmental Quality Act, DTSC shall prepare any necessary CEQA documents related to this Agreement. If required, Caltrans shall submit the information necessary for DTSC to prepare these documents. As required by law, Caltrans will ensure that each individual highway project will comply with CEQA, on a project specific basis. Caltrans will consider the reuse of ADL-contaminated soil during the project-specific CEQA process.

3.18 Dispute Resolution. The Parties agree that the procedures contained in this Section are the required informal administrative procedures for resolving disputes arising under this Agreement. If Caltrans fails to follow the procedures contained in this section, it shall have waived its right to further contest the disputed issue. Parties shall follow sections 3.18.1 through and including 3.18.2 to resolve disputes other than billing and cost recovery issues.

3.18.1 The Parties agree in the first instance to attempt to resolve informally, among the DTSC Project Manager and Caltrans Agreement Coordinator, any disagreement as to Caltrans' compliance with the requirements of this Agreement. The DTSC Project Manager shall memorialize the decision and rationale resulting from these discussions (Initial Informal Administrative Decision) and provide it to Caltrans.

3.18.2 If Caltrans disagrees with the Initial Informal Administrative Decision, it may seek a second level of review. The second level reviewers shall be a DTSC Cleanup Program Division Chief and the Caltrans Environmental Analysis Division

Chief, or their designee(s). Within thirty (30) days of the Initial Informal Administrative Decision Caltrans shall provide to these second level reviewers a written notice stating the reasons why the Initial Informal Administrative Decision is not acceptable and the remedy sought. The notice shall include (a) Caltrans original statement of dispute, (b) supporting documents, including the Initial Informal Administrative Decision, and (c) copies of any responses prepared by the DTSC Project Manager**.** These reviewers shall consider the issues raised in Caltrans' notice, and DTSC shall render a written decision to Caltrans within thirty (30) days of receipt of Caltrans written dispute notice. The Parties may meet and confer prior to the written decision and may mutually agree to extend the days for resolution of the dispute. The decision shall constitute DTSC's Final Informal Administrative Decision on the issues in dispute. Caltrans reserves its legal rights to contest or defend against any final informal administrative decision rendered by DTSC under this section. DTSC reserves its rights as set forth throughout this Agreement. If either party contests the Final Informal Administrative Decision they may elevate the dispute to their respective agency.

3.19 Additional Enforcement Actions. By agreeing to this Agreement, DTSC does not waive the right to take further enforcement actions, except to the extent provided in this Agreement.

3.20 Penalties for Noncompliance. Failure to comply with the terms of this Agreement may subject Caltrans, its local governmental entity partners and its contractors to civil penalties and/or punitive damages for any costs incurred by DTSC or other government agencies as a result of such failure, as provided by applicable provisions of law.

3.21 Exhibits. All exhibits attached to this Agreement are incorporated herein by this reference.

3.22 Time-Periods. Unless otherwise specified, time periods begin from the date this Agreement is fully executed, and "days" means calendar days. "Business days" means all calendar days that are not weekends or official State Holidays.

3.23 Caltrans Liabilities. Nothing in this Agreement shall constitute or be considered a satisfaction or release from liability for any condition or claim arising as a result of Caltrans' past, current, or future operations. Nothing in this Agreement is intended or shall be construed to limit the rights of any of the parties with respect to claims arising out of or relating to the deposit or disposal at any other location of substances removed from the rights-of-way, except to the extent provided in this Agreement as related to ADL-contaminated soil.

3.24 DTSC Liabilities. DTSC shall not be liable for any injuries or damages to persons or property resulting from acts or omissions by Caltrans or by related parties in carrying out activities pursuant to this Agreement, nor shall DTSC be held as a party to any contract entered into by Caltrans or its agents in carrying out the activities pursuant to this Agreement.

3.25 Third Party Actions. In the event that Caltrans is a party to any suit or claim for damages or contribution relating to work done under this Agreement to which DTSC is not a party, Caltrans shall notify DTSC in writing within ten (10) days after service of the complaint in the third-party. Caltrans shall pay all costs incurred by DTSC relating to such third-party actions, including but not limited to responding to subpoenas.

3.26 Reservation of Rights. Nothing in this Agreement is intended or shall be construed to limit or preclude DTSC from taking any action authorized by law or equity to protect human health or the environment and recovering the cost thereof.

3.26.1 By entering into this Agreement, Caltrans does not admit to any fact, fault, or liability under any statue or regulation.

3.27 Compliance with Applicable Laws. Nothing in this Agreement shall relieve Caltrans from complying with all other applicable laws and regulations, and Caltrans shall conform all actions required by this Agreement with all applicable federal, state and local laws and regulations.

3.28 California Law. This Agreement shall be governed, performed and interpreted under the laws under the State of California.

3.29 Severability. If any portion of this Agreement is ultimately determined not to be enforceable, that portion shall be severed from the Agreement and the severability shall not affect the enforceability of the remaining terms of the Agreement.

3.30 Parties Bound. This Agreement applies to and is binding upon Caltrans and any successor agency of the State of California, and upon DTSC and any successor agency of the State of California that may have responsibility for and jurisdiction over the subject matter of this Agreement.

3.31 Effective Date. The effective date of this Agreement is the date when this Agreement is fully executed.

3.32 Representative Authority. Each undersigned representative of the parties to this Agreement certifies that he or she is fully authorized to enter into the terms and conditions of this Agreement and to execute and legally bind the parties to this Agreement.

3.33 Counterparts. This Agreement may be executed and delivered in any number of counterparts, each of which when executed and delivered shall be deemed to be an original, but such counterparts shall together constitute one and the same document.

IV. REQUIREMENTS FOR MANAGING ADL-CONTAMINATED SOILS

4.0 All ADL-contaminated soil excavated or imported during construction activities shall be managed consistent with this Agreement to ensure there is not an unacceptable risk to human health or the environment. ADL-contaminated soil shall be managed by Caltrans, its local government entity partners and its contractors according to this section. Decisions regarding the handling of ADL-contaminated soil will be based on a 95 percent UCL in cases where this information is available. If this type of data analysis has not been performed it will be based on the maximum lead value detected.

4.1 General Requirements. General requirements for all highway projects operating under this Agreement:

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4.1.1 For all ADL-contaminated soil handling activities conducted under this Agreement, Caltrans and its contractors shall comply with all applicable federal, State and local laws, including but not limited to requirements of the State Water Resources Control Board (SWRCB) and California Regional Water Quality Control Boards (RWQCBs), water quality control plans and waste discharge requirements (including storm water permits), requirements for ADL-contaminated soil in Coastal Zone Permits issued by the Coastal Commission or its designees, requirements for ADL-contaminated soil in DFW permits, and requirements of the appropriate Air Quality Management District (AQMD) and/or Air Pollution Control District (APCD). If non-compliance with the requirements of any of these agencies related to the management of ADL-contaminated soil results in non-compliance with this Agreement, it may result in an enforcement action by DTSC. Any ADL-contaminated soil exceeding hazardous waste concentrations that, for any reason, is moved outside of the original project limits or the project defined construction corridor (in the case of ADL-contaminated soil moved from one Caltrans project to another) is not covered by this Agreement and is fully subject to the hazardous waste management standards of Health and Safety Code, chapter 6.5 (section 25100, et seq) and regulations adopted thereunder.

4.1.2 Any highway project operating under this Agreement shall comply with all provisions of any California Environmental Quality Act (CEQA) documents prepared by DTSC for this Agreement, and with any additional requirements imposed by any project-specific CEQA study prepared by another government or private entity. Reuse of ADL-contaminated soil will be evaluated during the project-specific CEQA process.

4.1.3 For each project that has the potential to excavate ADL-contaminated soil, 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.

4.1.4 Caltrans shall, pursuant to California Code of Regulations, title 22, section 66262.11, perform hazardous waste characterization of any soil to be disposed

of at a landfill under this Agreement. All sampling and analysis must be conducted in accordance with the appropriate methods specified in U.S. EPA SW-846.

4.1.5 ADL-contaminated soils with any of the following characteristics may not be managed under this Agreement and must be properly disposed of:

4.1.5.1 Soils that are RCRA hazardous waste, including but not limited to soils exceeding the RCRA hazardous waste threshold for lead according to the Toxicity Characteristic Leaching Procedure (TCLP), USEPA Method 1311.

4.1.5.2 Soils that are non-RCRA hazardous waste, except soils whose sole hazardous constituent posing an unacceptable risk to human health or the environment is lead in concentrations not exceeding 3,200 mg/kg of total lead and not exceeding 150 mg/l of extractable lead based on a modified waste extraction test using deionized water as the extractant (DI WET).

4.1.5.3 Soil having a pH less than or equal to 5.0.

4.1.6 Caltrans shall ensure that no hazardous waste, for constituents other than lead, is placed in areas where ADL-contaminated soil is stockpiled or buried in accordance with this Agreement.

4.1.7 ADL-contaminated soil excavated under the authority of this Agreement shall not be stockpiled or buried outside of the project-defined construction corridor from where the soil was excavated, except as provided in section 4.1.7.1. Caltrans may move ADL-contaminated soil from one Caltrans project to another Caltrans project for purposes of stockpiling, placement, or burial only if the soil remains within the project-defined construction corridor except that ADL-contaminated soil shall not be moved from one project to another project and placed on a roadway within the State right-of-way whose original road construction occurred after January 1, 1996, when lead was banned from gasoline nationwide.

4.1.7.1 Soils with concentrations of total lead greater than 80 mg/kg (but not exceeding 320 mg/kg) and extractable lead less than 5 mg/l, as determined by the CA-WET, may be removed from the State highway right of way without disposal in a landfill if they are managed in accordance with section 4.6.

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

4.1.9 During all handling of ADL-contaminated soil, including its initial excavation from roadsides, subsequent loading and unloading onto and from vehicles, and all handling related to stockpiling or burial, Caltrans shall implement fugitive dust control measures using water or other palliatives. Caltrans must comply with any additional dust control requirements imposed by the local AQMD or Air Pollution Control District (APCD).

4.1.10 If visible dust migration beyond the project limits occurs during any activity authorized by this Agreement, whether initial excavation, truck loading/unloading, transportation, stockpiling or burying of the soil, the activity must be stopped until remedial actions are taken, or other conditions change, which enable resumption of the activity without dust migration.

4.1.11 ADL-contaminated soil shall not be placed in or covered by soils with a pH less than 5.0.

4.2 Transportation of ADL-Contaminated Soils. In transporting ADL-contaminated soil on a highway open to the public within the project-defined construction corridor and to other locations pursuant to this Agreement, the following sections of California Code of Regulations, title 22, division 4.5, chapter 13 shall be followed:

4.2.1 Section 66263.16, which requires each vehicle and container used to transport hazardous waste to be designed and constructed, and its contents so limited, as to prevent release of hazardous waste to the environment, and to be free from leaks and all discharge openings securely closed during transportation;

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4.2.2 Section 66263.23, which requires transporters of hazardous waste to use a covered container to transport hazardous wastes that are subject to dispersal by wind;

4.2.3 Sections 66263.30 and 66263.31 which require the transporter, in the case of release of hazardous waste during transportation, to take immediate action to protect human health and the environment including notifying local authorities.

4.3 Stockpiling of ADL-Contaminated Soil Within the State Right-of-Way.

4.3.1 Excavated ADL-contaminated soil designated for burial not placed into the designated burial area by the end of the working day shall be stockpiled on sheets of polyethylene or geomembrane and covered with either sheets of polyethylene or at least one foot of clean soil. The excavated ADL-contaminated soil shall be protected from contacting surface water and from being dislodged or transported by wind or storm water in such a manner that no ADL-contaminated soil is transported beyond the limits of the stockpile while the ADL-contaminated soils are stockpiled. The covers shall be inspected at least once a week and within 24 hours after rainstorms. If the ADL-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.

4.3.2 Caltrans shall stockpile ADL-contaminated soil only on high ground (i.e. no sump areas or low points) so that stockpiled soil shall not come in contact with surface water run-on or run-off.

4.3.3 Caltrans shall not stockpile ADL-contaminated soil in environmentally or ecologically sensitive areas.

4.4 Placement of Surface Soils Within the State Right-of-Way. ADL-contaminated soil with a concentration of extractable lead not exceeding 5 mg/l, as determined by the CA-WET, and total lead not exceeding 320 mg/kg may be placed without cover. The 320 mg/kg limit is protective of adult workers, including pregnant

women. These soils shall not be placed in areas routinely used by the public (e.g. rest stops). Placement of these soils shall also comply with any requirements specified by the California Regional Water Quality Control Board and other agencies, such as the California Coastal Commission and the DFW, with responsibility for and jurisdiction over the area where the project is located.

4.5 Burial Within State Right-of-Way. ADL-contaminated soil containing lead exceeding 5 mg/L, as determined by the CA-WET, or 320 mg/kg total lead may be reused but shall be buried within the State right-of-way consistent with the following provisions. Placement of these soils shall also comply with any requirements specified by the California Regional Water Quality Control Board with responsibility for the area where the project is located.

4.5.1 ADL-contaminated soil shall be buried at least five (5) feet above the maximum historical water table elevation.

4.5.2 ADL-contaminated soil shall not be buried in locations that may require maintenance activities resulting in soil disturbance. ADL-contaminated soil shall not be buried within ten (10) feet of inlets and outlets of drainage unit/systems, such as culverts, in areas to be used for earthen-based stormwater structural treatment facilities, or in Ecologically Sensitive Habitat Areas (ESHA) as defined by the California Coastal Commission, unless it is demonstrated that doing so will not create unacceptable impacts to water quality.

4.5.3 Buried ADL-contaminated soil shall be adequately covered to prevent erosion and reduce water infiltration, in compliance with the following standards, which are also depicted in Table 1:

1. Soil exceeding 5 mg/L, as determined by the CA-WET, or exceeding 320 mg/kg total lead shall be covered by a minimum of one (1) foot of clean soil or a pavement structure, as long as the DI WET concentration does not exceed 1.5 mg/l and total lead does not exceed 1600 mg/kg. In vegetated areas the soil cover must be thick enough to preclude disturbance by planned plant establishment and irrigation system installation and maintenance.
2. Soil with a concentration of extractable lead by DI-WET exceeding 1.5 mg/l or a concentration of total lead exceeding 1600 mg/kg shall be

covered by a pavement structure, as long as the DI-WET concentration does not exceed 150 mg/l and total lead does not exceed 3200 mg/kg.

3. Soil with a concentration of extractable lead by DI-WET exceeding 150 mg/l or a concentration of total lead exceeding 3200 mg/kg total lead is not eligible for management under this Agreement and is subject to full regulation as hazardous waste.

Table 1. Minimum Cover Requirements for ADL-contaminated Soil Based on Extractable and Total Lead Concentrations (95% UCL)*

Extractable Lead Concentration		Total Lead Concentration	Minimum Cover Requirement
Less than 5 mg/l CA-WET	and	Less than 320 mg/kg	No cover requirement
Greater than 5 mg/l CA-WET and equal to or below 1.5 mg/l DI-WET	or	Greater than 320 mg/kg but equal to or below 1600 mg/kg	One foot of clean soil**
Greater than 1.5 mg/l DI-WET but equal to or below 150 mg/l DI-WET	or	Greater than 1600 mg/kg but equal to or below 3200 mg/kg	Pavement structure
Greater than 150 mg/l DI-WET	or	Greater than 3200 mg/kg	Subject to full regulation as hazardous waste

**** ADL-contaminated soil having a pH less than or equal to 5.0 may not be managed under this Agreement and must be properly disposed of.***

*** This is the minimum requirement. Such soil may alternatively be covered by a pavement structure.*

4.5.4 ADL-contaminated soil shall be buried and covered in a manner that shall prevent accidental breach of the covering soil or pavement. ADL-contaminated soil shall only be placed in locations that are protected from possible erosion by storm water run-on or run-off.

4.5.5 Caltrans shall conduct regular inspections, consistent with Caltrans' Maintenance Division's current Pavement Inspection and Slope Inspection programs, of the locations where ADL-contaminated soils have been buried and covered pursuant to this Agreement. If site inspections reveal deterioration of the cover such that conditions

in the Agreement are not met, Caltrans shall notify DTSC and repair or replace the cover within 30 days.

4.6 ADL-Contaminated Soil Reused Or Temporarily Stockpiled Outside The State Right-of-Way.

ADL-contaminated soil removed from the State right-of-way for reuse elsewhere shall be managed appropriately to ensure it does not pose an unacceptable risk to human health or the environment. Soils with a concentration of extractable lead not exceeding 5 mg/l, as determined by the CA-WET, and total lead not exceeding 320 mg/kg is only appropriate for use at commercial/industrial properties. If ADL-contaminated soil is used at a real property located outside the State right-of-way, Caltrans shall submit to DTSC a completed "Agreement between a contractor working on State facilities and a real property owner for disposing construction-related material on property owner's property" as part of the Completion Report described in section 4.12. ADL-contaminated soils with a concentration of extractable lead not exceeding 5 mg/l, as determined by the CA-WET, and total lead not exceeding 320 mg/kg may be temporarily stockpiled outside the project-defined construction corridor at a commercial facility of a contractor working on the project for Caltrans if the requirements of sections 4.2 and 4.3 are adhered to. All such stockpiles shall be removed from said commercial facility prior to completion of the highway project unless that location is to be the final resting place of the ADL-contaminated soil, in which case the soils will be managed according to all requirements of this section.

4.7 Field Changes.

4.7.1 Changes in location of ADL-contaminated soil placement, quantities or protection measures from the original design (field changes) shall be noted in the Resident Engineer's Diary within five (5) days of the field change.

4.7.2 Caltrans shall ensure that any field changes are in compliance with the requirements of this Agreement.

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4.8 Land Use Restrictions. For every property where ADL-contaminated soil is buried within State owned highway rights-of-way pursuant to this Agreement, Caltrans shall, pursuant to California Code of Regulations, title 22, section 67391.1, execute a land use covenant imposing appropriate limitations on land use of the property, which shall be binding in perpetuity upon Caltrans or any future owners of the property. The land use covenant, except as provided in section 4.8.1, shall be recorded within the county (or counties) wherein ADL-contaminated soil has been buried.

4.8.1 Properties within State owned highway rights-of-way typically do not have assessor parcel numbers (used to assess taxes) which prevents land use covenants from being properly recorded within the county (or counties) wherein they are located. For any property for which it is not feasible to establish a land use covenant, Caltrans shall meet all the following requirements.

4.8.1.1 Caltrans shall maintain a list, at its statewide office, of all locations where ADL-contaminated soil is placed or buried as part of this Agreement. Prior to any land use change for properties within State highway rights-of-way, the list shall be consulted and steps taken, if necessary, to ensure the land use change does not create an unacceptable risk to human health or the environment related to ADL-contaminated soil.

4.8.1.2 Caltrans shall revise its policy for the relinquishment of property within State highway rights-of-way to ensure that properties with ADL-contaminated soil are properly managed after relinquishment. The revised policy shall require properties relinquished to other government entities to be tracked and managed in a manner equivalent to that required of Caltrans. Properties relinquished to non-governmental entities shall, pursuant to California Code of Regulations, title 22, section 67391.1, execute a land use covenant imposing appropriate limitations on land use of the property, which shall be binding in perpetuity upon the non-governmental entity or any future owners of the property, as part of the relinquishment process. The land use covenant shall be recorded within the county (or counties) wherein ADL-contaminated soil has been buried. DTSC shall provide Caltrans sample land use covenant language upon request.

4.9 Information Available to Public.

4.9.1 Within 30 days of the effective date of this Agreement Caltrans shall post on its public website the URLs of Portable Document Format (PDF) versions of the following documents:

1. this Agreement;
2. the DTSC-prepared fact sheet concerning this Agreement;
3. a list of active projects for which the Agreement is being used to manage ADL-contaminated soil. The list shall be updated with new projects when notification for a specific project is made to DTSC.

4.9.2 Within 30 days of the effective date of this Agreement, DTSC shall post on its public website information regarding the reuse of excavated soils and appropriate land use specific to lead.

4.9.3 Within 30 days of the effective date of this Agreement DTSC and Caltrans will schedule meetings they will both participate in with (1) Caltrans transportation partners (such as cities, counties, and transportation agencies) and (2) the construction industry. The purpose of the meetings will be to explain DTSC's expectations regarding the management of soil containing lead and to explain the need for and implementation of this agreement between DTSC and Caltrans.

4.10 Project Notification. For any highway project for which this Agreement applies or is to be used, Caltrans shall provide written notification to DTSC, within 10 days of when that determination is made, and shall send copies of the notification to the RWQCB, AQMD (or APCD, as applicable), local Certified Uniform Program Agency (CUPA), and the Caltrans Agreement Coordinator. For projects that overlie multiple local agency jurisdictions, all appropriate agencies shall receive a copy of the notification.

4.10.1 The written notification shall include the following information:

1. A statement that the project shall entail excavation, stockpiling and/or burial of ADL-contaminated soil pursuant to this Agreement;
2. Project number;
3. Project description;

4. Project Limits (Route; District - County - Route - Begin Mile Post /End Mile Post);
5. URLs for or Portable Document Format (PDF) versions of the following documents:
   a) the environmental document prepared for the project;
   b) this Agreement; and
   c) the DTSC-prepared fact sheet about this Agreement.
6. Results of laboratory analysis collected during design for the ADL-contaminated soil to be placed within the highway right of way, and the name of the laboratory performing the analyses;
7. Results of laboratory analysis collected during design for the ADL-contaminated soils to be placed at a final destination property other than a landfill and name of the laboratory performing the analyses;
8. Copy of the construction contract specifications which define the management of ADL-contaminated soil; and
9. Definition of the project defined construction corridor if it has already been determined that soil will be moved from one Caltrans project to another and complete project information listed above for both the sending and receiving projects.

4.10.2 The Caltrans-authorized Lead Compliance Plan, authorized Excavation and Transportation Plan, and the contact information for the project resident engineer shall be submitted to DTSC within ten (10) days of document approval or staff identification, respectively.

4.10.3 For purposes of sending a copy of the notification to a local agency that is notified of the project pursuant to separate requirements of that local agency, that separate notification fulfills the requirement of this section only if such notification includes all information listed in 4.10.1 and is sent in advance as required by this subsection.

4.11 <u>Start of Construction Notification.</u> At least five (5) days in advance of initiation of construction on any project for which this Agreement applies or is used, Caltrans shall provide written notification to DTSC containing the following information concerning the project:

1. Project number;
2. Project description;
3. Project Limits (District - County - Route - Begin Postmile /End Postmile);

4. Anticipated start and end dates of the construction phase of the project;
5. Contact information for the project resident engineer;
6. A list of Caltrans contractors to be involved in the construction phase of the project;
7. Definition of the project defined construction corridor if soil will be moved from one Caltrans project to another. Include complete project information listed above for both the sending and receiving projects; and
8. The address and property owner information for the location where the contractor will stockpile or dispose nonhazardous ADL-contaminated soil with a total lead concentration between 80 and 320 mg/kg.

4.12 <u>Completion Report.</u> Within 180 days of completion of the construction phase of any project for which this Agreement applies or is used, provide to DTSC, in writing, the following:

4.12.1

1. Project number;
2. Project description;
3. Project limits (District - County - Route - Begin Postmile /End Postmile);
4. Actual start and end dates of construction; and
5. A list of all USEPA ID numbers (including temporary ID numbers) assigned by DTSC for use on the project.

4.12.2 If ADL-contaminated soil was buried in accordance with section 4.5 of this Agreement within the State right-of-way as part of the project, the following information:

1. All survey data for the placement location, including precise latitude and longitude, elevation (top and bottom in North American Vertical Datum of 1988[NAVD 88]), postmiles and highway number;
2. The approximate volume, in cubic yards, of ADL-contaminated soil buried;
3. The historical maximum elevation of the water table underlying the burial location NAVD 88;
4. The results of laboratory analysis collected during construction, if any, for the ADL-contaminated soil placed, and name of the laboratory performing the analyses;
5. Type of cover (soil or pavement);
6. Thickness of cover used; and
7. Copies of any and all bills of lading used for transporting ADL-contaminated soil to the active construction zone of the project.

4.12.3 For any ADL-contaminated soils that were permanently removed from the highway right of way, the following information:

1. The final destination of the soils (landfill, private property, other);
2. Copies of any and all bills of lading and hazardous waste manifests used to transport the ADL-contaminated soils;
3. The name and contact information for the landfill or property owner of the final destination property;
4. If not a landfill, the zoning for the final destination property;
5. The volume of ADL-contaminated soil moved to a landfill and/or final destination property;
6. If not a landfill, whether the ADL-contaminated soils were stockpiled or used as fill; and
7. For ADL-contaminated soils placed at a final destination property other than a landfill, the results of laboratory analysis collected during construction, if any, and the name of the laboratory performing the analyses.

4.13 Project Documentation Availability. Following construction contract acceptance, Caltrans shall maintain, at its statewide office or appropriate District or Regional office, individual project records containing information regarding all projects for which this Agreement applies or is used, and shall ensure that the information is readily accessible to the public. The project records for each project shall include:

1. A copy of the Agreement and all attachments thereto;
2. Copies of the project-specific information submitted to DTSC pursuant to this Agreement; and
3. A map showing the mappable survey data for each burial location.

4.14 Transition Plan. Transition of existing highway projects to the requirements of this Agreement shall be done according to Exhibit A. All projects that continue to follow the requirements of 2009 Variance No. V09HQSCD006, as described in the transition plan, after the date of this Agreement must be advertised for construction by July 1, 2020.

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4.15 **Public Health.** DTSC retains the right to require Caltrans or any future owner to remove, and properly dispose of ADL-contaminated soil in the event DTSC determines it is necessary for protection of human health or the environment.

Kome Ajise
Chief Deputy Director, Caltrans

Kome Ajise
Caltrans

6/28/16
DATE

Raymond Leclerc, P.E.
Assistant Deputy Director
Brownfields and Environmental Restoration Program

DTSC

6/29/16
DATE

Exhibit A
Transition Plan for existing projects

Exhibit B
2009 Variance

Exhibit C
Transition Plan project list

EXHIBIT A

TRANSITION PLAN
July 2016

Introduction

This plan details how projects will transition from operating under Department of Toxic Substances Control (DTSC) Variance No. V09HQSCD006 (Variance) to operating under the 2016 Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils (Agreement) for specified existing Caltrans projects. For purposes of this transition plan, aerially deposited lead (ADL)-contaminated soil is defined as in section 3.1.1 of the Agreement. Determinations regarding ADL-contaminated soil will be based on the upper 95% UCL in cases where this information is available. If this type of data analysis has not been performed it will be based on the maximum lead value detected. Lead-contaminated soil is defined as in section 6. of the Variance (Exhibit B of the Agreement).

Background – Caltrans Project Development Process

The development of transportation projects is controlled by State and federal laws, regulations, and policies. Projects are first considered and planning begun years in advance of design and construction. Per the Federal Highway Administration, transportation planning is based on a 20 year cycle.
Project development is composed of four major steps:

1. Programming and Project Initiation Document (PID, also identified as the K phase);
2. Project Acceptance & Environmental Document (PA&ED, also identified as the 0 phase);
3. Plans, Specifications and Estimates (PS&E, also identified as the 1 phase); and
4. Construction (also identified as the 3 and 4 phases).

PID
During the PID phase project candidates are identified and project initiation documents prepared. These documents outline the purpose and need of the potential project and a preliminary rough cost scope and schedule is sketched out. Preliminary environmental screening is done. At the end of the PID phase potential projects are programmed, which means that support costs are allocated based on a preliminary budget so that detailed studies may be performed.

PA&ED
During the PA&ED phase detailed studies are performed to meet California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) requirements as well as to support preparation of a Project Report (a preliminary design document). Aerially deposited lead studies are normally performed during this phase.

The budget for these studies is set in the PID phase based on knowledge of the project area.

At the end of PA&ED the project alternative is selected, the cost and schedule is officially identified, and continuing projects are given Project Approval. For most projects the California Transportation Commission (CTC) votes so that the project may proceed. If a project requires additional funding after this point is reached, the budget overrun must be explained and successfully justified to the CTC in order for the project to continue. Budget overruns can result in project termination.

PS&E
PS&E is the design phase of the project. Besides preparation of the plans and specifications, needed right of way is purchased, and necessary permits, licenses, agreements, and certifications are obtained. ADL data is evaluated and shared with design staff at the beginning of PS&E so that appropriate and efficient soil management can be incorporated into the project design. At the end of PS&E the project is advertised and the construction contract is awarded. Depending on the size and complexity of a project PS&E can take as little as a few months or as long as 30 months. A typical length of time for PS&E is 18 months.

Construction
Construction is performed by contractors reporting either directly to Caltrans staff or to a Caltrans partner in the case of some partnered projects. Depending on the size and complexity of the project, construction can take as little as a few months to as long as 10 years. The contingency allowed on Caltrans construction projects is only 5% so budget maintenance is critical.

Transition of existing Caltrans Projects

The requirements of the Agreement, described in sections 3 and 4 of the Agreement, shall be fully applied to all projects that have not completed the Project Approval and Environmental Document (PA&ED) milestone prior to July 1, 2016. PA&ED is defined in Caltrans' "Workplan Standards Guide" which is accessible at: http://www.dot.ca.gov/hq/projmgmt/documents/wsg/WSG_v11.1_2015.pdf.

This transition plan applies to existing projects that have completed the PA&ED milestone prior to July 1, 2016. Those projects for which the transition plan applies or is used shall comply with the requirements listed below in sections 1 through 6. These requirements are the requirements originally set forth in DTSC Variance No. V09HQSCD006 with added reporting requirements for Caltrans.

1. Provided Caltrans meets the terms and conditions described below in section 2, 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.

2. In order for the provisions discussed in section 1 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 the transition plan 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 for which this transition plan applies or is used, or as otherwise negotiated with the SWRCB or appropriate RWQCB, and as specified in section 2u).

   b) The provisions waived in section 1 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 transition plan 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 historical 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 historical 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, 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 transition plan shall not be moved outside the designated corridor boundaries (see section 2t below). All lead-contaminated soil not buried and covered within the same Caltrans corridor where it originated is not eligible for management under this transition plan and shall be managed as a hazardous waste.

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

i) Lead-contaminated soil managed pursuant to this transition plan 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:

i. Notify DTSC in writing of the 90 day exceedance and expected date of removal;

ii. Perform weekly inspections of the stockpiled material to ensure that there is adequate protection from run-on, runoff, public access, and wind dispersion; and

iii. 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 project where this transition plan applies or is to be used for the management of lead-contaminated soils all of the following information shall be submitted in writing to DTSC (and others as specified). If the submission date for a particular notification occurred prior to July 1, 2016 then Caltrans shall submit any

required information not included in the original notification with the Completion Report:

i. Project Notification. For any highway project for which this transition plan applies or is to be used to manage lead-contaminated soil, Caltrans shall provide written notification to DTSC within 10 days of when that determination is made, and shall send copies of the notification to the RWQCB, Air Quality Management District (AQMD) (or Air Pollution Control District, as applicable), local Certified Uniform Program Agency (CUPA), and the Caltrans Agreement Coordinator. For projects that overlie multiple local agency jurisdictions, all appropriate agencies shall receive a copy of the notification. The written notification shall include the following information:

1. A statement that the project shall entail excavation, stockpiling and/or burial of lead-contaminated soil pursuant to this Agreement;
2. Project number;
3. Project description;
4. Project Limits (Route; District - County - Route - Begin Post Mile /End Mile Post);
5. URLs for or Portable Document Format (PDF) versions of the following documents:
    a. The environmental document prepared for the project;
    b. This Agreement; and
    c. The DTSC-prepared fact sheet about this Agreement.
6. Results of laboratory analysis collected during design for the lead-contaminated soil to be placed within the highway right of way, and the name of the laboratory performing the analyses;
7. Copy of the construction contract specifications which define the management of lead-contaminated soil; and
8. Definition of the project defined construction corridor if it has already been determined that soil will be moved from one Caltrans project to another. Include complete project information listed above for both the sending and receiving projects.

ii. The Caltrans-authorized Lead Compliance Plan, authorized Excavation and Transportation Plan, and the contact information for the project resident engineer shall be submitted to DTSC within ten (10) days of document approval or staff identification, respectively.

iii. For purposes of sending a copy of the project notification to a local agency that is notified of the project pursuant to separate requirements of that local

agency, that separate notification fulfills this requirement only if such notification includes all information listed above and is sent in advance as required by this section.

iv. Start of Construction Notification. At least five (5) days in advance of initiation of construction on any project for which this transition plan applies or is used, Caltrans shall provide written notification to DTSC containing the following information concerning the project:

1. Project number;

2. Project description;

3. Project Limits (District - County - Route - Begin Post Mile /End Post Mile);

4. Anticipated start and end dates of the construction phase of the project;

5. Contact information for the project resident engineer;

6. A list of Caltrans contractors to be involved in the construction phase of the project; and

7. Definition of the project defined construction corridor if soil will be moved from one Caltrans project to another. Include complete project information listed above for both the sending and receiving projects.

v. Completion Report. Caltrans will provide in writing to DTSC the following information within 180 days of completion of the construction phase for any highway project for which Caltrans managed lead-contaminated soil under this transition plan:

1. Project number;
2. Project description;
3. Project Limits (District - County - Route - Begin Post Mile /End Post Mile);
4. Actual start and end dates of construction; and
5. A list of all USEPA ID numbers (including temporary ID numbers) assigned by DTSC for use on the project.

If lead-contaminated soil was buried within the State right-of-way as part of the project, the following information:

6. All survey data for the placement location, including precise latitude and longitude, elevation (top and bottom in North American Vertical Datum of 1988[NAVD 88]), Post Miles and highway number;

7. The approximate volume, in cubic yards, of lead-contaminated soil buried;
8. The historical maximum elevation of the water table underlying the burial location NAVD 88;
9. the results of laboratory analysis collected during construction, if any, for the lead-contaminated soil placed, and name of the laboratory performing the analyses;
10. type of cover (soil or pavement);
11. thickness of cover used; and
12. copies of any and all bills of lading used for transporting lead-contaminated soil to the active construction zone of the project.

vi. Project Documentation Availability. Following construction contract acceptance, Caltrans shall maintain, at its statewide office or appropriate District or Regional office, individual project records containing information regarding all projects for which this transition plan applies or is used, and shall ensure that the information is readily accessible to the public. The project records for each project shall include:

1. A copy of the Agreement and all attachments thereto;

2. Copies of the project-specific information submitted to DTSC pursuant to this transition plan, and

3. The “as-built” plans for each burial location.

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 transition plan.

x) Operational procedures described in the CEQA Initial Study shall be followed by Caltrans for activities conducted under this transition plan.

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) The Coordinators identified in section 3.9 of the Agreement will also be the Coordinators for the transition plan. These Coordinators will be the primary points

of contact for information flowing to, or received from, DTSC regarding any matter or submission under this transition plan.

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 transition plan. If site inspection reveals deterioration of cover so that conditions in the transition plan are not met, Caltrans shall repair or replace the cover.

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

cc) If areas within the State owned highway rights-of-way subject to the terms of this transition plan are sold, relinquished or abandoned (including roadways), all future property owners shall be notified in writing in advance by Caltrans of the requirements of section 4.8 of the Agreement, and Caltrans shall provide the owner with a copy of the Agreement. A copy of such a notice shall be sent to DTSC and contain the corridor location and project identification information. 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 set forth in the Agreement as Caltrans.

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

i. 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 work related to soils contaminated with lead.

ii. Maintain copies of all reports submitted to DTSC at the District office. Caltrans shall ensure that the reports are readily accessible to the public.

ee) Lead-contaminated soil may be buried only within the right-of-way in areas where access is limited or where lead-contaminated soil is covered or 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. Operating under this transition plan 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 transition plan 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, ADL-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 use this transition plan for existing joint projects where Caltrans and local government entities are involved provided that 1) the project is within the Caltrans' Right-of-Way and the plan is only implemented on State-owned highway rights-of-way; 2) Caltrans reviews/ oversees all phases of the project including design, contracting, environmental assessment, and construction, as well as operation and maintenance of the project segments within Caltrans' Right-of-Way; and 3) Caltrans oversees the project to verify all transition plan conditions/requirements are complied with. Caltrans will be fully responsible for lead-contaminated soil related notification and implementation in these joint projects.

3. A list of projects involving lead-contaminated soil for which the transition plan applies or is used is attached. Projects involving lead-contaminated soil not on the list must fully comply with the requirements of the Agreement regardless of whether they have been given Project Approval prior to July 1, 2016. If it is discovered after June 30, 2016 that one or more projects that were eligible to use the transition plan have been inadvertently omitted from the list provided to DTSC, Caltrans will request an exception to add those projects. DTSC will respond to Caltrans request within 10 business days. Caltrans may remove projects from the list at their discretion and shall provide DTSC an updated project list within 30 days of such an action.

4. If a shelved highway project that includes management of lead-contaminated soil under the Transition Plan has to be redesigned and Caltrans has to submit a request to the California Transportation Commission for additional capital outlay funding, then the Transition Plan no longer applies and the requirements of the Agreement shall be fully applied.

5. The requirements of the Agreement shall be fully applied to all projects advertised for construction after July 1, 2020.

6. For any ADL-contaminated soils that were permanently removed from the highway right of way after June 30, 2016 as part of a highway project, Caltrans shall provide

the following information in writing to DTSC within 180 days of completion of the construction phase:

a) Project number;

b) Project description;

c) Project limits (District - County - Route - Begin Post Mile /End Post Mile);

d) Actual start and end dates of construction;

e) The destination of the soils (landfill, private property, other);

f) Copies of any and all bills of lading and hazardous waste manifests used to transport the ADL-contaminated soils;

g) The name and contact information for the landfill or property owner/operator of the destination property;

h) If not a landfill, the zoning for the destination property;

i) The volume of ADL-contaminated soil moved to a landfill and/or the destination property;

j) If not a landfill, whether the ADL-contaminated soils were stockpiled or used as fill; and

k) If not a landfill, the results of laboratory analysis for the ADL-contaminated soils collected during construction, if any, and the name of the laboratory performing the analyses.

EXHIBIT B

California Environmental Protection Agency
Department of Toxic Substances Control

VARIANCE

Applicant Names:

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

Variance No. V09HQSCD006

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.

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

Date:

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 aerially-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 (TTLC) 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 xxxx");

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:

_____ _____

Date

Beverly Rikala
Operating Facilities Team
Department of Toxic Substances Control

EXHIBIT C

CALTRANS PROJECT LIST

District	EA	County	Route(s)	Post Mile Start	Post Mile End	Current Phase (PA&ED, Design, or Construction) as of January 2016	Local Partner Involved in Project (Yes or No)	Performing AAA (Caltrans, LAMTA, OCTA, SANDAG, etc)
District 01								
None								
District 02								
02	4E650	SIS	96	Bridge Rail Improvement - multiple locations		Design	No	CALTRANS
02	4G380	TRI	299	0	8.3	Design	No	CALTRANS
District 03								
03	3F170	SAC	5/50/51/99	City of Sacramento		Construction	No	CALTRANS
03	3F930	SAC	50	5.3	23.1	Design	No	CALTRANS
District 04								
04	15272	CC	242	0	3.4	Construction	No	CALTRANS
			4	8	25			
04	15330	SCL	101	0	26.7	Construction	No	CALTRANS
04	22911	CC	680/4	Interchange		Design	YES	CCCTA
04	23552	SM	82/92	Interchange		Design	Yes: city S. Mateo	CALTRANS
04	23565	SM	101	1.7	2.1	Design	No	CALTRANS
04	23584	SM	101	16.3	16.9	Construction	Yes: SMCoTA	CALTRANS
04	26409	MRN/SON	101	0	0	Bid Open	Yes: SonCoTA	CALTRANS
04	0A185	SON	101	7.1	8	Construction	YES: Petaluma	CALTRANS
04	0A534	SOL	80	2.1	2.8	Construction	Yes: Solano Trans Auth	CALTRANS
04	0A537	SOL	80/680	Interchange		Design	Yes: SolCoTA	CALTRANS
04	1G621	SM	101	8.8	8.6	Design	Yes: San Carlos	CALTRANS
04	1G940	CC	4	27.5	29	Construction	Yes: Contra Costa Trans	CALTRANS
04	2285E	CC	4	26.6	27.5	Construction	Yes: Contra Costa Trans	CALTRANS
04	2640K	SON	101	3.4	4.1	Construction	Yes: SonCoTA	CALTRANS
04	2908V	ALA	580	7.8	13.6	Construction	Yes: Alameda Trans Auth	CALTRANS
04	2908V	ALA	580	7.8	13.6	Construction	Yes: Ala CoTC	CALTRANS
04	2G850	ALA	580	3.9	4.2	Construction	No	CALTRANS
04	3G160	CC	24	5.3	5.5	Construction	No	CALTRANS
04	4G050	Ala&SCL	680	7.5	9.9	Design	Yes: AlaCoTC	CALTRANS
04	4G080	SOL	80	11.2	29.3	Design	Yes: SolCoTA	CALTRANS
04	4G320	SOL	80	7.3	7.3	Design	YES	CITY OF FAIRFIELD
04	4G510	Sol	80	31	32.6	Design	No	CALTRANS
04	4G680	SCL	280	11.2	11.5	Design	Yes: SCCoTA	CALTRANS
04	4H900	SF	280	0.14	1.46	Construction	No	CALTRANS
District 05								
05	31580	MON	101	0	0	Construction	NO	CALTRANS
05	36150	SLO	101	55.7	57.9	Construction	yes	City of El Paso de Robles
05	44782	SB	101	11.4	11.4	Design	YES	SBCAG
05	44800	MON	068	3.8	4.3	Design	yes	Monterey, City of
05	46580	SCR	001	17.5	17.7	Design	YES	CITY OF SANTA CRUZ
05	47450	SLO	101	5	5	Construction	yes	San Luis Obispo County
05	1E050	MON	101	52.4	60.8	Design	NO	CALTRANS
05	0A050	SB	001	15.6	15.6	Design	NO	CALTRANS

05	0C730	SCR	001	7.6	16.1	Design	YES	SCCRTC
05	0F970	MON	101	62.1	63.2	Design	NO	CALTRANS
05	0G070	SB	101	22.3	23	Construction	yes	CALTRANS
05	0H730	SLO	101	25.5	26.3	Construction	yes	San Luis Obispo, City of
05	0H823	MON	068	12.8	13.2	Design	YES	MONTEREY COUNTY
05	0L570	MON	001	72.3	72.9	Design	yes	Monterey County
05	0N700	SB	101	2	12.3	Design	NO	CALTRANS
05	0Q600	SCR	017	0.7	1.4	Design	NO	CALTRANS
05	1A870	SCR	001	17	17.2	Construction	NO	CALTRANS
05	1C080	SLO	101	44.6	59.7	Design	NO	CALTRANS
05	1C100	SCR	001	Multiple locations - safety pull outs		Design	NO	CALTRANS
05	1C120	SB	101	0	12.7	Design	NO	CALTRANS
05	1C820	SB	101	2.6	11.9	Design	NO	CALTRANS
05	1C890	MON	101	87.3	91.6	Design	NO	CALTRANS
05	1C970	SB	101	17.2	45.9	Design	NO	CALTRANS
05	1G380	MON	101	53.9	57.1	Design	NO	CALTRANS
05	4611U	SB	217	1.1	2.2	Design	yes	Goleta, City of
District 06								
06	42471	KER	119	10	13.3	Construction	NO	CALTRANS
06	43401	TUL	65	15.1	18	Design	NO	CALTRANS
06	47150	TUL	99	39.6	41.3	Design	NO	CALTRANS
06	48450	KER	99/204	Interchange		Design	YES	Bakersfield, City of
06	48460	KER	58	31.7	55.6	PA&ED January 2016	YES	Bakersfield, City of
06	49390	KER	178	0	0.4	Design	YES	Bakersfield, City of
06	0F360	KER	58	46.1	51.7	Construction	YES	CALTRANS
06	0H360	FRE	99	28.1	30.9	Design	YES	Fresno, City of
06	0K290	FRE	99	22.7	28.1	PA&ED April 1, 2016	No	CALTRANS
06	0K810	KER	99/178	Interchange		Design	NO	CALTRANS
06	0Q431	TUL	190	13.1	17.3	PA&ED March 2016	YES	Porterville, City of
06	0R050	TUL	193	4.2	8.3	Design	No	CALTRANS
06	0S480	TUL	65	9.4	14	Design	No	CALTRANS
06	0U520	MAD	99	13.1	19.6	PA&ED April 2016	No	CALTRANS
06	2HT00	FRE	099	23.5	26.6	PA&ED Pending	YES	California High Speed Rail Authority
06	2HT10	FRE	99	23.7	26.2	Design	YES - CHSRA	CALTRANS
06	3HT01	FRE/KIN/TUL	43/137/198/	High Speed Rail Interaction with State Highway System		Design	YES	California High Speed Rail Authority
District 07								
07	11707	LA	10	31.2	33.4	Construction	No	CALTRANS
07	12184	LA	5	26.7	36.4	Construction	No	CALTRANS
07	20211	LA	710	17.2	26.4	Construction	No	CALTRANS
07	20212	LA	710	21.9	23.1	Design	No	CALTRANS
07	21593	LA	5	2.7	4	Construction	No	CALTRANS
07	21594	LA	5	4	5.8	Construction	No	CALTRANS
07	21595	LA	5	5.8	6.8	Construction	No	CALTRANS
07	24540	LA	10	31.1	32.3	Construction	No	CALTRANS
07	25902	LA	5/10/91/110/134	Storm Water Improvements at numerous locations		Construction	No	CALTRANS

07	28150	LA	101	29.2	38.1	Design	No	CALTRANS
07	28910	LA	405	11.7	12.2	PAED/Design	No	CALTRANS
07	29100	LA	14	32.1	59.2	Design	No	CALTRANS
07	29110	LA	101	30.9	38.1	PAED	No	CALTRANS
07	29120	LA	57	7.7	12.2	Design	No	CALTRANS
07	29140	LA	1	56.5	56.9	PAED	No	CALTRANS
07	29230	LA	5	25.6	25.6	PA&ED Feb 2016	No	CALTRANS
07	29370	LA	110	8	9	PAED	No	CALTRANS
07	29510	LA	5	38.8	40.5	PAED	No	CALTRANS
07	29530	LA	110	24.1	31.9	PAED	No	CALTRANS
07	29540	VEN	101	30.2	31.4	PAED	No	CALTRANS
07	29580	LA	60	3.7	6.3	PAED	No	CALTRANS
07	29610	LA	405	0.7	6.7	PAED	No	CALTRANS
07	29630	LA	405	21.5	26.3	PA&ED Pending	No	CALTRANS
07	29740	LA	105	6.6	8	Design	No	CALTRANS
07	29850	LA	405	33	35.5	PAED	No	CALTRANS
07	29950	LA	1	3.8	30.8	Design	No	CALTRANS
07	29960	LA	27	0	11.1	Design	No	CALTRANS
07	30520	VEN	33	15.7	15.7	PAED	No	CALTRANS
07	30600	LA	5	44.2	46	Design	No	CALTRANS
07	30720	LA	91	6.3	6.3	Design	No	CALTRANS
07	31220	VEN	126	1	8.2	PAED	No	CALTRANS
07	31230	LA	14	25.5	35	PAED	No	CALTRANS
07	31250	LA	5	81.8	87.8	PAED	No	CALTRANS
07	31260	LA	5	75	81.8	PAED	No	CALTRANS
07	31280	LA	14	35	53.5	PAED	No	CALTRANS
07	1170U	LA	10	33.4	37.5	Construction	No	CALTRANS
07	1193U	LA	10	37.2	42.4	Construction	No	CALTRANS
07	1218W	LA	5	29.4	31.6	Construction	No	CALTRANS
07	1219U	LA	5	36.4	39.4	Construction	No	CALTRANS
07	1952U	VEN	101	0.1	3	Construction	No	CALTRANS
07	2055A	LA	2	14.1	15.1	Construction	No	CALTRANS
07	2159C	LA	5	1.8	3	Construction	No	CALTRANS
07	2159U	LA	5	0	1.5	Design	No	CALTRANS
07	4T730	LA	405	41.7	41.7	Construction	No	CALTRANS
07	4T770	LA	91	12.96	13.76	Design	No	CALTRANS
07	4T800	LA	405	0.6	0.6	Design	No	CALTRANS
District 08								
08	0A020	RIV	215	15.3	15.7	Design	YES	RCTC
08	0F540	RIV	91	0	13	Construction	YES	SANBAG
08	0J070	SBD	215	0.6	1.7	PS&E	YES	SANBAG
08	0J080	RIV	15	36.8	51.4	PA&ED March 2016	Yes - RCTC	RCTC
08	0J400	SBD	10	4.1	6.1	PA&ED March 2016	Yes	SANBAG
08	0M900	RIV	111	18.4	0	Design	Yes - Riverside County	Riverside County
08	0Q760	SBD	10	0	30.9	Construction	No	Caltrans
08	0R460	RIV	91	10.8	12.9	Construction	NO	CALTRANS
08	1A830	SBD	10	17.8	19.3	PS&E	YES	COUNTY OF SBD
08	1C170	SBD	60	1.86	2.86	PS&E	NO	Caltrans
08	1C180	SBD	60	0	1.86	PS&E	NO	Caltrans
08	1E030	SBD	10	20.1	22	Construction	Yes - SANBAG	SANBAG
08	1E710	SBD	10	31.6	31.9	PA&ED Feb 2016	Yes	SANBAG
08	1F980	RIV	215	17.5	17.5	PA&ED Feb 2016	Yes - City of Menifee	City of Menifee
District 09								
None								

District 10								
10	47210	STA	99	21	22.4	Construction	YES	CALTRANS
10	0E613	SJ	99	6.9	15	Construction	YES	CALTRANS
10	0G440	MER	99	19.3	20.9	Construction	YES	CALTRANS
10	0G470	SJ	005	28.5	35.6	Construction	YES - Stockton	CALTRANS
10	0H890	SJ	120	2.2	2.2	Design	YES	CALTRANS
10	0H910	SJ	205	2.6	5.1	Design	YES	CALTRANS
10	0P740	MER	59	21.5	22.5	Design	YES	CALTRANS
10	0Q880	AMA	49	17	17.5	Construction	YES	CALTRANS
10	0S110	SJ	99	14.4	14.8	Construction	YES	CALTRANS
10	0T910	STA	99	4.3	5	Design	YES	CALTRANS
10	0V070	MER	099	0	18.6	Design	YES - HSRA	California High Speed Rail Authority
10	0Y550	SJ	012	14.9	18.1	Design	No	CALTRANS
10	0Y620	STA	099	13.6	15.1	PA&ED 12/2015 overdue	No	CALTRANS
10	1C421	SJ	099	14	23	Design	No	CALTRANS
10	3A130	MER	140	38.1	38.6	Design	YES	CALTRANS
District 11								
11	00270	SD	5	19.9	21.2	Construction	No	CALTRANS
11	08023	IMP	98	31.6	32.1	Design	No	CALTRANS
11	08027	IMP	98	32.2	32.6	Design	No	CALTRANS
11	08578	SD	163	4.1	4.9	Design	YES - City of San Diego	CALTRANS
11	14665	SD	94/125	10	11.8	Design	No	CALTRANS
11	17790	SD	5	32.9	33.4	PA&ED 4/29/16	No	CALTRANS
11	23580	SD	5	28.4	55.4	Design	YES	CALTRANS
11	23796	SD	8	6.1	10.5	Design	No	CALTRANS
11	24151	SD	163	8.2	9.4	Construction	YES - City of San Diego	City of San Diego
11	24400	SD	5	3.9	9.2	Design	No	CALTRANS
11	26220	SD	75	20.2	22.2	Design	No	CALTRANS
11	26331	IMP	8	38.8	39.2	Design	No	CALTRANS
11	26501	SD	163	0.5	3.2	Construction	No	CALTRANS
11	29200	SD	125	9.8	12.4	PA&ED Jan 2016	No	CALTRANS
11	29520	SD	94	59.7	60.2	Design	No	CALTRANS
11	29910	SD	76	22.2	47.1	PA&ED Jan 2016	No	CALTRANS
11	40570	SD	76	32.6	33.2	Design	No	CALTRANS
11	40640	SD	Various	Bridge Rail modifications at multiple locations		Construction	No	CALTRANS
11	40860	SD	8	0.5	0.7	Design	No	CALTRANS
11	40960	SD	54	0	13	Design	No	CALTRANS
11	40970	SD	8	Roadside Safety Improvements at multiple locations		Design	No	CALTRANS
11	41040	IMP	8	36.5	37.5	Design	No	CALTRANS
11	41080	SD	805	15.7	17.5	Design	No	CALTRANS
11	41090	SD	5	0.3	5.4	Design	No	CALTRANS
11	41120	SD	805	0.3	4	PA&ED May 2016	No	CALTRANS
11	41350	SD	8	15.3	21.6	Construction	No	CALTRANS
11	41430	SD	79	31.3	49.9	PA&ED Jan 2016	No	CALTRANS
11	41440	SD	94	5.8	9.3	PA&ED Jan 2016	No	CALTRANS
11	41480	SD	8	0.1	2	PA&ED Over Due as of 12/2015	No	CALTRANS
11	41480	SD	805	0.1	2	PA&ED Over Due as of 12/2015	No	CALTRANS

11	41550	SD	5, 8, 15, 52, 54, et al	Traffic Management System Modifications		Construction	No	CALTRANS
11	41600	SD	5, 7, 8, 15, 52, et al	Traffic Management System Modifications		Construction	No	CALTRANS
11	41680	SD	163	3.6	3.6	Design	No	CALTRANS
11	41851	IMP	8	41.1	65	PA&ED due 1/19/2016	No	CALTRANS
11	41852	IMP	8	83.1	90	PA&ED Feb 2016	No	CALTRANS
11	42160	SD	78	13	14.1	PA&ED Jan 2016	No	CALTRANS
11	2T170	SD	5	37.5	51.4	Design	YES	CALTRANS
11	2T171	SD	5	37.5	51.4	Design	YES	CALTRANS
11	2T172	SD	5	37.5	39.6	Design	YES	CALTRANS
11	2T175	SD	5	28.7	28.7	Design	YES - VAR	CALTRANS
11	2T210	SD	5	38	51.2	Design	YES	CALTRANS
11	2T211	SD	5	43.4	47.5	Design	YES	CALTRANS
11	2T212	SD	5	47.5	51.2	Design	YES	CALTRANS
11	2T215	SD	5	28.4	29.5	Design	YES	CALTRANS
11	2T260	SD	805	4.4	10	Design	No	CALTRANS
11	2T270	SD	805	12.6	15.9	Design	No	CALTRANS
District 12								
12	0C110	ORA	57	19.9	21.5	Design	City of Brea	City of Brea
12	0C560	ORA	91	7.9	9.5	Construction	No	CALTRANS
12	0C571	ORA	91	0.9	5.4	PAED - Feb 2016	OCTA	OCTA
12	0C890	ORA	5	30.3	34	Design	OCTA	CALTRANS
12	0F04A	ORA	57	12.3	15.2	PA&ED April 2016	OCTA	OCTA
12	0F96A	ORA	5	3	3.7	Construction	OCTA	CALTRANS
12	0F96C	ORA	5	3.7	6.2	Construction	OCTA	CALTRANS
12	0F96E	ORA	5	6.2	8.7	Construction	OCTA	CALTRANS
12	0H045	ORA	405	2.4	3.9	PA&ED March 2016	Yes - OCTA	CALTRANS
12	0H100	ORA	405	10.2	24	Design	Yes - OCTA	OCTA
12	0H20U	ORA	55	2	5.9	Construction	No	CALTRANS
12	0H530	ORA	5/1	Interchange		Design	No	CALTRANS
12	0J340	ORA	55	6.2	10.3	Design	Yes - OCTA	CALTRANS
12	0K021	ORA	5	12.4	14.5	Design	Yes - OCTA	CALTRANS
12	0K022	ORA	5	14.5	17.1	Design	Yes - OCTA	CALTRANS
12	0K023	ORA	5	17.1	18.9	Design	Yes - OCTA	CALTRANS
12	0K330	ORA	91	17.8	18.2	Construction	No	CALTRANS
12	0L92U	ORA	5	0	29.6	Construction	NO	CALTRANS
12	0L090	ORA	57	11	22.5	Design	NO	CALTRANS
12	0L720	ORA	74	2.9	5.1	Design	NO	CALTRANS
12	0L74U	ORA	55	2	11.8	Construction	No	CALTRANS
12	0L850	ORA	5	33.9	43.4	Design	Yes - OCTA	CALTRANS
12	0M120	ORA	5	28.4	28.4	Construction	No	CALTRANS
12	0M340	ORA	73	16.5	16.6	Construction	No	CALTRANS
12	0M350	ORA	405	2.6	6.5	Design	No	CALTRANS
12	0M470	ORA	1	22.7	24.6	Design	No	CALTRANS
12	0M490	ORA	5	1.2	2.2	Design	No	CALTRANS
12	0M500	ORA	55	1.2	17.9	Design	No	CALTRANS
12	0M610	ORA	91	8.9	9.4	Design	No	CALTRANS
12	0M960	ORA	73	22.5	25.7	Design	NO	CALTRANS
12	0N040	ORA	91	7.5	18.9	Design	Yes - OCTA	CALTRANS
12	0N080	ORA	5	33.3	34.5	PA&ED Feb 2016	No	CALTRANS
12	0N110	ORA	133	9.5	9.5	Construction	No	CALTRANS

12	0N270	ORA	91	13.8	13.8	PA&ED April 2016	No	CALTRANS
12	0N280	ORA	22	33.7	33.7	Design	NO	CALTRANS
12	0N330	ORA	5	12.8	21.6	Construction	No	CALTRANS
12	0N340	ORA	57	10.8	21.8	Construction	NO	CALTRANS
12	0N360	ORA	91	1	5.4	Design	No	CALTRANS
12	0N480	ORA	1	19.6	19.8	PA&ED April 2016	YES - City of Newport Beach	City of Newport Beach
12	0N540	ORA	405	8.4	8.4	Construction	No	CALTRANS
12	0N580	ORA	57	14.9	15.2	Design	NO	CALTRANS
12	0N590	ORA	39	11.7	12.2	Design	No	CALTRANS
12	0N640	ORA	5	34.5	37.4	PA&ED March 2016	No	CALTRANS
12	0N670	ORA	5	2.1	3	Design	OCTA	CALTRANS
12	0N680	ORA	72	11.9	11.9	Design	No	CALTRANS
12	0N710	ORA	39	5.7	5.7	PA&ED Jan 2016	No	CALTRANS
12	0N821	ORA	VAR	Traffic Management System Installation		Design	No	CALTRANS
12	0N822	ORA	VAR	Traffic Management System Installation		Design	No	CALTRANS
12	0N880	ORA	405	1.1	1.1	Design	NO	CALTRANS
12	0N910	ORA	1	18.2	18.2	PA&ED March 2016	No	CALTRANS
12	0N980	ORA	55	5.7	6	Design	NO	CALTRANS
12	0N990	ORA	39	1.88	1.88	PA&ED May 2016	NO	CALTRANS
12	0P020	ORA	1	24.3	24.3	PA&ED April 2016	No	CALTRANS
12	0P040	ORA	405	7.8	7.8	Design	NO	CALTRANS
12	0P140	ORA	1	19.8	21.5	PA&ED March 2016	YES - City Newport Beach	City of Newport Beach
12	0P190	ORA	5	13.6	13.6	Design	NO	CALTRANS
12	0P200	ORA	133	1.6	3.3	Design	NO	CALTRANS
12	0P210	ORA	5	24.8	24.8	Design	NO	CALTRANS
12	0P260	ORA	5	24.9	24.9	PA&ED Jan 2016	No	CALTRANS
12	0P330	ORA	74	6	6.4	Design	NO	CALTRANS
12	0P340	ORA	1	12.9	25.5	Design	NO	CALTRANS
12	0P460	ORA	39	3.6	7.1	PA&ED Dec 2015 overdue	No	CALTRANS
12	0P540	ORA	1	8.37	8.37	Design	NO	CALTRANS
12	0P710	ORA	1	12.9	33	Design	NO	CALTRANS
12	0P750	ORA	1	5.5	5.5	Design	NO	CALTRANS
12	0P770	ORA	55	11.7	12.1	Design	NO	CALTRANS
12	0P890	ORA	5	25	26.4	Design	NO	CALTRANS

APPENDIX B

ADVANCED TECHNOLOGY LABORATORIES

September 19, 2018

Rick Day
Geocon Consultants, Inc.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, CA 95742
Tel: (916) 852-9118
Fax:(916) 852-9132

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

Re: ATL Work Order Number : 1803391

Client Reference : US-101 @ Blossom Hill, E9080-02-01

Enclosed are the results for sample(s) received on September 11, 2018 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

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B35-0	1803391-01	Soil	9/06/18 9:22	9/11/18 11:10
B35-1	1803391-02	Soil	9/06/18 9:23	9/11/18 11:10
B35-2	1803391-03	Soil	9/06/18 9:24	9/11/18 11:10
B34-0	1803391-04	Soil	9/06/18 9:28	9/11/18 11:10
B34-1	1803391-05	Soil	9/06/18 9:29	9/11/18 11:10
B34-2	1803391-06	Soil	9/06/18 9:30	9/11/18 11:10
B33-0	1803391-07	Soil	9/06/18 9:34	9/11/18 11:10
B33-1	1803391-08	Soil	9/06/18 9:35	9/11/18 11:10
B33-2	1803391-09	Soil	9/06/18 9:36	9/11/18 11:10
B32-0	1803391-10	Soil	9/06/18 9:40	9/11/18 11:10
B32-1	1803391-11	Soil	9/06/18 9:41	9/11/18 11:10
B32-2	1803391-12	Soil	9/06/18 9:42	9/11/18 11:10
B36-4.5	1803391-13	Soil	9/06/18 9:56	9/11/18 11:10
B36-11.5	1803391-14	Soil	9/06/18 10:00	9/11/18 11:10
B36-GW	1803391-15	Groundwater	9/06/18 10:50	9/11/18 11:10
B23-0	1803391-16	Soil	9/06/18 11:36	9/11/18 11:10
B23-1	1803391-17	Soil	9/06/18 11:37	9/11/18 11:10
B23-2	1803391-18	Soil	9/06/18 11:38	9/11/18 11:10
B24-0	1803391-19	Soil	9/06/18 11:42	9/11/18 11:10
B24-1	1803391-20	Soil	9/06/18 11:43	9/11/18 11:10
B24-2	1803391-21	Soil	9/06/18 11:44	9/11/18 11:10
B25-0	1803391-22	Soil	9/06/18 11:50	9/11/18 11:10
B25-1	1803391-23	Soil	9/06/18 11:51	9/11/18 11:10
B26-2.5	1803391-24	Soil	9/06/18 12:00	9/11/18 11:10
B27-0	1803391-25	Soil	9/06/18 12:34	9/11/18 11:10
B27-1	1803391-26	Soil	9/06/18 12:36	9/11/18 11:10
B27-2	1803391-27	Soil	9/06/18 12:40	9/11/18 11:10
B22-0HA	1803391-28	Soil	9/06/18 12:34	9/11/18 11:10
B22-1HA	1803391-29	Soil	9/06/18 12:36	9/11/18 11:10
B22-2HA	1803391-30	Soil	9/06/18 12:40	9/11/18 11:10
B28-0	1803391-31	Soil	9/06/18 12:52	9/11/18 11:10
B28-1	1803391-32	Soil	9/06/18 12:53	9/11/18 11:10
B28-2	1803391-33	Soil	9/06/18 12:54	9/11/18 11:10
B31-4.5	1803391-34	Soil	9/06/18 13:06	9/11/18 11:10
B31-11.5	1803391-35	Soil	9/06/18 13:12	9/11/18 11:10
B30-0	1803391-36	Soil	9/06/18 13:20	9/11/18 11:10
B30-1	1803391-37	Soil	9/06/18 13:21	9/11/18 11:10

Certificate of Analysis

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B30-2	1803391-38	Soil	9/06/18 13:22	9/11/18 11:10
B29-0	1803391-39	Soil	9/06/18 13:26	9/11/18 11:10
B29-1	1803391-40	Soil	9/06/18 13:27	9/11/18 11:10
B29-2	1803391-41	Soil	9/06/18 13:28	9/11/18 11:10
B21-0	1803391-42	Soil	9/06/18 13:50	9/11/18 11:10
B21-1	1803391-43	Soil	9/06/18 13:51	9/11/18 11:10
B21-2	1803391-44	Soil	9/06/18 13:52	9/11/18 11:10
B20-0	1803391-45	Soil	9/06/18 13:58	9/11/18 11:10
B20-1	1803391-46	Soil	9/06/18 13:59	9/11/18 11:10
B20-2	1803391-47	Soil	9/06/18 14:00	9/11/18 11:10
B17-0	1803391-48	Soil	9/06/18 14:04	9/11/18 11:10
B17-1	1803391-49	Soil	9/06/18 14:05	9/11/18 11:10
B17-2	1803391-50	Soil	9/06/18 14:06	9/11/18 11:10
B16-0	1803391-51	Soil	9/06/18 14:12	9/11/18 11:10
B16-1	1803391-52	Soil	9/06/18 14:13	9/11/18 11:10
B16-2	1803391-53	Soil	9/06/18 14:14	9/11/18 11:10
B15-0	1803391-54	Soil	9/06/18 14:22	9/11/18 11:10
B15-1	1803391-55	Soil	9/06/18 14:23	9/11/18 11:10
B19-0	1803391-56	Soil	9/06/18 14:38	9/11/18 11:10
B19-1	1803391-57	Soil	9/06/18 14:39	9/11/18 11:10
B14-0	1803391-58	Soil	9/06/18 14:44	9/11/18 11:10
B14-1	1803391-59	Soil	9/06/18 14:45	9/11/18 11:10
B14-2	1803391-60	Soil	9/06/18 14:46	9/11/18 11:10
B18-0HA	1803391-61	Soil	9/06/18 14:56	9/11/18 11:10
B18-1HA	1803391-62	Soil	9/06/18 14:58	9/11/18 11:10
B18-2HA	1803391-63	Soil	9/06/18 15:00	9/11/18 11:10
B1-0	1803391-64	Soil	9/06/18 15:14	9/11/18 11:10
B1-1	1803391-65	Soil	9/06/18 15:15	9/11/18 11:10
B1-2	1803391-66	Soil	9/06/18 15:16	9/11/18 11:10
B2-0	1803391-67	Soil	9/06/18 15:20	9/11/18 11:10
B2-1	1803391-68	Soil	9/06/18 15:21	9/11/18 11:10
B2-2	1803391-69	Soil	9/06/18 15:22	9/11/18 11:10
B3-0	1803391-70	Soil	9/06/18 15:28	9/11/18 11:10
B3-1	1803391-71	Soil	9/06/18 15:29	9/11/18 11:10
B3-2	1803391-72	Soil	9/06/18 15:30	9/11/18 11:10
B4-0	1803391-73	Soil	9/06/18 15:34	9/11/18 11:10
B4-1	1803391-74	Soil	9/06/18 15:35	9/11/18 11:10
B4-2	1803391-75	Soil	9/06/18 15:36	9/11/18 11:10
B40-0	1803391-76	Soil	9/07/18 7:08	9/11/18 11:10
B40-1	1803391-77	Soil	9/07/18 7:09	9/11/18 11:10
B40-2	1803391-78	Soil	9/07/18 7:10	9/11/18 11:10

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B39-0	1803391-79	Soil	9/07/18 7:16	9/11/18 11:10
B39-1	1803391-80	Soil	9/07/18 7:17	9/11/18 11:10
B38-0	1803391-81	Soil	9/07/18 7:20	9/11/18 11:10
B38-1	1803391-82	Soil	9/07/18 7:21	9/11/18 11:10
B37-0	1803391-83	Soil	9/07/18 7:24	9/11/18 11:10
B37-1	1803391-84	Soil	9/07/18 7:25	9/11/18 11:10
B12-0	1803391-85	Soil	9/07/18 7:38	9/11/18 11:10
B12-1	1803391-86	Soil	9/07/18 7:39	9/11/18 11:10
B12-2	1803391-87	Soil	9/07/18 7:40	9/11/18 11:10
B11-0	1803391-88	Soil	9/07/18 7:48	9/11/18 11:10
B11-1	1803391-89	Soil	9/07/18 7:49	9/11/18 11:10
B10-0	1803391-91	Soil	9/07/18 7:56	9/11/18 11:10
B9-0	1803391-92	Soil	9/07/18 7:58	9/11/18 11:10
B9-1	1803391-93	Soil	9/07/18 7:59	9/11/18 11:10
B8-0	1803391-94	Soil	9/07/18 8:14	9/11/18 11:10
B8-1	1803391-95	Soil	9/07/18 8:15	9/11/18 11:10
B8-2	1803391-96	Soil	9/07/18 8:16	9/11/18 11:10
B7-0	1803391-97	Soil	9/07/18 8:20	9/11/18 11:10
B7-1	1803391-98	Soil	9/07/18 8:21	9/11/18 11:10
B7-2	1803391-99	Soil	9/07/18 8:22	9/11/18 11:10
B6-0	1803391-AA	Soil	9/07/18 8:26	9/11/18 11:10
B6-1	1803391-AB	Soil	9/07/18 8:27	9/11/18 11:10
B6-2	1803391-AC	Soil	9/07/18 8:28	9/11/18 11:10
B5-0	1803391-AD	Soil	9/07/18 8:32	9/11/18 11:10
B5-1	1803391-AE	Soil	9/07/18 8:33	9/11/18 11:10
B13-0	1803391-AF	Soil	9/07/18 8:44	9/11/18 11:10
B13-1	1803391-AG	Soil	9/07/18 8:45	9/11/18 11:10
B48-0	1803391-AH	Soil	9/07/18 9:00	9/11/18 11:10
B48-1	1803391-AI	Soil	9/07/18 9:01	9/11/18 11:10
B48-2	1803391-AJ	Soil	9/07/18 9:02	9/11/18 11:10
B47-0	1803391-AK	Soil	9/07/18 9:06	9/11/18 11:10
B47-1	1803391-AL	Soil	9/07/18 9:07	9/11/18 11:10
B47-2	1803391-AM	Soil	9/07/18 9:08	9/11/18 11:10
B46-0HA	1803391-AN	Soil	9/07/18 9:18	9/11/18 11:10
B46-1HA	1803391-AO	Soil	9/07/18 9:30	9/11/18 11:10
B46-2HA	1803391-AP	Soil	9/07/18 9:34	9/11/18 11:10
B45-0	1803391-AQ	Soil	9/07/18 9:38	9/11/18 11:10
B44-0HA	1803391-AR	Soil	9/07/18 9:52	9/11/18 11:10
B44-1HA	1803391-AS	Soil	9/07/18 9:59	9/11/18 11:10
B44-2HA	1803391-AT	Soil	9/07/18 10:01	9/11/18 11:10
B43-0HA	1803391-AU	Soil	9/07/18 10:06	9/11/18 11:10

Certificate of Analysis

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Rancho Cordova , CA 95742		Reported :	09/19/2018

B43-1HA	1803391-AV	Soil	9/07/18 10:08	9/11/18 11:10
B43-2HA	1803391-AW	Soil	9/07/18 10:10	9/11/18 11:10
B42-0HA	1803391-AX	Soil	9/07/18 10:20	9/11/18 11:10
B42-1HA	1803391-AY	Soil	9/07/18 10:22	9/11/18 11:10
B42-2HA	1803391-AZ	Soil	9/07/18 10:30	9/11/18 11:10
B41-0HA	1803391-BA	Soil	9/07/18 10:36	9/11/18 11:10
B41-1HA	1803391-BB	Soil	9/07/18 10:38	9/11/18 11:10
B41-2HA	1803391-BC	Soil	9/07/18 10:40	9/11/18 11:10

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B35-0

Lab ID: 1803391-01

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**17**	1.0	1	B8I0352	09/17/2018	09/17/18 16:35	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B35-1

Lab ID: 1803391-02

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**5.8**	1.0	1	B8I0352	09/17/2018	09/17/18 16:39	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B35-2

Lab ID: 1803391-03

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	ND	1.0	1	B8I0352	09/17/2018	09/17/18 16:40	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0304	09/13/2018	09/13/18 09:55	
Surrogate: 4-Bromofluorobenzene	*102 %*	*57 - 144*		B8I0304	09/13/2018	*09/13/18 09:55*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**2.8**	1.0	1	B8I0452	09/17/2018	09/17/18 18:37	
ORO	**3.3**	1.0	1	B8I0452	09/17/2018	09/17/18 18:37	
Surrogate: p-Terphenyl	*107 %*	*34 - 158*		B8I0452	09/17/2018	*09/17/18 18:37*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0400	09/16/2018	09/16/18 10:42	
Benzene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 10:42	
Toluene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 10:42	
Ethylbenzene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 10:42	
m,p-Xylene	ND	10	1	B8I0400	09/16/2018	09/16/18 10:42	
o-Xylene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 10:42	
Surrogate: 4-Bromofluorobenzene	*82.5 %*	*54 - 140*		B8I0400	09/16/2018	*09/16/18 10:42*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0342	09/13/2018	09/14/18 11:46	
4,4´-DDE [2C]	ND	2.0	1	B8I0342	09/13/2018	09/14/18 11:46	
4,4´-DDT	ND	2.0	1	B8I0342	09/13/2018	09/14/18 11:46	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B35-2

Lab ID: 1803391-03

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:46	
alpha-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:46	
alpha-Chlordane	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:46	
beta-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:46	
Chlordane	ND	8.5	1	B8I0342	09/13/2018	09/14/18 11:46	
delta-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:46	
Dieldrin	ND	2.0	1	B8I0342	09/13/2018	09/14/18 11:46	
Endosulfan I	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:46	
Endosulfan II	ND	2.0	1	B8I0342	09/13/2018	09/14/18 11:46	
Endosulfan sulfate	ND	2.0	1	B8I0342	09/13/2018	09/14/18 11:46	
Endrin	ND	2.0	1	B8I0342	09/13/2018	09/14/18 11:46	
Endrin aldehyde	ND	2.0	1	B8I0342	09/13/2018	09/14/18 11:46	
Endrin ketone	ND	2.0	1	B8I0342	09/13/2018	09/14/18 11:46	
gamma-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:46	
gamma-Chlordane	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:46	
Heptachlor	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:46	
Heptachlor epoxide	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:46	
Methoxychlor	ND	5.0	1	B8I0342	09/13/2018	09/14/18 11:46	
Toxaphene	ND	50	1	B8I0342	09/13/2018	09/14/18 11:46	
Surrogate: Decachlorobiphenyl	*52.7 %*	*15 - 100*		B8I0342	09/13/2018	*09/14/18 11:46*	
Surrogate: Tetrachloro-m-xylene	*83.2 %*	*16 - 100*		B8I0342	09/13/2018	*09/14/18 11:46*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B34-0

Lab ID: 1803391-04

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**6.1**	1.0	1	B8I0352	09/17/2018	09/17/18 16:41	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B34-1

Lab ID: 1803391-05

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**3.1**	1.0	1	B8I0352	09/17/2018	09/17/18 16:42	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics		ND	1.0	1	B8I0304	09/13/2018	09/13/18 10:51	
Surrogate: 4-Bromofluorobenzene	*108 %*		*57 - 144*		B8I0304	09/13/2018	*09/13/18 10:51*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO		**3.9**	1.0	1	B8I0452	09/17/2018	09/17/18 18:53	
ORO		**3.6**	1.0	1	B8I0452	09/17/2018	09/17/18 18:53	
Surrogate: p-Terphenyl	*114 %*		*34 - 158*		B8I0452	09/17/2018	*09/17/18 18:53*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE		ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:00	
Benzene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:00	
Toluene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:00	
Ethylbenzene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:00	
m,p-Xylene		ND	10	1	B8I0400	09/16/2018	09/16/18 11:00	
o-Xylene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:00	
Surrogate: 4-Bromofluorobenzene	*93.4 %*		*54 - 140*		B8I0400	09/16/2018	*09/16/18 11:00*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0331	09/13/2018	09/13/18 15:53	
4,4´-DDE	ND	2.0	1	B8I0331	09/13/2018	09/13/18 15:53	
4,4´-DDT	ND	2.0	1	B8I0331	09/13/2018	09/13/18 15:53	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B34-1

Lab ID: 1803391-05

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0331	09/13/2018	09/13/18 15:53	
alpha-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 15:53	
alpha-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 15:53	
beta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 15:53	
Chlordane	ND	8.5	1	B8I0331	09/13/2018	09/13/18 15:53	
delta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 15:53	
Dieldrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 15:53	
Endosulfan I	ND	1.0	1	B8I0331	09/13/2018	09/13/18 15:53	
Endosulfan II	ND	2.0	1	B8I0331	09/13/2018	09/13/18 15:53	
Endosulfan sulfate	ND	2.0	1	B8I0331	09/13/2018	09/13/18 15:53	
Endrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 15:53	
Endrin aldehyde	ND	2.0	1	B8I0331	09/13/2018	09/13/18 15:53	
Endrin ketone	ND	2.0	1	B8I0331	09/13/2018	09/13/18 15:53	
gamma-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 15:53	
gamma-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 15:53	
Heptachlor	ND	1.0	1	B8I0331	09/13/2018	09/13/18 15:53	
Heptachlor epoxide	ND	1.0	1	B8I0331	09/13/2018	09/13/18 15:53	
Methoxychlor	ND	5.0	1	B8I0331	09/13/2018	09/13/18 15:53	
Toxaphene	ND	50	1	B8I0331	09/13/2018	09/13/18 15:53	
Surrogate: Decachlorobiphenyl	*60.4 %*	*15 - 100*		B8I0331	09/13/2018	*09/13/18 15:53*	
Surrogate: Tetrachloro-m-xylene	*91.5 %*	*16 - 100*		B8I0331	09/13/2018	*09/13/18 15:53*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B34-2

Lab ID: 1803391-06

Title 22 Metals by ICP-AES EPA 6010B — **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0351	09/14/2018	09/17/18 09:13	
Arsenic	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:13	
Barium	**100**	1.0	1	B8I0351	09/14/2018	09/17/18 09:13	
Beryllium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:13	
Cadmium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:13	
Chromium	**85**	1.0	1	B8I0351	09/14/2018	09/17/18 09:13	
Cobalt	**20**	1.0	1	B8I0351	09/14/2018	09/17/18 09:13	
Copper	**24**	2.0	1	B8I0351	09/14/2018	09/17/18 09:13	
Lead	**4.4**	1.0	1	B8I0351	09/14/2018	09/17/18 09:13	
Molybdenum	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:13	
Nickel	**270**	1.0	1	B8I0351	09/14/2018	09/17/18 09:13	
Selenium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:13	
Silver	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:13	
Thallium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:13	
Vanadium	**27**	1.0	1	B8I0351	09/14/2018	09/17/18 09:13	
Zinc	**46**	1.0	1	B8I0351	09/14/2018	09/17/18 09:13	

Mercury by AA (Cold Vapor) EPA 7471A — **Analyst: KEK**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0357	09/14/2018	09/17/18 12:50	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B33-0

Lab ID: 1803391-07

Title 22 Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0351	09/14/2018	09/17/18 09:16	
Arsenic	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:16	
Barium	**71**	1.0	1	B8I0351	09/14/2018	09/17/18 09:16	
Beryllium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:16	
Cadmium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:16	
Chromium	**97**	1.0	1	B8I0351	09/14/2018	09/17/18 09:16	
Cobalt	**29**	1.0	1	B8I0351	09/14/2018	09/17/18 09:16	
Copper	**19**	2.0	1	B8I0351	09/14/2018	09/17/18 09:16	
Lead	**6.4**	1.0	1	B8I0351	09/14/2018	09/17/18 09:16	
Molybdenum	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:16	
Nickel	**520**	1.0	1	B8I0351	09/14/2018	09/17/18 09:16	
Selenium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:16	
Silver	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:16	
Thallium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:16	
Vanadium	**25**	1.0	1	B8I0351	09/14/2018	09/17/18 09:16	
Zinc	**49**	1.0	1	B8I0351	09/14/2018	09/17/18 09:16	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: KEK

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0357	09/14/2018	09/17/18 12:58	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0304	09/13/2018	09/13/18 11:10	
Surrogate: 4-Bromofluorobenzene	*102 %*	*57 - 144*		B8I0304	09/13/2018	*09/13/18 11:10*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**9.0**	1.0	1	B8I0452	09/17/2018	09/17/18 20:17	
ORO	**8.0**	1.0	1	B8I0452	09/17/2018	09/17/18 20:17	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B33-0

Lab ID: 1803391-07

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Surrogate: p-Terphenyl	*98.7 %*	*34 - 158*		B8I0452	09/17/2018	*09/17/18 20:17*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:19	
Benzene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:19	
Toluene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:19	
Ethylbenzene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:19	
m,p-Xylene	ND	10	1	B8I0400	09/16/2018	09/16/18 11:19	
o-Xylene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:19	
Surrogate: 4-Bromofluorobenzene	*89.9 %*	*54 - 140*		B8I0400	09/16/2018	*09/16/18 11:19*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:03	
4,4´-DDE [2C]	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:03	
4,4´-DDT	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:03	
Aldrin	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:03	
alpha-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:03	
alpha-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:03	
beta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:03	
Chlordane	ND	8.5	1	B8I0331	09/13/2018	09/13/18 16:03	
delta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:03	
Dieldrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:03	
Endosulfan I	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:03	
Endosulfan II	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:03	
Endosulfan sulfate	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:03	
Endrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:03	
Endrin aldehyde	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:03	
Endrin ketone	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:03	
gamma-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:03	
gamma-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:03	
Heptachlor	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:03	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B33-0

Lab ID: 1803391-07

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Heptachlor epoxide		ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:03	
Methoxychlor		ND	5.0	1	B8I0331	09/13/2018	09/13/18 16:03	
Toxaphene		ND	50	1	B8I0331	09/13/2018	09/13/18 16:03	
Surrogate: Decachlorobiphenyl	*54.3 %*		*15 - 100*		B8I0331	09/13/2018	*09/13/18 16:03*	
Surrogate: Tetrachloro-m-xylene	*89.4 %*		*16 - 100*		B8I0331	09/13/2018	*09/13/18 16:03*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B33-1

Lab ID: 1803391-08

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**1.7**	1.0	1	B8I0352	09/17/2018	09/17/18 16:43	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B33-2

Lab ID: 1803391-09

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	ND	1.0	1	B8I0352	09/17/2018	09/17/18 16:47	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B32-0

Lab ID: 1803391-10

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**11**	1.0	1	B8I0352	09/17/2018	09/17/18 16:49	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B32-1

Lab ID: 1803391-11

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	ND	1.0	1	B8I0352	09/17/2018	09/17/18 16:50	

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B32-2

Lab ID: 1803391-12

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	ND	1.0	1	B8I0352	09/17/2018	09/17/18 16:51	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0304	09/13/2018	09/13/18 11:28	
Surrogate: 4-Bromofluorobenzene *125 %*		*57 - 144*		B8I0304	09/13/2018	*09/13/18 11:28*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**4.1**	1.0	1	B8I0452	09/17/2018	09/17/18 18:03	
ORO	**3.0**	1.0	1	B8I0452	09/17/2018	09/17/18 18:03	
Surrogate: p-Terphenyl *113 %*		*34 - 158*		B8I0452	09/17/2018	*09/17/18 18:03*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:37	
Benzene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:37	
Toluene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:37	
Ethylbenzene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:37	
m,p-Xylene	ND	10	1	B8I0400	09/16/2018	09/16/18 11:37	
o-Xylene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:37	
Surrogate: 4-Bromofluorobenzene *87.6 %*		*54 - 140*		B8I0400	09/16/2018	*09/16/18 11:37*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:14	
4,4´-DDE	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:14	
4,4´-DDT	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:14	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B32-2

Lab ID: 1803391-12

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:14	
alpha-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:14	
alpha-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:14	
beta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:14	
Chlordane	ND	8.5	1	B8I0331	09/13/2018	09/13/18 16:14	
delta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:14	
Dieldrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:14	
Endosulfan I	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:14	
Endosulfan II	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:14	
Endosulfan sulfate	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:14	
Endrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:14	
Endrin aldehyde	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:14	
Endrin ketone	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:14	
gamma-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:14	
gamma-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:14	
Heptachlor	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:14	
Heptachlor epoxide	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:14	
Methoxychlor	ND	5.0	1	B8I0331	09/13/2018	09/13/18 16:14	
Toxaphene	ND	50	1	B8I0331	09/13/2018	09/13/18 16:14	
Surrogate: Decachlorobiphenyl	*51.1 %*	*15 - 100*		B8I0331	09/13/2018	*09/13/18 16:14*	
Surrogate: Tetrachloro-m-xylene	*75.2 %*	*16 - 100*		B8I0331	09/13/2018	*09/13/18 16:14*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B36-4.5

Lab ID: 1803391-13

Title 22 Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0351	09/14/2018	09/17/18 09:18	
Arsenic	**5.3**	1.0	1	B8I0351	09/14/2018	09/17/18 09:18	
Barium	**160**	1.0	1	B8I0351	09/14/2018	09/17/18 09:18	
Beryllium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:18	
Cadmium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:18	
Chromium	**43**	1.0	1	B8I0351	09/14/2018	09/17/18 09:18	
Cobalt	**12**	1.0	1	B8I0351	09/14/2018	09/17/18 09:18	
Copper	**28**	2.0	1	B8I0351	09/14/2018	09/17/18 09:18	
Lead	**6.4**	1.0	1	B8I0351	09/14/2018	09/17/18 09:18	
Molybdenum	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:18	
Nickel	**73**	1.0	1	B8I0351	09/14/2018	09/17/18 09:18	
Selenium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:18	
Silver	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:18	
Thallium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:18	
Vanadium	**29**	1.0	1	B8I0351	09/14/2018	09/17/18 09:18	
Zinc	**56**	1.0	1	B8I0351	09/14/2018	09/17/18 09:18	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: KEK

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0357	09/14/2018	09/17/18 13:00	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0304	09/13/2018	09/13/18 11:47	
Surrogate: 4-Bromofluorobenzene	*119 %*	*57 - 144*		B8I0304	09/13/2018	*09/13/18 11:47*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**7.4**	1.0	1	B8I0452	09/17/2018	09/17/18 19:10	
ORO	**8.5**	1.0	1	B8I0452	09/17/2018	09/17/18 19:10	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B36-4.5

Lab ID: 1803391-13

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Surrogate: p-Terphenyl	*97.9 %*	*34 - 158*		B8I0452	09/17/2018	*09/17/18 19:10*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:56	
Benzene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:56	
Toluene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:56	
Ethylbenzene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:56	
m,p-Xylene	ND	10	1	B8I0400	09/16/2018	09/16/18 11:56	
o-Xylene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 11:56	
Surrogate: 4-Bromofluorobenzene	*96.2 %*	*54 - 140*		B8I0400	09/16/2018	*09/16/18 11:56*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:24	
4,4´-DDE [2C]	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:24	
4,4´-DDT	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:24	
Aldrin	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:24	
alpha-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:24	
alpha-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:24	
beta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:24	
Chlordane	ND	8.5	1	B8I0331	09/13/2018	09/13/18 16:24	
delta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:24	
Dieldrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:24	
Endosulfan I	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:24	
Endosulfan II	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:24	
Endosulfan sulfate	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:24	
Endrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:24	
Endrin aldehyde	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:24	
Endrin ketone	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:24	
gamma-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:24	
gamma-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:24	
Heptachlor	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:24	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B36-4.5

Lab ID: 1803391-13

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Heptachlor epoxide		ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:24	
Methoxychlor		ND	5.0	1	B8I0331	09/13/2018	09/13/18 16:24	
Toxaphene		ND	50	1	B8I0331	09/13/2018	09/13/18 16:24	
Surrogate: Decachlorobiphenyl	*43.8 %*		*15 - 100*		B8I0331	09/13/2018	*09/13/18 16:24*	
Surrogate: Tetrachloro-m-xylene	*78.4 %*		*16 - 100*		B8I0331	09/13/2018	*09/13/18 16:24*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B36-11.5

Lab ID: 1803391-14

Title 22 Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0351	09/14/2018	09/17/18 09:19	
Arsenic	**3.4**	1.0	1	B8I0351	09/14/2018	09/17/18 09:19	
Barium	**83**	1.0	1	B8I0351	09/14/2018	09/17/18 09:19	
Beryllium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:19	
Cadmium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:19	
Chromium	**110**	1.0	1	B8I0351	09/14/2018	09/17/18 09:19	
Cobalt	**23**	1.0	1	B8I0351	09/14/2018	09/17/18 09:19	
Copper	**21**	2.0	1	B8I0351	09/14/2018	09/17/18 09:19	
Lead	**4.5**	1.0	1	B8I0351	09/14/2018	09/17/18 09:19	
Molybdenum	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:19	
Nickel	**380**	1.0	1	B8I0351	09/14/2018	09/17/18 09:19	
Selenium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:19	
Silver	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:19	
Thallium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:19	
Vanadium	**24**	1.0	1	B8I0351	09/14/2018	09/17/18 09:19	
Zinc	**47**	1.0	1	B8I0351	09/14/2018	09/17/18 09:19	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: KEK

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0357	09/14/2018	09/17/18 13:01	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0304	09/13/2018	09/13/18 12:06	
Surrogate: 4-Bromofluorobenzene	*116 %*	*57 - 144*		B8I0304	09/13/2018	*09/13/18 12:06*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**13**	1.0	1	B8I0452	09/17/2018	09/17/18 19:43	
ORO	**19**	1.0	1	B8I0452	09/17/2018	09/17/18 19:43	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
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Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B36-11.5

Lab ID: 1803391-14

Diesel Range Organics by EPA 8015B **Analyst: CR**

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Surrogate: p-Terphenyl	*85.6 %*		*34 - 158*		B8I0452	09/17/2018	*09/17/18 19:43*	

BTEX/MTBE by EPA 8021 **Analyst: VW**

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE		ND	5.0	1	B8I0400	09/16/2018	09/16/18 12:15	
Benzene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 12:15	
Toluene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 12:15	
Ethylbenzene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 12:15	
m,p-Xylene		ND	10	1	B8I0400	09/16/2018	09/16/18 12:15	
o-Xylene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 12:15	
Surrogate: 4-Bromofluorobenzene	*101 %*		*54 - 140*		B8I0400	09/16/2018	*09/16/18 12:15*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B36-GW

Lab ID: 1803391-15

Title 22 Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	0.050	5	B8I0443	09/17/2018	09/17/18 18:20	D1
Arsenic	**0.055**	0.050	5	B8I0443	09/17/2018	09/17/18 18:20	D1
Barium	**5.9**	0.015	5	B8I0443	09/17/2018	09/17/18 18:20	D1
Beryllium	ND	0.015	5	B8I0443	09/17/2018	09/17/18 18:20	D1
Cadmium	ND	0.015	5	B8I0443	09/17/2018	09/17/18 18:20	D1
Chromium	**0.78**	0.015	5	B8I0443	09/17/2018	09/17/18 18:20	D1
Cobalt	**0.51**	0.015	5	B8I0443	09/17/2018	09/17/18 18:20	D1
Copper	**0.52**	0.045	5	B8I0443	09/17/2018	09/17/18 18:20	D1
Lead	**0.051**	0.025	5	B8I0443	09/17/2018	09/17/18 18:20	D1
Molybdenum	ND	0.025	5	B8I0443	09/17/2018	09/17/18 18:20	D1
Nickel	**2.6**	0.025	5	B8I0443	09/17/2018	09/17/18 18:20	D1
Selenium	ND	0.050	5	B8I0443	09/17/2018	09/17/18 18:20	D1
Silver	ND	0.015	5	B8I0443	09/17/2018	09/17/18 18:20	D1
Thallium	ND	0.075	5	B8I0443	09/17/2018	09/17/18 18:20	D1
Vanadium	**0.52**	0.015	5	B8I0443	09/17/2018	09/17/18 18:20	D1
Zinc	**1.2**	0.12	5	B8I0443	09/17/2018	09/17/18 18:20	D1

Mercury by AA (Cold Vapor) EPA 7470A

Analyst: KEK

Analyte	Result (ug/L)	PQL (ug/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	**0.91**	0.20	1	B8I0388	09/14/2018	09/17/18 17:16	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**0.16**	0.05	1	B8I0329	09/13/2018	09/13/18 15:50	
ORO	ND	0.05	1	B8I0329	09/13/2018	09/13/18 15:50	
Surrogate: p-Terphenyl	*96.3 %*	*32 - 169*		B8I0329	09/13/2018	*09/13/18 15:50*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B36-GW

Lab ID: 1803391-15

Volatile Organic Compounds by EPA 8260B **Analyst: QP**

Analyte	Result (ug/L)	PQL (ug/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1,1,1,2-Tetrachloroethane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,1,1-Trichloroethane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,1,2,2-Tetrachloroethane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,1,2-Trichloroethane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,1-Dichloroethane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,1-Dichloroethene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,1-Dichloropropene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,2,3-Trichloropropane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,2,3-Trichlorobenzene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,2,4-Trichlorobenzene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,2,4-Trimethylbenzene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,2-Dibromo-3-chloropropane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,2-Dibromoethane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,2-Dichlorobenzene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,2-Dichloroethane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,2-Dichloropropane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,3,5-Trimethylbenzene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,3-Dichlorobenzene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,3-Dichloropropane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
1,4-Dichlorobenzene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
2,2-Dichloropropane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
2-Chlorotoluene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
4-Chlorotoluene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
4-Isopropyltoluene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Benzene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Bromobenzene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Bromochloromethane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Bromodichloromethane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Bromoform	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Bromomethane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Carbon disulfide	ND	1.0	1	B8I0323	09/13/2018	09/13/18 19:00	
Carbon tetrachloride	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Chlorobenzene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Chloroethane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Chloroform	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Chloromethane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
cis-1,2-Dichloroethene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B36-GW

Lab ID: 1803391-15

Volatile Organic Compounds by EPA 8260B **Analyst: QP**

Analyte	Result (ug/L)	PQL (ug/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
cis-1,3-Dichloropropene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Di-isopropyl ether	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Dibromochloromethane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Dibromomethane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Dichlorodifluoromethane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Ethyl Acetate	ND	10	1	B8I0323	09/13/2018	09/13/18 19:00	
Ethyl Ether	ND	10	1	B8I0323	09/13/2018	09/13/18 19:00	
Ethyl tert-butyl ether	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Ethylbenzene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Freon-113	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Hexachlorobutadiene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Isopropylbenzene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
m,p-Xylene	ND	1.0	1	B8I0323	09/13/2018	09/13/18 19:00	
Methylene chloride	ND	1.0	1	B8I0323	09/13/2018	09/13/18 19:00	
MTBE	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
n-Butylbenzene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
n-Propylbenzene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Naphthalene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
o-Xylene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
sec-Butylbenzene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Styrene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
tert-Amyl methyl ether	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
tert-Butanol	ND	10	1	B8I0323	09/13/2018	09/13/18 19:00	
tert-Butylbenzene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Tetrachloroethene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Toluene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
trans-1,2-Dichloroethene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
trans-1,3-Dichloropropene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Trichloroethene	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Trichlorofluoromethane	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Vinyl acetate	ND	10	1	B8I0323	09/13/2018	09/13/18 19:00	
Vinyl chloride	ND	0.50	1	B8I0323	09/13/2018	09/13/18 19:00	
Gasoline Range Organics	ND	50	1	B8I0324	09/13/2018	09/13/18 19:00	
Surrogate: 1,2-Dichloroethane-d4	*93.0 %*	*74 - 132*		B8I0324	09/13/2018	*09/13/18 19:00*	
Surrogate: 1,2-Dichloroethane-d4	*98.2 %*	*74 - 132*		B8I0323	09/13/2018	*09/13/18 19:00*	
Surrogate: 4-Bromofluorobenzene	*96.6 %*	*82 - 123*		B8I0323	09/13/2018	*09/13/18 19:00*	
Surrogate: 4-Bromofluorobenzene	*99.4 %*	*82 - 123*		B8I0324	09/13/2018	*09/13/18 19:00*	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B36-GW

Lab ID: 1803391-15

Volatile Organic Compounds by EPA 8260B **Analyst: QP**

Analyte	Result (ug/L)	PQL (ug/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Surrogate: Dibromofluoromethane	*93.8 %*	*76 - 135*		B8I0324	09/13/2018	*09/13/18 19:00*	
Surrogate: Dibromofluoromethane	*98.6 %*	*76 - 135*		B8I0323	09/13/2018	*09/13/18 19:00*	
Surrogate: Toluene-d8	*103 %*	*85 - 125*		B8I0324	09/13/2018	*09/13/18 19:00*	
Surrogate: Toluene-d8	*101 %*	*85 - 125*		B8I0323	09/13/2018	*09/13/18 19:00*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B23-0

Lab ID: 1803391-16

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**17**	1.0	1	B8I0352	09/17/2018	09/17/18 16:52	

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Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
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Client Sample ID B23-1

Lab ID: 1803391-17

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**4.0**	1.0	1	B8I0352	09/17/2018	09/17/18 16:54	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics		ND	1.0	1	B8I0304	09/13/2018	09/13/18 12:24	
Surrogate: 4-Bromofluorobenzene	*119 %*		*57 - 144*		B8I0304	09/13/2018	*09/13/18 12:24*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO		**9.2**	1.0	1	B8I0452	09/17/2018	09/17/18 20:00	
ORO		**12**	1.0	1	B8I0452	09/17/2018	09/17/18 20:00	
Surrogate: p-Terphenyl	*84.3 %*		*34 - 158*		B8I0452	09/17/2018	*09/17/18 20:00*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE		ND	5.0	1	B8I0400	09/16/2018	09/16/18 12:33	
Benzene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 12:33	
Toluene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 12:33	
Ethylbenzene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 12:33	
m,p-Xylene		ND	10	1	B8I0400	09/16/2018	09/16/18 12:33	
o-Xylene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 12:33	
Surrogate: 4-Bromofluorobenzene	*103 %*		*54 - 140*		B8I0400	09/16/2018	*09/16/18 12:33*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:35	
4,4´-DDE [2C]	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:35	
4,4´-DDT	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:35	

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Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
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Client Sample ID B23-1

Lab ID: 1803391-17

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:35	
alpha-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:35	
alpha-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:35	
beta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:35	
Chlordane	ND	8.5	1	B8I0331	09/13/2018	09/13/18 16:35	
delta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:35	
Dieldrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:35	
Endosulfan I	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:35	
Endosulfan II	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:35	
Endosulfan sulfate	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:35	
Endrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:35	
Endrin aldehyde	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:35	
Endrin ketone	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:35	
gamma-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:35	
gamma-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:35	
Heptachlor	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:35	
Heptachlor epoxide	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:35	
Methoxychlor	ND	5.0	1	B8I0331	09/13/2018	09/13/18 16:35	
Toxaphene	ND	50	1	B8I0331	09/13/2018	09/13/18 16:35	
Surrogate: Decachlorobiphenyl	*53.3 %*	*15 - 100*		B8I0331	09/13/2018	*09/13/18 16:35*	
Surrogate: Tetrachloro-m-xylene	*97.1 %*	*16 - 100*		B8I0331	09/13/2018	*09/13/18 16:35*	

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Client Sample ID B23-2

Lab ID: 1803391-18

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**2.8**	1.0	1	B8I0352	09/17/2018	09/17/18 16:55	

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B24-0

Lab ID: 1803391-19

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**4.5**	1.0	1	B8I0352	09/17/2018	09/17/18 16:56	

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Client Sample ID B24-1

Lab ID: 1803391-20

Title 22 Metals by ICP-AES EPA 6010B — **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	4.0	2	B8I0351	09/14/2018	09/17/18 10:22	
Arsenic	ND	2.0	2	B8I0351	09/14/2018	09/17/18 10:22	
Barium	**43**	2.0	2	B8I0351	09/14/2018	09/17/18 10:22	
Beryllium	ND	2.0	2	B8I0351	09/14/2018	09/17/18 10:22	
Cadmium	ND	2.0	2	B8I0351	09/14/2018	09/17/18 10:22	
Chromium	**240**	2.0	2	B8I0351	09/14/2018	09/17/18 10:22	
Cobalt	**49**	2.0	2	B8I0351	09/14/2018	09/17/18 10:22	
Copper	**13**	4.0	2	B8I0351	09/14/2018	09/17/18 10:22	
Lead	**23**	2.0	2	B8I0351	09/14/2018	09/17/18 10:22	
Molybdenum	ND	2.0	2	B8I0351	09/14/2018	09/17/18 10:22	
Nickel	**830**	2.0	2	B8I0351	09/14/2018	09/17/18 10:22	
Selenium	ND	2.0	2	B8I0351	09/14/2018	09/17/18 10:22	
Silver	ND	2.0	2	B8I0351	09/14/2018	09/17/18 10:22	
Thallium	ND	2.0	2	B8I0351	09/14/2018	09/17/18 10:22	
Vanadium	**17**	2.0	2	B8I0351	09/14/2018	09/17/18 10:22	
Zinc	**32**	2.0	2	B8I0351	09/14/2018	09/17/18 10:22	

Mercury by AA (Cold Vapor) EPA 7471A — **Analyst: KEK**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0357	09/14/2018	09/17/18 13:07	

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Client Sample ID B24-2

Lab ID: 1803391-21

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**11**	1.0	1	B8I0352	09/17/2018	09/17/18 16:57	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics		ND	1.0	1	B8I0304	09/13/2018	09/13/18 12:43	
Surrogate: 4-Bromofluorobenzene	*107 %*		*57 - 144*		B8I0304	09/13/2018	*09/13/18 12:43*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO		**16**	1.0	1	B8I0452	09/17/2018	09/17/18 21:24	
ORO		**42**	1.0	1	B8I0452	09/17/2018	09/17/18 21:24	
Surrogate: p-Terphenyl	*89.2 %*		*34 - 158*		B8I0452	09/17/2018	*09/17/18 21:24*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE		ND	5.0	1	B8I0400	09/16/2018	09/16/18 12:52	
Benzene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 12:52	
Toluene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 12:52	
Ethylbenzene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 12:52	
m,p-Xylene		ND	10	1	B8I0400	09/16/2018	09/16/18 12:52	
o-Xylene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 12:52	
Surrogate: 4-Bromofluorobenzene	*97.7 %*		*54 - 140*		B8I0400	09/16/2018	*09/16/18 12:52*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:45	
4,4´-DDE	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:45	
4,4´-DDT [2C]	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:45	

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Client Sample ID B24-2

Lab ID: 1803391-21

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:45	
alpha-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:45	
alpha-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:45	
beta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:45	
Chlordane	ND	8.5	1	B8I0331	09/13/2018	09/13/18 16:45	
delta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:45	
Dieldrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:45	
Endosulfan I	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:45	
Endosulfan II	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:45	
Endosulfan sulfate	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:45	
Endrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:45	
Endrin aldehyde	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:45	
Endrin ketone	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:45	
gamma-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:45	
gamma-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:45	
Heptachlor	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:45	
Heptachlor epoxide	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:45	
Methoxychlor	ND	5.0	1	B8I0331	09/13/2018	09/13/18 16:45	
Toxaphene	ND	50	1	B8I0331	09/13/2018	09/13/18 16:45	
Surrogate: Decachlorobiphenyl	*30.7 %*	*15 - 100*		B8I0331	09/13/2018	*09/13/18 16:45*	
Surrogate: Tetrachloro-m-xylene	*56.7 %*	*16 - 100*		B8I0331	09/13/2018	*09/13/18 16:45*	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B25-0

Lab ID: 1803391-22

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**4.6**	1.0	1	B8I0352	09/17/2018	09/17/18 16:58	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0304	09/13/2018	09/13/18 13:01	
Surrogate: 4-Bromofluorobenzene *108 %*		*57 - 144*		B8I0304	09/13/2018	*09/13/18 13:01*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**25**	2.0	2	B8I0452	09/17/2018	09/17/18 21:40	
ORO	**83**	2.0	2	B8I0452	09/17/2018	09/17/18 21:40	
Surrogate: p-Terphenyl *87.5 %*		*34 - 158*		B8I0452	09/17/2018	*09/17/18 21:40*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0400	09/16/2018	09/16/18 13:10	
Benzene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 13:10	
Toluene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 13:10	
Ethylbenzene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 13:10	
m,p-Xylene	ND	10	1	B8I0400	09/16/2018	09/16/18 13:10	
o-Xylene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 13:10	
Surrogate: 4-Bromofluorobenzene *104 %*		*54 - 140*		B8I0400	09/16/2018	*09/16/18 13:10*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:55	
4,4´-DDE [2C]	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:55	
4,4´-DDT [2C]	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:55	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B25-0

Lab ID: 1803391-22

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:55	
alpha-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:55	
alpha-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:55	
beta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:55	
Chlordane	ND	8.5	1	B8I0331	09/13/2018	09/13/18 16:55	
delta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:55	
Dieldrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:55	
Endosulfan I	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:55	
Endosulfan II	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:55	
Endosulfan sulfate	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:55	
Endrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:55	
Endrin aldehyde	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:55	
Endrin ketone	ND	2.0	1	B8I0331	09/13/2018	09/13/18 16:55	
gamma-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:55	
gamma-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:55	
Heptachlor	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:55	
Heptachlor epoxide	ND	1.0	1	B8I0331	09/13/2018	09/13/18 16:55	
Methoxychlor	ND	5.0	1	B8I0331	09/13/2018	09/13/18 16:55	
Toxaphene	ND	50	1	B8I0331	09/13/2018	09/13/18 16:55	
Surrogate: Decachlorobiphenyl	*35.6 %*	*15 - 100*		B8I0331	09/13/2018	*09/13/18 16:55*	
Surrogate: Tetrachloro-m-xylene	*60.8 %*	*16 - 100*		B8I0331	09/13/2018	*09/13/18 16:55*	

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Client Sample ID B25-1

Lab ID: 1803391-23

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**3.4**	1.0	1	B8I0352	09/17/2018	09/17/18 17:02	

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
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Client Sample ID B26-2.5

Lab ID: 1803391-24

Title 22 Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	**6.1**	2.0	1	B8I0351	09/14/2018	09/17/18 09:21	
Arsenic	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:21	
Barium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:21	
Beryllium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:21	
Cadmium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:21	
Chromium	**430**	1.0	1	B8I0351	09/14/2018	09/17/18 09:21	
Cobalt	**79**	1.0	1	B8I0351	09/14/2018	09/17/18 09:21	
Copper	**7.2**	2.0	1	B8I0351	09/14/2018	09/17/18 09:21	
Lead	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:21	
Molybdenum	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:21	
Nickel	**1700**	5.0	5	B8I0351	09/14/2018	09/17/18 10:26	D6
Selenium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:21	
Silver	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:21	
Thallium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 09:21	
Vanadium	**22**	1.0	1	B8I0351	09/14/2018	09/17/18 09:21	
Zinc	**22**	1.0	1	B8I0351	09/14/2018	09/17/18 09:21	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: KEK

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0357	09/14/2018	09/17/18 13:09	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0304	09/13/2018	09/13/18 13:20	
Surrogate: 4-Bromofluorobenzene	*117 %*	*57 - 144*		B8I0304	09/13/2018	*09/13/18 13:20*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**8.7**	1.0	1	B8I0452	09/17/2018	09/17/18 20:33	
ORO	**11**	1.0	1	B8I0452	09/17/2018	09/17/18 20:33	

Certificate of Analysis

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Client Sample ID B26-2.5

Lab ID: 1803391-24

Diesel Range Organics by EPA 8015B **Analyst: CR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Surrogate: p-Terphenyl	*107 %*	*34 - 158*		B8I0452	09/17/2018	*09/17/18 20:33*	

BTEX/MTBE by EPA 8021 **Analyst: VW**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0401	09/17/2018	09/17/18 12:34	
Benzene	ND	5.0	1	B8I0401	09/17/2018	09/17/18 12:34	
Toluene	ND	5.0	1	B8I0401	09/17/2018	09/17/18 12:34	
Ethylbenzene	ND	5.0	1	B8I0401	09/17/2018	09/17/18 12:34	
m,p-Xylene	ND	10	1	B8I0401	09/17/2018	09/17/18 12:34	
o-Xylene	ND	5.0	1	B8I0401	09/17/2018	09/17/18 12:34	
Surrogate: 4-Bromofluorobenzene	*98.3 %*	*54 - 140*		B8I0401	09/17/2018	*09/17/18 12:34*	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
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Client Sample ID B27-0

Lab ID: 1803391-25

Title 22 Metals by ICP-AES EPA 6010B — **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0351	09/14/2018	09/17/18 10:02	
Arsenic	**2.9**	1.0	1	B8I0351	09/14/2018	09/17/18 10:02	
Barium	**130**	1.0	1	B8I0351	09/14/2018	09/17/18 10:02	
Beryllium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:02	
Cadmium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:02	
Chromium	**120**	1.0	1	B8I0351	09/14/2018	09/17/18 10:02	
Cobalt	**25**	1.0	1	B8I0351	09/14/2018	09/17/18 10:02	
Copper	**30**	2.0	1	B8I0351	09/14/2018	09/17/18 10:02	
Lead	**12**	1.0	1	B8I0351	09/14/2018	09/17/18 10:02	
Molybdenum	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:02	
Nickel	**390**	1.0	1	B8I0351	09/14/2018	09/17/18 10:02	
Selenium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:02	
Silver	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:02	
Thallium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:02	
Vanadium	**31**	1.0	1	B8I0351	09/14/2018	09/17/18 10:02	
Zinc	**88**	1.0	1	B8I0351	09/14/2018	09/17/18 10:02	

Mercury by AA (Cold Vapor) EPA 7471A — **Analyst: KEK**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0357	09/14/2018	09/17/18 13:11	

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Client Sample ID B27-1

Lab ID: 1803391-26

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**6.5**	1.0	1	B8I0352	09/17/2018	09/17/18 17:03	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0304	09/13/2018	09/13/18 13:38	
Surrogate: 4-Bromofluorobenzene *115 %*		*57 - 144*		B8I0304	09/13/2018	*09/13/18 13:38*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**9.2**	1.0	1	B8I0452	09/17/2018	09/17/18 21:07	
ORO	**18**	1.0	1	B8I0452	09/17/2018	09/17/18 21:07	
Surrogate: p-Terphenyl *86.7 %*		*34 - 158*		B8I0452	09/17/2018	*09/17/18 21:07*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0400	09/16/2018	09/16/18 13:29	
Benzene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 13:29	
Toluene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 13:29	
Ethylbenzene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 13:29	
m,p-Xylene	ND	10	1	B8I0400	09/16/2018	09/16/18 13:29	
o-Xylene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 13:29	
Surrogate: 4-Bromofluorobenzene *96.0 %*		*54 - 140*		B8I0400	09/16/2018	*09/16/18 13:29*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:06	
4,4´-DDE [2C]	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:06	
4,4´-DDT	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:06	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
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Client Sample ID B27-1

Lab ID: 1803391-26

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:06	
alpha-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:06	
alpha-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:06	
beta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:06	
Chlordane	ND	8.5	1	B8I0331	09/13/2018	09/13/18 17:06	
delta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:06	
Dieldrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:06	
Endosulfan I	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:06	
Endosulfan II	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:06	
Endosulfan sulfate	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:06	
Endrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:06	
Endrin aldehyde	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:06	
Endrin ketone	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:06	
gamma-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:06	
gamma-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:06	
Heptachlor	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:06	
Heptachlor epoxide	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:06	
Methoxychlor	ND	5.0	1	B8I0331	09/13/2018	09/13/18 17:06	
Toxaphene	ND	50	1	B8I0331	09/13/2018	09/13/18 17:06	
Surrogate: Decachlorobiphenyl	*55.9 %*	*15 - 100*		B8I0331	09/13/2018	*09/13/18 17:06*	
Surrogate: Tetrachloro-m-xylene	*93.7 %*	*16 - 100*		B8I0331	09/13/2018	*09/13/18 17:06*	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B27-2

Lab ID: 1803391-27

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	ND	1.0	1	B8I0352	09/17/2018	09/17/18 17:04	

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B22-0HA

Lab ID: 1803391-28

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**4.2**	1.0	1	B8I0352	09/17/2018	09/17/18 17:05	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0304	09/13/2018	09/13/18 13:57	
Surrogate: 4-Bromofluorobenzene *121 %*		*57 - 144*		B8I0304	09/13/2018	*09/13/18 13:57*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**40**	5.0	5	B8I0452	09/17/2018	09/17/18 21:57	
ORO	**120**	5.0	5	B8I0452	09/17/2018	09/17/18 21:57	
Surrogate: p-Terphenyl *101 %*		*34 - 158*		B8I0452	09/17/2018	*09/17/18 21:57*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0400	09/16/2018	09/16/18 13:48	
Benzene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 13:48	
Toluene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 13:48	
Ethylbenzene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 13:48	
m,p-Xylene	ND	10	1	B8I0400	09/16/2018	09/16/18 13:48	
o-Xylene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 13:48	
Surrogate: 4-Bromofluorobenzene *102 %*		*54 - 140*		B8I0400	09/16/2018	*09/16/18 13:48*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:16	
4,4´-DDE [2C]	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:16	
4,4´-DDT	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:16	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B22-0HA

Lab ID: 1803391-28

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:16	
alpha-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:16	
alpha-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:16	
beta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:16	
Chlordane [2C]	ND	8.5	1	B8I0331	09/13/2018	09/13/18 17:16	
delta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:16	
Dieldrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:16	
Endosulfan I	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:16	
Endosulfan II	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:16	
Endosulfan sulfate	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:16	
Endrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:16	
Endrin aldehyde	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:16	
Endrin ketone	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:16	
gamma-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:16	
gamma-Chlordane [2C]	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:16	
Heptachlor	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:16	
Heptachlor epoxide	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:16	
Methoxychlor	ND	5.0	1	B8I0331	09/13/2018	09/13/18 17:16	
Toxaphene	ND	50	1	B8I0331	09/13/2018	09/13/18 17:16	
Surrogate: Decachlorobiphenyl	*29.1 %*	*15 - 100*		B8I0331	09/13/2018	*09/13/18 17:16*	
Surrogate: Tetrachloro-m-xylene	*55.3 %*	*16 - 100*		B8I0331	09/13/2018	*09/13/18 17:16*	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B22-1HA

Lab ID: 1803391-29

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**4.9**	1.0	1	B8I0353	09/17/2018	09/17/18 17:09	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B22-2HA

Lab ID: 1803391-30

Title 22 Metals by ICP-AES EPA 6010B — **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0351	09/14/2018	09/17/18 10:03	
Arsenic	**3.4**	1.0	1	B8I0351	09/14/2018	09/17/18 10:03	
Barium	**120**	1.0	1	B8I0351	09/14/2018	09/17/18 10:03	
Beryllium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:03	
Cadmium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:03	
Chromium	**110**	1.0	1	B8I0351	09/14/2018	09/17/18 10:03	
Cobalt	**22**	1.0	1	B8I0351	09/14/2018	09/17/18 10:03	
Copper	**24**	2.0	1	B8I0351	09/14/2018	09/17/18 10:03	
Lead	**5.5**	1.0	1	B8I0351	09/14/2018	09/17/18 10:03	
Molybdenum	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:03	
Nickel	**290**	1.0	1	B8I0351	09/14/2018	09/17/18 10:03	
Selenium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:03	
Silver	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:03	
Thallium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:03	
Vanadium	**31**	1.0	1	B8I0351	09/14/2018	09/17/18 10:03	
Zinc	**46**	1.0	1	B8I0351	09/14/2018	09/17/18 10:03	

Mercury by AA (Cold Vapor) EPA 7471A — **Analyst: KEK**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	**0.69**	0.10	1	B8I0357	09/14/2018	09/17/18 13:13	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B28-0

Lab ID: 1803391-31

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**5.1**	1.0	1	B8I0353	09/17/2018	09/17/18 17:13	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B28-1

Lab ID: 1803391-32

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	ND	20	20	B8I0353	09/17/2018	09/18/18 09:39	D5

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B28-2

Lab ID: 1803391-33

Title 22 Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0351	09/14/2018	09/17/18 10:04	
Arsenic	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:04	
Barium	**48**	1.0	1	B8I0351	09/14/2018	09/17/18 10:04	
Beryllium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:04	
Cadmium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:04	
Chromium	**180**	1.0	1	B8I0351	09/14/2018	09/17/18 10:04	
Cobalt	**53**	1.0	1	B8I0351	09/14/2018	09/17/18 10:04	
Copper	**15**	2.0	1	B8I0351	09/14/2018	09/17/18 10:04	
Lead	**5.0**	1.0	1	B8I0351	09/14/2018	09/17/18 10:04	
Molybdenum	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:04	
Nickel	**1000**	1.0	1	B8I0351	09/14/2018	09/17/18 10:04	
Selenium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:04	
Silver	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:04	
Thallium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:04	
Vanadium	**17**	1.0	1	B8I0351	09/14/2018	09/17/18 10:04	
Zinc	**31**	1.0	1	B8I0351	09/14/2018	09/17/18 10:04	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: KEK

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0357	09/14/2018	09/17/18 13:15	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0397	09/15/2018	09/15/18 13:26	
Surrogate: 4-Bromofluorobenzene	*118 %*	*57 - 144*		B8I0397	09/15/2018	*09/15/18 13:26*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**7.3**	1.0	1	B8I0452	09/17/2018	09/17/18 20:50	
ORO	**9.3**	1.0	1	B8I0452	09/17/2018	09/17/18 20:50	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B28-2

Lab ID: 1803391-33

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Surrogate: p-Terphenyl	*87.1 %*	*34 - 158*		B8I0452	09/17/2018	*09/17/18 20:50*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0397	09/15/2018	09/15/18 13:26	
Benzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 13:26	
Toluene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 13:26	
Ethylbenzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 13:26	
m,p-Xylene	ND	10	1	B8I0397	09/15/2018	09/15/18 13:26	
o-Xylene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 13:26	
Surrogate: 4-Bromofluorobenzene	*101 %*	*54 - 140*		B8I0397	09/15/2018	*09/15/18 13:26*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:27	
4,4´-DDE	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:27	
4,4´-DDT	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:27	
Aldrin	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:27	
alpha-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:27	
alpha-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:27	
beta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:27	
Chlordane	ND	8.5	1	B8I0331	09/13/2018	09/13/18 17:27	
delta-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:27	
Dieldrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:27	
Endosulfan I	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:27	
Endosulfan II	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:27	
Endosulfan sulfate	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:27	
Endrin	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:27	
Endrin aldehyde	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:27	
Endrin ketone	ND	2.0	1	B8I0331	09/13/2018	09/13/18 17:27	
gamma-BHC	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:27	
gamma-Chlordane	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:27	
Heptachlor	ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:27	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B28-2

Lab ID: 1803391-33

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Heptachlor epoxide		ND	1.0	1	B8I0331	09/13/2018	09/13/18 17:27	
Methoxychlor		ND	5.0	1	B8I0331	09/13/2018	09/13/18 17:27	
Toxaphene		ND	50	1	B8I0331	09/13/2018	09/13/18 17:27	
Surrogate: Decachlorobiphenyl	*65.1 %*		*15 - 100*		B8I0331	09/13/2018	*09/13/18 17:27*	
Surrogate: Tetrachloro-m-xylene	*99.6 %*		*16 - 100*		B8I0331	09/13/2018	*09/13/18 17:27*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B31-4.5

Lab ID: 1803391-34

Title 22 Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0351	09/14/2018	09/17/18 10:05	
Arsenic	**5.7**	1.0	1	B8I0351	09/14/2018	09/17/18 10:05	
Barium	**170**	1.0	1	B8I0351	09/14/2018	09/17/18 10:05	
Beryllium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:05	
Cadmium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:05	
Chromium	**41**	1.0	1	B8I0351	09/14/2018	09/17/18 10:05	
Cobalt	**12**	1.0	1	B8I0351	09/14/2018	09/17/18 10:05	
Copper	**27**	2.0	1	B8I0351	09/14/2018	09/17/18 10:05	
Lead	**13**	1.0	1	B8I0351	09/14/2018	09/17/18 10:05	
Molybdenum	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:05	
Nickel	**71**	1.0	1	B8I0351	09/14/2018	09/17/18 10:05	
Selenium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:05	
Silver	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:05	
Thallium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:05	
Vanadium	**29**	1.0	1	B8I0351	09/14/2018	09/17/18 10:05	
Zinc	**55**	1.0	1	B8I0351	09/14/2018	09/17/18 10:05	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: KEK

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0357	09/14/2018	09/17/18 13:16	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0304	09/13/2018	09/13/18 14:34	
Surrogate: 4-Bromofluorobenzene	*108 %*	*57 - 144*		B8I0304	09/13/2018	*09/13/18 14:34*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**3.1**	1.0	1	B8I0461	09/18/2018	09/18/18 10:25	
ORO	**1.9**	1.0	1	B8I0461	09/18/2018	09/18/18 10:25	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B31-4.5

Lab ID: 1803391-34

Diesel Range Organics by EPA 8015B **Analyst: CR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Surrogate: p-Terphenyl	*111 %*	*34 - 158*		B8I0461	09/18/2018	*09/18/18 10:25*	

BTEX/MTBE by EPA 8021 **Analyst: VW**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0397	09/15/2018	09/15/18 13:45	
Benzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 13:45	
Toluene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 13:45	
Ethylbenzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 13:45	
m,p-Xylene	ND	10	1	B8I0397	09/15/2018	09/15/18 13:45	
o-Xylene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 13:45	
Surrogate: 4-Bromofluorobenzene	*101 %*	*54 - 140*		B8I0397	09/15/2018	*09/15/18 13:45*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B31-11.5

Lab ID: 1803391-35

Title 22 Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0351	09/14/2018	09/17/18 10:06	
Arsenic	**4.5**	1.0	1	B8I0351	09/14/2018	09/17/18 10:06	
Barium	**130**	1.0	1	B8I0351	09/14/2018	09/17/18 10:06	
Beryllium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:06	
Cadmium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:06	
Chromium	**44**	1.0	1	B8I0351	09/14/2018	09/17/18 10:06	
Cobalt	**12**	1.0	1	B8I0351	09/14/2018	09/17/18 10:06	
Copper	**25**	2.0	1	B8I0351	09/14/2018	09/17/18 10:06	
Lead	**6.0**	1.0	1	B8I0351	09/14/2018	09/17/18 10:06	
Molybdenum	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:06	
Nickel	**82**	1.0	1	B8I0351	09/14/2018	09/17/18 10:06	
Selenium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:06	
Silver	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:06	
Thallium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:06	
Vanadium	**28**	1.0	1	B8I0351	09/14/2018	09/17/18 10:06	
Zinc	**48**	1.0	1	B8I0351	09/14/2018	09/17/18 10:06	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: KEK

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0357	09/14/2018	09/17/18 13:18	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0397	09/15/2018	09/15/18 14:03	
Surrogate: 4-Bromofluorobenzene	*125 %*	*57 - 144*		B8I0397	09/15/2018	*09/15/18 14:03*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**5.2**	1.0	1	B8I0461	09/18/2018	09/18/18 10:42	
ORO	**3.1**	1.0	1	B8I0461	09/18/2018	09/18/18 10:42	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B31-11.5

Lab ID: 1803391-35

Diesel Range Organics by EPA 8015B — **Analyst: CR**

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Surrogate: p-Terphenyl	*86.2 %*		*34 - 158*		B8I0461	09/18/2018	*09/18/18 10:42*	

BTEX/MTBE by EPA 8021 — **Analyst: VW**

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE		ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:03	
Benzene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:03	
Toluene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:03	
Ethylbenzene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:03	
m,p-Xylene		ND	10	1	B8I0397	09/15/2018	09/15/18 14:03	
o-Xylene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:03	
Surrogate: 4-Bromofluorobenzene	*107 %*		*54 - 140*		B8I0397	09/15/2018	*09/15/18 14:03*	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B30-0

Lab ID: 1803391-36

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	ND	1.0	1	B8I0353	09/17/2018	09/17/18 17:18	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B30-1

Lab ID: 1803391-37

Title 22 Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	**3.8**	2.0	1	B8I0351	09/14/2018	09/17/18 10:10	
Arsenic	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:10	
Barium	**26**	1.0	1	B8I0351	09/14/2018	09/17/18 10:10	
Beryllium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:10	
Cadmium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:10	
Chromium	**280**	1.0	1	B8I0351	09/14/2018	09/17/18 10:10	
Cobalt	**44**	1.0	1	B8I0351	09/14/2018	09/17/18 10:10	
Copper	**13**	2.0	1	B8I0351	09/14/2018	09/17/18 10:10	
Lead	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:10	
Molybdenum	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:10	
Nickel	**920**	1.0	1	B8I0351	09/14/2018	09/17/18 10:10	
Selenium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:10	
Silver	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:10	
Thallium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:10	
Vanadium	**15**	1.0	1	B8I0351	09/14/2018	09/17/18 10:10	
Zinc	**27**	1.0	1	B8I0351	09/14/2018	09/17/18 10:10	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: KEK

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0357	09/14/2018	09/17/18 13:20	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0397	09/15/2018	09/15/18 14:22	
Surrogate: 4-Bromofluorobenzene	*105 %*	*57 - 144*		B8I0397	09/15/2018	*09/15/18 14:22*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**7.0**	1.0	1	B8I0461	09/18/2018	09/18/18 10:58	
ORO	**4.7**	1.0	1	B8I0461	09/18/2018	09/18/18 10:58	

Certificate of Analysis

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Client Sample ID B30-1

Lab ID: 1803391-37

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Surrogate: p-Terphenyl	*96.4 %*	*34 - 158*		B8I0461	09/18/2018	*09/18/18 10:58*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:22	
Benzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:22	
Toluene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:22	
Ethylbenzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:22	
m,p-Xylene	ND	10	1	B8I0397	09/15/2018	09/15/18 14:22	
o-Xylene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:22	
Surrogate: 4-Bromofluorobenzene	*89.8 %*	*54 - 140*		B8I0397	09/15/2018	*09/15/18 14:22*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0342	09/13/2018	09/14/18 11:57	
4,4´-DDE	ND	2.0	1	B8I0342	09/13/2018	09/14/18 11:57	
4,4´-DDT	ND	2.0	1	B8I0342	09/13/2018	09/14/18 11:57	
Aldrin	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:57	
alpha-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:57	
alpha-Chlordane	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:57	
beta-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:57	
Chlordane	ND	8.5	1	B8I0342	09/13/2018	09/14/18 11:57	
delta-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:57	
Dieldrin	ND	2.0	1	B8I0342	09/13/2018	09/14/18 11:57	
Endosulfan I	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:57	
Endosulfan II	ND	2.0	1	B8I0342	09/13/2018	09/14/18 11:57	
Endosulfan sulfate	ND	2.0	1	B8I0342	09/13/2018	09/14/18 11:57	
Endrin	ND	2.0	1	B8I0342	09/13/2018	09/14/18 11:57	
Endrin aldehyde	ND	2.0	1	B8I0342	09/13/2018	09/14/18 11:57	
Endrin ketone	ND	2.0	1	B8I0342	09/13/2018	09/14/18 11:57	
gamma-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:57	
gamma-Chlordane	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:57	
Heptachlor	ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:57	

Certificate of Analysis

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Client Sample ID B30-1

Lab ID: 1803391-37

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Heptachlor epoxide		ND	1.0	1	B8I0342	09/13/2018	09/14/18 11:57	
Methoxychlor		ND	5.0	1	B8I0342	09/13/2018	09/14/18 11:57	
Toxaphene		ND	50	1	B8I0342	09/13/2018	09/14/18 11:57	
Surrogate: Decachlorobiphenyl	*44.4 %*		*15 - 100*		B8I0342	09/13/2018	*09/14/18 11:57*	
Surrogate: Tetrachloro-m-xylene	*69.3 %*		*16 - 100*		B8I0342	09/13/2018	*09/14/18 11:57*	

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Client Sample ID B30-2

Lab ID: 1803391-38

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	ND	1.0	1	B8I0353	09/17/2018	09/17/18 17:19	

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Client Sample ID B29-0

Lab ID: 1803391-39

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	ND	1.0	1	B8I0353	09/17/2018	09/17/18 17:20	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0397	09/15/2018	09/15/18 14:41	
Surrogate: 4-Bromofluorobenzene *120 %*		*57 - 144*		B8I0397	09/15/2018	*09/15/18 14:41*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**13**	1.0	1	B8I0461	09/18/2018	09/18/18 11:48	
ORO	**13**	1.0	1	B8I0461	09/18/2018	09/18/18 11:48	
Surrogate: p-Terphenyl *120 %*		*34 - 158*		B8I0461	09/18/2018	*09/18/18 11:48*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:41	
Benzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:41	
Toluene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:41	
Ethylbenzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:41	
m,p-Xylene	ND	10	1	B8I0397	09/15/2018	09/15/18 14:41	
o-Xylene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:41	
Surrogate: 4-Bromofluorobenzene *100 %*		*54 - 140*		B8I0397	09/15/2018	*09/15/18 14:41*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:07	
4,4´-DDE	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:07	
4,4´-DDT	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:07	

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Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B29-0

Lab ID: 1803391-39

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:07	
alpha-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:07	
alpha-Chlordane	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:07	
beta-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:07	
Chlordane	ND	8.5	1	B8I0342	09/13/2018	09/14/18 12:07	
delta-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:07	
Dieldrin	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:07	
Endosulfan I	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:07	
Endosulfan II	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:07	
Endosulfan sulfate	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:07	
Endrin	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:07	
Endrin aldehyde	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:07	
Endrin ketone	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:07	
gamma-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:07	
gamma-Chlordane	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:07	
Heptachlor	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:07	
Heptachlor epoxide	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:07	
Methoxychlor	ND	5.0	1	B8I0342	09/13/2018	09/14/18 12:07	
Toxaphene	ND	50	1	B8I0342	09/13/2018	09/14/18 12:07	
Surrogate: Decachlorobiphenyl	*60.8 %*	*15 - 100*		B8I0342	09/13/2018	*09/14/18 12:07*	
Surrogate: Tetrachloro-m-xylene	*80.7 %*	*16 - 100*		B8I0342	09/13/2018	*09/14/18 12:07*	

Certificate of Analysis

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Client Sample ID B29-1

Lab ID: 1803391-40

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	ND	1.0	1	B8I0353	09/17/2018	09/17/18 17:21	

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Client Sample ID B29-2

Lab ID: 1803391-41

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	ND	1.0	1	B8I0353	09/17/2018	09/17/18 17:22	

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Client Sample ID B21-0

Lab ID: 1803391-42

Title 22 Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0351	09/14/2018	09/17/18 10:11	
Arsenic	**3.3**	1.0	1	B8I0351	09/14/2018	09/17/18 10:11	
Barium	**85**	1.0	1	B8I0351	09/14/2018	09/17/18 10:11	
Beryllium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:11	
Cadmium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:11	
Chromium	**38**	1.0	1	B8I0351	09/14/2018	09/17/18 10:11	
Cobalt	**8.2**	1.0	1	B8I0351	09/14/2018	09/17/18 10:11	
Copper	**58**	2.0	1	B8I0351	09/14/2018	09/17/18 10:11	
Lead	**18**	1.0	1	B8I0351	09/14/2018	09/17/18 10:11	
Molybdenum	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:11	
Nickel	**81**	1.0	1	B8I0351	09/14/2018	09/17/18 10:11	
Selenium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:11	
Silver	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:11	
Thallium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:11	
Vanadium	**24**	1.0	1	B8I0351	09/14/2018	09/17/18 10:11	
Zinc	**120**	1.0	1	B8I0351	09/14/2018	09/17/18 10:11	

Mercury by AA (Cold Vapor) EPA 7471A **Analyst: KEK**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	**0.12**	0.10	1	B8I0357	09/14/2018	09/17/18 13:22	

Certificate of Analysis

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Client Sample ID B21-1

Lab ID: 1803391-43

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**3.9**	1.0	1	B8I0353	09/17/2018	09/17/18 17:23	

Certificate of Analysis

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Client Sample ID B21-2

Lab ID: 1803391-44

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**5.7**	1.0	1	B8I0353	09/17/2018	09/17/18 17:25	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0397	09/15/2018	09/15/18 14:59	
Surrogate: 4-Bromofluorobenzene *118 %*		*57 - 144*		B8I0397	09/15/2018	*09/15/18 14:59*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**260**	25	25	B8I0461	09/18/2018	09/18/18 16:17	
ORO	**810**	25	25	B8I0461	09/18/2018	09/18/18 16:17	
Surrogate: p-Terphenyl *0%*		*34 - 158*		B8I0461	09/18/2018	*09/18/18 16:17*	S4

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:59	
Benzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:59	
Toluene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:59	
Ethylbenzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:59	
m,p-Xylene	ND	10	1	B8I0397	09/15/2018	09/15/18 14:59	
o-Xylene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 14:59	
Surrogate: 4-Bromofluorobenzene *100 %*		*54 - 140*		B8I0397	09/15/2018	*09/15/18 14:59*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:18	
4,4´-DDE [2C]	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:18	
4,4´-DDT [2C]	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:18	

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Client Sample ID B21-2

Lab ID: 1803391-44

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:18	
alpha-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:18	
alpha-Chlordane	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:18	
beta-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:18	
Chlordane	ND	8.5	1	B8I0342	09/13/2018	09/14/18 12:18	
delta-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:18	
Dieldrin	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:18	
Endosulfan I	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:18	
Endosulfan II	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:18	
Endosulfan sulfate	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:18	
Endrin	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:18	
Endrin aldehyde	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:18	
Endrin ketone	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:18	
gamma-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:18	
gamma-Chlordane	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:18	
Heptachlor	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:18	
Heptachlor epoxide	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:18	
Methoxychlor	ND	5.0	1	B8I0342	09/13/2018	09/14/18 12:18	
Toxaphene	ND	50	1	B8I0342	09/13/2018	09/14/18 12:18	
Surrogate: Decachlorobiphenyl	*52.7 %*	*15 - 100*		B8I0342	09/13/2018	*09/14/18 12:18*	
Surrogate: Tetrachloro-m-xylene	*80.3 %*	*16 - 100*		B8I0342	09/13/2018	*09/14/18 12:18*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B20-0

Lab ID: 1803391-45

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**39**	1.0	1	B8I0353	09/17/2018	09/17/18 17:26	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B20-1

Lab ID: 1803391-46

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**4.1**	1.0	1	B8I0353	09/17/2018	09/17/18 17:27	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0397	09/15/2018	09/15/18 15:18	
Surrogate: 4-Bromofluorobenzene *126 %*		*57 - 144*		B8I0397	09/15/2018	*09/15/18 15:18*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**7.7**	1.0	1	B8I0461	09/18/2018	09/18/18 12:05	
ORO	**6.2**	1.0	1	B8I0461	09/18/2018	09/18/18 12:05	
Surrogate: p-Terphenyl *98.2 %*		*34 - 158*		B8I0461	09/18/2018	*09/18/18 12:05*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0397	09/15/2018	09/15/18 15:18	
Benzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 15:18	
Toluene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 15:18	
Ethylbenzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 15:18	
m,p-Xylene	ND	10	1	B8I0397	09/15/2018	09/15/18 15:18	
o-Xylene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 15:18	
Surrogate: 4-Bromofluorobenzene *111 %*		*54 - 140*		B8I0397	09/15/2018	*09/15/18 15:18*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:28	
4,4´-DDE	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:28	
4,4´-DDT	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:28	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B20-1

Lab ID: 1803391-46

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:28	
alpha-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:28	
alpha-Chlordane	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:28	
beta-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:28	
Chlordane	ND	8.5	1	B8I0342	09/13/2018	09/14/18 12:28	
delta-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:28	
Dieldrin	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:28	
Endosulfan I	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:28	
Endosulfan II	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:28	
Endosulfan sulfate	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:28	
Endrin	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:28	
Endrin aldehyde	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:28	
Endrin ketone	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:28	
gamma-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:28	
gamma-Chlordane	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:28	
Heptachlor	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:28	
Heptachlor epoxide	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:28	
Methoxychlor	ND	5.0	1	B8I0342	09/13/2018	09/14/18 12:28	
Toxaphene	ND	50	1	B8I0342	09/13/2018	09/14/18 12:28	
Surrogate: Decachlorobiphenyl	*38.5 %*	*15 - 100*		B8I0342	09/13/2018	*09/14/18 12:28*	
Surrogate: Tetrachloro-m-xylene	*64.7 %*	*16 - 100*		B8I0342	09/13/2018	*09/14/18 12:28*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B20-2

Lab ID: 1803391-47

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**7.5**	1.0	1	B8I0353	09/17/2018	09/17/18 17:31	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B17-0

Lab ID: 1803391-48

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	ND	1.0	1	B8I0353	09/17/2018	09/17/18 17:32	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics		ND	1.0	1	B8I0397	09/15/2018	09/15/18 11:16	
Surrogate: 4-Bromofluorobenzene	*117 %*		*57 - 144*		B8I0397	09/15/2018	*09/15/18 11:16*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO		**16**	1.0	1	B8I0461	09/18/2018	09/18/18 14:36	
ORO		**52**	1.0	1	B8I0461	09/18/2018	09/18/18 14:36	
Surrogate: p-Terphenyl	*95.3 %*		*34 - 158*		B8I0461	09/18/2018	*09/18/18 14:36*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE		ND	5.0	1	B8I0397	09/15/2018	09/15/18 11:16	
Benzene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 11:16	
Toluene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 11:16	
Ethylbenzene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 11:16	
m,p-Xylene		ND	10	1	B8I0397	09/15/2018	09/15/18 11:16	
o-Xylene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 11:16	
Surrogate: 4-Bromofluorobenzene	*98.7 %*		*54 - 140*		B8I0397	09/15/2018	*09/15/18 11:16*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:39	
4,4´-DDE	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:39	
4,4´-DDT	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:39	

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Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B17-0

Lab ID: 1803391-48

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:39	
alpha-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:39	
alpha-Chlordane	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:39	
beta-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:39	
Chlordane	ND	8.5	1	B8I0342	09/13/2018	09/14/18 12:39	
delta-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:39	
Dieldrin	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:39	
Endosulfan I	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:39	
Endosulfan II	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:39	
Endosulfan sulfate	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:39	
Endrin	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:39	
Endrin aldehyde	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:39	
Endrin ketone	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:39	
gamma-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:39	
gamma-Chlordane	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:39	
Heptachlor	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:39	
Heptachlor epoxide	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:39	
Methoxychlor	ND	5.0	1	B8I0342	09/13/2018	09/14/18 12:39	
Toxaphene	ND	50	1	B8I0342	09/13/2018	09/14/18 12:39	
Surrogate: Decachlorobiphenyl	*76.7 %*	*15 - 100*		B8I0342	09/13/2018	*09/14/18 12:39*	
Surrogate: Tetrachloro-m-xylene	*83.0 %*	*16 - 100*		B8I0342	09/13/2018	*09/14/18 12:39*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B17-1

Lab ID: 1803391-49

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	ND	1.0	1	B8I0353	09/17/2018	09/17/18 17:33	

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B17-2

Lab ID: 1803391-50

Title 22 Metals by ICP-AES EPA 6010B — **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0351	09/14/2018	09/17/18 10:12	
Arsenic	**2.0**	1.0	1	B8I0351	09/14/2018	09/17/18 10:12	
Barium	**110**	1.0	1	B8I0351	09/14/2018	09/17/18 10:12	
Beryllium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:12	
Cadmium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:12	
Chromium	**140**	1.0	1	B8I0351	09/14/2018	09/17/18 10:12	
Cobalt	**32**	1.0	1	B8I0351	09/14/2018	09/17/18 10:12	
Copper	**22**	2.0	1	B8I0351	09/14/2018	09/17/18 10:12	
Lead	**7.2**	1.0	1	B8I0351	09/14/2018	09/17/18 10:12	
Molybdenum	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:12	
Nickel	**540**	1.0	1	B8I0351	09/14/2018	09/17/18 10:12	
Selenium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:12	
Silver	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:12	
Thallium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:12	
Vanadium	**27**	1.0	1	B8I0351	09/14/2018	09/17/18 10:12	
Zinc	**43**	1.0	1	B8I0351	09/14/2018	09/17/18 10:12	

Mercury by AA (Cold Vapor) EPA 7471A — **Analyst: KEK**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0357	09/14/2018	09/17/18 13:24	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B16-0

Lab ID: 1803391-51

Title 22 Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0351	09/14/2018	09/17/18 10:13	
Arsenic	**2.1**	1.0	1	B8I0351	09/14/2018	09/17/18 10:13	
Barium	**77**	1.0	1	B8I0351	09/14/2018	09/17/18 10:13	
Beryllium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:13	
Cadmium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:13	
Chromium	**80**	1.0	1	B8I0351	09/14/2018	09/17/18 10:13	
Cobalt	**24**	1.0	1	B8I0351	09/14/2018	09/17/18 10:13	
Copper	**23**	2.0	1	B8I0351	09/14/2018	09/17/18 10:13	
Lead	**17**	1.0	1	B8I0351	09/14/2018	09/17/18 10:13	
Molybdenum	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:13	
Nickel	**410**	1.0	1	B8I0351	09/14/2018	09/17/18 10:13	
Selenium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:13	
Silver	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:13	
Thallium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:13	
Vanadium	**21**	1.0	1	B8I0351	09/14/2018	09/17/18 10:13	
Zinc	**120**	1.0	1	B8I0351	09/14/2018	09/17/18 10:13	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: KEK

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0357	09/14/2018	09/17/18 13:30	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0397	09/15/2018	09/15/18 11:35	
Surrogate: 4-Bromofluorobenzene *104 %*		*57 - 144*		B8I0397	09/15/2018	*09/15/18 11:35*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**19**	2.0	2	B8I0461	09/18/2018	09/18/18 16:00	
ORO	**63**	2.0	2	B8I0461	09/18/2018	09/18/18 16:00	

Certificate of Analysis

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Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B16-0

Lab ID: 1803391-51

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Surrogate: p-Terphenyl	*90.9 %*	*34 - 158*		B8I0461	09/18/2018	*09/18/18 16:00*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0397	09/15/2018	09/15/18 11:35	
Benzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 11:35	
Toluene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 11:35	
Ethylbenzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 11:35	
m,p-Xylene	ND	10	1	B8I0397	09/15/2018	09/15/18 11:35	
o-Xylene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 11:35	
Surrogate: 4-Bromofluorobenzene	*88.0 %*	*54 - 140*		B8I0397	09/15/2018	*09/15/18 11:35*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:49	
4,4´-DDE [2C]	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:49	
4,4´-DDT [2C]	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:49	
Aldrin	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:49	
alpha-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:49	
alpha-Chlordane	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:49	
beta-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:49	
Chlordane [2C]	ND	8.5	1	B8I0342	09/13/2018	09/14/18 12:49	
delta-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:49	
Dieldrin	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:49	
Endosulfan I	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:49	
Endosulfan II	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:49	
Endosulfan sulfate	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:49	
Endrin	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:49	
Endrin aldehyde	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:49	
Endrin ketone	ND	2.0	1	B8I0342	09/13/2018	09/14/18 12:49	
gamma-BHC	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:49	
gamma-Chlordane [2C]	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:49	
Heptachlor	ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:49	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B16-0

Lab ID: 1803391-51

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Heptachlor epoxide		ND	1.0	1	B8I0342	09/13/2018	09/14/18 12:49	
Methoxychlor		ND	5.0	1	B8I0342	09/13/2018	09/14/18 12:49	
Toxaphene		ND	50	1	B8I0342	09/13/2018	09/14/18 12:49	
Surrogate: Decachlorobiphenyl	*38.0 %*		*15 - 100*		B8I0342	09/13/2018	*09/14/18 12:49*	
Surrogate: Tetrachloro-m-xylene	*56.9 %*		*16 - 100*		B8I0342	09/13/2018	*09/14/18 12:49*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B16-1

Lab ID: 1803391-52

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**2.3**	1.0	1	B8I0353	09/17/2018	09/17/18 17:34	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B16-2

Lab ID: 1803391-53

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**6.7**	1.0	1	B8I0353	09/17/2018	09/17/18 17:35	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B15-0

Lab ID: 1803391-54

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**68**	1.0	1	B8I0353	09/17/2018	09/17/18 17:36	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B15-1

Lab ID: 1803391-55

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	ND	1.0	1	B8I0353	09/17/2018	09/17/18 17:37	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B19-0

Lab ID: 1803391-56

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	ND	1.0	1	B8I0353	09/17/2018	09/17/18 17:39	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0397	09/15/2018	09/15/18 11:54	
Surrogate: 4-Bromofluorobenzene *106 %*		*57 - 144*		B8I0397	09/15/2018	*09/15/18 11:54*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**8.2**	1.0	1	B8I0461	09/18/2018	09/18/18 11:32	
ORO	**9.8**	1.0	1	B8I0461	09/18/2018	09/18/18 11:32	
Surrogate: p-Terphenyl *103 %*		*34 - 158*		B8I0461	09/18/2018	*09/18/18 11:32*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0397	09/15/2018	09/15/18 11:54	
Benzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 11:54	
Toluene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 11:54	
Ethylbenzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 11:54	
m,p-Xylene	ND	10	1	B8I0397	09/15/2018	09/15/18 11:54	
o-Xylene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 11:54	
Surrogate: 4-Bromofluorobenzene *89.5 %*		*54 - 140*		B8I0397	09/15/2018	*09/15/18 11:54*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:22	
4,4´-DDE	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:22	
4,4´-DDT [2C]	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:22	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B19-0

Lab ID: 1803391-56

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:22	
alpha-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:22	
alpha-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:22	
beta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:22	
Chlordane	ND	8.5	1	B8I0390	09/14/2018	09/16/18 17:22	
delta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:22	
Dieldrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:22	
Endosulfan I	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:22	
Endosulfan II	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:22	
Endosulfan sulfate	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:22	
Endrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:22	
Endrin aldehyde	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:22	
Endrin ketone	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:22	
gamma-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:22	
gamma-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:22	
Heptachlor	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:22	
Heptachlor epoxide	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:22	
Methoxychlor	ND	5.0	1	B8I0390	09/14/2018	09/16/18 17:22	
Toxaphene	ND	50	1	B8I0390	09/14/2018	09/16/18 17:22	
Surrogate: Decachlorobiphenyl	*61.5 %*	*15 - 100*		B8I0390	09/14/2018	*09/16/18 17:22*	
Surrogate: Tetrachloro-m-xylene	*83.8 %*	*16 - 100*		B8I0390	09/14/2018	*09/16/18 17:22*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B19-1

Lab ID: 1803391-57

Title 22 Metals by ICP-AES EPA 6010B — **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	10	5	B8I0351	09/14/2018	09/17/18 11:21	
Arsenic	ND	5.0	5	B8I0351	09/14/2018	09/17/18 11:21	
Barium	ND	5.0	5	B8I0351	09/14/2018	09/17/18 11:21	
Beryllium	ND	5.0	5	B8I0351	09/14/2018	09/17/18 11:21	
Cadmium	ND	5.0	5	B8I0351	09/14/2018	09/17/18 11:21	
Chromium	**290**	5.0	5	B8I0351	09/14/2018	09/17/18 11:21	
Cobalt	**70**	5.0	5	B8I0351	09/14/2018	09/17/18 11:21	
Copper	ND	10	5	B8I0351	09/14/2018	09/17/18 11:21	
Lead	ND	5.0	5	B8I0351	09/14/2018	09/17/18 11:21	
Molybdenum	ND	5.0	5	B8I0351	09/14/2018	09/17/18 11:21	
Nickel	**1400**	5.0	5	B8I0351	09/14/2018	09/17/18 11:21	
Selenium	ND	5.0	5	B8I0351	09/14/2018	09/17/18 11:21	
Silver	ND	5.0	5	B8I0351	09/14/2018	09/17/18 11:21	
Thallium	ND	5.0	5	B8I0351	09/14/2018	09/17/18 11:21	
Vanadium	**6.3**	5.0	5	B8I0351	09/14/2018	09/17/18 11:21	
Zinc	**19**	5.0	5	B8I0351	09/14/2018	09/17/18 11:21	

Mercury by AA (Cold Vapor) EPA 7471A — **Analyst: KEK**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0357	09/14/2018	09/17/18 13:46	

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Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B14-0

Lab ID: 1803391-58

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**120**	1.0	1	B8I0354	09/17/2018	09/17/18 18:34	

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Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B14-1

Lab ID: 1803391-59

Title 22 Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0351	09/14/2018	09/17/18 10:16	
Arsenic	**2.0**	1.0	1	B8I0351	09/14/2018	09/17/18 10:16	
Barium	**110**	1.0	1	B8I0351	09/14/2018	09/17/18 10:16	
Beryllium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:16	
Cadmium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:16	
Chromium	**120**	1.0	1	B8I0351	09/14/2018	09/17/18 10:16	
Cobalt	**25**	1.0	1	B8I0351	09/14/2018	09/17/18 10:16	
Copper	**31**	2.0	1	B8I0351	09/14/2018	09/17/18 10:16	
Lead	**7.1**	1.0	1	B8I0351	09/14/2018	09/17/18 10:16	
Molybdenum	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:16	
Nickel	**370**	1.0	1	B8I0351	09/14/2018	09/17/18 10:16	
Selenium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:16	
Silver	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:16	
Thallium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:16	
Vanadium	**26**	1.0	1	B8I0351	09/14/2018	09/17/18 10:16	
Zinc	**44**	1.0	1	B8I0351	09/14/2018	09/17/18 10:16	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: KEK

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0357	09/14/2018	09/17/18 13:48	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0397	09/15/2018	09/15/18 12:12	
Surrogate: 4-Bromofluorobenzene	*95.8 %*	*57 - 144*		B8I0397	09/15/2018	*09/15/18 12:12*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**11**	1.0	1	B8I0461	09/18/2018	09/18/18 13:12	
ORO	**22**	1.0	1	B8I0461	09/18/2018	09/18/18 13:12	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B14-1

Lab ID: 1803391-59

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Surrogate: p-Terphenyl	*103 %*	*34 - 158*		B8I0461	09/18/2018	*09/18/18 13:12*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0397	09/15/2018	09/15/18 12:12	
Benzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 12:12	
Toluene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 12:12	
Ethylbenzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 12:12	
m,p-Xylene	ND	10	1	B8I0397	09/15/2018	09/15/18 12:12	
o-Xylene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 12:12	
Surrogate: 4-Bromofluorobenzene	*81.0 %*	*54 - 140*		B8I0397	09/15/2018	*09/15/18 12:12*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:32	
4,4´-DDE	**27**	2.0	1	B8I0390	09/14/2018	09/16/18 17:32	
4,4´-DDT	**16**	2.0	1	B8I0390	09/14/2018	09/16/18 17:32	
Aldrin	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:32	
alpha-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:32	
alpha-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:32	
beta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:32	
Chlordane [2C]	ND	8.5	1	B8I0390	09/14/2018	09/16/18 17:32	
delta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:32	
Dieldrin [2C]	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:32	
Endosulfan I	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:32	
Endosulfan II	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:32	
Endosulfan sulfate	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:32	
Endrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:32	
Endrin aldehyde	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:32	
Endrin ketone	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:32	
gamma-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:32	
gamma-Chlordane [2C]	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:32	
Heptachlor	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:32	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B14-1

Lab ID: 1803391-59

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Heptachlor epoxide		ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:32	
Methoxychlor		ND	5.0	1	B8I0390	09/14/2018	09/16/18 17:32	
Toxaphene		ND	50	1	B8I0390	09/14/2018	09/16/18 17:32	
Surrogate: Decachlorobiphenyl	*57.9 %*		*15 - 100*		B8I0390	09/14/2018	*09/16/18 17:32*	
Surrogate: Tetrachloro-m-xylene	*96.3 %*		*16 - 100*		B8I0390	09/14/2018	*09/16/18 17:32*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B14-2

Lab ID: 1803391-60

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**1.5**	1.0	1	B8I0354	09/17/2018	09/17/18 18:37	

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Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B18-0HA

Lab ID: 1803391-61

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**37**	1.0	1	B8I0354	09/17/2018	09/17/18 18:38	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B18-1HA

Lab ID: 1803391-62

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**49**	1.0	1	B8I0354	09/17/2018	09/17/18 18:40	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B18-2HA

Lab ID: 1803391-63

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**14**	1.0	1	B8I0354	09/17/2018	09/17/18 18:41	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics		ND	1.0	1	B8I0397	09/15/2018	09/15/18 12:31	
Surrogate: 4-Bromofluorobenzene	*93.6 %*		*57 - 144*		B8I0397	09/15/2018	*09/15/18 12:31*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO		**12**	1.0	1	B8I0461	09/18/2018	09/18/18 14:02	
ORO		**31**	1.0	1	B8I0461	09/18/2018	09/18/18 14:02	
Surrogate: p-Terphenyl	*91.5 %*		*34 - 158*		B8I0461	09/18/2018	*09/18/18 14:02*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE		ND	5.0	1	B8I0397	09/15/2018	09/15/18 12:31	
Benzene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 12:31	
Toluene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 12:31	
Ethylbenzene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 12:31	
m,p-Xylene		ND	10	1	B8I0397	09/15/2018	09/15/18 12:31	
o-Xylene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 12:31	
Surrogate: 4-Bromofluorobenzene	*80.5 %*		*54 - 140*		B8I0397	09/15/2018	*09/15/18 12:31*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0444	09/17/2018	09/17/18 14:32	
4,4´-DDE [2C]	**4.5**	2.0	1	B8I0444	09/17/2018	09/17/18 14:32	
4,4´-DDT	**3.5**	2.0	1	B8I0444	09/17/2018	09/17/18 14:32	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B18-2HA

Lab ID: 1803391-63

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:32	
alpha-BHC	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:32	
alpha-Chlordane	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:32	
beta-BHC	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:32	
Chlordane	ND	8.5	1	B8I0444	09/17/2018	09/17/18 14:32	
delta-BHC	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:32	
Dieldrin [2C]	ND	2.0	1	B8I0444	09/17/2018	09/17/18 14:32	
Endosulfan I	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:32	
Endosulfan II	ND	2.0	1	B8I0444	09/17/2018	09/17/18 14:32	
Endosulfan sulfate	ND	2.0	1	B8I0444	09/17/2018	09/17/18 14:32	
Endrin	ND	2.0	1	B8I0444	09/17/2018	09/17/18 14:32	
Endrin aldehyde	ND	2.0	1	B8I0444	09/17/2018	09/17/18 14:32	
Endrin ketone	ND	2.0	1	B8I0444	09/17/2018	09/17/18 14:32	
gamma-BHC	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:32	
gamma-Chlordane	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:32	
Heptachlor	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:32	
Heptachlor epoxide	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:32	
Methoxychlor	ND	5.0	1	B8I0444	09/17/2018	09/17/18 14:32	
Toxaphene	ND	50	1	B8I0444	09/17/2018	09/17/18 14:32	
Surrogate: Decachlorobiphenyl	*60.9 %*	*15 - 100*		B8I0444	09/17/2018	*09/17/18 14:32*	
Surrogate: Tetrachloro-m-xylene	*90.5 %*	*16 - 100*		B8I0444	09/17/2018	*09/17/18 14:32*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B1-0

Lab ID: 1803391-64

Title 22 Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0351	09/14/2018	09/17/18 10:17	
Arsenic	**3.3**	1.0	1	B8I0351	09/14/2018	09/17/18 10:17	
Barium	**110**	1.0	1	B8I0351	09/14/2018	09/17/18 10:17	
Beryllium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:17	
Cadmium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:17	
Chromium	**110**	1.0	1	B8I0351	09/14/2018	09/17/18 10:17	
Cobalt	**25**	1.0	1	B8I0351	09/14/2018	09/17/18 10:17	
Copper	**34**	2.0	1	B8I0351	09/14/2018	09/17/18 10:17	
Lead	**9.0**	1.0	1	B8I0351	09/14/2018	09/17/18 10:17	
Molybdenum	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:17	
Nickel	**340**	1.0	1	B8I0351	09/14/2018	09/17/18 10:17	
Selenium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:17	
Silver	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:17	
Thallium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:17	
Vanadium	**27**	1.0	1	B8I0351	09/14/2018	09/17/18 10:17	
Zinc	**46**	1.0	1	B8I0351	09/14/2018	09/17/18 10:17	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: KEK

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0357	09/14/2018	09/17/18 13:50	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0397	09/15/2018	09/15/18 12:49	
Surrogate: 4-Bromofluorobenzene	*100 %*	*57 - 144*		B8I0397	09/15/2018	*09/15/18 12:49*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**54**	2.0	2	B8I0461	09/18/2018	09/18/18 15:10	
ORO	**180**	2.0	2	B8I0461	09/18/2018	09/18/18 15:10	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B1-0

Lab ID: 1803391-64

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Surrogate: p-Terphenyl	*73.5 %*	*34 - 158*		B8I0461	09/18/2018	*09/18/18 15:10*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	**5.1**	5.0	1	B8I0397	09/15/2018	09/15/18 12:49	
Benzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 12:49	
Toluene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 12:49	
Ethylbenzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 12:49	
m,p-Xylene	ND	10	1	B8I0397	09/15/2018	09/15/18 12:49	
o-Xylene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 12:49	
Surrogate: 4-Bromofluorobenzene	*88.2 %*	*54 - 140*		B8I0397	09/15/2018	*09/15/18 12:49*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:43	
4,4´-DDE	**230**	20	10	B8I0390	09/14/2018	09/17/18 13:12	
4,4´-DDT	**80**	20	10	B8I0390	09/14/2018	09/17/18 13:12	
Aldrin	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:43	
alpha-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:43	
alpha-Chlordane [2C]	**3.8**	1.0	1	B8I0390	09/14/2018	09/16/18 17:43	
beta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:43	
Chlordane	**42**	8.5	1	B8I0390	09/14/2018	09/16/18 17:43	
delta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:43	
Dieldrin	**9.6**	2.0	1	B8I0390	09/14/2018	09/16/18 17:43	
Endosulfan I	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:43	
Endosulfan II	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:43	
Endosulfan sulfate	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:43	
Endrin	**8.4**	2.0	1	B8I0390	09/14/2018	09/16/18 17:43	
Endrin aldehyde	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:43	
Endrin ketone	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:43	
gamma-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:43	
gamma-Chlordane [2C]	**4.1**	1.0	1	B8I0390	09/14/2018	09/16/18 17:43	
Heptachlor	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:43	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B1-0

Lab ID: 1803391-64

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Heptachlor epoxide	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:43	
Methoxychlor	ND	5.0	1	B8I0390	09/14/2018	09/16/18 17:43	
Toxaphene	ND	50	1	B8I0390	09/14/2018	09/16/18 17:43	
Surrogate: Decachlorobiphenyl	*80.0 %*	*15 - 100*		B8I0390	09/14/2018	*09/16/18 17:43*	
Surrogate: Decachlorobiphenyl	*59.2 %*	*15 - 100*		B8I0390	09/14/2018	*09/17/18 13:12*	
Surrogate: Tetrachloro-m-xylene	*74.4 %*	*16 - 100*		B8I0390	09/14/2018	*09/17/18 13:12*	
Surrogate: Tetrachloro-m-xylene	*71.9 %*	*16 - 100*		B8I0390	09/14/2018	*09/16/18 17:43*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B1-1

Lab ID: 1803391-65

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**12**	1.0	1	B8I0354	09/17/2018	09/17/18 18:42	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B1-2

Lab ID: 1803391-66

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**8.6**	1.0	1	B8I0354	09/17/2018	09/17/18 18:45	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B2-0

Lab ID: 1803391-67

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**26**	1.0	1	B8I0354	09/17/2018	09/17/18 18:47	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B2-1

Lab ID: 1803391-68

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**4.1**	1.0	1	B8I0354	09/17/2018	09/17/18 18:48	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0397	09/15/2018	09/15/18 13:08	
Surrogate: 4-Bromofluorobenzene *113 %*		*57 - 144*		B8I0397	09/15/2018	*09/15/18 13:08*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**6.3**	1.0	1	B8I0461	09/18/2018	09/18/18 11:15	
ORO	**5.1**	1.0	1	B8I0461	09/18/2018	09/18/18 11:15	
Surrogate: p-Terphenyl *111 %*		*34 - 158*		B8I0461	09/18/2018	*09/18/18 11:15*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0397	09/15/2018	09/15/18 13:08	
Benzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 13:08	
Toluene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 13:08	
Ethylbenzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 13:08	
m,p-Xylene	ND	10	1	B8I0397	09/15/2018	09/15/18 13:08	
o-Xylene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 13:08	
Surrogate: 4-Bromofluorobenzene *94.4 %*		*54 - 140*		B8I0397	09/15/2018	*09/15/18 13:08*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:53	
4,4´-DDE	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:53	
4,4´-DDT	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:53	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B2-1

Lab ID: 1803391-68

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:53	
alpha-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:53	
alpha-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:53	
beta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:53	
Chlordane	ND	8.5	1	B8I0390	09/14/2018	09/16/18 17:53	
delta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:53	
Dieldrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:53	
Endosulfan I	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:53	
Endosulfan II	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:53	
Endosulfan sulfate	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:53	
Endrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:53	
Endrin aldehyde	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:53	
Endrin ketone	ND	2.0	1	B8I0390	09/14/2018	09/16/18 17:53	
gamma-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:53	
gamma-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:53	
Heptachlor	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:53	
Heptachlor epoxide	ND	1.0	1	B8I0390	09/14/2018	09/16/18 17:53	
Methoxychlor	ND	5.0	1	B8I0390	09/14/2018	09/16/18 17:53	
Toxaphene	ND	50	1	B8I0390	09/14/2018	09/16/18 17:53	
Surrogate: Decachlorobiphenyl	*81.2 %*	*15 - 100*		B8I0390	09/14/2018	*09/16/18 17:53*	
Surrogate: Tetrachloro-m-xylene	*86.0 %*	*16 - 100*		B8I0390	09/14/2018	*09/16/18 17:53*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B2-2

Lab ID: 1803391-69

Title 22 Metals by ICP-AES EPA 6010B — **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	**2.1**	2.0	1	B8I0351	09/14/2018	09/17/18 10:18	
Arsenic	**1.5**	1.0	1	B8I0351	09/14/2018	09/17/18 10:18	
Barium	**120**	1.0	1	B8I0351	09/14/2018	09/17/18 10:18	
Beryllium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:18	
Cadmium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:18	
Chromium	**160**	1.0	1	B8I0351	09/14/2018	09/17/18 10:18	
Cobalt	**28**	1.0	1	B8I0351	09/14/2018	09/17/18 10:18	
Copper	**25**	2.0	1	B8I0351	09/14/2018	09/17/18 10:18	
Lead	**3.7**	1.0	1	B8I0351	09/14/2018	09/17/18 10:18	
Molybdenum	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:18	
Nickel	**380**	1.0	1	B8I0351	09/14/2018	09/17/18 10:18	
Selenium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:18	
Silver	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:18	
Thallium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:18	
Vanadium	**32**	1.0	1	B8I0351	09/14/2018	09/17/18 10:18	
Zinc	**38**	1.0	1	B8I0351	09/14/2018	09/17/18 10:18	

Mercury by AA (Cold Vapor) EPA 7471A — **Analyst: KEK**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	**0.11**	0.10	1	B8I0357	09/14/2018	09/17/18 13:52	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B3-0

Lab ID: 1803391-70

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**8.7**	1.0	1	B8I0354	09/17/2018	09/17/18 18:49	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B3-1

Lab ID: 1803391-71

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**6.3**	1.0	1	B8I0354	09/17/2018	09/17/18 18:50	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B3-2

Lab ID: 1803391-72

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**5.1**	1.0	1	B8I0354	09/17/2018	09/17/18 18:51	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics		ND	1.0	1	B8I0397	09/15/2018	09/15/18 15:36	
Surrogate: 4-Bromofluorobenzene	*106 %*		*57 - 144*		B8I0397	09/15/2018	*09/15/18 15:36*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO		**8.7**	1.0	1	B8I0461	09/18/2018	09/18/18 13:29	
ORO		**14**	1.0	1	B8I0461	09/18/2018	09/18/18 13:29	
Surrogate: p-Terphenyl	*88.0 %*		*34 - 158*		B8I0461	09/18/2018	*09/18/18 13:29*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE		ND	5.0	1	B8I0397	09/15/2018	09/15/18 15:36	
Benzene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 15:36	
Toluene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 15:36	
Ethylbenzene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 15:36	
m,p-Xylene		ND	10	1	B8I0397	09/15/2018	09/15/18 15:36	
o-Xylene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 15:36	
Surrogate: 4-Bromofluorobenzene	*91.9 %*		*54 - 140*		B8I0397	09/15/2018	*09/15/18 15:36*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:04	
4,4´-DDE	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:04	
4,4´-DDT	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:04	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B3-2

Lab ID: 1803391-72

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:04	
alpha-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:04	
alpha-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:04	
beta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:04	
Chlordane	ND	8.5	1	B8I0390	09/14/2018	09/16/18 18:04	
delta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:04	
Dieldrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:04	
Endosulfan I	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:04	
Endosulfan II	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:04	
Endosulfan sulfate	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:04	
Endrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:04	
Endrin aldehyde	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:04	
Endrin ketone	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:04	
gamma-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:04	
gamma-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:04	
Heptachlor	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:04	
Heptachlor epoxide	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:04	
Methoxychlor	ND	5.0	1	B8I0390	09/14/2018	09/16/18 18:04	
Toxaphene	ND	50	1	B8I0390	09/14/2018	09/16/18 18:04	
Surrogate: Decachlorobiphenyl	*54.0 %*	*15 - 100*		B8I0390	09/14/2018	*09/16/18 18:04*	
Surrogate: Tetrachloro-m-xylene	*67.3 %*	*16 - 100*		B8I0390	09/14/2018	*09/16/18 18:04*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B4-0

Lab ID: 1803391-73

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**18**	1.0	1	B8I0354	09/17/2018	09/17/18 18:52	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics		ND	1.0	1	B8I0397	09/15/2018	09/15/18 15:55	
Surrogate: 4-Bromofluorobenzene	*73.2 %*		*57 - 144*		B8I0397	09/15/2018	*09/15/18 15:55*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO		**16**	1.0	1	B8I0461	09/18/2018	09/18/18 14:19	
ORO		**49**	1.0	1	B8I0461	09/18/2018	09/18/18 14:19	
Surrogate: p-Terphenyl	*79.8 %*		*34 - 158*		B8I0461	09/18/2018	*09/18/18 14:19*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE		ND	5.0	1	B8I0397	09/15/2018	09/15/18 15:55	
Benzene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 15:55	
Toluene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 15:55	
Ethylbenzene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 15:55	
m,p-Xylene		ND	10	1	B8I0397	09/15/2018	09/15/18 15:55	
o-Xylene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 15:55	
Surrogate: 4-Bromofluorobenzene	*61.6 %*		*54 - 140*		B8I0397	09/15/2018	*09/15/18 15:55*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:14	
4,4´-DDE	**16**	2.0	1	B8I0390	09/14/2018	09/16/18 18:14	
4,4´-DDT	**9.6**	2.0	1	B8I0390	09/14/2018	09/16/18 18:14	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B4-0

Lab ID: 1803391-73

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:14	
alpha-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:14	
alpha-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:14	
beta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:14	
Chlordane [2C]	**8.9**	8.5	1	B8I0390	09/14/2018	09/16/18 18:14	
delta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:14	
Dieldrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:14	
Endosulfan I	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:14	
Endosulfan II	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:14	
Endosulfan sulfate	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:14	
Endrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:14	
Endrin aldehyde	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:14	
Endrin ketone	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:14	
gamma-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:14	
gamma-Chlordane [2C]	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:14	
Heptachlor	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:14	
Heptachlor epoxide	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:14	
Methoxychlor	ND	5.0	1	B8I0390	09/14/2018	09/16/18 18:14	
Toxaphene	ND	50	1	B8I0390	09/14/2018	09/16/18 18:14	
Surrogate: Decachlorobiphenyl	*70.8 %*	*15 - 100*		B8I0390	09/14/2018	*09/16/18 18:14*	
Surrogate: Tetrachloro-m-xylene	*84.9 %*	*16 - 100*		B8I0390	09/14/2018	*09/16/18 18:14*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B4-1

Lab ID: 1803391-74

Title 22 Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0351	09/14/2018	09/17/18 10:19	
Arsenic	**5.2**	1.0	1	B8I0351	09/14/2018	09/17/18 10:19	
Barium	**92**	1.0	1	B8I0351	09/14/2018	09/17/18 10:19	
Beryllium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:19	
Cadmium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:19	
Chromium	**37**	1.0	1	B8I0351	09/14/2018	09/17/18 10:19	
Cobalt	**11**	1.0	1	B8I0351	09/14/2018	09/17/18 10:19	
Copper	**27**	2.0	1	B8I0351	09/14/2018	09/17/18 10:19	
Lead	**5.4**	1.0	1	B8I0351	09/14/2018	09/17/18 10:19	
Molybdenum	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:19	
Nickel	**95**	1.0	1	B8I0351	09/14/2018	09/17/18 10:19	
Selenium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:19	
Silver	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:19	
Thallium	ND	1.0	1	B8I0351	09/14/2018	09/17/18 10:19	
Vanadium	**31**	1.0	1	B8I0351	09/14/2018	09/17/18 10:19	
Zinc	**49**	1.0	1	B8I0351	09/14/2018	09/17/18 10:19	

Mercury by AA (Cold Vapor) EPA 7471A **Analyst: KEK**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0357	09/14/2018	09/17/18 13:54	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B4-2

Lab ID: 1803391-75

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**6.7**	1.0	1	B8I0354	09/17/2018	09/17/18 18:53	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B40-0

Lab ID: 1803391-76

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**21**	1.0	1	B8I0354	09/17/2018	09/17/18 18:55	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics		ND	1.0	1	B8I0397	09/15/2018	09/15/18 16:14	
Surrogate: 4-Bromofluorobenzene	*108 %*		*57 - 144*		B8I0397	09/15/2018	*09/15/18 16:14*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO		**56**	2.0	2	B8I0461	09/18/2018	09/18/18 14:53	
ORO		**180**	2.0	2	B8I0461	09/18/2018	09/18/18 14:53	
Surrogate: p-Terphenyl	*92.4 %*		*34 - 158*		B8I0461	09/18/2018	*09/18/18 14:53*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE		ND	5.0	1	B8I0397	09/15/2018	09/15/18 16:14	
Benzene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 16:14	
Toluene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 16:14	
Ethylbenzene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 16:14	
m,p-Xylene		ND	10	1	B8I0397	09/15/2018	09/15/18 16:14	
o-Xylene		ND	5.0	1	B8I0397	09/15/2018	09/15/18 16:14	
Surrogate: 4-Bromofluorobenzene	*94.7 %*		*54 - 140*		B8I0397	09/15/2018	*09/15/18 16:14*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:25	
4,4´-DDE	**7.3**	2.0	1	B8I0390	09/14/2018	09/16/18 18:25	
4,4´-DDT	**14**	2.0	1	B8I0390	09/14/2018	09/16/18 18:25	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B40-0

Lab ID: 1803391-76

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:25	
alpha-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:25	
alpha-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:25	
beta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:25	
Chlordane [2C]	**9.3**	8.5	1	B8I0390	09/14/2018	09/16/18 18:25	
delta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:25	
Dieldrin	**5.5**	2.0	1	B8I0390	09/14/2018	09/16/18 18:25	
Endosulfan I	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:25	
Endosulfan II	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:25	
Endosulfan sulfate	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:25	
Endrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:25	
Endrin aldehyde	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:25	
Endrin ketone	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:25	
gamma-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:25	
gamma-Chlordane [2C]	**1.1**	1.0	1	B8I0390	09/14/2018	09/16/18 18:25	
Heptachlor	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:25	
Heptachlor epoxide	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:25	
Methoxychlor	ND	5.0	1	B8I0390	09/14/2018	09/16/18 18:25	
Toxaphene	ND	50	1	B8I0390	09/14/2018	09/16/18 18:25	
Surrogate: Decachlorobiphenyl	*71.2 %*	*15 - 100*		B8I0390	09/14/2018	*09/16/18 18:25*	
Surrogate: Tetrachloro-m-xylene	*87.1 %*	*16 - 100*		B8I0390	09/14/2018	*09/16/18 18:25*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B40-1

Lab ID: 1803391-77

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**8.2**	1.0	1	B8I0354	09/17/2018	09/17/18 18:56	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B40-2

Lab ID: 1803391-78

Title 22 Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0359	09/14/2018	09/17/18 09:28	
Arsenic	**4.2**	1.0	1	B8I0359	09/14/2018	09/17/18 09:28	
Barium	**140**	1.0	1	B8I0359	09/14/2018	09/17/18 09:28	
Beryllium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:28	
Cadmium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:28	
Chromium	**37**	1.0	1	B8I0359	09/14/2018	09/17/18 09:28	
Cobalt	**9.7**	1.0	1	B8I0359	09/14/2018	09/17/18 09:28	
Copper	**24**	2.0	1	B8I0359	09/14/2018	09/17/18 09:28	
Lead	**4.8**	1.0	1	B8I0359	09/14/2018	09/17/18 09:28	
Molybdenum	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:28	
Nickel	**65**	1.0	1	B8I0359	09/14/2018	09/17/18 09:28	
Selenium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:28	
Silver	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:28	
Thallium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:28	
Vanadium	**30**	1.0	1	B8I0359	09/14/2018	09/17/18 09:28	
Zinc	**41**	1.0	1	B8I0359	09/14/2018	09/17/18 09:28	

Mercury by AA (Cold Vapor) EPA 7471A **Analyst: KEK**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0358	09/14/2018	09/17/18 13:59	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B39-0

Lab ID: 1803391-79

Title 22 Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0359	09/14/2018	09/17/18 09:32	
Arsenic	**6.2**	1.0	1	B8I0359	09/14/2018	09/17/18 09:32	
Barium	**130**	1.0	1	B8I0359	09/14/2018	09/17/18 09:32	
Beryllium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:32	
Cadmium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:32	
Chromium	**43**	1.0	1	B8I0359	09/14/2018	09/17/18 09:32	
Cobalt	**11**	1.0	1	B8I0359	09/14/2018	09/17/18 09:32	
Copper	**28**	2.0	1	B8I0359	09/14/2018	09/17/18 09:32	
Lead	**5.8**	1.0	1	B8I0359	09/14/2018	09/17/18 09:32	
Molybdenum	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:32	
Nickel	**76**	1.0	1	B8I0359	09/14/2018	09/17/18 09:32	
Selenium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:32	
Silver	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:32	
Thallium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:32	
Vanadium	**31**	1.0	1	B8I0359	09/14/2018	09/17/18 09:32	
Zinc	**50**	1.0	1	B8I0359	09/14/2018	09/17/18 09:32	

Mercury by AA (Cold Vapor) EPA 7471A **Analyst: KEK**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	**0.11**	0.10	1	B8I0358	09/14/2018	09/17/18 14:11	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B39-1

Lab ID: 1803391-80

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**5.9**	1.0	1	B8I0354	09/17/2018	09/17/18 18:59	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B38-0

Lab ID: 1803391-81

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**2.4**	1.0	1	B8I0354	09/17/2018	09/17/18 19:01	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B38-1

Lab ID: 1803391-82

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**3.0**	1.0	1	B8I0354	09/17/2018	09/17/18 19:02	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0346	09/14/2018	09/14/18 09:57	
Surrogate: 4-Bromofluorobenzene *96.4 %*		*57 - 144*		B8I0346	09/14/2018	*09/14/18 09:57*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**170**	10	10	B8I0461	09/18/2018	09/18/18 15:43	
ORO	**650**	10	10	B8I0461	09/18/2018	09/18/18 15:43	
Surrogate: p-Terphenyl *0%*		*34 - 158*		B8I0461	09/18/2018	*09/18/18 15:43*	S4

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	**6.2**	5.0	1	B8I0346	09/14/2018	09/14/18 09:57	
Benzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 09:57	
Toluene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 09:57	
Ethylbenzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 09:57	
m,p-Xylene	ND	10	1	B8I0346	09/14/2018	09/14/18 09:57	
o-Xylene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 09:57	
Surrogate: 4-Bromofluorobenzene *82.6 %*		*54 - 140*		B8I0346	09/14/2018	*09/14/18 09:57*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:35	
4,4´-DDE	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:35	
4,4´-DDT	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:35	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B38-1

Lab ID: 1803391-82

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:35	
alpha-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:35	
alpha-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:35	
beta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:35	
Chlordane	ND	8.5	1	B8I0390	09/14/2018	09/16/18 18:35	
delta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:35	
Dieldrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:35	
Endosulfan I	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:35	
Endosulfan II	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:35	
Endosulfan sulfate	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:35	
Endrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:35	
Endrin aldehyde	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:35	
Endrin ketone	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:35	
gamma-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:35	
gamma-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:35	
Heptachlor	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:35	
Heptachlor epoxide	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:35	
Methoxychlor	ND	5.0	1	B8I0390	09/14/2018	09/16/18 18:35	
Toxaphene	ND	50	1	B8I0390	09/14/2018	09/16/18 18:35	
Surrogate: Decachlorobiphenyl	*60.5 %*	*15 - 100*		B8I0390	09/14/2018	*09/16/18 18:35*	
Surrogate: Tetrachloro-m-xylene	*89.8 %*	*16 - 100*		B8I0390	09/14/2018	*09/16/18 18:35*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
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Client Sample ID B37-0

Lab ID: 1803391-83

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**5.7**	1.0	1	B8I0354	09/17/2018	09/17/18 19:03	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0346	09/14/2018	09/14/18 10:15	
Surrogate: 4-Bromofluorobenzene *116 %*		*57 - 144*		B8I0346	09/14/2018	*09/14/18 10:15*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**210**	10	10	B8I0461	09/18/2018	09/18/18 15:26	
ORO	**830**	10	10	B8I0461	09/18/2018	09/18/18 15:26	
Surrogate: p-Terphenyl *0%*		*34 - 158*		B8I0461	09/18/2018	*09/18/18 15:26*	S4

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0346	09/14/2018	09/14/18 10:15	
Benzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 10:15	
Toluene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 10:15	
Ethylbenzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 10:15	
m,p-Xylene	ND	10	1	B8I0346	09/14/2018	09/14/18 10:15	
o-Xylene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 10:15	
Surrogate: 4-Bromofluorobenzene *98.7 %*		*54 - 140*		B8I0346	09/14/2018	*09/14/18 10:15*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	10	5	B8I0390	09/14/2018	09/16/18 18:46	D1
4,4´-DDE	ND	10	5	B8I0390	09/14/2018	09/16/18 18:46	D1
4,4´-DDT	ND	10	5	B8I0390	09/14/2018	09/16/18 18:46	D1

Certificate of Analysis

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Client Sample ID B37-0

Lab ID: 1803391-83

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	5.0	5	B8I0390	09/14/2018	09/16/18 18:46	D1
alpha-BHC	ND	5.0	5	B8I0390	09/14/2018	09/16/18 18:46	D1
alpha-Chlordane	ND	5.0	5	B8I0390	09/14/2018	09/16/18 18:46	D1
beta-BHC	ND	5.0	5	B8I0390	09/14/2018	09/16/18 18:46	D1
Chlordane	ND	42	5	B8I0390	09/14/2018	09/16/18 18:46	D1
delta-BHC	ND	5.0	5	B8I0390	09/14/2018	09/16/18 18:46	D1
Dieldrin	ND	10	5	B8I0390	09/14/2018	09/16/18 18:46	D1
Endosulfan I	ND	5.0	5	B8I0390	09/14/2018	09/16/18 18:46	D1
Endosulfan II	ND	10	5	B8I0390	09/14/2018	09/16/18 18:46	D1
Endosulfan sulfate	ND	10	5	B8I0390	09/14/2018	09/16/18 18:46	D1
Endrin	ND	10	5	B8I0390	09/14/2018	09/16/18 18:46	D1
Endrin aldehyde	ND	10	5	B8I0390	09/14/2018	09/16/18 18:46	D1
Endrin ketone	ND	10	5	B8I0390	09/14/2018	09/16/18 18:46	D1
gamma-BHC	ND	5.0	5	B8I0390	09/14/2018	09/16/18 18:46	D1
gamma-Chlordane	ND	5.0	5	B8I0390	09/14/2018	09/16/18 18:46	D1
Heptachlor	ND	5.0	5	B8I0390	09/14/2018	09/16/18 18:46	D1
Heptachlor epoxide	ND	5.0	5	B8I0390	09/14/2018	09/16/18 18:46	D1
Methoxychlor	ND	25	5	B8I0390	09/14/2018	09/16/18 18:46	D1
Toxaphene	ND	250	5	B8I0390	09/14/2018	09/16/18 18:46	D1
Surrogate: Decachlorobiphenyl	*54.5 %*	*15 - 100*		B8I0390	09/14/2018	*09/16/18 18:46*	
Surrogate: Tetrachloro-m-xylene	*46.8 %*	*16 - 100*		B8I0390	09/14/2018	*09/16/18 18:46*	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B37-1

Lab ID: 1803391-84

Title 22 Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0359	09/14/2018	09/17/18 09:33	
Arsenic	**2.1**	1.0	1	B8I0359	09/14/2018	09/17/18 09:33	
Barium	**72**	1.0	1	B8I0359	09/14/2018	09/17/18 09:33	
Beryllium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:33	
Cadmium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:33	
Chromium	**71**	1.0	1	B8I0359	09/14/2018	09/17/18 09:33	
Cobalt	**16**	1.0	1	B8I0359	09/14/2018	09/17/18 09:33	
Copper	**14**	2.0	1	B8I0359	09/14/2018	09/17/18 09:33	
Lead	**3.3**	1.0	1	B8I0359	09/14/2018	09/17/18 09:33	
Molybdenum	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:33	
Nickel	**230**	1.0	1	B8I0359	09/14/2018	09/17/18 09:33	
Selenium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:33	
Silver	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:33	
Thallium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:33	
Vanadium	**29**	1.0	1	B8I0359	09/14/2018	09/17/18 09:33	
Zinc	**28**	1.0	1	B8I0359	09/14/2018	09/17/18 09:33	

Mercury by AA (Cold Vapor) EPA 7471A **Analyst: KEK**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0358	09/14/2018	09/17/18 14:13	

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Client Sample ID B12-0

Lab ID: 1803391-85

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**15**	1.0	1	B8I0363	09/17/2018	09/17/18 19:07	

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Client Sample ID B12-1

Lab ID: 1803391-86

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**2.5**	2.0	2	B8I0363	09/17/2018	09/18/18 09:27	D5

Certificate of Analysis

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Client Sample ID B12-2

Lab ID: 1803391-87

Title 22 Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0359	09/14/2018	09/17/18 09:34	
Arsenic	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:34	
Barium	**71**	1.0	1	B8I0359	09/14/2018	09/17/18 09:34	
Beryllium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:34	
Cadmium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:34	
Chromium	**130**	1.0	1	B8I0359	09/14/2018	09/17/18 09:34	
Cobalt	**38**	1.0	1	B8I0359	09/14/2018	09/17/18 09:34	
Copper	**18**	2.0	1	B8I0359	09/14/2018	09/17/18 09:34	
Lead	**3.0**	1.0	1	B8I0359	09/14/2018	09/17/18 09:34	
Molybdenum	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:34	
Nickel	**740**	1.0	1	B8I0359	09/14/2018	09/17/18 09:34	
Selenium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:34	
Silver	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:34	
Thallium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:34	
Vanadium	**23**	1.0	1	B8I0359	09/14/2018	09/17/18 09:34	
Zinc	**40**	1.0	1	B8I0359	09/14/2018	09/17/18 09:34	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: KEK

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0358	09/14/2018	09/17/18 14:15	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0346	09/14/2018	09/14/18 10:34	
Surrogate: 4-Bromofluorobenzene	*116 %*	*57 - 144*		B8I0346	09/14/2018	*09/14/18 10:34*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**7.7**	1.0	1	B8I0461	09/18/2018	09/18/18 12:55	
ORO	**13**	1.0	1	B8I0461	09/18/2018	09/18/18 12:55	

Certificate of Analysis

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Lab ID: 1803391-87

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Surrogate: p-Terphenyl	*101 %*	*34 - 158*		B8I0461	09/18/2018	*09/18/18 12:55*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0346	09/14/2018	09/14/18 10:34	
Benzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 10:34	
Toluene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 10:34	
Ethylbenzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 10:34	
m,p-Xylene	ND	10	1	B8I0346	09/14/2018	09/14/18 10:34	
o-Xylene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 10:34	
Surrogate: 4-Bromofluorobenzene	*101 %*	*54 - 140*		B8I0346	09/14/2018	*09/14/18 10:34*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:56	
4,4´-DDE	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:56	
4,4´-DDT	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:56	
Aldrin	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:56	
alpha-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:56	
alpha-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:56	
beta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:56	
Chlordane	ND	8.5	1	B8I0390	09/14/2018	09/16/18 18:56	
delta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:56	
Dieldrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:56	
Endosulfan I	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:56	
Endosulfan II	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:56	
Endosulfan sulfate	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:56	
Endrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:56	
Endrin aldehyde	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:56	
Endrin ketone	ND	2.0	1	B8I0390	09/14/2018	09/16/18 18:56	
gamma-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:56	
gamma-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:56	
Heptachlor	ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:56	

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Client Sample ID B12-2

Lab ID: 1803391-87

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Heptachlor epoxide		ND	1.0	1	B8I0390	09/14/2018	09/16/18 18:56	
Methoxychlor		ND	5.0	1	B8I0390	09/14/2018	09/16/18 18:56	
Toxaphene		ND	50	1	B8I0390	09/14/2018	09/16/18 18:56	
Surrogate: Decachlorobiphenyl	*45.5 %*		*15 - 100*		B8I0390	09/14/2018	*09/16/18 18:56*	
Surrogate: Tetrachloro-m-xylene	*74.7 %*		*16 - 100*		B8I0390	09/14/2018	*09/16/18 18:56*	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B11-0

Lab ID: 1803391-88

Title 22 Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	**3.4**	2.0	1	B8I0359	09/14/2018	09/17/18 09:35	
Arsenic	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:35	
Barium	**47**	1.0	1	B8I0359	09/14/2018	09/17/18 09:35	
Beryllium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:35	
Cadmium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:35	
Chromium	**240**	1.0	1	B8I0359	09/14/2018	09/17/18 09:35	
Cobalt	**35**	1.0	1	B8I0359	09/14/2018	09/17/18 09:35	
Copper	**19**	2.0	1	B8I0359	09/14/2018	09/17/18 09:35	
Lead	**23**	1.0	1	B8I0359	09/14/2018	09/17/18 09:35	
Molybdenum	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:35	
Nickel	**660**	1.0	1	B8I0359	09/14/2018	09/17/18 09:35	
Selenium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:35	
Silver	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:35	
Thallium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:35	
Vanadium	**17**	1.0	1	B8I0359	09/14/2018	09/17/18 09:35	
Zinc	**78**	1.0	1	B8I0359	09/14/2018	09/17/18 09:35	

Mercury by AA (Cold Vapor) EPA 7471A **Analyst: KEK**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0358	09/14/2018	09/17/18 14:16	

Certificate of Analysis

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Client Sample ID B11-1

Lab ID: 1803391-89

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	ND	1.0	1	B8I0363	09/17/2018	09/17/18 19:14	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0346	09/14/2018	09/14/18 10:52	
Surrogate: 4-Bromofluorobenzene *118 %*		*57 - 144*		B8I0346	09/14/2018	*09/14/18 10:52*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**3.7**	1.0	1	B8I0482	09/18/2018	09/18/18 19:56	
ORO	**3.8**	1.0	1	B8I0482	09/18/2018	09/18/18 19:56	
Surrogate: p-Terphenyl *96.1 %*		*34 - 158*		B8I0482	09/18/2018	*09/18/18 19:56*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0346	09/14/2018	09/14/18 10:52	
Benzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 10:52	
Toluene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 10:52	
Ethylbenzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 10:52	
m,p-Xylene	ND	10	1	B8I0346	09/14/2018	09/14/18 10:52	
o-Xylene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 10:52	
Surrogate: 4-Bromofluorobenzene *103 %*		*54 - 140*		B8I0346	09/14/2018	*09/14/18 10:52*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:06	
4,4´-DDE	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:06	
4,4´-DDT	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:06	

Certificate of Analysis

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Client Sample ID B11-1

Lab ID: 1803391-89

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:06	
alpha-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:06	
alpha-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:06	
beta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:06	
Chlordane	ND	8.5	1	B8I0390	09/14/2018	09/16/18 19:06	
delta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:06	
Dieldrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:06	
Endosulfan I	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:06	
Endosulfan II	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:06	
Endosulfan sulfate	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:06	
Endrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:06	
Endrin aldehyde	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:06	
Endrin ketone	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:06	
gamma-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:06	
gamma-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:06	
Heptachlor	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:06	
Heptachlor epoxide	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:06	
Methoxychlor	ND	5.0	1	B8I0390	09/14/2018	09/16/18 19:06	
Toxaphene	ND	50	1	B8I0390	09/14/2018	09/16/18 19:06	
Surrogate: Decachlorobiphenyl	*43.5 %*	*15 - 100*		B8I0390	09/14/2018	*09/16/18 19:06*	
Surrogate: Tetrachloro-m-xylene	*78.9 %*	*16 - 100*		B8I0390	09/14/2018	*09/16/18 19:06*	

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B10-0

Lab ID: 1803391-91

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**9.1**	1.0	1	B8I0363	09/17/2018	09/17/18 19:15	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0346	09/14/2018	09/14/18 11:11	
Surrogate: 4-Bromofluorobenzene *105 %*		*57 - 144*		B8I0346	09/14/2018	*09/14/18 11:11*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**80**	1.0	1	B8I0461	09/18/2018	09/18/18 13:46	
ORO	**80**	1.0	1	B8I0461	09/18/2018	09/18/18 13:46	
Surrogate: p-Terphenyl *79.5 %*		*34 - 158*		B8I0461	09/18/2018	*09/18/18 13:46*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0346	09/14/2018	09/14/18 11:11	
Benzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 11:11	
Toluene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 11:11	
Ethylbenzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 11:11	
m,p-Xylene	ND	10	1	B8I0346	09/14/2018	09/14/18 11:11	
o-Xylene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 11:11	
Surrogate: 4-Bromofluorobenzene *87.8 %*		*54 - 140*		B8I0346	09/14/2018	*09/14/18 11:11*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:17	
4,4´-DDE	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:17	
4,4´-DDT [2C]	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:17	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
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Client Sample ID B10-0

Lab ID: 1803391-91

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:17	
alpha-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:17	
alpha-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:17	
beta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:17	
Chlordane	ND	8.5	1	B8I0390	09/14/2018	09/16/18 19:17	
delta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:17	
Dieldrin [2C]	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:17	
Endosulfan I	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:17	
Endosulfan II	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:17	
Endosulfan sulfate	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:17	
Endrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:17	
Endrin aldehyde	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:17	
Endrin ketone	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:17	
gamma-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:17	
gamma-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:17	
Heptachlor	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:17	
Heptachlor epoxide	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:17	
Methoxychlor	ND	5.0	1	B8I0390	09/14/2018	09/16/18 19:17	
Toxaphene	ND	50	1	B8I0390	09/14/2018	09/16/18 19:17	
Surrogate: Decachlorobiphenyl	*49.8 %*	*15 - 100*		B8I0390	09/14/2018	*09/16/18 19:17*	
Surrogate: Tetrachloro-m-xylene	*89.3 %*	*16 - 100*		B8I0390	09/14/2018	*09/16/18 19:17*	

Certificate of Analysis

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Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B9-0

Lab ID: 1803391-92

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**24**	1.0	1	B8I0363	09/17/2018	09/17/18 19:16	

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Client Sample ID B9-1

Lab ID: 1803391-93

Title 22 Metals by ICP-AES EPA 6010B — **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0359	09/14/2018	09/17/18 09:36	
Arsenic	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:36	
Barium	**77**	1.0	1	B8I0359	09/14/2018	09/17/18 09:36	
Beryllium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:36	
Cadmium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:36	
Chromium	**230**	1.0	1	B8I0359	09/14/2018	09/17/18 09:36	
Cobalt	**53**	1.0	1	B8I0359	09/14/2018	09/17/18 09:36	
Copper	**18**	2.0	1	B8I0359	09/14/2018	09/17/18 09:36	
Lead	**11**	1.0	1	B8I0359	09/14/2018	09/17/18 09:36	
Molybdenum	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:36	
Nickel	**900**	1.0	1	B8I0359	09/14/2018	09/17/18 09:36	
Selenium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:36	
Silver	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:36	
Thallium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:36	
Vanadium	**23**	1.0	1	B8I0359	09/14/2018	09/17/18 09:36	
Zinc	**38**	1.0	1	B8I0359	09/14/2018	09/17/18 09:36	

Mercury by AA (Cold Vapor) EPA 7471A — **Analyst: KEK**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0358	09/14/2018	09/17/18 14:18	

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Client Sample ID B8-0

Lab ID: 1803391-94

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**27**	1.0	1	B8I0363	09/17/2018	09/17/18 19:17	

Certificate of Analysis

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Client Sample ID B8-1

Lab ID: 1803391-95

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**10**	1.0	1	B8I0363	09/17/2018	09/17/18 19:19	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0346	09/14/2018	09/14/18 11:29	
Surrogate: 4-Bromofluorobenzene *116 %*		*57 - 144*		B8I0346	09/14/2018	*09/14/18 11:29*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**8.9**	1.0	1	B8I0482	09/18/2018	09/18/18 21:37	
ORO	**17**	1.0	1	B8I0482	09/18/2018	09/18/18 21:37	
Surrogate: p-Terphenyl *103 %*		*34 - 158*		B8I0482	09/18/2018	*09/18/18 21:37*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	**8.5**	5.0	1	B8I0346	09/14/2018	09/14/18 11:29	
Benzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 11:29	
Toluene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 11:29	
Ethylbenzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 11:29	
m,p-Xylene	ND	10	1	B8I0346	09/14/2018	09/14/18 11:29	
o-Xylene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 11:29	
Surrogate: 4-Bromofluorobenzene *98.2 %*		*54 - 140*		B8I0346	09/14/2018	*09/14/18 11:29*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:27	
4,4´-DDE	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:27	
4,4´-DDT	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:27	

Certificate of Analysis

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Lab ID: 1803391-95

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:27	
alpha-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:27	
alpha-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:27	
beta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:27	
Chlordane	ND	8.5	1	B8I0390	09/14/2018	09/16/18 19:27	
delta-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:27	
Dieldrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:27	
Endosulfan I	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:27	
Endosulfan II	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:27	
Endosulfan sulfate	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:27	
Endrin	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:27	
Endrin aldehyde	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:27	
Endrin ketone	ND	2.0	1	B8I0390	09/14/2018	09/16/18 19:27	
gamma-BHC	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:27	
gamma-Chlordane	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:27	
Heptachlor	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:27	
Heptachlor epoxide	ND	1.0	1	B8I0390	09/14/2018	09/16/18 19:27	
Methoxychlor	ND	5.0	1	B8I0390	09/14/2018	09/16/18 19:27	
Toxaphene	ND	50	1	B8I0390	09/14/2018	09/16/18 19:27	
Surrogate: Decachlorobiphenyl	*58.2 %*	*15 - 100*		B8I0390	09/14/2018	*09/16/18 19:27*	
Surrogate: Tetrachloro-m-xylene	*88.6 %*	*16 - 100*		B8I0390	09/14/2018	*09/16/18 19:27*	

Certificate of Analysis

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Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B8-2

Lab ID: 1803391-96

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**3.1**	1.0	1	B8I0363	09/17/2018	09/17/18 19:20	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
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Client Sample ID B7-0

Lab ID: 1803391-97

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**15**	1.0	1	B8I0363	09/17/2018	09/17/18 19:21	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0346	09/14/2018	09/14/18 11:48	
Surrogate: 4-Bromofluorobenzene *123 %*		*57 - 144*		B8I0346	09/14/2018	*09/14/18 11:48*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**16**	1.0	1	B8I0482	09/18/2018	09/18/18 22:10	
ORO	**40**	1.0	1	B8I0482	09/18/2018	09/18/18 22:10	
Surrogate: p-Terphenyl *107 %*		*34 - 158*		B8I0482	09/18/2018	*09/18/18 22:10*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0346	09/14/2018	09/14/18 11:48	
Benzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 11:48	
Toluene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 11:48	
Ethylbenzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 11:48	
m,p-Xylene	ND	10	1	B8I0346	09/14/2018	09/14/18 11:48	
o-Xylene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 11:48	
Surrogate: 4-Bromofluorobenzene *105 %*		*54 - 140*		B8I0346	09/14/2018	*09/14/18 11:48*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	4.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1
4,4´-DDE	ND	4.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1
4,4´-DDT	ND	4.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B7-0

Lab ID: 1803391-97

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	2.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1
alpha-BHC	ND	2.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1
alpha-Chlordane	ND	2.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1
beta-BHC	ND	2.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1
Chlordane [2C]	ND	17	2	B8I0390	09/14/2018	09/16/18 19:38	D1
delta-BHC	ND	2.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1
Dieldrin	ND	4.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1
Endosulfan I	ND	2.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1
Endosulfan II	ND	4.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1
Endosulfan sulfate	ND	4.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1
Endrin	ND	4.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1
Endrin aldehyde	ND	4.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1
Endrin ketone	ND	4.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1
gamma-BHC	ND	2.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1
gamma-Chlordane [2C]	ND	2.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1
Heptachlor	ND	2.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1
Heptachlor epoxide	ND	2.0	2	B8I0390	09/14/2018	09/16/18 19:38	D1
Methoxychlor	ND	10	2	B8I0390	09/14/2018	09/16/18 19:38	D1
Toxaphene	ND	100	2	B8I0390	09/14/2018	09/16/18 19:38	D1
Surrogate: Decachlorobiphenyl	*42.8 %*	*15 - 100*		B8I0390	09/14/2018	*09/16/18 19:38*	
Surrogate: Tetrachloro-m-xylene	*83.9 %*	*16 - 100*		B8I0390	09/14/2018	*09/16/18 19:38*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B7-1

Lab ID: 1803391-98

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**6.7**	1.0	1	B8I0363	09/17/2018	09/17/18 19:22	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B7-2

Lab ID: 1803391-99

Title 22 Metals by ICP-AES EPA 6010B — **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0359	09/14/2018	09/17/18 09:42	
Arsenic	**3.4**	1.0	1	B8I0359	09/14/2018	09/17/18 09:42	
Barium	**160**	1.0	1	B8I0359	09/14/2018	09/17/18 09:42	
Beryllium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:42	
Cadmium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:42	
Chromium	**79**	1.0	1	B8I0359	09/14/2018	09/17/18 09:42	
Cobalt	**18**	1.0	1	B8I0359	09/14/2018	09/17/18 09:42	
Copper	**27**	2.0	1	B8I0359	09/14/2018	09/17/18 09:42	
Lead	**7.1**	1.0	1	B8I0359	09/14/2018	09/17/18 09:42	
Molybdenum	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:42	
Nickel	**180**	1.0	1	B8I0359	09/14/2018	09/17/18 09:42	
Selenium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:42	
Silver	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:42	
Thallium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:42	
Vanadium	**30**	1.0	1	B8I0359	09/14/2018	09/17/18 09:42	
Zinc	**57**	1.0	1	B8I0359	09/14/2018	09/17/18 09:42	

Mercury by AA (Cold Vapor) EPA 7471A — **Analyst: KEK**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0358	09/14/2018	09/17/18 14:20	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
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Client Sample ID B6-0

Lab ID: 1803391-AA

Title 22 Metals by ICP-AES EPA 6010B — **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0359	09/14/2018	09/17/18 09:43	
Arsenic	**5.4**	1.0	1	B8I0359	09/14/2018	09/17/18 09:43	
Barium	**200**	1.0	1	B8I0359	09/14/2018	09/17/18 09:43	
Beryllium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:43	
Cadmium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:43	
Chromium	**70**	1.0	1	B8I0359	09/14/2018	09/17/18 09:43	
Cobalt	**16**	1.0	1	B8I0359	09/14/2018	09/17/18 09:43	
Copper	**41**	2.0	1	B8I0359	09/14/2018	09/17/18 09:43	
Lead	**50**	1.0	1	B8I0359	09/14/2018	09/17/18 09:43	
Molybdenum	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:43	
Nickel	**140**	1.0	1	B8I0359	09/14/2018	09/17/18 09:43	
Selenium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:43	
Silver	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:43	
Thallium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:43	
Vanadium	**34**	1.0	1	B8I0359	09/14/2018	09/17/18 09:43	
Zinc	**160**	1.0	1	B8I0359	09/14/2018	09/17/18 09:43	

Mercury by AA (Cold Vapor) EPA 7471A — **Analyst: KEK**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0358	09/14/2018	09/17/18 14:22	

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B6-1

Lab ID: 1803391-AB

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**4.2**	1.0	1	B8I0363	09/17/2018	09/17/18 19:23	

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B6-2

Lab ID: 1803391-AC

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**4.2**	1.0	1	B8I0363	09/17/2018	09/17/18 19:24	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0346	09/14/2018	09/14/18 12:07	
Surrogate: 4-Bromofluorobenzene *115 %*		*57 - 144*		B8I0346	09/14/2018	*09/14/18 12:07*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**7.0**	1.0	1	B8I0482	09/18/2018	09/18/18 20:46	
ORO	**6.3**	1.0	1	B8I0482	09/18/2018	09/18/18 20:46	
Surrogate: p-Terphenyl *84.5 %*		*34 - 158*		B8I0482	09/18/2018	*09/18/18 20:46*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0346	09/14/2018	09/14/18 12:07	
Benzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 12:07	
Toluene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 12:07	
Ethylbenzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 12:07	
m,p-Xylene	ND	10	1	B8I0346	09/14/2018	09/14/18 12:07	
o-Xylene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 12:07	
Surrogate: 4-Bromofluorobenzene *97.2 %*		*54 - 140*		B8I0346	09/14/2018	*09/14/18 12:07*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:10	
4,4´-DDE [2C]	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:10	
4,4´-DDT	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:10	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B6-2

Lab ID: 1803391-AC

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:10	
alpha-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:10	
alpha-Chlordane	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:10	
beta-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:10	
Chlordane	ND	8.5	1	B8I0394	09/14/2018	09/16/18 13:10	
delta-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:10	
Dieldrin	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:10	
Endosulfan I	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:10	
Endosulfan II	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:10	
Endosulfan sulfate	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:10	
Endrin	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:10	
Endrin aldehyde	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:10	
Endrin ketone	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:10	
gamma-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:10	
gamma-Chlordane	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:10	
Heptachlor	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:10	
Heptachlor epoxide	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:10	
Methoxychlor	ND	5.0	1	B8I0394	09/14/2018	09/16/18 13:10	
Toxaphene	ND	50	1	B8I0394	09/14/2018	09/16/18 13:10	
Surrogate: Decachlorobiphenyl	*55.5 %*	*15 - 100*		B8I0394	09/14/2018	*09/16/18 13:10*	
Surrogate: Tetrachloro-m-xylene	*74.9 %*	*16 - 100*		B8I0394	09/14/2018	*09/16/18 13:10*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B5-0

Lab ID: 1803391-AD

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**46**	1.0	1	B8I0363	09/17/2018	09/17/18 19:28	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B5-1

Lab ID: 1803391-AE

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**25**	1.0	1	B8I0363	09/17/2018	09/17/18 19:29	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0346	09/14/2018	09/14/18 12:25	
Surrogate: 4-Bromofluorobenzene *125 %*		*57 - 144*		B8I0346	09/14/2018	*09/14/18 12:25*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**35**	2.0	2	B8I0482	09/18/2018	09/18/18 23:00	
ORO	**110**	2.0	2	B8I0482	09/18/2018	09/18/18 23:00	
Surrogate: p-Terphenyl *47.2 %*		*34 - 158*		B8I0482	09/18/2018	*09/18/18 23:00*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0346	09/14/2018	09/14/18 12:25	
Benzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 12:25	
Toluene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 12:25	
Ethylbenzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 12:25	
m,p-Xylene	ND	10	1	B8I0346	09/14/2018	09/14/18 12:25	
o-Xylene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 12:25	
Surrogate: 4-Bromofluorobenzene *108 %*		*54 - 140*		B8I0346	09/14/2018	*09/14/18 12:25*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:21	
4,4´-DDE [2C]	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:21	
4,4´-DDT	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:21	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B5-1

Lab ID: 1803391-AE

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:21	
alpha-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:21	
alpha-Chlordane [2C]	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:21	
beta-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:21	
Chlordane	**9.8**	8.5	1	B8I0394	09/14/2018	09/16/18 13:21	
delta-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:21	
Dieldrin	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:21	
Endosulfan I	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:21	
Endosulfan II	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:21	
Endosulfan sulfate	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:21	
Endrin	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:21	
Endrin aldehyde	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:21	
Endrin ketone	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:21	
gamma-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:21	
gamma-Chlordane [2C]	**1.1**	1.0	1	B8I0394	09/14/2018	09/16/18 13:21	
Heptachlor	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:21	
Heptachlor epoxide	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:21	
Methoxychlor	ND	5.0	1	B8I0394	09/14/2018	09/16/18 13:21	
Toxaphene	ND	50	1	B8I0394	09/14/2018	09/16/18 13:21	
Surrogate: Decachlorobiphenyl	*65.1 %*	*15 - 100*		B8I0394	09/14/2018	*09/16/18 13:21*	
Surrogate: Tetrachloro-m-xylene	*84.9 %*	*16 - 100*		B8I0394	09/14/2018	*09/16/18 13:21*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B13-0

Lab ID: 1803391-AF

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**15**	1.0	1	B8I0363	09/17/2018	09/17/18 19:30	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0346	09/14/2018	09/14/18 12:44	
Surrogate: 4-Bromofluorobenzene *118 %*		*57 - 144*		B8I0346	09/14/2018	*09/14/18 12:44*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**200**	20	20	B8I0482	09/18/2018	09/18/18 23:17	
ORO	**740**	20	20	B8I0482	09/18/2018	09/18/18 23:17	
Surrogate: p-Terphenyl *0%*		*34 - 158*		B8I0482	09/18/2018	*09/18/18 23:17*	S4

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0346	09/14/2018	09/14/18 12:44	
Benzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 12:44	
Toluene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 12:44	
Ethylbenzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 12:44	
m,p-Xylene	ND	10	1	B8I0346	09/14/2018	09/14/18 12:44	
o-Xylene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 12:44	
Surrogate: 4-Bromofluorobenzene *98.1 %*		*54 - 140*		B8I0346	09/14/2018	*09/14/18 12:44*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	20	10	B8I0394	09/14/2018	09/16/18 13:31	D1
4,4´-DDE	ND	20	10	B8I0394	09/14/2018	09/16/18 13:31	D1
4,4´-DDT	ND	20	10	B8I0394	09/14/2018	09/16/18 13:31	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B13-0

Lab ID: 1803391-AF

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	10	10	B8I0394	09/14/2018	09/16/18 13:31	D1
alpha-BHC	ND	10	10	B8I0394	09/14/2018	09/16/18 13:31	D1
alpha-Chlordane	ND	10	10	B8I0394	09/14/2018	09/16/18 13:31	D1
beta-BHC	ND	10	10	B8I0394	09/14/2018	09/16/18 13:31	D1
Chlordane	ND	85	10	B8I0394	09/14/2018	09/16/18 13:31	D1
delta-BHC	ND	10	10	B8I0394	09/14/2018	09/16/18 13:31	D1
Dieldrin	ND	20	10	B8I0394	09/14/2018	09/16/18 13:31	D1
Endosulfan I	ND	10	10	B8I0394	09/14/2018	09/16/18 13:31	D1
Endosulfan II	ND	20	10	B8I0394	09/14/2018	09/16/18 13:31	D1
Endosulfan sulfate	ND	20	10	B8I0394	09/14/2018	09/16/18 13:31	D1
Endrin	ND	20	10	B8I0394	09/14/2018	09/16/18 13:31	D1
Endrin aldehyde	ND	20	10	B8I0394	09/14/2018	09/16/18 13:31	D1
Endrin ketone	ND	20	10	B8I0394	09/14/2018	09/16/18 13:31	D1
gamma-BHC	ND	10	10	B8I0394	09/14/2018	09/16/18 13:31	D1
gamma-Chlordane	ND	10	10	B8I0394	09/14/2018	09/16/18 13:31	D1
Heptachlor	ND	10	10	B8I0394	09/14/2018	09/16/18 13:31	D1
Heptachlor epoxide	ND	10	10	B8I0394	09/14/2018	09/16/18 13:31	D1
Methoxychlor	ND	50	10	B8I0394	09/14/2018	09/16/18 13:31	D1
Toxaphene	ND	500	10	B8I0394	09/14/2018	09/16/18 13:31	D1
Surrogate: Decachlorobiphenyl	*29.2 %*	*15 - 100*		B8I0394	09/14/2018	*09/16/18 13:31*	
Surrogate: Tetrachloro-m-xylene	*24.5 %*	*16 - 100*		B8I0394	09/14/2018	*09/16/18 13:31*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B13-1

Lab ID: 1803391-AG

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**2.9**	1.0	1	B8I0363	09/17/2018	09/17/18 19:31	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B48-0

Lab ID: 1803391-AH

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**4.1**	1.0	1	B8I0363	09/17/2018	09/17/18 19:33	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B48-1

Lab ID: 1803391-AI

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**4.8**	1.0	1	B8I0363	09/17/2018	09/17/18 19:34	

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B48-2

Lab ID: 1803391-AJ

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**3.2**	1.0	1	B8I0363	09/17/2018	09/17/18 19:35	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0346	09/14/2018	09/14/18 13:02	
Surrogate: 4-Bromofluorobenzene *122 %*		*57 - 144*		B8I0346	09/14/2018	*09/14/18 13:02*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**5.6**	1.0	1	B8I0482	09/18/2018	09/18/18 20:13	
ORO	**5.3**	1.0	1	B8I0482	09/18/2018	09/18/18 20:13	
Surrogate: p-Terphenyl *96.9 %*		*34 - 158*		B8I0482	09/18/2018	*09/18/18 20:13*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0346	09/14/2018	09/14/18 13:02	
Benzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 13:02	
Toluene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 13:02	
Ethylbenzene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 13:02	
m,p-Xylene	ND	10	1	B8I0346	09/14/2018	09/14/18 13:02	
o-Xylene	ND	5.0	1	B8I0346	09/14/2018	09/14/18 13:02	
Surrogate: 4-Bromofluorobenzene *102 %*		*54 - 140*		B8I0346	09/14/2018	*09/14/18 13:02*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:42	
4,4´-DDE	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:42	
4,4´-DDT	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:42	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B48-2

Lab ID: 1803391-AJ

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:42	
alpha-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:42	
alpha-Chlordane	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:42	
beta-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:42	
Chlordane	ND	8.5	1	B8I0394	09/14/2018	09/16/18 13:42	
delta-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:42	
Dieldrin	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:42	
Endosulfan I	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:42	
Endosulfan II	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:42	
Endosulfan sulfate	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:42	
Endrin	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:42	
Endrin aldehyde	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:42	
Endrin ketone	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:42	
gamma-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:42	
gamma-Chlordane	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:42	
Heptachlor	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:42	
Heptachlor epoxide	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:42	
Methoxychlor	ND	5.0	1	B8I0394	09/14/2018	09/16/18 13:42	
Toxaphene	ND	50	1	B8I0394	09/14/2018	09/16/18 13:42	
Surrogate: Decachlorobiphenyl	*55.0 %*	*15 - 100*		B8I0394	09/14/2018	*09/16/18 13:42*	
Surrogate: Tetrachloro-m-xylene	*66.6 %*	*16 - 100*		B8I0394	09/14/2018	*09/16/18 13:42*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B47-0

Lab ID: 1803391-AK

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**6.2**	1.0	1	B8I0363	09/17/2018	09/17/18 19:36	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B47-1

Lab ID: 1803391-AL

Title 22 Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0359	09/14/2018	09/17/18 09:44	
Arsenic	**5.1**	1.0	1	B8I0359	09/14/2018	09/17/18 09:44	
Barium	**88**	1.0	1	B8I0359	09/14/2018	09/17/18 09:44	
Beryllium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:44	
Cadmium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:44	
Chromium	**37**	1.0	1	B8I0359	09/14/2018	09/17/18 09:44	
Cobalt	**9.6**	1.0	1	B8I0359	09/14/2018	09/17/18 09:44	
Copper	**24**	2.0	1	B8I0359	09/14/2018	09/17/18 09:44	
Lead	**4.3**	1.0	1	B8I0359	09/14/2018	09/17/18 09:44	
Molybdenum	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:44	
Nickel	**83**	1.0	1	B8I0359	09/14/2018	09/17/18 09:44	
Selenium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:44	
Silver	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:44	
Thallium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:44	
Vanadium	**26**	1.0	1	B8I0359	09/14/2018	09/17/18 09:44	
Zinc	**42**	1.0	1	B8I0359	09/14/2018	09/17/18 09:44	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: KEK

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0358	09/14/2018	09/17/18 14:24	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0400	09/16/2018	09/16/18 14:06	
Surrogate: 4-Bromofluorobenzene	*116 %*	*57 - 144*		B8I0400	09/16/2018	*09/16/18 14:06*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**6.5**	1.0	1	B8I0482	09/18/2018	09/18/18 20:30	
ORO	**6.9**	1.0	1	B8I0482	09/18/2018	09/18/18 20:30	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B47-1

Lab ID: 1803391-AL

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Surrogate: p-Terphenyl	*102 %*	*34 - 158*		B8I0482	09/18/2018	*09/18/18 20:30*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0400	09/16/2018	09/16/18 14:06	
Benzene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 14:06	
Toluene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 14:06	
Ethylbenzene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 14:06	
m,p-Xylene	ND	10	1	B8I0400	09/16/2018	09/16/18 14:06	
o-Xylene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 14:06	
Surrogate: 4-Bromofluorobenzene	*101 %*	*54 - 140*		B8I0400	09/16/2018	*09/16/18 14:06*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0444	09/17/2018	09/17/18 14:42	
4,4´-DDE [2C]	ND	2.0	1	B8I0444	09/17/2018	09/17/18 14:42	
4,4´-DDT [2C]	ND	2.0	1	B8I0444	09/17/2018	09/17/18 14:42	
Aldrin	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:42	
alpha-BHC	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:42	
alpha-Chlordane	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:42	
beta-BHC	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:42	
Chlordane	ND	8.5	1	B8I0444	09/17/2018	09/17/18 14:42	
delta-BHC	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:42	
Dieldrin	ND	2.0	1	B8I0444	09/17/2018	09/17/18 14:42	
Endosulfan I	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:42	
Endosulfan II	ND	2.0	1	B8I0444	09/17/2018	09/17/18 14:42	
Endosulfan sulfate	ND	2.0	1	B8I0444	09/17/2018	09/17/18 14:42	
Endrin	ND	2.0	1	B8I0444	09/17/2018	09/17/18 14:42	
Endrin aldehyde	ND	2.0	1	B8I0444	09/17/2018	09/17/18 14:42	
Endrin ketone	ND	2.0	1	B8I0444	09/17/2018	09/17/18 14:42	
gamma-BHC	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:42	
gamma-Chlordane	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:42	
Heptachlor	ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:42	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B47-1

Lab ID: 1803391-AL

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Heptachlor epoxide		ND	1.0	1	B8I0444	09/17/2018	09/17/18 14:42	
Methoxychlor		ND	5.0	1	B8I0444	09/17/2018	09/17/18 14:42	
Toxaphene		ND	50	1	B8I0444	09/17/2018	09/17/18 14:42	
Surrogate: Decachlorobiphenyl	*65.2 %*		*15 - 100*		B8I0444	09/17/2018	*09/17/18 14:42*	
Surrogate: Tetrachloro-m-xylene	*96.1 %*		*16 - 100*		B8I0444	09/17/2018	*09/17/18 14:42*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B47-2

Lab ID: 1803391-AM

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**3.5**	1.0	1	B8I0364	09/17/2018	09/18/18 08:59	

Certificate of Analysis

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3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B46-0HA

Lab ID: 1803391-AN

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**15**	1.0	1	B8I0364	09/17/2018	09/18/18 09:02	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics		ND	1.0	1	B8I0400	09/16/2018	09/16/18 14:25	
Surrogate: 4-Bromofluorobenzene	*120 %*		*57 - 144*		B8I0400	09/16/2018	*09/16/18 14:25*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO		**37**	2.0	2	B8I0482	09/18/2018	09/18/18 22:44	
ORO		**130**	2.0	2	B8I0482	09/18/2018	09/18/18 22:44	
Surrogate: p-Terphenyl	*71.8 %*		*34 - 158*		B8I0482	09/18/2018	*09/18/18 22:44*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE		ND	5.0	1	B8I0400	09/16/2018	09/16/18 14:25	
Benzene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 14:25	
Toluene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 14:25	
Ethylbenzene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 14:25	
m,p-Xylene		ND	10	1	B8I0400	09/16/2018	09/16/18 14:25	
o-Xylene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 14:25	
Surrogate: 4-Bromofluorobenzene	*105 %*		*54 - 140*		B8I0400	09/16/2018	*09/16/18 14:25*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:52	
4,4´-DDE	**12**	2.0	1	B8I0394	09/14/2018	09/16/18 13:52	
4,4´-DDT	**11**	2.0	1	B8I0394	09/14/2018	09/16/18 13:52	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B46-0HA

Lab ID: 1803391-AN

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:52	
alpha-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:52	
alpha-Chlordane	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:52	
beta-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:52	
Chlordane	ND	8.5	1	B8I0394	09/14/2018	09/16/18 13:52	
delta-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:52	
Dieldrin	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:52	
Endosulfan I	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:52	
Endosulfan II	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:52	
Endosulfan sulfate	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:52	
Endrin	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:52	
Endrin aldehyde	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:52	
Endrin ketone	ND	2.0	1	B8I0394	09/14/2018	09/16/18 13:52	
gamma-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:52	
gamma-Chlordane	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:52	
Heptachlor	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:52	
Heptachlor epoxide	ND	1.0	1	B8I0394	09/14/2018	09/16/18 13:52	
Methoxychlor	ND	5.0	1	B8I0394	09/14/2018	09/16/18 13:52	
Toxaphene	ND	50	1	B8I0394	09/14/2018	09/16/18 13:52	
Surrogate: Decachlorobiphenyl	*33.0 %*	*15 - 100*		B8I0394	09/14/2018	*09/16/18 13:52*	
Surrogate: Tetrachloro-m-xylene	*46.5 %*	*16 - 100*		B8I0394	09/14/2018	*09/16/18 13:52*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B46-1HA

Lab ID: 1803391-AO

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**5.7**	1.0	1	B8I0364	09/17/2018	09/18/18 09:03	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B46-2HA

Lab ID: 1803391-AP

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**7.2**	1.0	1	B8I0364	09/17/2018	09/18/18 09:04	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B45-0

Lab ID: 1803391-AQ

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**4.4**	1.0	1	B8I0364	09/17/2018	09/18/18 09:06	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B44-0HA

Lab ID: 1803391-AR

Title 22 Metals by ICP-AES EPA 6010B — **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0359	09/14/2018	09/17/18 09:45	
Arsenic	**1.8**	1.0	1	B8I0359	09/14/2018	09/17/18 09:45	
Barium	**130**	1.0	1	B8I0359	09/14/2018	09/17/18 09:45	
Beryllium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:45	
Cadmium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:45	
Chromium	**74**	1.0	1	B8I0359	09/14/2018	09/17/18 09:45	
Cobalt	**13**	1.0	1	B8I0359	09/14/2018	09/17/18 09:45	
Copper	**49**	2.0	1	B8I0359	09/14/2018	09/17/18 09:45	
Lead	**24**	1.0	1	B8I0359	09/14/2018	09/17/18 09:45	
Molybdenum	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:45	
Nickel	**130**	1.0	1	B8I0359	09/14/2018	09/17/18 09:45	
Selenium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:45	
Silver	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:45	
Thallium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:45	
Vanadium	**35**	1.0	1	B8I0359	09/14/2018	09/17/18 09:45	
Zinc	**130**	1.0	1	B8I0359	09/14/2018	09/17/18 09:45	

Mercury by AA (Cold Vapor) EPA 7471A — **Analyst: KEK**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0358	09/14/2018	09/17/18 14:29	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B44-1HA

Lab ID: 1803391-AS

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**7.1**	1.0	1	B8I0364	09/17/2018	09/18/18 09:07	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0400	09/16/2018	09/16/18 14:43	
Surrogate: 4-Bromofluorobenzene *119 %*		*57 - 144*		B8I0400	09/16/2018	*09/16/18 14:43*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**4.7**	1.0	1	B8I0482	09/18/2018	09/18/18 21:03	
ORO	**7.2**	1.0	1	B8I0482	09/18/2018	09/18/18 21:03	
Surrogate: p-Terphenyl *94.5 %*		*34 - 158*		B8I0482	09/18/2018	*09/18/18 21:03*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0400	09/16/2018	09/16/18 14:43	
Benzene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 14:43	
Toluene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 14:43	
Ethylbenzene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 14:43	
m,p-Xylene	ND	10	1	B8I0400	09/16/2018	09/16/18 14:43	
o-Xylene	ND	5.0	1	B8I0400	09/16/2018	09/16/18 14:43	
Surrogate: 4-Bromofluorobenzene *102 %*		*54 - 140*		B8I0400	09/16/2018	*09/16/18 14:43*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:03	
4,4´-DDE [2C]	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:03	
4,4´-DDT [2C]	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:03	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B44-1HA

Lab ID: 1803391-AS

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:03	
alpha-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:03	
alpha-Chlordane	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:03	
beta-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:03	
Chlordane	ND	8.5	1	B8I0394	09/14/2018	09/16/18 14:03	
delta-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:03	
Dieldrin	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:03	
Endosulfan I	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:03	
Endosulfan II	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:03	
Endosulfan sulfate	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:03	
Endrin	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:03	
Endrin aldehyde	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:03	
Endrin ketone	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:03	
gamma-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:03	
gamma-Chlordane	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:03	
Heptachlor	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:03	
Heptachlor epoxide	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:03	
Methoxychlor	ND	5.0	1	B8I0394	09/14/2018	09/16/18 14:03	
Toxaphene	ND	50	1	B8I0394	09/14/2018	09/16/18 14:03	
Surrogate: Decachlorobiphenyl	*60.6 %*	*15 - 100*		B8I0394	09/14/2018	*09/16/18 14:03*	
Surrogate: Tetrachloro-m-xylene	*80.4 %*	*16 - 100*		B8I0394	09/14/2018	*09/16/18 14:03*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B44-2HA

Lab ID: 1803391-AT

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**7.6**	1.0	1	B8I0364	09/17/2018	09/18/18 09:10	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B43-0HA

Lab ID: 1803391-AU

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**16**	1.0	1	B8I0364	09/17/2018	09/18/18 09:12	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics		ND	1.0	1	B8I0400	09/16/2018	09/16/18 15:02	
Surrogate: 4-Bromofluorobenzene	*115 %*		*57 - 144*		B8I0400	09/16/2018	*09/16/18 15:02*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO		**19**	5.0	5	B8I0482	09/18/2018	09/18/18 22:27	
ORO		**56**	5.0	5	B8I0482	09/18/2018	09/18/18 22:27	
Surrogate: p-Terphenyl	*64.6 %*		*34 - 158*		B8I0482	09/18/2018	*09/18/18 22:27*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE		ND	5.0	1	B8I0400	09/16/2018	09/16/18 15:02	
Benzene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 15:02	
Toluene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 15:02	
Ethylbenzene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 15:02	
m,p-Xylene		ND	10	1	B8I0400	09/16/2018	09/16/18 15:02	
o-Xylene		ND	5.0	1	B8I0400	09/16/2018	09/16/18 15:02	
Surrogate: 4-Bromofluorobenzene	*102 %*		*54 - 140*		B8I0400	09/16/2018	*09/16/18 15:02*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD		ND	4.0	2	B8I0394	09/14/2018	09/16/18 14:13	
4,4´-DDE		ND	4.0	2	B8I0394	09/14/2018	09/16/18 14:13	
4,4´-DDT		**8.0**	4.0	2	B8I0394	09/14/2018	09/16/18 14:13	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B43-0HA

Lab ID: 1803391-AU

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	2.0	2	B8I0394	09/14/2018	09/16/18 14:13	
alpha-BHC	ND	2.0	2	B8I0394	09/14/2018	09/16/18 14:13	
alpha-Chlordane	ND	2.0	2	B8I0394	09/14/2018	09/16/18 14:13	
beta-BHC	ND	2.0	2	B8I0394	09/14/2018	09/16/18 14:13	
Chlordane	ND	17	2	B8I0394	09/14/2018	09/16/18 14:13	
delta-BHC	ND	2.0	2	B8I0394	09/14/2018	09/16/18 14:13	
Dieldrin	ND	4.0	2	B8I0394	09/14/2018	09/16/18 14:13	
Endosulfan I	ND	2.0	2	B8I0394	09/14/2018	09/16/18 14:13	
Endosulfan II	ND	4.0	2	B8I0394	09/14/2018	09/16/18 14:13	
Endosulfan sulfate	ND	4.0	2	B8I0394	09/14/2018	09/16/18 14:13	
Endrin	ND	4.0	2	B8I0394	09/14/2018	09/16/18 14:13	
Endrin aldehyde	ND	4.0	2	B8I0394	09/14/2018	09/16/18 14:13	
Endrin ketone	ND	4.0	2	B8I0394	09/14/2018	09/16/18 14:13	
gamma-BHC	ND	2.0	2	B8I0394	09/14/2018	09/16/18 14:13	
gamma-Chlordane	ND	2.0	2	B8I0394	09/14/2018	09/16/18 14:13	
Heptachlor	ND	2.0	2	B8I0394	09/14/2018	09/16/18 14:13	
Heptachlor epoxide	ND	2.0	2	B8I0394	09/14/2018	09/16/18 14:13	
Methoxychlor	ND	10	2	B8I0394	09/14/2018	09/16/18 14:13	
Toxaphene	ND	100	2	B8I0394	09/14/2018	09/16/18 14:13	
Surrogate: Decachlorobiphenyl	*54.0 %*	*15 - 100*		B8I0394	09/14/2018	*09/16/18 14:13*	
Surrogate: Tetrachloro-m-xylene	*72.8 %*	*16 - 100*		B8I0394	09/14/2018	*09/16/18 14:13*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B43-1HA

Lab ID: 1803391-AV

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**5.2**	1.0	1	B8I0364	09/17/2018	09/18/18 09:13	

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Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B43-2HA

Lab ID: 1803391-AW

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**3.6**	1.0	1	B8I0364	09/17/2018	09/18/18 09:14	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B42-0HA

Lab ID: 1803391-AX

Total Metals by ICP-AES EPA 6010B **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**11**	1.0	1	B8I0364	09/17/2018	09/18/18 09:15	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B42-1HA

Lab ID: 1803391-AY

Title 22 Metals by ICP-AES EPA 6010B — **Analyst: GO**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B8I0359	09/14/2018	09/17/18 09:46	
Arsenic	**2.4**	1.0	1	B8I0359	09/14/2018	09/17/18 09:46	
Barium	**80**	1.0	1	B8I0359	09/14/2018	09/17/18 09:46	
Beryllium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:46	
Cadmium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:46	
Chromium	**110**	1.0	1	B8I0359	09/14/2018	09/17/18 09:46	
Cobalt	**27**	1.0	1	B8I0359	09/14/2018	09/17/18 09:46	
Copper	**20**	2.0	1	B8I0359	09/14/2018	09/17/18 09:46	
Lead	**3.6**	1.0	1	B8I0359	09/14/2018	09/17/18 09:46	
Molybdenum	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:46	
Nickel	**460**	1.0	1	B8I0359	09/14/2018	09/17/18 09:46	
Selenium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:46	
Silver	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:46	
Thallium	ND	1.0	1	B8I0359	09/14/2018	09/17/18 09:46	
Vanadium	**23**	1.0	1	B8I0359	09/14/2018	09/17/18 09:46	
Zinc	**45**	1.0	1	B8I0359	09/14/2018	09/17/18 09:46	

Mercury by AA (Cold Vapor) EPA 7471A — **Analyst: KEK**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B8I0358	09/14/2018	09/17/18 14:31	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B42-2HA

Lab ID: 1803391-AZ

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**2.5**	1.0	1	B8I0364	09/17/2018	09/18/18 09:16	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0397	09/15/2018	09/15/18 16:32	
Surrogate: 4-Bromofluorobenzene *112 %*		*57 - 144*		B8I0397	09/15/2018	*09/15/18 16:32*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**5.6**	1.0	1	B8I0482	09/18/2018	09/18/18 21:20	
ORO	**7.1**	1.0	1	B8I0482	09/18/2018	09/18/18 21:20	
Surrogate: p-Terphenyl *95.9 %*		*34 - 158*		B8I0482	09/18/2018	*09/18/18 21:20*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0397	09/15/2018	09/15/18 16:32	
Benzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 16:32	
Toluene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 16:32	
Ethylbenzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 16:32	
m,p-Xylene	ND	10	1	B8I0397	09/15/2018	09/15/18 16:32	
o-Xylene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 16:32	
Surrogate: 4-Bromofluorobenzene *98.3 %*		*54 - 140*		B8I0397	09/15/2018	*09/15/18 16:32*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:24	
4,4´-DDE	**11**	2.0	1	B8I0394	09/14/2018	09/16/18 14:24	
4,4´-DDT	**39**	2.0	1	B8I0394	09/14/2018	09/16/18 14:24	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B42-2HA

Lab ID: 1803391-AZ

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin [2C]	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:24	
alpha-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:24	
alpha-Chlordane [2C]	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:24	
beta-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:24	
Chlordane	ND	8.5	1	B8I0394	09/14/2018	09/16/18 14:24	
delta-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:24	
Dieldrin	**36**	2.0	1	B8I0394	09/14/2018	09/16/18 14:24	
Endosulfan I	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:24	
Endosulfan II	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:24	
Endosulfan sulfate	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:24	
Endrin	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:24	
Endrin aldehyde	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:24	
Endrin ketone	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:24	
gamma-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:24	
gamma-Chlordane [2C]	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:24	
Heptachlor	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:24	
Heptachlor epoxide	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:24	
Methoxychlor	ND	5.0	1	B8I0394	09/14/2018	09/16/18 14:24	
Toxaphene	ND	50	1	B8I0394	09/14/2018	09/16/18 14:24	
Surrogate: Decachlorobiphenyl	*57.8 %*	*15 - 100*		B8I0394	09/14/2018	*09/16/18 14:24*	
Surrogate: Tetrachloro-m-xylene	*81.3 %*	*16 - 100*		B8I0394	09/14/2018	*09/16/18 14:24*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B41-0HA

Lab ID: 1803391-BA

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**5.4**	1.0	1	B8I0364	09/17/2018	09/18/18 09:17	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B41-1HA

Lab ID: 1803391-BB

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	ND	1.0	1	B8I0364	09/17/2018	09/18/18 09:18	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: VW

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B8I0397	09/15/2018	09/15/18 16:51	
Surrogate: 4-Bromofluorobenzene	*121 %*	*57 - 144*		B8I0397	09/15/2018	*09/15/18 16:51*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**7.2**	1.0	1	B8I0482	09/18/2018	09/18/18 21:53	
ORO	**15**	1.0	1	B8I0482	09/18/2018	09/18/18 21:53	
Surrogate: p-Terphenyl	*101 %*	*34 - 158*		B8I0482	09/18/2018	*09/18/18 21:53*	

BTEX/MTBE by EPA 8021

Analyst: VW

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
MTBE	ND	5.0	1	B8I0397	09/15/2018	09/15/18 16:51	
Benzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 16:51	
Toluene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 16:51	
Ethylbenzene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 16:51	
m,p-Xylene	ND	10	1	B8I0397	09/15/2018	09/15/18 16:51	
o-Xylene	ND	5.0	1	B8I0397	09/15/2018	09/15/18 16:51	
Surrogate: 4-Bromofluorobenzene	*106 %*	*54 - 140*		B8I0397	09/15/2018	*09/15/18 16:51*	

Organochlorine Pesticides by EPA 8081

Analyst: CO/

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
4,4´-DDD	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:34	
4,4´-DDE [2C]	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:34	
4,4´-DDT	**7.8**	2.0	1	B8I0394	09/14/2018	09/16/18 14:34	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
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Client Sample ID B41-1HA

Lab ID: 1803391-BB

Organochlorine Pesticides by EPA 8081 **Analyst: CO/**

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Aldrin	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:34	
alpha-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:34	
alpha-Chlordane	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:34	
beta-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:34	
Chlordane	ND	8.5	1	B8I0394	09/14/2018	09/16/18 14:34	
delta-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:34	
Dieldrin [2C]	**2.2**	2.0	1	B8I0394	09/14/2018	09/16/18 14:34	
Endosulfan I	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:34	
Endosulfan II	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:34	
Endosulfan sulfate	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:34	
Endrin	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:34	
Endrin aldehyde	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:34	
Endrin ketone	ND	2.0	1	B8I0394	09/14/2018	09/16/18 14:34	
gamma-BHC	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:34	
gamma-Chlordane	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:34	
Heptachlor	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:34	
Heptachlor epoxide	ND	1.0	1	B8I0394	09/14/2018	09/16/18 14:34	
Methoxychlor	ND	5.0	1	B8I0394	09/14/2018	09/16/18 14:34	
Toxaphene	ND	50	1	B8I0394	09/14/2018	09/16/18 14:34	
Surrogate: Decachlorobiphenyl	*56.0 %*	*15 - 100*		B8I0394	09/14/2018	*09/16/18 14:34*	
Surrogate: Tetrachloro-m-xylene	*79.4 %*	*16 - 100*		B8I0394	09/14/2018	*09/16/18 14:34*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Client Sample ID B41-2HA

Lab ID: 1803391-BC

Total Metals by ICP-AES EPA 6010B

Analyst: GO

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**18**	1.0	1	B8I0364	09/17/2018	09/18/18 09:20	

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QUALITY CONTROL SECTION

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

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0352 - EPA 3050B_S										
Blank (B8I0352-BLK1)					Prepared: 9/17/2018 Analyzed: 9/17/2018					
Lead	ND	1.0	0.18							
LCS (B8I0352-BS1)					Prepared: 9/17/2018 Analyzed: 9/17/2018					
Lead	44.7816	1.0	0.18	50.0000		89.6	80 - 120			
Matrix Spike (B8I0352-MS1)			**Source: 1803391-01**		Prepared: 9/17/2018 Analyzed: 9/17/2018					
Lead	94.0123	1.0	0.18	124.378	17.2073	61.8	36 - 121			
Matrix Spike Dup (B8I0352-MSD1)			**Source: 1803391-01**		Prepared: 9/17/2018 Analyzed: 9/17/2018					
Lead	94.4456	1.0	0.18	124.378	17.2073	62.1	36 - 121	0.460	20	

Certificate of Analysis

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

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0353 - EPA 3050B_S										
Blank (B8I0353-BLK1)					Prepared: 9/17/2018 Analyzed: 9/17/2018					
Lead	ND	1.0	0.18							
LCS (B8I0353-BS1)					Prepared: 9/17/2018 Analyzed: 9/17/2018					
Lead	44.5572	1.0	0.18	50.0000		89.1	80 - 120			
Matrix Spike (B8I0353-MS1)			**Source: 1803391-29**		Prepared: 9/17/2018 Analyzed: 9/17/2018					
Lead	84.3349	1.0	0.18	125.000	4.92342	63.5	36 - 121			
Matrix Spike Dup (B8I0353-MSD1)			**Source: 1803391-29**		Prepared: 9/17/2018 Analyzed: 9/17/2018					
Lead	81.5338	1.0	0.18	125.000	4.92342	61.3	36 - 121	3.38	20	

Certificate of Analysis

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

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0354 - EPA 3050B_S										
Blank (B8I0354-BLK1)					Prepared: 9/17/2018 Analyzed: 9/17/2018					
Lead	ND	1.0	0.18							
LCS (B8I0354-BS1)					Prepared: 9/17/2018 Analyzed: 9/17/2018					
Lead	45.6724	1.0	0.18	50.0000		91.3	80 - 120			
Matrix Spike (B8I0354-MS1)			**Source: 1803391-58**		Prepared: 9/17/2018 Analyzed: 9/17/2018					
Lead	231.195	1.0	0.18	125.000	118.611	90.1	36 - 121			
Matrix Spike Dup (B8I0354-MSD1)			**Source: 1803391-58**		Prepared: 9/17/2018 Analyzed: 9/17/2018					
Lead	204.850	1.0	0.18	125.000	118.611	69.0	36 - 121	12.1	20	

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

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0363 - EPA 3050B_S										
Blank (B8I0363-BLK1)					Prepared: 9/17/2018 Analyzed: 9/17/2018					
Lead	ND	1.0	0.18							
LCS (B8I0363-BS1)					Prepared: 9/17/2018 Analyzed: 9/17/2018					
Lead	47.4924	1.0	0.18	50.0000		95.0	80 - 120			
Matrix Spike (B8I0363-MS1)			**Source: 1803391-85**		Prepared: 9/17/2018 Analyzed: 9/17/2018					
Lead	106.239	1.0	0.18	125.000	15.1059	72.9	36 - 121			
Matrix Spike Dup (B8I0363-MSD1)			**Source: 1803391-85**		Prepared: 9/17/2018 Analyzed: 9/18/2018					
Lead	102.253	2.0	0.36	125.000	15.1059	69.7	36 - 121	3.82	20	

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

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0364 - EPA 3050B_S										
Blank (B8I0364-BLK1)					Prepared: 9/17/2018 Analyzed: 9/18/2018					
Lead	ND	1.0	0.18							
LCS (B8I0364-BS1)					Prepared: 9/17/2018 Analyzed: 9/18/2018					
Lead	46.0016	1.0	0.18	50.0000		92.0	80 - 120			
Matrix Spike (B8I0364-MS1)			**Source: 1803391-AM**		Prepared: 9/17/2018 Analyzed: 9/18/2018					
Lead	97.2262	1.0	0.18	125.000	3.54002	74.9	36 - 121			
Matrix Spike Dup (B8I0364-MSD1)			**Source: 1803391-AM**		Prepared: 9/17/2018 Analyzed: 9/18/2018					
Lead	110.820	1.0	0.18	125.000	3.54002	85.8	36 - 121	13.1	20	

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Title 22 Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0351 - EPA 3050B_S										
Blank (B8I0351-BLK1)						Prepared: 9/14/2018 Analyzed: 9/17/2018				
Antimony	ND	2.0	0.51							
Arsenic	ND	1.0	0.12							
Barium	ND	1.0	0.12							
Beryllium	ND	1.0	0.03							
Cadmium	ND	1.0	0.14							
Chromium	ND	1.0	0.26							
Cobalt	ND	1.0	0.07							
Copper	ND	2.0	0.19							
Lead	ND	1.0	0.18							
Molybdenum	ND	1.0	0.12							
Nickel	ND	1.0	0.18							
Selenium	ND	1.0	0.40							
Silver	ND	1.0	0.12							
Thallium	ND	1.0	0.38							
Vanadium	ND	1.0	0.06							
Zinc	ND	1.0	0.15							
LCS (B8I0351-BS1)						Prepared: 9/14/2018 Analyzed: 9/17/2018				
Antimony	44.9602	2.0	0.51	50.0000		89.9	80 - 120			
Arsenic	42.1900	1.0	0.12	50.0000		84.4	80 - 120			
Barium	46.4172	1.0	0.12	50.0000		92.8	80 - 120			
Beryllium	42.6886	1.0	0.03	50.0000		85.4	80 - 120			
Cadmium	43.0467	1.0	0.14	50.0000		86.1	80 - 120			
Chromium	46.6426	1.0	0.26	50.0000		93.3	80 - 120			
Cobalt	45.7318	1.0	0.07	50.0000		91.5	80 - 120			
Copper	46.5636	2.0	0.19	50.0000		93.1	80 - 120			
Lead	45.1963	1.0	0.18	50.0000		90.4	80 - 120			
Molybdenum	45.0493	1.0	0.12	50.0000		90.1	80 - 120			
Nickel	45.5110	1.0	0.18	50.0000		91.0	80 - 120			
Selenium	41.8728	1.0	0.40	50.0000		83.7	80 - 120			
Silver	44.3196	1.0	0.12	50.0000		88.6	80 - 120			
Thallium	44.8424	1.0	0.38	50.0000		89.7	80 - 120			
Vanadium	46.0895	1.0	0.06	50.0000		92.2	80 - 120			
Zinc	42.3354	1.0	0.15	50.0000		84.7	80 - 120			
Matrix Spike (B8I0351-MS1)				**Source: 1803391-06**		Prepared: 9/14/2018 Analyzed: 9/17/2018				
Antimony	75.9192	2.0	0.51	125.000	ND	60.7	28 - 99			
Arsenic	97.4167	1.0	0.12	125.000	0.481935	77.5	49 - 99			
Barium	196.802	1.0	0.12	125.000	102.354	75.6	19 - 135			
Beryllium	96.5191	1.0	0.03	125.000	0.199341	77.1	53 - 99			
Cadmium	87.1652	1.0	0.14	125.000	0.192550	69.6	49 - 95			
Chromium	179.558	1.0	0.26	125.000	85.0731	75.6	41 - 114			

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Rancho Cordova , CA 95742

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Title 22 Metals by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0351 - EPA 3050B_S (continued)										
Matrix Spike (B8I0351-MS1) - Continued			**Source: 1803391-06**		Prepared: 9/14/2018 Analyzed: 9/17/2018					
Cobalt	107.714	1.0	0.07	125.000	19.5484	70.5	44 - 106			
Copper	129.067	2.0	0.19	125.000	23.8868	84.1	42 - 120			
Lead	94.9210	1.0	0.18	125.000	4.44992	72.4	36 - 121			
Molybdenum	91.6432	1.0	0.12	125.000	ND	73.3	49 - 102			
Nickel	337.079	1.0	0.18	125.000	266.893	56.1	45 - 101			
Selenium	94.6060	1.0	0.40	125.000	ND	75.7	50 - 94			
Silver	100.837	1.0	0.12	125.000	ND	80.7	33 - 120			
Thallium	88.2096	1.0	0.38	125.000	ND	70.6	41 - 95			
Vanadium	122.965	1.0	0.06	125.000	27.0075	76.8	45 - 113			
Zinc	132.097	1.0	0.15	125.000	46.3910	68.6	26 - 117			
Matrix Spike Dup (B8I0351-MSD1)			**Source: 1803391-06**		Prepared: 9/14/2018 Analyzed: 9/17/2018					
Antimony	85.5210	2.0	0.51	125.000	ND	68.4	28 - 99	11.9	20	
Arsenic	106.623	1.0	0.12	125.000	0.481935	84.9	49 - 99	9.02	20	
Barium	213.668	1.0	0.12	125.000	102.354	89.1	19 - 135	8.22	20	
Beryllium	105.022	1.0	0.03	125.000	0.199341	83.9	53 - 99	8.44	20	
Cadmium	97.4026	1.0	0.14	125.000	0.192550	77.8	49 - 95	11.1	20	
Chromium	196.033	1.0	0.26	125.000	85.0731	88.8	41 - 114	8.77	20	
Cobalt	120.069	1.0	0.07	125.000	19.5484	80.4	44 - 106	10.8	20	
Copper	137.267	2.0	0.19	125.000	23.8868	90.7	42 - 120	6.16	20	
Lead	104.396	1.0	0.18	125.000	4.44992	80.0	36 - 121	9.51	20	
Molybdenum	101.562	1.0	0.12	125.000	ND	81.2	49 - 102	10.3	20	
Nickel	376.984	1.0	0.18	125.000	266.893	88.1	45 - 101	11.2	20	
Selenium	104.797	1.0	0.40	125.000	ND	83.8	50 - 94	10.2	20	
Silver	109.858	1.0	0.12	125.000	ND	87.9	33 - 120	8.56	20	
Thallium	97.3727	1.0	0.38	125.000	ND	77.9	41 - 95	9.87	20	
Vanadium	134.733	1.0	0.06	125.000	27.0075	86.2	45 - 113	9.13	20	
Zinc	142.338	1.0	0.15	125.000	46.3910	76.8	26 - 117	7.46	20	

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Rancho Cordova , CA 95742	Reported : 09/19/2018

Title 22 Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0359 - EPA 3050B_S										
Blank (B8I0359-BLK1)						Prepared: 9/14/2018 Analyzed: 9/17/2018				
Antimony	ND	2.0	0.51							
Arsenic	ND	1.0	0.12							
Barium	ND	1.0	0.12							
Beryllium	ND	1.0	0.03							
Cadmium	ND	1.0	0.14							
Chromium	ND	1.0	0.26							
Cobalt	ND	1.0	0.07							
Copper	ND	2.0	0.19							
Lead	ND	1.0	0.18							
Molybdenum	ND	1.0	0.12							
Nickel	ND	1.0	0.18							
Selenium	ND	1.0	0.40							
Silver	ND	1.0	0.12							
Thallium	ND	1.0	0.38							
Vanadium	ND	1.0	0.06							
Zinc	ND	1.0	0.15							
LCS (B8I0359-BS1)						Prepared: 9/14/2018 Analyzed: 9/17/2018				
Antimony	45.9151	2.0	0.51	50.0000		91.8	80 - 120			
Arsenic	42.5314	1.0	0.12	50.0000		85.1	80 - 120			
Barium	44.9489	1.0	0.12	50.0000		89.9	80 - 120			
Beryllium	42.5932	1.0	0.03	50.0000		85.2	80 - 120			
Cadmium	42.8574	1.0	0.14	50.0000		85.7	80 - 120			
Chromium	45.5128	1.0	0.26	50.0000		91.0	80 - 120			
Cobalt	44.8035	1.0	0.07	50.0000		89.6	80 - 120			
Copper	45.5534	2.0	0.19	50.0000		91.1	80 - 120			
Lead	44.4760	1.0	0.18	50.0000		89.0	80 - 120			
Molybdenum	44.5084	1.0	0.12	50.0000		89.0	80 - 120			
Nickel	44.5179	1.0	0.18	50.0000		89.0	80 - 120			
Selenium	42.3220	1.0	0.40	50.0000		84.6	80 - 120			
Silver	43.3630	1.0	0.12	50.0000		86.7	80 - 120			
Thallium	44.8655	1.0	0.38	50.0000		89.7	80 - 120			
Vanadium	45.1353	1.0	0.06	50.0000		90.3	80 - 120			
Zinc	41.8300	1.0	0.15	50.0000		83.7	80 - 120			
Matrix Spike (B8I0359-MS1)				**Source: 1803391-78**		Prepared: 9/14/2018 Analyzed: 9/17/2018				
Antimony	84.0004	2.0	0.51	125.000	ND	67.2	28 - 99			
Arsenic	104.272	1.0	0.12	125.000	4.16392	80.1	49 - 99			
Barium	251.125	1.0	0.12	125.000	139.297	89.5	19 - 135			
Beryllium	99.3240	1.0	0.03	125.000	0.085596	79.4	53 - 99			
Cadmium	95.2470	1.0	0.14	125.000	0.194004	76.0	49 - 95			
Chromium	143.142	1.0	0.26	125.000	36.5228	85.3	41 - 114			

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Title 22 Metals by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0359 - EPA 3050B_S (continued)										
Matrix Spike (B8I0359-MS1) - Continued			**Source: 1803391-78**		Prepared: 9/14/2018 Analyzed: 9/17/2018					
Cobalt	106.902	1.0	0.07	125.000	9.66991	77.8	44 - 106			
Copper	139.154	2.0	0.19	125.000	24.2393	91.9	42 - 120			
Lead	100.749	1.0	0.18	125.000	4.84527	76.7	36 - 121			
Molybdenum	97.0790	1.0	0.12	125.000	ND	77.7	49 - 102			
Nickel	158.969	1.0	0.18	125.000	65.3948	74.9	45 - 101			
Selenium	97.7642	1.0	0.40	125.000	ND	78.2	50 - 94			
Silver	105.844	1.0	0.12	125.000	ND	84.7	33 - 120			
Thallium	91.9056	1.0	0.38	125.000	ND	73.5	41 - 95			
Vanadium	142.693	1.0	0.06	125.000	30.4500	89.8	45 - 113			
Zinc	135.848	1.0	0.15	125.000	41.0901	75.8	26 - 117			
Matrix Spike Dup (B8I0359-MSD1)			**Source: 1803391-78**		Prepared: 9/14/2018 Analyzed: 9/17/2018					
Antimony	71.3101	2.0	0.51	125.000	ND	57.0	28 - 99	16.3	20	
Arsenic	90.6504	1.0	0.12	125.000	4.16392	69.2	49 - 99	14.0	20	
Barium	258.865	1.0	0.12	125.000	139.297	95.7	19 - 135	3.04	20	
Beryllium	86.2377	1.0	0.03	125.000	0.085596	68.9	53 - 99	14.1	20	
Cadmium	80.4872	1.0	0.14	125.000	0.194004	64.2	49 - 95	16.8	20	
Chromium	123.421	1.0	0.26	125.000	36.5228	69.5	41 - 114	14.8	20	
Cobalt	98.2606	1.0	0.07	125.000	9.66991	70.9	44 - 106	8.42	20	
Copper	114.169	2.0	0.19	125.000	24.2393	71.9	42 - 120	19.7	20	
Lead	90.0996	1.0	0.18	125.000	4.84527	68.2	36 - 121	11.2	20	
Molybdenum	83.9107	1.0	0.12	125.000	ND	67.1	49 - 102	14.6	20	
Nickel	142.622	1.0	0.18	125.000	65.3948	61.8	45 - 101	10.8	20	
Selenium	85.3893	1.0	0.40	125.000	ND	68.3	50 - 94	13.5	20	
Silver	87.4991	1.0	0.12	125.000	ND	70.0	33 - 120	19.0	20	
Thallium	79.5290	1.0	0.38	125.000	ND	63.6	41 - 95	14.4	20	
Vanadium	119.467	1.0	0.06	125.000	30.4500	71.2	45 - 113	17.7	20	
Zinc	119.600	1.0	0.15	125.000	41.0901	62.8	26 - 117	12.7	20	

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Title 22 Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	MDL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0443 - EPA 3010A_W										
Blank (B8I0443-BLK1)					Prepared: 9/17/2018 Analyzed: 9/18/2018					
Antimony	ND	0.010	0.0088							
Arsenic	ND	0.010	0.0078							
Barium	ND	0.0030	0.0026							
Beryllium	ND	0.0030	0.0016							
Cadmium	ND	0.0030	0.0024							
Chromium	ND	0.0030	0.0020							
Cobalt	ND	0.0030	0.0016							
Copper	ND	0.0090	0.0038							
Lead	ND	0.0050	0.0047							
Molybdenum	ND	0.0050	0.0030							
Nickel	ND	0.0050	0.0046							
Selenium	ND	0.010	0.0093							
Silver	ND	0.0030	0.0024							
Thallium	ND	0.015	0.0085							
Vanadium	ND	0.0030	0.0022							
Zinc	ND	0.025	0.0057							
LCS (B8I0443-BS1)					Prepared: 9/17/2018 Analyzed: 9/17/2018					
Antimony	0.857438	0.010	0.0088	1.00000		85.7	80 - 120			
Arsenic	0.836528	0.010	0.0078	1.00000		83.7	80 - 120			
Barium	0.901004	0.0030	0.0026	1.00000		90.1	80 - 120			
Beryllium	0.824055	0.0030	0.0016	1.00000		82.4	80 - 120			
Cadmium	0.827463	0.0030	0.0024	1.00000		82.7	80 - 120			
Chromium	0.887605	0.0030	0.0020	1.00000		88.8	80 - 120			
Cobalt	0.876872	0.0030	0.0016	1.00000		87.7	80 - 120			
Copper	0.876055	0.0090	0.0038	1.00000		87.6	80 - 120			
Lead	0.854690	0.0050	0.0047	1.00000		85.5	80 - 120			
Molybdenum	0.871762	0.0050	0.0030	1.00000		87.2	80 - 120			
Nickel	0.875892	0.0050	0.0046	1.00000		87.6	80 - 120			
Selenium	0.817425	0.010	0.0093	1.00000		81.7	80 - 120			
Silver	0.829253	0.0030	0.0024	1.00000		82.9	80 - 120			
Thallium	0.851332	0.015	0.0085	1.00000		85.1	80 - 120			
Vanadium	0.865666	0.0030	0.0022	1.00000		86.6	80 - 120			
Zinc	0.815714	0.025	0.0057	1.00000		81.6	80 - 120			
Matrix Spike (B8I0443-MS1)			**Source: 1803391-15**		Prepared: 9/17/2018 Analyzed: 9/18/2018					
Antimony	1.22155	0.050	0.044	2.50000	ND	48.9	81 - 115			M1
Arsenic	2.04973	0.050	0.039	2.50000	0.055430	79.8	79 - 116			
Barium	7.55762	0.015	0.013	2.50000	5.87547	67.3	76 - 116			M1
Beryllium	2.01327	0.015	0.0082	2.50000	0.012286	80.0	85 - 111			M1
Cadmium	1.98276	0.015	0.012	2.50000	ND	79.3	74 - 108			
Chromium	2.69356	0.015	0.0098	2.50000	0.781818	76.5	79 - 114			M1

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Title 22 Metals by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/L)	PQL (mg/L)	MDL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0443 - EPA 3010A_W (continued)										
Matrix Spike (B8I0443-MS1) - Continued			**Source: 1803391-15**		Prepared: 9/17/2018 Analyzed: 9/18/2018					
Cobalt	2.61009	0.015	0.0079	2.50000	0.512693	83.9	77 - 110			
Copper	2.52902	0.045	0.019	2.50000	0.518503	80.4	84 - 115			M1
Lead	2.01059	0.025	0.024	2.50000	0.051366	78.4	76 - 108			
Molybdenum	1.93707	0.025	0.015	2.50000	ND	77.5	83 - 111			M1
Nickel	4.51004	0.025	0.023	2.50000	2.62436	75.4	75 - 109			
Selenium	1.87166	0.050	0.047	2.50000	ND	74.9	71 - 120			
Silver	2.07401	0.015	0.012	2.50000	ND	83.0	72 - 129			
Thallium	1.93674	0.075	0.043	2.50000	ND	77.5	67 - 113			
Vanadium	2.46653	0.015	0.011	2.50000	0.524932	77.7	75 - 123			
Zinc	3.04310	0.12	0.029	2.50000	1.22968	72.5	73 - 108			M1
Matrix Spike Dup (B8I0443-MSD1)			**Source: 1803391-15**		Prepared: 9/17/2018 Analyzed: 9/17/2018					
Antimony	1.47361	0.050	0.044	2.50000	ND	58.9	81 - 115	18.7	20	M1
Arsenic	2.17720	0.050	0.039	2.50000	0.055430	84.9	79 - 116	6.03	20	
Barium	8.18868	0.015	0.013	2.50000	5.87547	92.5	76 - 116	8.02	20	
Beryllium	2.12481	0.015	0.0082	2.50000	0.012286	84.5	85 - 111	5.39	20	M1
Cadmium	2.06058	0.015	0.012	2.50000	ND	82.4	74 - 108	3.85	20	
Chromium	2.87393	0.015	0.0098	2.50000	0.781818	83.7	79 - 114	6.48	20	
Cobalt	2.77853	0.015	0.0079	2.50000	0.512693	90.6	77 - 110	6.25	20	
Copper	2.67566	0.045	0.019	2.50000	0.518503	86.3	84 - 115	5.63	20	
Lead	2.12082	0.025	0.024	2.50000	0.051366	82.8	76 - 108	5.34	20	
Molybdenum	2.11799	0.025	0.015	2.50000	ND	84.7	83 - 111	8.92	20	
Nickel	4.74576	0.025	0.023	2.50000	2.62436	84.9	75 - 109	5.09	20	
Selenium	2.04544	0.050	0.047	2.50000	ND	81.8	71 - 120	8.87	20	
Silver	2.20969	0.015	0.012	2.50000	ND	88.4	72 - 129	6.33	20	
Thallium	2.05109	0.075	0.043	2.50000	ND	82.0	67 - 113	5.73	20	
Vanadium	2.59630	0.015	0.011	2.50000	0.524932	82.9	75 - 123	5.13	20	
Zinc	3.16160	0.12	0.029	2.50000	1.22968	77.3	73 - 108	3.82	20	

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Mercury by AA (Cold Vapor) EPA 7470A - Quality Control

Analyte	Result (ug/L)	PQL (ug/L)	MDL (ug/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0388 - EPA 245.1/7470_W										
Blank (B8I0388-BLK1)					Prepared: 9/14/2018 Analyzed: 9/17/2018					
Mercury	ND	0.20	0.03							
LCS (B8I0388-BS1)					Prepared: 9/14/2018 Analyzed: 9/17/2018					
Mercury	9.27156	0.20	0.03	10.0000		92.7	80 - 120			
Duplicate (B8I0388-DUP1)			**Source: 1803391-15**		Prepared: 9/14/2018 Analyzed: 9/17/2018					
Mercury	1.01607	0.20	0.03		0.907292			11.3	20	
Matrix Spike (B8I0388-MS1)			**Source: 1803373-01**		Prepared: 9/14/2018 Analyzed: 9/17/2018					
Mercury	8.98007	0.20	0.03	10.0000	ND	89.8	70 - 130			
Matrix Spike Dup (B8I0388-MSD1)			**Source: 1803373-01**		Prepared: 9/14/2018 Analyzed: 9/17/2018					
Mercury	8.73048	0.20	0.03	10.0000	ND	87.3	70 - 130	2.82	20	
Post Spike (B8I0388-PS1)			**Source: 1803373-01**		Prepared: 9/14/2018 Analyzed: 9/17/2018					
Mercury	4.77950			5.00000	-0.009368	95.6	85 - 115			

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Mercury by AA (Cold Vapor) EPA 7471A - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0357 - EPA 7471_S										
Blank (B8I0357-BLK1)					Prepared: 9/14/2018 Analyzed: 9/17/2018					
Mercury	ND	0.10	0.006							
LCS (B8I0357-BS1)					Prepared: 9/14/2018 Analyzed: 9/17/2018					
Mercury	0.789053	0.10	0.006	0.833333		94.7	80 - 120			
Matrix Spike (B8I0357-MS1)			**Source: 1803391-06**		Prepared: 9/14/2018 Analyzed: 9/17/2018					
Mercury	0.814238	0.10	0.006	0.833333	0.020205	95.3	70 - 130			
Matrix Spike Dup (B8I0357-MSD1)			**Source: 1803391-06**		Prepared: 9/14/2018 Analyzed: 9/17/2018					
Mercury	0.834710	0.10	0.006	0.833333	0.020205	97.7	70 - 130	2.48	20	

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Mercury by AA (Cold Vapor) EPA 7471A - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0357 - EPA 7471_S									
Post Spike (B8I0357-PS1)			**Source: 1803391-06**		Prepared: 9/14/2018 Analyzed: 9/17/2018				
Mercury	0.005808		5.00000E-3	0.000242	111	85 - 115			

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Mercury by AA (Cold Vapor) EPA 7471A - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0358 - EPA 7471_S										
Blank (B8I0358-BLK1)					Prepared: 9/14/2018 Analyzed: 9/17/2018					
Mercury	ND	0.10	0.006							
LCS (B8I0358-BS1)					Prepared: 9/14/2018 Analyzed: 9/17/2018					
Mercury	0.778432	0.10	0.006	0.833333		93.4	80 - 120			
Matrix Spike (B8I0358-MS1)			**Source: 1803391-78**		Prepared: 9/14/2018 Analyzed: 9/17/2018					
Mercury	0.871345	0.10	0.006	0.833333	0.052677	98.2	70 - 130			
Matrix Spike Dup (B8I0358-MSD1)			**Source: 1803391-78**		Prepared: 9/14/2018 Analyzed: 9/17/2018					
Mercury	0.857103	0.10	0.006	0.833333	0.052677	96.5	70 - 130	1.65	20	

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Mercury by AA (Cold Vapor) EPA 7471A - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0358 - EPA 7471_S									
Post Spike (B8I0358-PS1)			**Source: 1803391-78**	Prepared: 9/14/2018 Analyzed: 9/17/2018					
Mercury	0.007833		5.00000E-3	0.000632	144	85 - 115			M1

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Gasoline Range Organics by EPA 8015B (Modified) - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0304 - GCVOA_S										
Blank (B8I0304-BLK1)					Prepared: 9/13/2018 Analyzed: 9/13/2018					
Gasoline Range Organics	ND	1.0	0.20							
Surrogate: 4-Bromofluorobenzene	*0.2136*			*0.200000*		*107*	*57 - 144*			
LCS (B8I0304-BS1)					Prepared: 9/13/2018 Analyzed: 9/13/2018					
Gasoline Range Organics	5.11400	1.0	0.20	5.00000		102	70 - 130			
Surrogate: 4-Bromofluorobenzene	*0.2336*			*0.200000*		*117*	*57 - 144*			
Matrix Spike (B8I0304-MS1)			**Source: 1803391-03**		Prepared: 9/13/2018 Analyzed: 9/13/2018					
Gasoline Range Organics	4.34500	1.0	0.20	5.00000	ND	86.9	28 - 118			
Surrogate: 4-Bromofluorobenzene	*0.2499*			*0.200000*		*125*	*57 - 144*			
Matrix Spike Dup (B8I0304-MSD1)			**Source: 1803391-03**		Prepared: 9/13/2018 Analyzed: 9/13/2018					
Gasoline Range Organics	3.64800	1.0	0.20	5.00000	ND	73.0	28 - 118	17.4	20	
Surrogate: 4-Bromofluorobenzene	*0.2420*			*0.200000*		*121*	*57 - 144*			

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Gasoline Range Organics by EPA 8015B (Modified) - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0346 - GCVOA_S										
Blank (B8I0346-BLK1)					Prepared: 9/14/2018 Analyzed: 9/14/2018					
Gasoline Range Organics	ND	1.0	0.20							
Surrogate: 4-Bromofluorobenzene	*0.2128*			*0.200000*		*106*	*57 - 144*			
LCS (B8I0346-BS1)					Prepared: 9/14/2018 Analyzed: 9/14/2018					
Gasoline Range Organics	4.87100	1.0	0.20	5.00000		97.4	70 - 130			
Surrogate: 4-Bromofluorobenzene	*0.2339*			*0.200000*		*117*	*57 - 144*			
Matrix Spike (B8I0346-MS1)			**Source: 1803391-82**		Prepared: 9/14/2018 Analyzed: 9/14/2018					
Gasoline Range Organics	3.80500	1.0	0.20	5.00000	ND	76.1	28 - 118			
Surrogate: 4-Bromofluorobenzene	*0.1926*			*0.200000*		*96.3*	*57 - 144*			
Matrix Spike Dup (B8I0346-MSD1)			**Source: 1803391-82**		Prepared: 9/14/2018 Analyzed: 9/14/2018					
Gasoline Range Organics	4.51700	1.0	0.20	5.00000	ND	90.3	28 - 118	17.1	20	
Surrogate: 4-Bromofluorobenzene	*0.2340*			*0.200000*		*117*	*57 - 144*			

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Rancho Cordova , CA 95742	Reported : 09/19/2018

Gasoline Range Organics by EPA 8015B (Modified) - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0397 - GCVOA_S										
Blank (B8I0397-BLK1)						Prepared: 9/15/2018 Analyzed: 9/15/2018				
Gasoline Range Organics	ND	1.0	0.20							
Surrogate: 4-Bromofluorobenzene	*0.2238*			*0.200000*		*112*	*57 - 144*			
LCS (B8I0397-BS1)						Prepared: 9/15/2018 Analyzed: 9/15/2018				
Gasoline Range Organics	4.32400	1.0	0.20	5.00000		86.5	70 - 130			
Surrogate: 4-Bromofluorobenzene	*0.2072*			*0.200000*		*104*	*57 - 144*			
Matrix Spike (B8I0397-MS1)			**Source: 1803391-48**			Prepared: 9/15/2018 Analyzed: 9/15/2018				
Gasoline Range Organics	3.99300	1.0	0.20	5.00000	ND	79.9	28 - 118			
Surrogate: 4-Bromofluorobenzene	*0.2302*			*0.200000*		*115*	*57 - 144*			
Matrix Spike Dup (B8I0397-MSD1)			**Source: 1803391-48**			Prepared: 9/15/2018 Analyzed: 9/15/2018				
Gasoline Range Organics	3.99400	1.0	0.20	5.00000	ND	79.9	28 - 118	0.0250	20	
Surrogate: 4-Bromofluorobenzene	*0.2128*			*0.200000*		*106*	*57 - 144*			

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Gasoline Range Organics by EPA 8015B (Modified) - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0400 - GCVOA_S										
Blank (B8I0400-BLK1)						Prepared: 9/16/2018 Analyzed: 9/16/2018				
Gasoline Range Organics	ND	1.0	0.20							
Surrogate: 4-Bromofluorobenzene	*0.1432*			*0.200000*		*71.6*	*57 - 144*			
LCS (B8I0400-BS1)						Prepared: 9/16/2018 Analyzed: 9/16/2018				
Gasoline Range Organics	4.56400	1.0	0.20	5.00000		91.3	70 - 130			
Surrogate: 4-Bromofluorobenzene	*0.2171*			*0.200000*		*109*	*57 - 144*			
Matrix Spike (B8I0400-MS1)			**Source: 1803391-03**			Prepared: 9/16/2018 Analyzed: 9/16/2018				
Gasoline Range Organics	4.04500	1.0	0.20	5.00000	ND	80.9	28 - 118			
Surrogate: 4-Bromofluorobenzene	*0.2202*			*0.200000*		*110*	*57 - 144*			
Matrix Spike Dup (B8I0400-MSD1)			**Source: 1803391-03**			Prepared: 9/16/2018 Analyzed: 9/16/2018				
Gasoline Range Organics	3.52700	1.0	0.20	5.00000	ND	70.5	28 - 118	13.7	20	
Surrogate: 4-Bromofluorobenzene	*0.1837*			*0.200000*		*91.9*	*57 - 144*			

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Diesel Range Organics by EPA 8015B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	MDL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0329 - GCSEMI_DRO_W										
Blank (B8I0329-BLK1)						Prepared: 9/13/2018 Analyzed: 9/13/2018				
DRO	ND	0.05	0.05							
ORO	ND	0.05	0.05							
Surrogate: p-Terphenyl	*0.07342*			*8.00000E-2*		*91.8*	*32 - 169*			
LCS (B8I0329-BS1)						Prepared: 9/13/2018 Analyzed: 9/13/2018				
DRO	1.03948	0.05	0.05	1.00000		104	45 - 161			
Surrogate: p-Terphenyl	*0.07391*			*8.00000E-2*		*92.4*	*32 - 169*			
LCS Dup (B8I0329-BSD1)						Prepared: 9/13/2018 Analyzed: 9/13/2018				
DRO	1.00373	0.05	0.05	1.00000		100	45 - 161	3.50	20	
Surrogate: p-Terphenyl	*0.06903*			*8.00000E-2*		*86.3*	*32 - 169*			

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Diesel Range Organics by EPA 8015B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0452 - GCSEMI_DRO_LL_S										
Blank (B8I0452-BLK1)						Prepared: 9/17/2018 Analyzed: 9/17/2018				
DRO	ND	1.0	1.0							
ORO	ND	1.0	1.0							
Surrogate: p-Terphenyl	*3.378*			*2.66667*		*127*	*34 - 158*			
LCS (B8I0452-BS1)						Prepared: 9/17/2018 Analyzed: 9/17/2018				
DRO	58.4133	1.0	1.0	66.6667		87.6	47 - 152			
Surrogate: p-Terphenyl	*3.294*			*2.66667*		*124*	*34 - 158*			
Matrix Spike (B8I0452-MS1)			**Source: 1803391-12**			Prepared: 9/17/2018 Analyzed: 9/17/2018				
DRO	36.2140	1.0	1.0	33.3333	4.08233	96.4	34 - 130			
Surrogate: p-Terphenyl	*2.547*			*2.66667*		*95.5*	*34 - 158*			
Matrix Spike Dup (B8I0452-MSD1)			**Source: 1803391-12**			Prepared: 9/17/2018 Analyzed: 9/17/2018				
DRO	35.6820	1.0	1.0	33.3333	4.08233	94.8	34 - 130	1.48	20	
Surrogate: p-Terphenyl	*2.399*			*2.66667*		*90.0*	*34 - 158*			

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Diesel Range Organics by EPA 8015B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0461 - GCSEMI_DRO_LL_S										
Blank (B8I0461-BLK1)						Prepared: 9/18/2018 Analyzed: 9/18/2018				
DRO	ND	1.0	1.0							
ORO	ND	1.0	1.0							
Surrogate: p-Terphenyl	*2.182*			*2.66667*		*81.8*	*34 - 158*			
LCS (B8I0461-BS1)						Prepared: 9/18/2018 Analyzed: 9/18/2018				
DRO	37.0243	1.0	1.0	33.3333		111	47 - 152			
Surrogate: p-Terphenyl	*2.114*			*2.66667*		*79.3*	*34 - 158*			
Matrix Spike (B8I0461-MS1)			**Source: 1803391-46**			Prepared: 9/18/2018 Analyzed: 9/18/2018				
DRO	40.5437	1.0	1.0	33.3333	7.74733	98.4	34 - 130			
Surrogate: p-Terphenyl	*1.971*			*2.66667*		*73.9*	*34 - 158*			
Matrix Spike Dup (B8I0461-MSD1)			**Source: 1803391-46**			Prepared: 9/18/2018 Analyzed: 9/18/2018				
DRO	36.6133	1.0	1.0	33.3333	7.74733	86.6	34 - 130	10.2	20	
Surrogate: p-Terphenyl	*2.047*			*2.66667*		*76.8*	*34 - 158*			

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Diesel Range Organics by EPA 8015B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	MDL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0482 - GCSEMI_DRO_LL_S										
Blank (B8I0482-BLK1)						Prepared: 9/18/2018 Analyzed: 9/18/2018				
DRO	ND	1.0	1.0							
ORO	ND	1.0	1.0							
Surrogate: p-Terphenyl	*2.317*			*2.66667*		*86.9*	*34 - 158*			
LCS (B8I0482-BS1)						Prepared: 9/18/2018 Analyzed: 9/18/2018				
DRO	27.9207	1.0	1.0	33.3333		83.8	47 - 152			
Surrogate: p-Terphenyl	*2.484*			*2.66667*		*93.1*	*34 - 158*			
Matrix Spike (B8I0482-MS1)			**Source: 1803391-89**			Prepared: 9/18/2018 Analyzed: 9/18/2018				
DRO	41.2670	1.0	1.0	33.3333	3.71767	113	34 - 130			
Surrogate: p-Terphenyl	*2.481*			*2.66667*		*93.0*	*34 - 158*			
Matrix Spike Dup (B8I0482-MSD1)			**Source: 1803391-89**			Prepared: 9/18/2018 Analyzed: 9/18/2018				
DRO	27.0943	1.0	1.0	33.3333	3.71767	70.1	34 - 130	41.5	20	R
Surrogate: p-Terphenyl	*2.245*			*2.66667*		*84.2*	*34 - 158*			

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BTEX/MTBE by EPA 8021 - Quality Control

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0346 - GCVOA_S										
Blank (B8I0346-BLK1)					Prepared: 9/14/2018 Analyzed: 9/14/2018					
MTBE	ND	5.0	0.73							
Benzene	ND	5.0	0.29							
Toluene	ND	5.0	0.44							
Ethylbenzene	ND	5.0	0.45							
m,p-Xylene	ND	10	0.50							
o-Xylene	ND	5.0	0.32							
Surrogate: 4-Bromofluorobenzene	*180.6*			*200.000*		*90.3*	*54 - 140*			
LCS (B8I0346-BS2)					Prepared: 9/14/2018 Analyzed: 9/14/2018					
MTBE	80.7600	5.0	0.73	100.000		80.8	70 - 130			
Benzene	91.6130	5.0	0.29	100.000		91.6	70 - 130			
Toluene	92.8320	5.0	0.44	100.000		92.8	70 - 130			
Ethylbenzene	97.1140	5.0	0.45	100.000		97.1	70 - 130			
m,p-Xylene	192.111	10	0.50	200.000		96.1	70 - 130			
o-Xylene	93.1360	5.0	0.32	100.000		93.1	70 - 130			
Surrogate: 4-Bromofluorobenzene	*189.4*			*200.000*		*94.7*	*54 - 140*			
Matrix Spike (B8I0346-MS1)			**Source: 1803391-82**		Prepared: 9/14/2018 Analyzed: 9/14/2018					
MTBE	352.995	5.0	0.73	411.055	6.18100	84.4	32 - 152			
Benzene	38.5310	5.0	0.29	31.1750	ND	124	6 - 173			
Toluene	134.567	5.0	0.44	192.275	2.58700	68.6	14 - 127			
Ethylbenzene	43.8970	5.0	0.45	50.7300	ND	86.5	12 - 140			
m,p-Xylene	150.684	10	0.50	193.730	3.00100	76.2	12 - 138			
o-Xylene	62.9280	5.0	0.32	75.3325	ND	83.5	11 - 135			
Surrogate: 4-Bromofluorobenzene	*165.4*			*200.000*		*82.7*	*54 - 140*			
Matrix Spike Dup (B8I0346-MSD1)			**Source: 1803391-82**		Prepared: 9/14/2018 Analyzed: 9/14/2018					
MTBE	436.366	5.0	0.73	411.055	6.18100	105	32 - 152	21.1	20	R
Benzene	35.0310	5.0	0.29	31.1750	ND	112	6 - 173	9.52	20	
Toluene	159.406	5.0	0.44	192.275	2.58700	81.6	14 - 127	16.9	20	
Ethylbenzene	50.0710	5.0	0.45	50.7300	ND	98.7	12 - 140	13.1	20	
m,p-Xylene	176.570	10	0.50	193.730	3.00100	89.6	12 - 138	15.8	86	
o-Xylene	64.4210	5.0	0.32	75.3325	ND	85.5	11 - 135	2.34	20	
Surrogate: 4-Bromofluorobenzene	*201.3*			*200.000*		*101*	*54 - 140*			

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BTEX/MTBE by EPA 8021 - Quality Control

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0397 - GCVOA_S										
Blank (B8I0397-BLK1)					Prepared: 9/15/2018 Analyzed: 9/15/2018					
MTBE	ND	5.0	0.73							
Benzene	ND	5.0	0.29							
Toluene	ND	5.0	0.44							
Ethylbenzene	ND	5.0	0.45							
m,p-Xylene	ND	10	0.50							
o-Xylene	ND	5.0	0.32							
Surrogate: 4-Bromofluorobenzene	*192.5*			*200.000*		*96.2*	*54 - 140*			
LCS (B8I0397-BS2)					Prepared: 9/15/2018 Analyzed: 9/15/2018					
MTBE	77.3250	5.0	0.73	100.000		77.3	70 - 130			
Benzene	81.9930	5.0	0.29	100.000		82.0	70 - 130			
Toluene	84.1200	5.0	0.44	100.000		84.1	70 - 130			
Ethylbenzene	94.4320	5.0	0.45	100.000		94.4	70 - 130			
m,p-Xylene	177.618	10	0.50	200.000		88.8	70 - 130			
o-Xylene	88.6090	5.0	0.32	100.000		88.6	70 - 130			
Surrogate: 4-Bromofluorobenzene	*203.1*			*200.000*		*102*	*54 - 140*			
Matrix Spike (B8I0397-MS1)			**Source: 1803391-48**		Prepared: 9/15/2018 Analyzed: 9/15/2018					
MTBE	412.653	5.0	0.73	411.055	ND	100	32 - 152			
Benzene	37.2930	5.0	0.29	31.1750	ND	120	6 - 173			
Toluene	153.893	5.0	0.44	192.275	ND	80.0	14 - 127			
Ethylbenzene	51.9340	5.0	0.45	50.7300	ND	102	12 - 140			
m,p-Xylene	166.785	10	0.50	193.730	ND	86.1	12 - 138			
o-Xylene	66.9670	5.0	0.32	75.3325	ND	88.9	11 - 135			
Surrogate: 4-Bromofluorobenzene	*202.6*			*200.000*		*101*	*54 - 140*			
Matrix Spike Dup (B8I0397-MSD1)			**Source: 1803391-48**		Prepared: 9/15/2018 Analyzed: 9/15/2018					
MTBE	389.329	5.0	0.73	411.055	ND	94.7	32 - 152	5.82	20	
Benzene	30.2150	5.0	0.29	31.1750	ND	96.9	6 - 173	21.0	20	R
Toluene	150.099	5.0	0.44	192.275	ND	78.1	14 - 127	2.50	20	
Ethylbenzene	45.8820	5.0	0.45	50.7300	ND	90.4	12 - 140	12.4	20	
m,p-Xylene	154.304	10	0.50	193.730	ND	79.6	12 - 138	7.77	86	
o-Xylene	57.3980	5.0	0.32	75.3325	ND	76.2	11 - 135	15.4	20	
Surrogate: 4-Bromofluorobenzene	*186.7*			*200.000*		*93.4*	*54 - 140*			

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BTEX/MTBE by EPA 8021 - Quality Control

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0400 - GCVOA_S										
Blank (B8I0400-BLK1)					Prepared: 9/16/2018 Analyzed: 9/16/2018					
MTBE	ND	5.0	0.73							
Benzene	ND	5.0	0.29							
Toluene	ND	5.0	0.44							
Ethylbenzene	ND	5.0	0.45							
m,p-Xylene	ND	10	0.50							
o-Xylene	ND	5.0	0.32							
Surrogate: 4-Bromofluorobenzene	*131.9*			*200.000*		*66.0*	*54 - 140*			
LCS (B8I0400-BS2)					Prepared: 9/16/2018 Analyzed: 9/16/2018					
MTBE	84.1520	5.0	0.73	100.000		84.2	70 - 130			
Benzene	87.3710	5.0	0.29	100.000		87.4	70 - 130			
Toluene	90.2160	5.0	0.44	100.000		90.2	70 - 130			
Ethylbenzene	94.1560	5.0	0.45	100.000		94.2	70 - 130			
m,p-Xylene	179.464	10	0.50	200.000		89.7	70 - 130			
o-Xylene	88.5680	5.0	0.32	100.000		88.6	70 - 130			
Surrogate: 4-Bromofluorobenzene	*197.9*			*200.000*		*99.0*	*54 - 140*			
Matrix Spike (B8I0400-MS1)			**Source: 1803391-03**		Prepared: 9/16/2018 Analyzed: 9/16/2018					
MTBE	375.400	5.0	0.73	411.055	3.07100	90.6	32 - 152			
Benzene	31.4550	5.0	0.29	31.1750	ND	101	6 - 173			
Toluene	152.597	5.0	0.44	192.275	ND	79.4	14 - 127			
Ethylbenzene	42.4270	5.0	0.45	50.7300	3.36700	77.0	12 - 140			
m,p-Xylene	166.095	10	0.50	193.730	ND	85.7	12 - 138			
o-Xylene	59.1420	5.0	0.32	75.3325	ND	78.5	11 - 135			
Surrogate: 4-Bromofluorobenzene	*202.5*			*200.000*		*101*	*54 - 140*			
Matrix Spike Dup (B8I0400-MSD1)			**Source: 1803391-03**		Prepared: 9/16/2018 Analyzed: 9/16/2018					
MTBE	356.351	5.0	0.73	411.055	3.07100	85.9	32 - 152	5.21	20	
Benzene	29.4280	5.0	0.29	31.1750	ND	94.4	6 - 173	6.66	20	
Toluene	124.434	5.0	0.44	192.275	ND	64.7	14 - 127	20.3	20	R
Ethylbenzene	40.1780	5.0	0.45	50.7300	3.36700	72.6	12 - 140	5.45	20	
m,p-Xylene	137.248	10	0.50	193.730	ND	70.8	12 - 138	19.0	86	
o-Xylene	53.8000	5.0	0.32	75.3325	ND	71.4	11 - 135	9.46	20	
Surrogate: 4-Bromofluorobenzene	*169.4*			*200.000*		*84.7*	*54 - 140*			

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BTEX/MTBE by EPA 8021 - Quality Control

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0401 - GCVOA_S										
Blank (B8I0401-BLK1)					Prepared: 9/17/2018 Analyzed: 9/17/2018					
MTBE	ND	5.0	0.73							
Benzene	ND	5.0	0.29							
Toluene	ND	5.0	0.44							
Ethylbenzene	ND	5.0	0.45							
m,p-Xylene	ND	10	0.50							
o-Xylene	ND	5.0	0.32							
Surrogate: 4-Bromofluorobenzene	*195.1*			*200.000*		*97.5*	*54 - 140*			
LCS (B8I0401-BS2)					Prepared: 9/17/2018 Analyzed: 9/17/2018					
MTBE	74.2320	5.0	0.73	100.000		74.2	70 - 130			
Benzene	83.9780	5.0	0.29	100.000		84.0	70 - 130			
Toluene	82.1640	5.0	0.44	100.000		82.2	70 - 130			
Ethylbenzene	89.8380	5.0	0.45	100.000		89.8	70 - 130			
m,p-Xylene	174.352	10	0.50	200.000		87.2	70 - 130			
o-Xylene	86.4940	5.0	0.32	100.000		86.5	70 - 130			
Surrogate: 4-Bromofluorobenzene	*179.9*			*200.000*		*90.0*	*54 - 140*			
Matrix Spike (B8I0401-MS2)			**Source: 1803391-24**		Prepared: 9/17/2018 Analyzed: 9/17/2018					
MTBE	376.284	5.0	0.73	411.055	ND	91.5	32 - 152			
Benzene	31.3790	5.0	0.29	31.1750	ND	101	6 - 173			
Toluene	137.185	5.0	0.44	192.275	ND	71.3	14 - 127			
Ethylbenzene	42.9990	5.0	0.45	50.7300	ND	84.8	12 - 140			
m,p-Xylene	154.442	10	0.50	193.730	ND	79.7	12 - 138			
o-Xylene	63.8650	5.0	0.32	75.3325	ND	84.8	11 - 135			
Surrogate: 4-Bromofluorobenzene	*186.1*			*200.000*		*93.0*	*54 - 140*			
Matrix Spike Dup (B8I0401-MSD2)			**Source: 1803391-24**		Prepared: 9/17/2018 Analyzed: 9/17/2018					
MTBE	427.968	5.0	0.73	411.055	ND	104	32 - 152	12.9	20	
Benzene	41.1890	5.0	0.29	31.1750	ND	132	6 - 173	27.0	20	R
Toluene	161.736	5.0	0.44	192.275	ND	84.1	14 - 127	16.4	20	
Ethylbenzene	52.0870	5.0	0.45	50.7300	ND	103	12 - 140	19.1	20	
m,p-Xylene	176.208	10	0.50	193.730	ND	91.0	12 - 138	13.2	86	
o-Xylene	67.6900	5.0	0.32	75.3325	ND	89.9	11 - 135	5.82	20	
Surrogate: 4-Bromofluorobenzene	*214.9*			*200.000*		*107*	*54 - 140*			

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Organochlorine Pesticides by EPA 8081 - Quality Control

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0331 - GCSEMI_PCB/PEST_S										
Blank (B8I0331-BLK1)							Prepared: 9/13/2018 Analyzed: 9/13/2018			
4,4´-DDD	ND	2.0	0.10							
4,4´-DDD [2C]	ND	2.0	0.10							
4,4´-DDE	ND	2.0	0.07							
4,4´-DDE [2C]	ND	2.0	0.07							
4,4´-DDT	ND	2.0	0.14							
4,4´-DDT [2C]	ND	2.0	0.14							
Aldrin	ND	1.0	0.08							
Aldrin [2C]	ND	1.0	0.08							
alpha-BHC	ND	1.0	0.04							
alpha-BHC [2C]	ND	1.0	0.04							
alpha-Chlordane	ND	1.0	0.04							
alpha-Chlordane [2C]	ND	1.0	0.04							
beta-BHC	ND	1.0	0.04							
beta-BHC [2C]	ND	1.0	0.04							
Chlordane	ND	8.5	0.90							
Chlordane [2C]	ND	8.5	0.90							
delta-BHC	ND	1.0	0.04							
delta-BHC [2C]	ND	1.0	0.04							
Dieldrin	ND	2.0	0.05							
Dieldrin [2C]	ND	2.0	0.05							
Endosulfan I	ND	1.0	0.04							
Endosulfan I [2C]	ND	1.0	0.04							
Endosulfan II	ND	2.0	0.10							
Endosulfan II [2C]	ND	2.0	0.10							
Endosulfan sulfate	ND	2.0	0.06							
Endosulfan Sulfate [2C]	ND	2.0	0.06							
Endrin	ND	2.0	0.08							
Endrin [2C]	ND	2.0	0.08							
Endrin aldehyde	ND	2.0	0.09							
Endrin aldehyde [2C]	ND	2.0	0.09							
Endrin ketone	ND	2.0	0.07							
Endrin ketone [2C]	ND	2.0	0.07							
gamma-BHC	ND	1.0	0.05							
gamma-BHC [2C]	ND	1.0	0.05							
gamma-Chlordane	ND	1.0	0.04							
gamma-Chlordane [2C]	ND	1.0	0.04							
Heptachlor	ND	1.0	0.07							
Heptachlor [2C]	ND	1.0	0.07							
Heptachlor epoxide	ND	1.0	0.04							
Heptachlor epoxide [2C]	ND	1.0	0.04							
Methoxychlor	ND	5.0	0.10							

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0331 - GCSEMI_PCB/PEST_S (continued)										
Blank (B8I0331-BLK1) - Continued					Prepared: 9/13/2018 Analyzed: 9/13/2018					
Methoxychlor [2C]	ND	5.0	0.10							
Toxaphene	ND	50	8.2							
Toxaphene [2C]	ND	50	8.2							
Surrogate: Decachlorobiphenyl	*7.176*			*16.6667*		*43.1*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*9.727*			*16.6667*		*58.4*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*13.92*			*16.6667*		*83.5*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*13.16*			*16.6667*		*78.9*	*16 - 100*			
LCS (B8I0331-BS1)					Prepared: 9/13/2018 Analyzed: 9/13/2018					
4,4´-DDD	13.1700	2.0	0.10	16.6667		79.0	62 - 129			
4,4´-DDD [2C]	13.0782	2.0	0.10	16.6667		78.5	62 - 129			
4,4´-DDE	14.7217	2.0	0.07	16.6667		88.3	65 - 117			
4,4´-DDE [2C]	13.1357	2.0	0.07	16.6667		78.8	65 - 117			
4,4´-DDT	14.8120	2.0	0.14	16.6667		88.9	35 - 136			
4,4´-DDT [2C]	13.5480	2.0	0.14	16.6667		81.3	35 - 136			
Aldrin	14.4545	1.0	0.08	16.6667		86.7	67 - 110			
Aldrin [2C]	12.9780	1.0	0.08	16.6667		77.9	67 - 110			
alpha-BHC	15.0647	1.0	0.04	16.6667		90.4	69 - 110			
alpha-BHC [2C]	13.0920	1.0	0.04	16.6667		78.6	69 - 110			
alpha-Chlordane	14.4427	1.0	0.04	16.6667		86.7	65 - 114			
alpha-Chlordane [2C]	12.9115	1.0	0.04	16.6667		77.5	65 - 114			
beta-BHC	14.0250	1.0	0.04	16.6667		84.1	64 - 108			
beta-BHC [2C]	12.5902	1.0	0.04	16.6667		75.5	64 - 108			
delta-BHC	14.6613	1.0	0.04	16.6667		88.0	44 - 110			
delta-BHC [2C]	13.3693	1.0	0.04	16.6667		80.2	44 - 110			
Dieldrin	13.2162	2.0	0.05	16.6667		79.3	63 - 107			
Dieldrin [2C]	12.2712	2.0	0.05	16.6667		73.6	63 - 107			
Endosulfan I	13.5750	1.0	0.04	16.6667		81.4	63 - 103			
Endosulfan I [2C]	12.5403	1.0	0.04	16.6667		75.2	63 - 103			
Endosulfan II	14.0268	2.0	0.10	16.6667		84.2	62 - 122			
Endosulfan II [2C]	13.1873	2.0	0.10	16.6667		79.1	62 - 122			
Endosulfan sulfate	14.1645	2.0	0.06	16.6667		85.0	53 - 127			
Endosulfan Sulfate [2C]	12.1663	2.0	0.06	16.6667		73.0	53 - 127			
Endrin	14.0777	2.0	0.08	16.6667		84.5	66 - 120			
Endrin [2C]	13.2678	2.0	0.08	16.6667		79.6	66 - 120			
Endrin aldehyde	15.0395	2.0	0.09	16.6667		90.2	67 - 121			
Endrin aldehyde [2C]	13.6620	2.0	0.09	16.6667		82.0	67 - 121			
Endrin ketone	13.7327	2.0	0.07	16.6667		82.4	41 - 146			
Endrin ketone [2C]	11.0348	2.0	0.07	16.6667		66.2	41 - 146			
gamma-BHC	13.9408	1.0	0.05	16.6667		83.6	67 - 109			
gamma-BHC [2C]	12.6563	1.0	0.05	16.6667		75.9	67 - 109			

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0331 - GCSEMI_PCB/PEST_S (continued)										
LCS (B8I0331-BS1) - Continued						Prepared: 9/13/2018 Analyzed: 9/13/2018				
gamma-Chlordane	14.0107	1.0	0.04	16.6667		84.1	63 - 110			
gamma-Chlordane [2C]	12.6188	1.0	0.04	16.6667		75.7	63 - 110			
Heptachlor	14.8663	1.0	0.07	16.6667		89.2	67 - 120			
Heptachlor [2C]	13.2815	1.0	0.07	16.6667		79.7	67 - 120			
Heptachlor epoxide	13.4985	1.0	0.04	16.6667		81.0	62 - 108			
Heptachlor epoxide [2C]	12.1858	1.0	0.04	16.6667		73.1	62 - 108			
Methoxychlor	14.7602	5.0	0.10	16.6667		88.6	47 - 152			
Methoxychlor [2C]	13.9783	5.0	0.10	16.6667		83.9	47 - 152			
Surrogate: Decachlorobiphenyl	*12.27*			*16.6667*		*73.6*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*11.28*			*16.6667*		*67.7*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*14.76*			*16.6667*		*88.5*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*13.09*			*16.6667*		*78.5*	*16 - 100*			
Matrix Spike (B8I0331-MS1)				**Source: 1803358-05**		Prepared: 9/13/2018 Analyzed: 9/13/2018				
4,4´-DDD	15.2722	2.0	0.10	16.6667	ND	91.6	0 - 127			
4,4´-DDD [2C]	11.1407	2.0	0.10	16.6667	ND	66.8	0 - 127			
4,4´-DDE	14.6883	2.0	0.07	16.6667	ND	88.1	0 - 125			
4,4´-DDE [2C]	12.0588	2.0	0.07	16.6667	ND	72.4	0 - 125			
4,4´-DDT	15.0655	2.0	0.14	16.6667	ND	90.4	0 - 103			
4,4´-DDT [2C]	11.9858	2.0	0.14	16.6667	ND	71.9	0 - 103			
Aldrin	14.4010	1.0	0.08	16.6667	ND	86.4	6 - 104			
Aldrin [2C]	11.8442	1.0	0.08	16.6667	ND	71.1	6 - 104			
alpha-BHC	15.2880	1.0	0.04	16.6667	ND	91.7	0 - 114			
alpha-BHC [2C]	12.6400	1.0	0.04	16.6667	ND	75.8	0 - 114			
alpha-Chlordane	14.8388	1.0	0.04	16.6667	ND	89.0	0 - 110			
alpha-Chlordane [2C]	11.6380	1.0	0.04	16.6667	ND	69.8	0 - 110			
beta-BHC	15.3348	1.0	0.04	16.6667	ND	92.0	0 - 129			
beta-BHC [2C]	13.2068	1.0	0.04	16.6667	ND	79.2	0 - 129			
delta-BHC	15.3735	1.0	0.04	16.6667	ND	92.2	18 - 99			
delta-BHC [2C]	12.7867	1.0	0.04	16.6667	ND	76.7	18 - 99			
Dieldrin	13.8848	2.0	0.05	16.6667	ND	83.3	0 - 124			
Dieldrin [2C]	11.1425	2.0	0.05	16.6667	ND	66.9	0 - 124			
Endosulfan I	13.6690	1.0	0.04	16.6667	ND	82.0	0 - 106			
Endosulfan I [2C]	10.9235	1.0	0.04	16.6667	ND	65.5	0 - 106			
Endosulfan II	14.9300	2.0	0.10	16.6667	ND	89.6	20 - 130			
Endosulfan II [2C]	11.2815	2.0	0.10	16.6667	ND	67.7	20 - 130			
Endosulfan sulfate	14.5382	2.0	0.06	16.6667	ND	87.2	24 - 119			
Endosulfan Sulfate [2C]	11.4233	2.0	0.06	16.6667	ND	68.5	24 - 119			
Endrin	15.7833	2.0	0.08	16.6667	ND	94.7	0 - 135			
Endrin [2C]	12.0613	2.0	0.08	16.6667	ND	72.4	0 - 135			
Endrin aldehyde	14.5990	2.0	0.09	16.6667	ND	87.6	19 - 132			

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0331 - GCSEMI_PCB/PEST_S (continued)										
Matrix Spike (B8I0331-MS1) - Continued			**Source: 1803358-05**			Prepared: 9/13/2018 Analyzed: 9/13/2018				
Endrin aldehyde [2C]	8.62883	2.0	0.09	16.6667	ND	51.8	19 - 132			
Endrin ketone	13.7237	2.0	0.07	16.6667	ND	82.3	7 - 141			
Endrin ketone [2C]	11.7460	2.0	0.07	16.6667	ND	70.5	7 - 141			
gamma-BHC	14.3553	1.0	0.05	16.6667	ND	86.1	0 - 117			
gamma-BHC [2C]	11.7583	1.0	0.05	16.6667	ND	70.5	0 - 117			
gamma-Chlordane	14.7708	1.0	0.04	16.6667	ND	88.6	0 - 156			
gamma-Chlordane [2C]	11.2053	1.0	0.04	16.6667	ND	67.2	0 - 156			
Heptachlor	14.8087	1.0	0.07	16.6667	ND	88.9	3 - 112			
Heptachlor [2C]	12.3225	1.0	0.07	16.6667	ND	73.9	3 - 112			
Heptachlor epoxide	13.8623	1.0	0.04	16.6667	ND	83.2	0 - 118			
Heptachlor epoxide [2C]	11.6163	1.0	0.04	16.6667	ND	69.7	0 - 118			
Methoxychlor	15.2212	5.0	0.10	16.6667	ND	91.3	0 - 161			
Methoxychlor [2C]	13.0523	5.0	0.10	16.6667	ND	78.3	0 - 161			
Surrogate: Decachlorobiphenyl	*10.89*			*16.6667*		*65.4*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*8.514*			*16.6667*		*51.1*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*14.51*			*16.6667*		*87.0*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*12.63*			*16.6667*		*75.8*	*16 - 100*			
Matrix Spike Dup (B8I0331-MSD1)			**Source: 1803358-05**			Prepared: 9/13/2018 Analyzed: 9/13/2018				
4,4´-DDD	14.7703	2.0	0.10	16.6667	ND	88.6	0 - 127	3.34	20	
4,4´-DDD [2C]	11.1120	2.0	0.10	16.6667	ND	66.7	0 - 127	0.258	20	
4,4´-DDE	14.0718	2.0	0.07	16.6667	ND	84.4	0 - 125	4.29	20	
4,4´-DDE [2C]	11.5807	2.0	0.07	16.6667	ND	69.5	0 - 125	4.05	20	
4,4´-DDT	14.5518	2.0	0.14	16.6667	ND	87.3	0 - 103	3.47	20	
4,4´-DDT [2C]	12.7858	2.0	0.14	16.6667	ND	76.7	0 - 103	6.46	20	
Aldrin	13.7515	1.0	0.08	16.6667	ND	82.5	6 - 104	4.61	20	
Aldrin [2C]	11.3665	1.0	0.08	16.6667	ND	68.2	6 - 104	4.12	20	
alpha-BHC	14.6613	1.0	0.04	16.6667	ND	88.0	0 - 114	4.18	20	
alpha-BHC [2C]	12.0455	1.0	0.04	16.6667	ND	72.3	0 - 114	4.82	20	
alpha-Chlordane	14.1718	1.0	0.04	16.6667	ND	85.0	0 - 110	4.60	20	
alpha-Chlordane [2C]	11.1567	1.0	0.04	16.6667	ND	66.9	0 - 110	4.22	20	
beta-BHC	14.6033	1.0	0.04	16.6667	ND	87.6	0 - 129	4.89	20	
beta-BHC [2C]	12.7258	1.0	0.04	16.6667	ND	76.4	0 - 129	3.71	20	
delta-BHC	14.6375	1.0	0.04	16.6667	ND	87.8	18 - 99	4.90	20	
delta-BHC [2C]	12.3148	1.0	0.04	16.6667	ND	73.9	18 - 99	3.76	20	
Dieldrin	13.4287	2.0	0.05	16.6667	ND	80.6	0 - 124	3.34	20	
Dieldrin [2C]	10.8138	2.0	0.05	16.6667	ND	64.9	0 - 124	2.99	20	
Endosulfan I	13.1073	1.0	0.04	16.6667	ND	78.6	0 - 106	4.20	20	
Endosulfan I [2C]	10.2878	1.0	0.04	16.6667	ND	61.7	0 - 106	5.99	20	
Endosulfan II	14.3632	2.0	0.10	16.6667	ND	86.2	20 - 130	3.87	20	
Endosulfan II [2C]	11.4788	2.0	0.10	16.6667	ND	68.9	20 - 130	1.73	20	

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Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0331 - GCSEMI_PCB/PEST_S (continued)										
Matrix Spike Dup (B8I0331-MSD1) - Continued			**Source: 1803358-05**		Prepared: 9/13/2018 Analyzed: 9/13/2018					
Endosulfan sulfate	14.0900	2.0	0.06	16.6667	ND	84.5	24 - 119	3.13	20	
Endosulfan Sulfate [2C]	11.1483	2.0	0.06	16.6667	ND	66.9	24 - 119	2.44	20	
Endrin	15.2615	2.0	0.08	16.6667	ND	91.6	0 - 135	3.36	20	
Endrin [2C]	11.8557	2.0	0.08	16.6667	ND	71.1	0 - 135	1.72	20	
Endrin aldehyde	14.1683	2.0	0.09	16.6667	ND	85.0	19 - 132	2.99	20	
Endrin aldehyde [2C]	9.02717	2.0	0.09	16.6667	ND	54.2	19 - 132	4.51	20	
Endrin ketone	13.8543	2.0	0.07	16.6667	ND	83.1	7 - 141	0.948	20	
Endrin ketone [2C]	10.9452	2.0	0.07	16.6667	ND	65.7	7 - 141	7.06	20	
gamma-BHC	13.6678	1.0	0.05	16.6667	ND	82.0	0 - 117	4.91	20	
gamma-BHC [2C]	11.6623	1.0	0.05	16.6667	ND	70.0	0 - 117	0.820	20	
gamma-Chlordane	14.1140	1.0	0.04	16.6667	ND	84.7	0 - 156	4.55	20	
gamma-Chlordane [2C]	10.6368	1.0	0.04	16.6667	ND	63.8	0 - 156	5.21	20	
Heptachlor	14.0945	1.0	0.07	16.6667	ND	84.6	3 - 112	4.94	20	
Heptachlor [2C]	11.7910	1.0	0.07	16.6667	ND	70.7	3 - 112	4.41	20	
Heptachlor epoxide	13.1095	1.0	0.04	16.6667	ND	78.7	0 - 118	5.58	20	
Heptachlor epoxide [2C]	11.2232	1.0	0.04	16.6667	ND	67.3	0 - 118	3.44	20	
Methoxychlor	14.7123	5.0	0.10	16.6667	ND	88.3	0 - 161	3.40	20	
Methoxychlor [2C]	13.2555	5.0	0.10	16.6667	ND	79.5	0 - 161	1.54	20	
Surrogate: Decachlorobiphenyl	*8.031*			*16.6667*		*48.2*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*8.306*			*16.6667*		*49.8*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*13.94*			*16.6667*		*83.6*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*12.14*			*16.6667*		*72.8*	*16 - 100*			

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Organochlorine Pesticides by EPA 8081 - Quality Control

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0342 - GCSEMI_PCB/PEST_S										
Blank (B8I0342-BLK1)							Prepared: 9/13/2018 Analyzed: 9/14/2018			
4,4´-DDD	ND	2.0	0.10							
4,4´-DDD [2C]	ND	2.0	0.10							
4,4´-DDE	ND	2.0	0.07							
4,4´-DDE [2C]	ND	2.0	0.07							
4,4´-DDT	ND	2.0	0.14							
4,4´-DDT [2C]	ND	2.0	0.14							
Aldrin	ND	1.0	0.08							
Aldrin [2C]	ND	1.0	0.08							
alpha-BHC	ND	1.0	0.04							
alpha-BHC [2C]	ND	1.0	0.04							
alpha-Chlordane	ND	1.0	0.04							
alpha-Chlordane [2C]	ND	1.0	0.04							
beta-BHC	ND	1.0	0.04							
beta-BHC [2C]	ND	1.0	0.04							
Chlordane	ND	8.5	0.90							
Chlordane [2C]	ND	8.5	0.90							
delta-BHC	ND	1.0	0.04							
delta-BHC [2C]	ND	1.0	0.04							
Dieldrin	ND	2.0	0.05							
Dieldrin [2C]	ND	2.0	0.05							
Endosulfan I	ND	1.0	0.04							
Endosulfan I [2C]	ND	1.0	0.04							
Endosulfan II	ND	2.0	0.10							
Endosulfan II [2C]	ND	2.0	0.10							
Endosulfan sulfate	ND	2.0	0.06							
Endosulfan Sulfate [2C]	ND	2.0	0.06							
Endrin	ND	2.0	0.08							
Endrin [2C]	ND	2.0	0.08							
Endrin aldehyde	ND	2.0	0.09							
Endrin aldehyde [2C]	ND	2.0	0.09							
Endrin ketone	ND	2.0	0.07							
Endrin ketone [2C]	ND	2.0	0.07							
gamma-BHC	ND	1.0	0.05							
gamma-BHC [2C]	ND	1.0	0.05							
gamma-Chlordane	ND	1.0	0.04							
gamma-Chlordane [2C]	ND	1.0	0.04							
Heptachlor	ND	1.0	0.07							
Heptachlor [2C]	ND	1.0	0.07							
Heptachlor epoxide	ND	1.0	0.04							
Heptachlor epoxide [2C]	ND	1.0	0.04							
Methoxychlor	ND	5.0	0.10							

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
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Rancho Cordova , CA 95742	Reported : 09/19/2018

Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0342 - GCSEMI_PCB/PEST_S (continued)										
Blank (B8I0342-BLK1) - Continued					Prepared: 9/13/2018 Analyzed: 9/14/2018					
Methoxychlor [2C]	ND	5.0	0.10							
Toxaphene	ND	50	8.2							
Toxaphene [2C]	ND	50	8.2							
Surrogate: Decachlorobiphenyl	*8.787*			*16.6667*		*52.7*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*10.62*			*16.6667*		*63.7*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*13.63*			*16.6667*		*81.8*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*13.15*			*16.6667*		*78.9*	*16 - 100*			
LCS (B8I0342-BS1)					Prepared: 9/13/2018 Analyzed: 9/14/2018					
4,4´-DDD	14.2347	2.0	0.10	16.6667		85.4	62 - 129			
4,4´-DDD [2C]	13.1628	2.0	0.10	16.6667		79.0	62 - 129			
4,4´-DDE	14.9432	2.0	0.07	16.6667		89.7	65 - 117			
4,4´-DDE [2C]	13.0623	2.0	0.07	16.6667		78.4	65 - 117			
4,4´-DDT	14.8488	2.0	0.14	16.6667		89.1	35 - 136			
4,4´-DDT [2C]	13.7898	2.0	0.14	16.6667		82.7	35 - 136			
Aldrin	14.4063	1.0	0.08	16.6667		86.4	67 - 110			
Aldrin [2C]	12.7963	1.0	0.08	16.6667		76.8	67 - 110			
alpha-BHC	14.4888	1.0	0.04	16.6667		86.9	69 - 110			
alpha-BHC [2C]	14.3978	1.0	0.04	16.6667		86.4	69 - 110			
alpha-Chlordane	14.3572	1.0	0.04	16.6667		86.1	65 - 114			
alpha-Chlordane [2C]	12.7097	1.0	0.04	16.6667		76.3	65 - 114			
beta-BHC	13.7978	1.0	0.04	16.6667		82.8	64 - 108			
beta-BHC [2C]	13.4018	1.0	0.04	16.6667		80.4	64 - 108			
delta-BHC	14.8953	1.0	0.04	16.6667		89.4	44 - 110			
delta-BHC [2C]	13.5990	1.0	0.04	16.6667		81.6	44 - 110			
Dieldrin	13.4868	2.0	0.05	16.6667		80.9	63 - 107			
Dieldrin [2C]	12.0992	2.0	0.05	16.6667		72.6	63 - 107			
Endosulfan I	13.5970	1.0	0.04	16.6667		81.6	63 - 103			
Endosulfan I [2C]	12.0847	1.0	0.04	16.6667		72.5	63 - 103			
Endosulfan II	14.4147	2.0	0.10	16.6667		86.5	62 - 122			
Endosulfan II [2C]	13.1132	2.0	0.10	16.6667		78.7	62 - 122			
Endosulfan sulfate	13.4435	2.0	0.06	16.6667		80.7	53 - 127			
Endosulfan Sulfate [2C]	12.2282	2.0	0.06	16.6667		73.4	53 - 127			
Endrin	15.3788	2.0	0.08	16.6667		92.3	66 - 120			
Endrin [2C]	13.3648	2.0	0.08	16.6667		80.2	66 - 120			
Endrin aldehyde	14.8193	2.0	0.09	16.6667		88.9	67 - 121			
Endrin aldehyde [2C]	13.7400	2.0	0.09	16.6667		82.4	67 - 121			
Endrin ketone	13.6502	2.0	0.07	16.6667		81.9	41 - 146			
Endrin ketone [2C]	11.7935	2.0	0.07	16.6667		70.8	41 - 146			
gamma-BHC	13.9185	1.0	0.05	16.6667		83.5	67 - 109			
gamma-BHC [2C]	12.8937	1.0	0.05	16.6667		77.4	67 - 109			

Certificate of Analysis

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0342 - GCSEMI_PCB/PEST_S (continued)										
LCS (B8I0342-BS1) - Continued						Prepared: 9/13/2018 Analyzed: 9/14/2018				
gamma-Chlordane	13.9118	1.0	0.04	16.6667		83.5	63 - 110			
gamma-Chlordane [2C]	12.4067	1.0	0.04	16.6667		74.4	63 - 110			
Heptachlor	14.7085	1.0	0.07	16.6667		88.3	67 - 120			
Heptachlor [2C]	13.5057	1.0	0.07	16.6667		81.0	67 - 120			
Heptachlor epoxide	13.4083	1.0	0.04	16.6667		80.4	62 - 108			
Heptachlor epoxide [2C]	11.9667	1.0	0.04	16.6667		71.8	62 - 108			
Methoxychlor	14.5265	5.0	0.10	16.6667		87.2	47 - 152			
Methoxychlor [2C]	14.4183	5.0	0.10	16.6667		86.5	47 - 152			
Surrogate: Decachlorobiphenyl	*11.20*			*16.6667*		*67.2*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*10.46*			*16.6667*		*62.8*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*14.72*			*16.6667*		*88.3*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*13.03*			*16.6667*		*78.2*	*16 - 100*			
Matrix Spike (B8I0342-MS1)			**Source: 1803391-37**			Prepared: 9/13/2018 Analyzed: 9/14/2018				
4,4´-DDD	14.9650	2.0	0.10	16.6667	ND	89.8	0 - 127			
4,4´-DDD [2C]	11.1038	2.0	0.10	16.6667	ND	66.6	0 - 127			
4,4´-DDE	13.9600	2.0	0.07	16.6667	ND	83.8	0 - 125			
4,4´-DDE [2C]	11.4408	2.0	0.07	16.6667	ND	68.6	0 - 125			
4,4´-DDT	14.3622	2.0	0.14	16.6667	ND	86.2	0 - 103			
4,4´-DDT [2C]	13.3357	2.0	0.14	16.6667	ND	80.0	0 - 103			
Aldrin	13.3688	1.0	0.08	16.6667	ND	80.2	6 - 104			
Aldrin [2C]	10.8107	1.0	0.08	16.6667	ND	64.9	6 - 104			
alpha-BHC	14.2448	1.0	0.04	16.6667	ND	85.5	0 - 114			
alpha-BHC [2C]	11.2962	1.0	0.04	16.6667	ND	67.8	0 - 114			
alpha-Chlordane	13.9818	1.0	0.04	16.6667	ND	83.9	0 - 110			
alpha-Chlordane [2C]	10.8150	1.0	0.04	16.6667	ND	64.9	0 - 110			
beta-BHC	14.3965	1.0	0.04	16.6667	ND	86.4	0 - 129			
beta-BHC [2C]	11.4478	1.0	0.04	16.6667	ND	68.7	0 - 129			
delta-BHC	14.1083	1.0	0.04	16.6667	ND	84.6	18 - 99			
delta-BHC [2C]	11.9403	1.0	0.04	16.6667	ND	71.6	18 - 99			
Dieldrin	13.2670	2.0	0.05	16.6667	ND	79.6	0 - 124			
Dieldrin [2C]	10.7877	2.0	0.05	16.6667	ND	64.7	0 - 124			
Endosulfan I	12.7960	1.0	0.04	16.6667	ND	76.8	0 - 106			
Endosulfan I [2C]	10.0035	1.0	0.04	16.6667	ND	60.0	0 - 106			
Endosulfan II	14.2292	2.0	0.10	16.6667	ND	85.4	20 - 130			
Endosulfan II [2C]	11.4958	2.0	0.10	16.6667	ND	69.0	20 - 130			
Endosulfan sulfate	13.4243	2.0	0.06	16.6667	ND	80.5	24 - 119			
Endosulfan Sulfate [2C]	11.2997	2.0	0.06	16.6667	ND	67.8	24 - 119			
Endrin	15.0587	2.0	0.08	16.6667	ND	90.4	0 - 135			
Endrin [2C]	11.8783	2.0	0.08	16.6667	ND	71.3	0 - 135			
Endrin aldehyde	14.4858	2.0	0.09	16.6667	ND	86.9	19 - 132			

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0342 - GCSEMI_PCB/PEST_S (continued)										
Matrix Spike (B8I0342-MS1) - Continued			**Source: 1803391-37**			Prepared: 9/13/2018 Analyzed: 9/14/2018				
Endrin aldehyde [2C]	8.97067	2.0	0.09	16.6667	ND	53.8	19 - 132			
Endrin ketone	13.0820	2.0	0.07	16.6667	ND	78.5	7 - 141			
Endrin ketone [2C]	11.0018	2.0	0.07	16.6667	ND	66.0	7 - 141			
gamma-BHC	13.6660	1.0	0.05	16.6667	ND	82.0	0 - 117			
gamma-BHC [2C]	10.8533	1.0	0.05	16.6667	ND	65.1	0 - 117			
gamma-Chlordane	13.8220	1.0	0.04	16.6667	ND	82.9	0 - 156			
gamma-Chlordane [2C]	9.90867	1.0	0.04	16.6667	ND	59.5	0 - 156			
Heptachlor	13.5575	1.0	0.07	16.6667	ND	81.3	3 - 112			
Heptachlor [2C]	11.0823	1.0	0.07	16.6667	ND	66.5	3 - 112			
Heptachlor epoxide	12.2920	1.0	0.04	16.6667	ND	73.8	0 - 118			
Heptachlor epoxide [2C]	10.6423	1.0	0.04	16.6667	ND	63.9	0 - 118			
Methoxychlor	15.3980	5.0	0.10	16.6667	ND	92.4	0 - 161			
Methoxychlor [2C]	13.3327	5.0	0.10	16.6667	ND	80.0	0 - 161			
Surrogate: Decachlorobiphenyl	*9.881*			*16.6667*		*59.3*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*7.819*			*16.6667*		*46.9*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*11.55*			*16.6667*		*69.3*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*8.990*			*16.6667*		*53.9*	*16 - 100*			
Matrix Spike (B8I0342-MS2)			**Source: 1803419-03**			Prepared: 9/13/2018 Analyzed: 9/14/2018				
4,4´-DDD	12.7758	2.0	0.10	16.6667	ND	76.7	0 - 127			
4,4´-DDD [2C]	10.6850	2.0	0.10	16.6667	ND	64.1	0 - 127			
4,4´-DDE	31.2523	2.0	0.07	16.6667	16.3167	89.6	0 - 125			
4,4´-DDE [2C]	27.1757	2.0	0.07	16.6667	16.2705	65.4	0 - 125			
4,4´-DDT	16.0950	2.0	0.14	16.6667	3.83333	73.6	0 - 103			
4,4´-DDT [2C]	16.8642	2.0	0.14	16.6667	3.43933	80.5	0 - 103			
Aldrin	10.5643	1.0	0.08	16.6667	ND	63.4	6 - 104			
Aldrin [2C]	9.88583	1.0	0.08	16.6667	ND	59.3	6 - 104			
alpha-BHC	12.2530	1.0	0.04	16.6667	ND	73.5	0 - 114			
alpha-BHC [2C]	10.7607	1.0	0.04	16.6667	ND	64.6	0 - 114			
alpha-Chlordane	11.0810	1.0	0.04	16.6667	ND	66.5	0 - 110			
alpha-Chlordane [2C]	9.85117	1.0	0.04	16.6667	ND	59.1	0 - 110			
beta-BHC	12.2460	1.0	0.04	16.6667	ND	73.5	0 - 129			
beta-BHC [2C]	11.3720	1.0	0.04	16.6667	ND	68.2	0 - 129			
delta-BHC	11.9688	1.0	0.04	16.6667	ND	71.8	18 - 99			
delta-BHC [2C]	11.2153	1.0	0.04	16.6667	ND	67.3	18 - 99			
Dieldrin	22.6175	2.0	0.05	16.6667	8.42750	85.1	0 - 124			
Dieldrin [2C]	20.1917	2.0	0.05	16.6667	9.52050	64.0	0 - 124			
Endosulfan I	10.3275	1.0	0.04	16.6667	ND	62.0	0 - 106			
Endosulfan I [2C]	9.53750	1.0	0.04	16.6667	ND	57.2	0 - 106			
Endosulfan II	11.8853	2.0	0.10	16.6667	ND	71.3	20 - 130			
Endosulfan II [2C]	11.2247	2.0	0.10	16.6667	ND	67.3	20 - 130			

Certificate of Analysis

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0342 - GCSEMI_PCB/PEST_S (continued)										
Matrix Spike (B8I0342-MS2) - Continued			**Source: 1803419-03**			Prepared: 9/13/2018 Analyzed: 9/14/2018				
Endosulfan sulfate	11.6770	2.0	0.06	16.6667	ND	70.1	24 - 119			
Endosulfan Sulfate [2C]	10.7850	2.0	0.06	16.6667	ND	64.7	24 - 119			
Endrin	12.3405	2.0	0.08	16.6667	ND	74.0	0 - 135			
Endrin [2C]	11.1383	2.0	0.08	16.6667	ND	66.8	0 - 135			
Endrin aldehyde	12.8722	2.0	0.09	16.6667	ND	77.2	19 - 132			
Endrin aldehyde [2C]	9.11233	2.0	0.09	16.6667	ND	54.7	19 - 132			
Endrin ketone	11.6248	2.0	0.07	16.6667	ND	69.7	7 - 141			
Endrin ketone [2C]	11.8660	2.0	0.07	16.6667	ND	71.2	7 - 141			
gamma-BHC	11.3357	1.0	0.05	16.6667	ND	68.0	0 - 117			
gamma-BHC [2C]	11.2318	1.0	0.05	16.6667	ND	67.4	0 - 117			
gamma-Chlordane	12.9973	1.0	0.04	16.6667	ND	78.0	0 - 156			
gamma-Chlordane [2C]	9.26400	1.0	0.04	16.6667	ND	55.6	0 - 156			
Heptachlor	11.3130	1.0	0.07	16.6667	ND	67.9	3 - 112			
Heptachlor [2C]	10.2252	1.0	0.07	16.6667	ND	61.4	3 - 112			
Heptachlor epoxide	9.67417	1.0	0.04	16.6667	ND	58.0	0 - 118			
Heptachlor epoxide [2C]	9.65433	1.0	0.04	16.6667	ND	57.9	0 - 118			
Methoxychlor	16.4705	5.0	0.10	16.6667	ND	98.8	0 - 161			
Methoxychlor [2C]	12.9018	5.0	0.10	16.6667	ND	77.4	0 - 161			
Surrogate: Decachlorobiphenyl	*7.031*			*16.6667*		*42.2*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*9.257*			*16.6667*		*55.5*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*13.34*			*16.6667*		*80.1*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*11.01*			*16.6667*		*66.1*	*16 - 100*			
Matrix Spike Dup (B8I0342-MSD1)			**Source: 1803391-37**			Prepared: 9/13/2018 Analyzed: 9/14/2018				
4,4´-DDD	14.6038	2.0	0.10	16.6667	ND	87.6	0 - 127	2.44	20	
4,4´-DDD [2C]	10.9073	2.0	0.10	16.6667	ND	65.4	0 - 127	1.79	20	
4,4´-DDE	13.6145	2.0	0.07	16.6667	ND	81.7	0 - 125	2.51	20	
4,4´-DDE [2C]	11.5195	2.0	0.07	16.6667	ND	69.1	0 - 125	0.685	20	
4,4´-DDT	14.5937	2.0	0.14	16.6667	ND	87.6	0 - 103	1.60	20	
4,4´-DDT [2C]	12.2365	2.0	0.14	16.6667	ND	73.4	0 - 103	8.60	20	
Aldrin	12.9620	1.0	0.08	16.6667	ND	77.8	6 - 104	3.09	20	
Aldrin [2C]	11.0195	1.0	0.08	16.6667	ND	66.1	6 - 104	1.91	20	
alpha-BHC	13.9315	1.0	0.04	16.6667	ND	83.6	0 - 114	2.22	20	
alpha-BHC [2C]	11.2105	1.0	0.04	16.6667	ND	67.3	0 - 114	0.761	20	
alpha-Chlordane	13.8768	1.0	0.04	16.6667	ND	83.3	0 - 110	0.754	20	
alpha-Chlordane [2C]	10.9312	1.0	0.04	16.6667	ND	65.6	0 - 110	1.07	20	
beta-BHC	13.9413	1.0	0.04	16.6667	ND	83.6	0 - 129	3.21	20	
beta-BHC [2C]	11.7137	1.0	0.04	16.6667	ND	70.3	0 - 129	2.30	20	
delta-BHC	13.8102	1.0	0.04	16.6667	ND	82.9	18 - 99	2.14	20	
delta-BHC [2C]	11.9720	1.0	0.04	16.6667	ND	71.8	18 - 99	0.265	20	
Dieldrin	13.0018	2.0	0.05	16.6667	ND	78.0	0 - 124	2.02	20	

Certificate of Analysis

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0342 - GCSEMI_PCB/PEST_S (continued)										
Matrix Spike Dup (B8I0342-MSD1) - Continued			**Source: 1803391-37**			Prepared: 9/13/2018 Analyzed: 9/14/2018				
Dieldrin [2C]	10.7847	2.0	0.05	16.6667	ND	64.7	0 - 124	0.0278	20	
Endosulfan I	12.7688	1.0	0.04	16.6667	ND	76.6	0 - 106	0.213	20	
Endosulfan I [2C]	10.0137	1.0	0.04	16.6667	ND	60.1	0 - 106	0.102	20	
Endosulfan II	14.1990	2.0	0.10	16.6667	ND	85.2	20 - 130	0.212	20	
Endosulfan II [2C]	11.1388	2.0	0.10	16.6667	ND	66.8	20 - 130	3.15	20	
Endosulfan sulfate	13.5737	2.0	0.06	16.6667	ND	81.4	24 - 119	1.11	20	
Endosulfan Sulfate [2C]	10.6117	2.0	0.06	16.6667	ND	63.7	24 - 119	6.28	20	
Endrin	14.7322	2.0	0.08	16.6667	ND	88.4	0 - 135	2.19	20	
Endrin [2C]	11.7943	2.0	0.08	16.6667	ND	70.8	0 - 135	0.710	20	
Endrin aldehyde	14.1650	2.0	0.09	16.6667	ND	85.0	19 - 132	2.24	20	
Endrin aldehyde [2C]	8.69783	2.0	0.09	16.6667	ND	52.2	19 - 132	3.09	20	
Endrin ketone	13.1747	2.0	0.07	16.6667	ND	79.0	7 - 141	0.706	20	
Endrin ketone [2C]	11.0855	2.0	0.07	16.6667	ND	66.5	7 - 141	0.758	20	
gamma-BHC	13.3860	1.0	0.05	16.6667	ND	80.3	0 - 117	2.07	20	
gamma-BHC [2C]	10.8052	1.0	0.05	16.6667	ND	64.8	0 - 117	0.445	20	
gamma-Chlordane	13.7285	1.0	0.04	16.6667	ND	82.4	0 - 156	0.679	20	
gamma-Chlordane [2C]	10.2307	1.0	0.04	16.6667	ND	61.4	0 - 156	3.20	20	
Heptachlor	13.2082	1.0	0.07	16.6667	ND	79.2	3 - 112	2.61	20	
Heptachlor [2C]	11.1797	1.0	0.07	16.6667	ND	67.1	3 - 112	0.874	20	
Heptachlor epoxide	11.8837	1.0	0.04	16.6667	ND	71.3	0 - 118	3.38	20	
Heptachlor epoxide [2C]	10.9802	1.0	0.04	16.6667	ND	65.9	0 - 118	3.12	20	
Methoxychlor	15.8538	5.0	0.10	16.6667	ND	95.1	0 - 161	2.92	20	
Methoxychlor [2C]	13.4272	5.0	0.10	16.6667	ND	80.6	0 - 161	0.706	20	
Surrogate: Decachlorobiphenyl	*7.551*			*16.6667*		*45.3*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*7.912*			*16.6667*		*47.5*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*11.28*			*16.6667*		*67.7*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*8.976*			*16.6667*		*53.9*	*16 - 100*			
Matrix Spike Dup (B8I0342-MSD2)			**Source: 1803419-03**			Prepared: 9/13/2018 Analyzed: 9/14/2018				
4,4´-DDD	10.7303	2.0	0.10	16.6667	ND	64.4	0 - 127	17.4	20	
4,4´-DDD [2C]	9.89000	2.0	0.10	16.6667	ND	59.3	0 - 127	7.73	20	
4,4´-DDE	29.2805	2.0	0.07	16.6667	16.3167	77.8	0 - 125	6.51	20	
4,4´-DDE [2C]	25.8083	2.0	0.07	16.6667	16.2705	57.2	0 - 125	5.16	20	
4,4´-DDT	14.4160	2.0	0.14	16.6667	3.83333	63.5	0 - 103	11.0	20	
4,4´-DDT [2C]	15.0060	2.0	0.14	16.6667	3.43933	69.4	0 - 103	11.7	20	
Aldrin	10.7405	1.0	0.08	16.6667	ND	64.4	6 - 104	1.65	20	
Aldrin [2C]	9.56250	1.0	0.08	16.6667	ND	57.4	6 - 104	3.33	20	
alpha-BHC	12.1422	1.0	0.04	16.6667	ND	72.9	0 - 114	0.909	20	
alpha-BHC [2C]	10.8235	1.0	0.04	16.6667	ND	64.9	0 - 114	0.582	20	
alpha-Chlordane	11.1018	1.0	0.04	16.6667	ND	66.6	0 - 110	0.188	20	
alpha-Chlordane [2C]	9.09383	1.0	0.04	16.6667	ND	54.6	0 - 110	8.00	20	

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0342 - GCSEMI_PCB/PEST_S (continued)										
Matrix Spike Dup (B8I0342-MSD2) - Continued			**Source: 1803419-03**		Prepared: 9/13/2018 Analyzed: 9/14/2018					
beta-BHC	11.8397	1.0	0.04	16.6667	ND	71.0	0 - 129	3.37	20	
beta-BHC [2C]	11.2955	1.0	0.04	16.6667	ND	67.8	0 - 129	0.675	20	
delta-BHC	12.1643	1.0	0.04	16.6667	ND	73.0	18 - 99	1.62	20	
delta-BHC [2C]	11.1202	1.0	0.04	16.6667	ND	66.7	18 - 99	0.852	20	
Dieldrin	18.2935	2.0	0.05	16.6667	8.42750	59.2	0 - 124	21.1	20	R3
Dieldrin [2C]	19.7520	2.0	0.05	16.6667	9.52050	61.4	0 - 124	2.20	20	
Endosulfan I	10.2633	1.0	0.04	16.6667	ND	61.6	0 - 106	0.623	20	
Endosulfan I [2C]	8.62683	1.0	0.04	16.6667	ND	51.8	0 - 106	10.0	20	
Endosulfan II	10.8438	2.0	0.10	16.6667	ND	65.1	20 - 130	9.16	20	
Endosulfan II [2C]	9.88683	2.0	0.10	16.6667	ND	59.3	20 - 130	12.7	20	
Endosulfan sulfate	9.50283	2.0	0.06	16.6667	ND	57.0	24 - 119	20.5	20	R3
Endosulfan Sulfate [2C]	11.1810	2.0	0.06	16.6667	ND	67.1	24 - 119	3.61	20	
Endrin	11.1573	2.0	0.08	16.6667	ND	66.9	0 - 135	10.1	20	
Endrin [2C]	10.4457	2.0	0.08	16.6667	ND	62.7	0 - 135	6.42	20	
Endrin aldehyde	10.9915	2.0	0.09	16.6667	ND	65.9	19 - 132	15.8	20	
Endrin aldehyde [2C]	8.54533	2.0	0.09	16.6667	ND	51.3	19 - 132	6.42	20	
Endrin ketone	11.8023	2.0	0.07	16.6667	ND	70.8	7 - 141	1.52	20	
Endrin ketone [2C]	10.8440	2.0	0.07	16.6667	ND	65.1	7 - 141	9.00	20	
gamma-BHC	11.0318	1.0	0.05	16.6667	ND	66.2	0 - 117	2.72	20	
gamma-BHC [2C]	10.7580	1.0	0.05	16.6667	ND	64.5	0 - 117	4.31	20	
gamma-Chlordane	13.0432	1.0	0.04	16.6667	ND	78.3	0 - 156	0.352	20	
gamma-Chlordane [2C]	8.66900	1.0	0.04	16.6667	ND	52.0	0 - 156	6.64	20	
Heptachlor	11.4222	1.0	0.07	16.6667	ND	68.5	3 - 112	0.960	20	
Heptachlor [2C]	10.0148	1.0	0.07	16.6667	ND	60.1	3 - 112	2.08	20	
Heptachlor epoxide	10.0033	1.0	0.04	16.6667	ND	60.0	0 - 118	3.35	20	
Heptachlor epoxide [2C]	9.05917	1.0	0.04	16.6667	ND	54.4	0 - 118	6.36	20	
Methoxychlor	15.9720	5.0	0.10	16.6667	ND	95.8	0 - 161	3.07	20	
Methoxychlor [2C]	10.4773	5.0	0.10	16.6667	ND	62.9	0 - 161	20.7	20	R3
Surrogate: Decachlorobiphenyl	*7.791*			*16.6667*		*46.7*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*8.992*			*16.6667*		*54.0*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*13.53*			*16.6667*		*81.2*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*11.04*			*16.6667*		*66.2*	*16 - 100*			

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Organochlorine Pesticides by EPA 8081 - Quality Control

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0390 - GCSEMI_PCB/PEST_S										
Blank (B8I0390-BLK1)							Prepared: 9/14/2018 Analyzed: 9/16/2018			
4,4´-DDD	ND	2.0	0.10							
4,4´-DDD [2C]	ND	2.0	0.10							
4,4´-DDE	ND	2.0	0.07							
4,4´-DDE [2C]	ND	2.0	0.07							
4,4´-DDT	ND	2.0	0.14							
4,4´-DDT [2C]	ND	2.0	0.14							
Aldrin	ND	1.0	0.08							
Aldrin [2C]	ND	1.0	0.08							
alpha-BHC	ND	1.0	0.04							
alpha-BHC [2C]	ND	1.0	0.04							
alpha-Chlordane	ND	1.0	0.04							
alpha-Chlordane [2C]	ND	1.0	0.04							
beta-BHC	ND	1.0	0.04							
beta-BHC [2C]	ND	1.0	0.04							
Chlordane	ND	8.5	0.90							
Chlordane [2C]	ND	8.5	0.90							
delta-BHC	ND	1.0	0.04							
delta-BHC [2C]	ND	1.0	0.04							
Dieldrin	ND	2.0	0.05							
Dieldrin [2C]	ND	2.0	0.05							
Endosulfan I	ND	1.0	0.04							
Endosulfan I [2C]	ND	1.0	0.04							
Endosulfan II	ND	2.0	0.10							
Endosulfan II [2C]	ND	2.0	0.10							
Endosulfan sulfate	ND	2.0	0.06							
Endosulfan Sulfate [2C]	ND	2.0	0.06							
Endrin	ND	2.0	0.08							
Endrin [2C]	ND	2.0	0.08							
Endrin aldehyde	ND	2.0	0.09							
Endrin aldehyde [2C]	ND	2.0	0.09							
Endrin ketone	ND	2.0	0.07							
Endrin ketone [2C]	ND	2.0	0.07							
gamma-BHC	ND	1.0	0.05							
gamma-BHC [2C]	ND	1.0	0.05							
gamma-Chlordane	ND	1.0	0.04							
gamma-Chlordane [2C]	ND	1.0	0.04							
Heptachlor	ND	1.0	0.07							
Heptachlor [2C]	ND	1.0	0.07							
Heptachlor epoxide	ND	1.0	0.04							
Heptachlor epoxide [2C]	ND	1.0	0.04							
Methoxychlor	ND	5.0	0.10							

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0390 - GCSEMI_PCB/PEST_S (continued)										
Blank (B8I0390-BLK1) - Continued						Prepared: 9/14/2018 Analyzed: 9/16/2018				
Methoxychlor [2C]	ND	5.0	0.10							
Toxaphene	ND	50	8.2							
Toxaphene [2C]	ND	50	8.2							
Surrogate: Decachlorobiphenyl	*10.33*			*16.6667*		*62.0*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*10.50*			*16.6667*		*63.0*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*14.15*			*16.6667*		*84.9*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*12.89*			*16.6667*		*77.3*	*16 - 100*			
LCS (B8I0390-BS1)						Prepared: 9/14/2018 Analyzed: 9/16/2018				
4,4´-DDD	17.9813	2.0	0.10	16.6667		108	62 - 129			
4,4´-DDD [2C]	15.9112	2.0	0.10	16.6667		95.5	62 - 129			
4,4´-DDE	17.4217	2.0	0.07	16.6667		105	65 - 117			
4,4´-DDE [2C]	15.1885	2.0	0.07	16.6667		91.1	65 - 117			
4,4´-DDT	14.8397	2.0	0.14	16.6667		89.0	35 - 136			
4,4´-DDT [2C]	13.6357	2.0	0.14	16.6667		81.8	35 - 136			
Aldrin	16.6608	1.0	0.08	16.6667		100	67 - 110			
Aldrin [2C]	15.0517	1.0	0.08	16.6667		90.3	67 - 110			
alpha-BHC	16.3717	1.0	0.04	16.6667		98.2	69 - 110			
alpha-BHC [2C]	13.9775	1.0	0.04	16.6667		83.9	69 - 110			
alpha-Chlordane	16.0882	1.0	0.04	16.6667		96.5	65 - 114			
alpha-Chlordane [2C]	14.4152	1.0	0.04	16.6667		86.5	65 - 114			
beta-BHC	14.0767	1.0	0.04	16.6667		84.5	64 - 108			
beta-BHC [2C]	12.8898	1.0	0.04	16.6667		77.3	64 - 108			
delta-BHC	16.7688	1.0	0.04	16.6667		101	44 - 110			
delta-BHC [2C]	14.9772	1.0	0.04	16.6667		89.9	44 - 110			
Dieldrin	15.7107	2.0	0.05	16.6667		94.3	63 - 107			
Dieldrin [2C]	13.8612	2.0	0.05	16.6667		83.2	63 - 107			
Endosulfan I	16.1832	1.0	0.04	16.6667		97.1	63 - 103			
Endosulfan I [2C]	14.5132	1.0	0.04	16.6667		87.1	63 - 103			
Endosulfan II	17.2255	2.0	0.10	16.6667		103	62 - 122			
Endosulfan II [2C]	14.9350	2.0	0.10	16.6667		89.6	62 - 122			
Endosulfan sulfate	15.9922	2.0	0.06	16.6667		96.0	53 - 127			
Endosulfan Sulfate [2C]	14.2622	2.0	0.06	16.6667		85.6	53 - 127			
Endrin	17.1327	2.0	0.08	16.6667		103	66 - 120			
Endrin [2C]	14.5985	2.0	0.08	16.6667		87.6	66 - 120			
Endrin aldehyde	17.6880	2.0	0.09	16.6667		106	67 - 121			
Endrin aldehyde [2C]	16.0173	2.0	0.09	16.6667		96.1	67 - 121			
Endrin ketone	16.0698	2.0	0.07	16.6667		96.4	41 - 146			
Endrin ketone [2C]	14.1357	2.0	0.07	16.6667		84.8	41 - 146			
gamma-BHC	15.3295	1.0	0.05	16.6667		92.0	67 - 109			
gamma-BHC [2C]	13.8312	1.0	0.05	16.6667		83.0	67 - 109			

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0390 - GCSEMI_PCB/PEST_S (continued)										
LCS (B8I0390-BS1) - Continued						Prepared: 9/14/2018 Analyzed: 9/16/2018				
gamma-Chlordane	15.9463	1.0	0.04	16.6667		95.7	63 - 110			
gamma-Chlordane [2C]	14.2500	1.0	0.04	16.6667		85.5	63 - 110			
Heptachlor	17.4242	1.0	0.07	16.6667		105	67 - 120			
Heptachlor [2C]	14.7028	1.0	0.07	16.6667		88.2	67 - 120			
Heptachlor epoxide	15.5570	1.0	0.04	16.6667		93.3	62 - 108			
Heptachlor epoxide [2C]	13.8935	1.0	0.04	16.6667		83.4	62 - 108			
Methoxychlor	15.5262	5.0	0.10	16.6667		93.2	47 - 152			
Methoxychlor [2C]	14.8882	5.0	0.10	16.6667		89.3	47 - 152			
Surrogate: Decachlorobiphenyl	*12.45*			*16.6667*		*74.7*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*11.96*			*16.6667*		*71.7*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*15.49*			*16.6667*		*92.9*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*13.56*			*16.6667*		*81.4*	*16 - 100*			
Matrix Spike (B8I0390-MS1)			**Source: 1803391-72**			Prepared: 9/14/2018 Analyzed: 9/16/2018				
4,4´-DDD	15.4173	2.0	0.10	16.6667	ND	92.5	0 - 127			
4,4´-DDD [2C]	12.6412	2.0	0.10	16.6667	ND	75.8	0 - 127			
4,4´-DDE	14.6082	2.0	0.07	16.6667	ND	87.6	0 - 125			
4,4´-DDE [2C]	12.8392	2.0	0.07	16.6667	ND	77.0	0 - 125			
4,4´-DDT	13.3172	2.0	0.14	16.6667	ND	79.9	0 - 103			
4,4´-DDT [2C]	12.0348	2.0	0.14	16.6667	ND	72.2	0 - 103			
Aldrin	13.4023	1.0	0.08	16.6667	ND	80.4	6 - 104			
Aldrin [2C]	12.4647	1.0	0.08	16.6667	ND	74.8	6 - 104			
alpha-BHC	14.5652	1.0	0.04	16.6667	ND	87.4	0 - 114			
alpha-BHC [2C]	13.4563	1.0	0.04	16.6667	ND	80.7	0 - 114			
alpha-Chlordane	13.8420	1.0	0.04	16.6667	ND	83.1	0 - 110			
alpha-Chlordane [2C]	12.2192	1.0	0.04	16.6667	ND	73.3	0 - 110			
beta-BHC	13.6467	1.0	0.04	16.6667	ND	81.9	0 - 129			
beta-BHC [2C]	13.3193	1.0	0.04	16.6667	ND	79.9	0 - 129			
delta-BHC	13.8322	1.0	0.04	16.6667	ND	83.0	18 - 99			
delta-BHC [2C]	13.2435	1.0	0.04	16.6667	ND	79.5	18 - 99			
Dieldrin	13.1680	2.0	0.05	16.6667	ND	79.0	0 - 124			
Dieldrin [2C]	11.7447	2.0	0.05	16.6667	ND	70.5	0 - 124			
Endosulfan I	12.8700	1.0	0.04	16.6667	ND	77.2	0 - 106			
Endosulfan I [2C]	11.3610	1.0	0.04	16.6667	ND	68.2	0 - 106			
Endosulfan II	14.1070	2.0	0.10	16.6667	ND	84.6	20 - 130			
Endosulfan II [2C]	12.1772	2.0	0.10	16.6667	ND	73.1	20 - 130			
Endosulfan sulfate	13.6397	2.0	0.06	16.6667	ND	81.8	24 - 119			
Endosulfan Sulfate [2C]	12.0455	2.0	0.06	16.6667	ND	72.3	24 - 119			
Endrin	15.0712	2.0	0.08	16.6667	ND	90.4	0 - 135			
Endrin [2C]	12.8222	2.0	0.08	16.6667	ND	76.9	0 - 135			
Endrin aldehyde	13.7190	2.0	0.09	16.6667	ND	82.3	19 - 132			

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0390 - GCSEMI_PCB/PEST_S (continued)										
Matrix Spike (B8I0390-MS1) - Continued			**Source: 1803391-72**			Prepared: 9/14/2018 Analyzed: 9/16/2018				
Endrin aldehyde [2C]	9.61967	2.0	0.09	16.6667	ND	57.7	19 - 132			
Endrin ketone	13.2278	2.0	0.07	16.6667	ND	79.4	7 - 141			
Endrin ketone [2C]	11.7988	2.0	0.07	16.6667	ND	70.8	7 - 141			
gamma-BHC	13.8098	1.0	0.05	16.6667	ND	82.9	0 - 117			
gamma-BHC [2C]	12.6168	1.0	0.05	16.6667	ND	75.7	0 - 117			
gamma-Chlordane	13.6330	1.0	0.04	16.6667	ND	81.8	0 - 156			
gamma-Chlordane [2C]	11.3510	1.0	0.04	16.6667	ND	68.1	0 - 156			
Heptachlor	13.5437	1.0	0.07	16.6667	ND	81.3	3 - 112			
Heptachlor [2C]	12.8157	1.0	0.07	16.6667	ND	76.9	3 - 112			
Heptachlor epoxide	12.5812	1.0	0.04	16.6667	ND	75.5	0 - 118			
Heptachlor epoxide [2C]	11.6307	1.0	0.04	16.6667	ND	69.8	0 - 118			
Methoxychlor	13.1427	5.0	0.10	16.6667	ND	78.9	0 - 161			
Methoxychlor [2C]	13.6262	5.0	0.10	16.6667	ND	81.8	0 - 161			
Surrogate: Decachlorobiphenyl	*9.496*			*16.6667*		*57.0*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*9.719*			*16.6667*		*58.3*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*13.38*			*16.6667*		*80.3*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*12.80*			*16.6667*		*76.8*	*16 - 100*			
Matrix Spike Dup (B8I0390-MSD1)			**Source: 1803391-72**			Prepared: 9/14/2018 Analyzed: 9/16/2018				
4,4´-DDD	13.8367	2.0	0.10	16.6667	ND	83.0	0 - 127	10.8	20	
4,4´-DDD [2C]	11.7965	2.0	0.10	16.6667	ND	70.8	0 - 127	6.91	20	
4,4´-DDE	13.0883	2.0	0.07	16.6667	ND	78.5	0 - 125	11.0	20	
4,4´-DDE [2C]	11.7343	2.0	0.07	16.6667	ND	70.4	0 - 125	8.99	20	
4,4´-DDT	12.2397	2.0	0.14	16.6667	ND	73.4	0 - 103	8.43	20	
4,4´-DDT [2C]	12.6050	2.0	0.14	16.6667	ND	75.6	0 - 103	4.63	20	
Aldrin	12.7743	1.0	0.08	16.6667	ND	76.6	6 - 104	4.80	20	
Aldrin [2C]	11.8240	1.0	0.08	16.6667	ND	70.9	6 - 104	5.28	20	
alpha-BHC	13.9393	1.0	0.04	16.6667	ND	83.6	0 - 114	4.39	20	
alpha-BHC [2C]	13.1318	1.0	0.04	16.6667	ND	78.8	0 - 114	2.44	20	
alpha-Chlordane	12.7700	1.0	0.04	16.6667	ND	76.6	0 - 110	8.06	20	
alpha-Chlordane [2C]	11.1590	1.0	0.04	16.6667	ND	67.0	0 - 110	9.07	20	
beta-BHC	13.0855	1.0	0.04	16.6667	ND	78.5	0 - 129	4.20	20	
beta-BHC [2C]	12.8122	1.0	0.04	16.6667	ND	76.9	0 - 129	3.88	20	
delta-BHC	13.3928	1.0	0.04	16.6667	ND	80.4	18 - 99	3.23	20	
delta-BHC [2C]	12.9292	1.0	0.04	16.6667	ND	77.6	18 - 99	2.40	20	
Dieldrin	11.7413	2.0	0.05	16.6667	ND	70.4	0 - 124	11.5	20	
Dieldrin [2C]	10.7173	2.0	0.05	16.6667	ND	64.3	0 - 124	9.15	20	
Endosulfan I	11.9032	1.0	0.04	16.6667	ND	71.4	0 - 106	7.81	20	
Endosulfan I [2C]	10.1552	1.0	0.04	16.6667	ND	60.9	0 - 106	11.2	20	
Endosulfan II	12.8663	2.0	0.10	16.6667	ND	77.2	20 - 130	9.20	20	
Endosulfan II [2C]	11.4377	2.0	0.10	16.6667	ND	68.6	20 - 130	6.26	20	

Certificate of Analysis

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0390 - GCSEMI_PCB/PEST_S (continued)										
Matrix Spike Dup (B8I0390-MSD1) - Continued			**Source: 1803391-72**		Prepared: 9/14/2018 Analyzed: 9/16/2018					
Endosulfan sulfate	12.0913	2.0	0.06	16.6667	ND	72.5	24 - 119	12.0	20	
Endosulfan Sulfate [2C]	11.2307	2.0	0.06	16.6667	ND	67.4	24 - 119	7.00	20	
Endrin	13.5337	2.0	0.08	16.6667	ND	81.2	0 - 135	10.7	20	
Endrin [2C]	11.9345	2.0	0.08	16.6667	ND	71.6	0 - 135	7.17	20	
Endrin aldehyde	12.6838	2.0	0.09	16.6667	ND	76.1	19 - 132	7.84	20	
Endrin aldehyde [2C]	9.43983	2.0	0.09	16.6667	ND	56.6	19 - 132	1.89	20	
Endrin ketone	12.1675	2.0	0.07	16.6667	ND	73.0	7 - 141	8.35	20	
Endrin ketone [2C]	11.0183	2.0	0.07	16.6667	ND	66.1	7 - 141	6.84	20	
gamma-BHC	13.1513	1.0	0.05	16.6667	ND	78.9	0 - 117	4.88	20	
gamma-BHC [2C]	12.2980	1.0	0.05	16.6667	ND	73.8	0 - 117	2.56	20	
gamma-Chlordane	12.7352	1.0	0.04	16.6667	ND	76.4	0 - 156	6.81	20	
gamma-Chlordane [2C]	10.5398	1.0	0.04	16.6667	ND	63.2	0 - 156	7.41	20	
Heptachlor	12.9655	1.0	0.07	16.6667	ND	77.8	3 - 112	4.36	20	
Heptachlor [2C]	12.3278	1.0	0.07	16.6667	ND	74.0	3 - 112	3.88	20	
Heptachlor epoxide	11.9085	1.0	0.04	16.6667	ND	71.5	0 - 118	5.49	20	
Heptachlor epoxide [2C]	10.7488	1.0	0.04	16.6667	ND	64.5	0 - 118	7.88	20	
Methoxychlor	11.9965	5.0	0.10	16.6667	ND	72.0	0 - 161	9.12	20	
Methoxychlor [2C]	12.9275	5.0	0.10	16.6667	ND	77.6	0 - 161	5.26	20	
Surrogate: Decachlorobiphenyl	*8.832*			*16.6667*		*53.0*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*9.709*			*16.6667*		*58.3*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*13.05*			*16.6667*		*78.3*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*12.31*			*16.6667*		*73.9*	*16 - 100*			

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Organochlorine Pesticides by EPA 8081 - Quality Control

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0394 - GCSEMI_PCB/PEST_S										
Blank (B8I0394-BLK1)										Prepared: 9/14/2018 Analyzed: 9/16/2018
4,4´-DDD	ND	2.0	0.10							
4,4´-DDD [2C]	ND	2.0	0.10							
4,4´-DDE	ND	2.0	0.07							
4,4´-DDE [2C]	ND	2.0	0.07							
4,4´-DDT	ND	2.0	0.14							
4,4´-DDT [2C]	ND	2.0	0.14							
Aldrin	ND	1.0	0.08							
Aldrin [2C]	ND	1.0	0.08							
alpha-BHC	ND	1.0	0.04							
alpha-BHC [2C]	ND	1.0	0.04							
alpha-Chlordane	ND	1.0	0.04							
alpha-Chlordane [2C]	ND	1.0	0.04							
beta-BHC	ND	1.0	0.04							
beta-BHC [2C]	ND	1.0	0.04							
Chlordane	ND	8.5	0.90							
Chlordane [2C]	ND	8.5	0.90							
delta-BHC	ND	1.0	0.04							
delta-BHC [2C]	ND	1.0	0.04							
Dieldrin	ND	2.0	0.05							
Dieldrin [2C]	ND	2.0	0.05							
Endosulfan I	ND	1.0	0.04							
Endosulfan I [2C]	ND	1.0	0.04							
Endosulfan II	ND	2.0	0.10							
Endosulfan II [2C]	ND	2.0	0.10							
Endosulfan sulfate	ND	2.0	0.06							
Endosulfan Sulfate [2C]	ND	2.0	0.06							
Endrin	ND	2.0	0.08							
Endrin [2C]	ND	2.0	0.08							
Endrin aldehyde	ND	2.0	0.09							
Endrin aldehyde [2C]	ND	2.0	0.09							
Endrin ketone	ND	2.0	0.07							
Endrin ketone [2C]	ND	2.0	0.07							
gamma-BHC	ND	1.0	0.05							
gamma-BHC [2C]	ND	1.0	0.05							
gamma-Chlordane	ND	1.0	0.04							
gamma-Chlordane [2C]	ND	1.0	0.04							
Heptachlor	ND	1.0	0.07							
Heptachlor [2C]	ND	1.0	0.07							
Heptachlor epoxide	ND	1.0	0.04							
Heptachlor epoxide [2C]	ND	1.0	0.04							
Methoxychlor	ND	5.0	0.10							

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0394 - GCSEMI_PCB/PEST_S (continued)										
Blank (B8I0394-BLK1) - Continued					Prepared: 9/14/2018 Analyzed: 9/16/2018					
Methoxychlor [2C]	ND	5.0	0.10							
Toxaphene	ND	50	8.2							
Toxaphene [2C]	ND	50	8.2							
Surrogate: Decachlorobiphenyl	*9.944*			*16.6667*		*59.7*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*10.69*			*16.6667*		*64.2*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*13.90*			*16.6667*		*83.4*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*12.90*			*16.6667*		*77.4*	*16 - 100*			
LCS (B8I0394-BS1)					Prepared: 9/14/2018 Analyzed: 9/16/2018					
4,4´-DDD	15.1058	2.0	0.10	16.6667		90.6	62 - 129			
4,4´-DDD [2C]	13.5275	2.0	0.10	16.6667		81.2	62 - 129			
4,4´-DDE	15.2365	2.0	0.07	16.6667		91.4	65 - 117			
4,4´-DDE [2C]	13.4097	2.0	0.07	16.6667		80.5	65 - 117			
4,4´-DDT	14.8143	2.0	0.14	16.6667		88.9	35 - 136			
4,4´-DDT [2C]	13.7745	2.0	0.14	16.6667		82.6	35 - 136			
Aldrin	14.3750	1.0	0.08	16.6667		86.2	67 - 110			
Aldrin [2C]	13.0353	1.0	0.08	16.6667		78.2	67 - 110			
alpha-BHC	14.3353	1.0	0.04	16.6667		86.0	69 - 110			
alpha-BHC [2C]	13.1427	1.0	0.04	16.6667		78.9	69 - 110			
alpha-Chlordane	14.3665	1.0	0.04	16.6667		86.2	65 - 114			
alpha-Chlordane [2C]	12.7762	1.0	0.04	16.6667		76.7	65 - 114			
beta-BHC	14.0465	1.0	0.04	16.6667		84.3	64 - 108			
beta-BHC [2C]	12.9563	1.0	0.04	16.6667		77.7	64 - 108			
delta-BHC	15.0597	1.0	0.04	16.6667		90.4	44 - 110			
delta-BHC [2C]	13.4613	1.0	0.04	16.6667		80.8	44 - 110			
Dieldrin	13.7513	2.0	0.05	16.6667		82.5	63 - 107			
Dieldrin [2C]	12.3732	2.0	0.05	16.6667		74.2	63 - 107			
Endosulfan I	13.7280	1.0	0.04	16.6667		82.4	63 - 103			
Endosulfan I [2C]	12.2793	1.0	0.04	16.6667		73.7	63 - 103			
Endosulfan II	15.0128	2.0	0.10	16.6667		90.1	62 - 122			
Endosulfan II [2C]	13.4530	2.0	0.10	16.6667		80.7	62 - 122			
Endosulfan sulfate	14.4073	2.0	0.06	16.6667		86.4	53 - 127			
Endosulfan Sulfate [2C]	12.8965	2.0	0.06	16.6667		77.4	53 - 127			
Endrin	15.5045	2.0	0.08	16.6667		93.0	66 - 120			
Endrin [2C]	13.2758	2.0	0.08	16.6667		79.7	66 - 120			
Endrin aldehyde	15.4627	2.0	0.09	16.6667		92.8	67 - 121			
Endrin aldehyde [2C]	14.3425	2.0	0.09	16.6667		86.1	67 - 121			
Endrin ketone	13.8918	2.0	0.07	16.6667		83.4	41 - 146			
Endrin ketone [2C]	12.8493	2.0	0.07	16.6667		77.1	41 - 146			
gamma-BHC	13.6378	1.0	0.05	16.6667		81.8	67 - 109			
gamma-BHC [2C]	12.5748	1.0	0.05	16.6667		75.4	67 - 109			

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0394 - GCSEMI_PCB/PEST_S (continued)										
LCS (B8I0394-BS1) - Continued						Prepared: 9/14/2018 Analyzed: 9/16/2018				
gamma-Chlordane	13.9163	1.0	0.04	16.6667		83.5	63 - 110			
gamma-Chlordane [2C]	12.2213	1.0	0.04	16.6667		73.3	63 - 110			
Heptachlor	14.8103	1.0	0.07	16.6667		88.9	67 - 120			
Heptachlor [2C]	13.0777	1.0	0.07	16.6667		78.5	67 - 120			
Heptachlor epoxide	13.3915	1.0	0.04	16.6667		80.3	62 - 108			
Heptachlor epoxide [2C]	12.0968	1.0	0.04	16.6667		72.6	62 - 108			
Methoxychlor	15.0432	5.0	0.10	16.6667		90.3	47 - 152			
Methoxychlor [2C]	14.8580	5.0	0.10	16.6667		89.1	47 - 152			
Surrogate: Decachlorobiphenyl	*11.17*			*16.6667*		*67.0*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*11.31*			*16.6667*		*67.9*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*14.15*			*16.6667*		*84.9*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*12.46*			*16.6667*		*74.8*	*16 - 100*			
Matrix Spike (B8I0394-MS1)			**Source: 1803391-AJ**			Prepared: 9/14/2018 Analyzed: 9/16/2018				
4,4´-DDD	15.5523	2.0	0.10	16.6667	ND	93.3	0 - 127			
4,4´-DDD [2C]	12.8497	2.0	0.10	16.6667	ND	77.1	0 - 127			
4,4´-DDE	14.8067	2.0	0.07	16.6667	ND	88.8	0 - 125			
4,4´-DDE [2C]	12.6822	2.0	0.07	16.6667	ND	76.1	0 - 125			
4,4´-DDT	14.8723	2.0	0.14	16.6667	ND	89.2	0 - 103			
4,4´-DDT [2C]	14.5883	2.0	0.14	16.6667	ND	87.5	0 - 103			
Aldrin	13.6132	1.0	0.08	16.6667	ND	81.7	6 - 104			
Aldrin [2C]	12.0930	1.0	0.08	16.6667	ND	72.6	6 - 104			
alpha-BHC	14.6067	1.0	0.04	16.6667	ND	87.6	0 - 114			
alpha-BHC [2C]	13.1118	1.0	0.04	16.6667	ND	78.7	0 - 114			
alpha-Chlordane	13.9880	1.0	0.04	16.6667	ND	83.9	0 - 110			
alpha-Chlordane [2C]	11.8898	1.0	0.04	16.6667	ND	71.3	0 - 110			
beta-BHC	14.4185	1.0	0.04	16.6667	ND	86.5	0 - 129			
beta-BHC [2C]	13.4918	1.0	0.04	16.6667	ND	81.0	0 - 129			
delta-BHC	14.5943	1.0	0.04	16.6667	ND	87.6	18 - 99			
delta-BHC [2C]	13.4042	1.0	0.04	16.6667	ND	80.4	18 - 99			
Dieldrin	13.5123	2.0	0.05	16.6667	ND	81.1	0 - 124			
Dieldrin [2C]	11.8217	2.0	0.05	16.6667	ND	70.9	0 - 124			
Endosulfan I	12.9003	1.0	0.04	16.6667	ND	77.4	0 - 106			
Endosulfan I [2C]	10.9913	1.0	0.04	16.6667	ND	65.9	0 - 106			
Endosulfan II	14.9783	2.0	0.10	16.6667	ND	89.9	20 - 130			
Endosulfan II [2C]	13.2487	2.0	0.10	16.6667	ND	79.5	20 - 130			
Endosulfan sulfate	14.5683	2.0	0.06	16.6667	ND	87.4	24 - 119			
Endosulfan Sulfate [2C]	12.8807	2.0	0.06	16.6667	ND	77.3	24 - 119			
Endrin	15.6515	2.0	0.08	16.6667	ND	93.9	0 - 135			
Endrin [2C]	13.2030	2.0	0.08	16.6667	ND	79.2	0 - 135			
Endrin aldehyde	15.3597	2.0	0.09	16.6667	ND	92.2	19 - 132			

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0394 - GCSEMI_PCB/PEST_S (continued)										
Matrix Spike (B8I0394-MS1) - Continued			**Source: 1803391-AJ**			Prepared: 9/14/2018 Analyzed: 9/16/2018				
Endrin aldehyde [2C]	11.0370	2.0	0.09	16.6667	ND	66.2	19 - 132			
Endrin ketone	13.7298	2.0	0.07	16.6667	ND	82.4	7 - 141			
Endrin ketone [2C]	13.2455	2.0	0.07	16.6667	ND	79.5	7 - 141			
gamma-BHC	13.7240	1.0	0.05	16.6667	ND	82.3	0 - 117			
gamma-BHC [2C]	12.3423	1.0	0.05	16.6667	ND	74.1	0 - 117			
gamma-Chlordane	13.8055	1.0	0.04	16.6667	ND	82.8	0 - 156			
gamma-Chlordane [2C]	10.8277	1.0	0.04	16.6667	ND	65.0	0 - 156			
Heptachlor	13.7498	1.0	0.07	16.6667	ND	82.5	3 - 112			
Heptachlor [2C]	12.4865	1.0	0.07	16.6667	ND	74.9	3 - 112			
Heptachlor epoxide	12.5258	1.0	0.04	16.6667	ND	75.2	0 - 118			
Heptachlor epoxide [2C]	11.2822	1.0	0.04	16.6667	ND	67.7	0 - 118			
Methoxychlor	16.0292	5.0	0.10	16.6667	ND	96.2	0 - 161			
Methoxychlor [2C]	15.3177	5.0	0.10	16.6667	ND	91.9	0 - 161			
Surrogate: Decachlorobiphenyl	*9.673*			*16.6667*		*58.0*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*8.378*			*16.6667*		*50.3*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*10.73*			*16.6667*		*64.4*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*10.41*			*16.6667*		*62.4*	*16 - 100*			
Matrix Spike Dup (B8I0394-MSD1)			**Source: 1803391-AJ**			Prepared: 9/14/2018 Analyzed: 9/16/2018				
4,4´-DDD	15.8542	2.0	0.10	16.6667	ND	95.1	0 - 127	1.92	20	
4,4´-DDD [2C]	13.2235	2.0	0.10	16.6667	ND	79.3	0 - 127	2.87	20	
4,4´-DDE	15.0747	2.0	0.07	16.6667	ND	90.4	0 - 125	1.79	20	
4,4´-DDE [2C]	13.0903	2.0	0.07	16.6667	ND	78.5	0 - 125	3.17	20	
4,4´-DDT	15.2645	2.0	0.14	16.6667	ND	91.6	0 - 103	2.60	20	
4,4´-DDT [2C]	14.9938	2.0	0.14	16.6667	ND	90.0	0 - 103	2.74	20	
Aldrin	13.7027	1.0	0.08	16.6667	ND	82.2	6 - 104	0.655	20	
Aldrin [2C]	12.6008	1.0	0.08	16.6667	ND	75.6	6 - 104	4.11	20	
alpha-BHC	14.8013	1.0	0.04	16.6667	ND	88.8	0 - 114	1.32	20	
alpha-BHC [2C]	13.6438	1.0	0.04	16.6667	ND	81.9	0 - 114	3.98	20	
alpha-Chlordane	14.3558	1.0	0.04	16.6667	ND	86.1	0 - 110	2.60	20	
alpha-Chlordane [2C]	12.3165	1.0	0.04	16.6667	ND	73.9	0 - 110	3.53	20	
beta-BHC	14.5592	1.0	0.04	16.6667	ND	87.4	0 - 129	0.971	20	
beta-BHC [2C]	14.0660	1.0	0.04	16.6667	ND	84.4	0 - 129	4.17	20	
delta-BHC	14.7358	1.0	0.04	16.6667	ND	88.4	18 - 99	0.965	20	
delta-BHC [2C]	14.0028	1.0	0.04	16.6667	ND	84.0	18 - 99	4.37	20	
Dieldrin	13.7288	2.0	0.05	16.6667	ND	82.4	0 - 124	1.59	20	
Dieldrin [2C]	12.2593	2.0	0.05	16.6667	ND	73.6	0 - 124	3.63	20	
Endosulfan I	13.1425	1.0	0.04	16.6667	ND	78.9	0 - 106	1.86	20	
Endosulfan I [2C]	11.3335	1.0	0.04	16.6667	ND	68.0	0 - 106	3.07	20	
Endosulfan II	15.2563	2.0	0.10	16.6667	ND	91.5	20 - 130	1.84	20	
Endosulfan II [2C]	13.5853	2.0	0.10	16.6667	ND	81.5	20 - 130	2.51	20	

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0394 - GCSEMI_PCB/PEST_S (continued)										
Matrix Spike Dup (B8I0394-MSD1) - Continued			**Source: 1803391-AJ**		Prepared: 9/14/2018 Analyzed: 9/16/2018					
Endosulfan sulfate	14.8815	2.0	0.06	16.6667	ND	89.3	24 - 119	2.13	20	
Endosulfan Sulfate [2C]	13.7447	2.0	0.06	16.6667	ND	82.5	24 - 119	6.49	20	
Endrin	15.9843	2.0	0.08	16.6667	ND	95.9	0 - 135	2.10	20	
Endrin [2C]	13.7360	2.0	0.08	16.6667	ND	82.4	0 - 135	3.96	20	
Endrin aldehyde	15.3367	2.0	0.09	16.6667	ND	92.0	19 - 132	0.150	20	
Endrin aldehyde [2C]	11.0025	2.0	0.09	16.6667	ND	66.0	19 - 132	0.313	20	
Endrin ketone	13.7455	2.0	0.07	16.6667	ND	82.5	7 - 141	0.114	20	
Endrin ketone [2C]	13.2780	2.0	0.07	16.6667	ND	79.7	7 - 141	0.245	20	
gamma-BHC	13.9182	1.0	0.05	16.6667	ND	83.5	0 - 117	1.40	20	
gamma-BHC [2C]	12.8618	1.0	0.05	16.6667	ND	77.2	0 - 117	4.12	20	
gamma-Chlordane	14.1772	1.0	0.04	16.6667	ND	85.1	0 - 156	2.66	20	
gamma-Chlordane [2C]	11.2432	1.0	0.04	16.6667	ND	67.5	0 - 156	3.77	20	
Heptachlor	13.9853	1.0	0.07	16.6667	ND	83.9	3 - 112	1.70	20	
Heptachlor [2C]	13.0117	1.0	0.07	16.6667	ND	78.1	3 - 112	4.12	20	
Heptachlor epoxide	12.6863	1.0	0.04	16.6667	ND	76.1	0 - 118	1.27	20	
Heptachlor epoxide [2C]	11.7443	1.0	0.04	16.6667	ND	70.5	0 - 118	4.01	20	
Methoxychlor	16.3242	5.0	0.10	16.6667	ND	97.9	0 - 161	1.82	20	
Methoxychlor [2C]	16.1450	5.0	0.10	16.6667	ND	96.9	0 - 161	5.26	20	
Surrogate: Decachlorobiphenyl	*8.002*			*16.6667*		*48.0*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*8.631*			*16.6667*		*51.8*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*10.79*			*16.6667*		*64.7*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*10.76*			*16.6667*		*64.6*	*16 - 100*			

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Organochlorine Pesticides by EPA 8081 - Quality Control

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0444 - GCSEMI_PCB/PEST_S										
Blank (B8I0444-BLK1)							Prepared: 9/17/2018 Analyzed: 9/17/2018			
4,4´-DDD	ND	2.0	0.10							
4,4´-DDD [2C]	ND	2.0	0.10							
4,4´-DDE	ND	2.0	0.07							
4,4´-DDE [2C]	ND	2.0	0.07							
4,4´-DDT	ND	2.0	0.14							
4,4´-DDT [2C]	ND	2.0	0.14							
Aldrin	ND	1.0	0.08							
Aldrin [2C]	ND	1.0	0.08							
alpha-BHC	ND	1.0	0.04							
alpha-BHC [2C]	ND	1.0	0.04							
alpha-Chlordane	ND	1.0	0.04							
alpha-Chlordane [2C]	ND	1.0	0.04							
beta-BHC	ND	1.0	0.04							
beta-BHC [2C]	ND	1.0	0.04							
Chlordane	ND	8.5	0.90							
Chlordane [2C]	ND	8.5	0.90							
delta-BHC	ND	1.0	0.04							
delta-BHC [2C]	ND	1.0	0.04							
Dieldrin	ND	2.0	0.05							
Dieldrin [2C]	ND	2.0	0.05							
Endosulfan I	ND	1.0	0.04							
Endosulfan I [2C]	ND	1.0	0.04							
Endosulfan II	ND	2.0	0.10							
Endosulfan II [2C]	ND	2.0	0.10							
Endosulfan sulfate	ND	2.0	0.06							
Endosulfan Sulfate [2C]	ND	2.0	0.06							
Endrin	ND	2.0	0.08							
Endrin [2C]	ND	2.0	0.08							
Endrin aldehyde	ND	2.0	0.09							
Endrin aldehyde [2C]	ND	2.0	0.09							
Endrin ketone	ND	2.0	0.07							
Endrin ketone [2C]	ND	2.0	0.07							
gamma-BHC	ND	1.0	0.05							
gamma-BHC [2C]	ND	1.0	0.05							
gamma-Chlordane	ND	1.0	0.04							
gamma-Chlordane [2C]	ND	1.0	0.04							
Heptachlor	ND	1.0	0.07							
Heptachlor [2C]	ND	1.0	0.07							
Heptachlor epoxide	ND	1.0	0.04							
Heptachlor epoxide [2C]	ND	1.0	0.04							
Methoxychlor	ND	5.0	0.10							

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0444 - GCSEMI_PCB/PEST_S (continued)										
Blank (B8I0444-BLK1) - Continued					Prepared: 9/17/2018 Analyzed: 9/17/2018					
Methoxychlor [2C]	ND	5.0	0.10							
Toxaphene	ND	50	8.2							
Toxaphene [2C]	ND	50	8.2							
Surrogate: Decachlorobiphenyl	*10.55*			*16.6667*		*63.3*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*10.85*			*16.6667*		*65.1*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*14.44*			*16.6667*		*86.6*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*13.61*			*16.6667*		*81.7*	*16 - 100*			
LCS (B8I0444-BS1)					Prepared: 9/17/2018 Analyzed: 9/17/2018					
4,4´-DDD	15.4992	2.0	0.10	16.6667		93.0	62 - 129			
4,4´-DDD [2C]	14.0613	2.0	0.10	16.6667		84.4	62 - 129			
4,4´-DDE	15.5903	2.0	0.07	16.6667		93.5	65 - 117			
4,4´-DDE [2C]	13.7102	2.0	0.07	16.6667		82.3	65 - 117			
4,4´-DDT	14.6148	2.0	0.14	16.6667		87.7	35 - 136			
4,4´-DDT [2C]	13.5448	2.0	0.14	16.6667		81.3	35 - 136			
Aldrin	15.0882	1.0	0.08	16.6667		90.5	67 - 110			
Aldrin [2C]	13.3870	1.0	0.08	16.6667		80.3	67 - 110			
alpha-BHC	15.2618	1.0	0.04	16.6667		91.6	69 - 110			
alpha-BHC [2C]	13.8350	1.0	0.04	16.6667		83.0	69 - 110			
alpha-Chlordane	15.0155	1.0	0.04	16.6667		90.1	65 - 114			
alpha-Chlordane [2C]	13.2777	1.0	0.04	16.6667		79.7	65 - 114			
beta-BHC	14.8317	1.0	0.04	16.6667		89.0	64 - 108			
beta-BHC [2C]	13.5725	1.0	0.04	16.6667		81.4	64 - 108			
delta-BHC	15.9063	1.0	0.04	16.6667		95.4	44 - 110			
delta-BHC [2C]	14.3780	1.0	0.04	16.6667		86.3	44 - 110			
Dieldrin	13.8452	2.0	0.05	16.6667		83.1	63 - 107			
Dieldrin [2C]	12.6322	2.0	0.05	16.6667		75.8	63 - 107			
Endosulfan I	13.9363	1.0	0.04	16.6667		83.6	63 - 103			
Endosulfan I [2C]	12.1962	1.0	0.04	16.6667		73.2	63 - 103			
Endosulfan II	14.9358	2.0	0.10	16.6667		89.6	62 - 122			
Endosulfan II [2C]	13.4982	2.0	0.10	16.6667		81.0	62 - 122			
Endosulfan sulfate	14.4392	2.0	0.06	16.6667		86.6	53 - 127			
Endosulfan Sulfate [2C]	13.1040	2.0	0.06	16.6667		78.6	53 - 127			
Endrin	15.5225	2.0	0.08	16.6667		93.1	66 - 120			
Endrin [2C]	13.6108	2.0	0.08	16.6667		81.7	66 - 120			
Endrin aldehyde	15.6255	2.0	0.09	16.6667		93.8	67 - 121			
Endrin aldehyde [2C]	14.4043	2.0	0.09	16.6667		86.4	67 - 121			
Endrin ketone	13.7083	2.0	0.07	16.6667		82.2	41 - 146			
Endrin ketone [2C]	12.6327	2.0	0.07	16.6667		75.8	41 - 146			
gamma-BHC	14.7043	1.0	0.05	16.6667		88.2	67 - 109			
gamma-BHC [2C]	13.3473	1.0	0.05	16.6667		80.1	67 - 109			

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0444 - GCSEMI_PCB/PEST_S (continued)										
LCS (B8I0444-BS1) - Continued					Prepared: 9/17/2018 Analyzed: 9/17/2018					
gamma-Chlordane	14.5413	1.0	0.04	16.6667		87.2	63 - 110			
gamma-Chlordane [2C]	13.0275	1.0	0.04	16.6667		78.2	63 - 110			
Heptachlor	15.1168	1.0	0.07	16.6667		90.7	67 - 120			
Heptachlor [2C]	13.5393	1.0	0.07	16.6667		81.2	67 - 120			
Heptachlor epoxide	13.9463	1.0	0.04	16.6667		83.7	62 - 108			
Heptachlor epoxide [2C]	12.3948	1.0	0.04	16.6667		74.4	62 - 108			
Methoxychlor	14.9297	5.0	0.10	16.6667		89.6	47 - 152			
Methoxychlor [2C]	14.2860	5.0	0.10	16.6667		85.7	47 - 152			
Surrogate: Decachlorobiphenyl	*11.28*			*16.6667*		*67.7*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*11.06*			*16.6667*		*66.4*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*15.72*			*16.6667*		*94.3*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*13.68*			*16.6667*		*82.1*	*16 - 100*			
Duplicate (B8I0444-DUP1)			**Source: 1803401-04**		Prepared: 9/17/2018 Analyzed: 9/17/2018					
4,4´-DDD	9.02850	2.0	0.10		9.32833			3.27	20	
4,4´-DDD [2C]	8.22000	2.0	0.10		8.00567			2.64	20	
4,4´-DDE	14.3870	2.0	0.07		14.9162			3.61	20	
4,4´-DDE [2C]	14.4237	2.0	0.07		14.7505			2.24	20	
4,4´-DDT	2.28350	2.0	0.14		2.23050			2.35	20	
4,4´-DDT [2C]	2.48700	2.0	0.14		2.37167			4.75	20	
Aldrin	ND	1.0	0.08		ND				20	
Aldrin [2C]	ND	1.0	0.08		ND				20	
alpha-BHC	ND	1.0	0.04		ND				20	
alpha-BHC [2C]	ND	1.0	0.04		ND				20	
alpha-Chlordane	ND	1.0	0.04		ND				20	
alpha-Chlordane [2C]	ND	1.0	0.04		ND				20	
beta-BHC	ND	1.0	0.04		ND				20	
beta-BHC [2C]	ND	1.0	0.04		ND				20	
delta-BHC	0.978333	1.0	0.04		0.975000			0.341	20	
delta-BHC [2C]	1.05717	1.0	0.04		1.04833			0.839	20	
Dieldrin	ND	2.0	0.05		ND				20	
Dieldrin [2C]	ND	2.0	0.05		ND				20	
Endosulfan I	ND	1.0	0.04		ND				20	
Endosulfan I [2C]	ND	1.0	0.04		ND				20	
Endosulfan II	ND	2.0	0.10		ND				20	
Endosulfan II [2C]	ND	2.0	0.10		ND				20	
Endosulfan sulfate	ND	2.0	0.06		ND				20	
Endosulfan Sulfate [2C]	ND	2.0	0.06		ND				20	
Endrin	ND	2.0	0.08		ND				20	
Endrin [2C]	ND	2.0	0.08		ND				20	
Endrin aldehyde	ND	2.0	0.09		ND				20	

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0444 - GCSEMI_PCB/PEST_S (continued)										
Duplicate (B8I0444-DUP1) - Continued			**Source: 1803401-04**		Prepared: 9/17/2018 Analyzed: 9/17/2018					
Endrin aldehyde [2C]	ND	2.0	0.09		ND				20	
Endrin ketone	ND	2.0	0.07		ND				20	
Endrin ketone [2C]	ND	2.0	0.07		ND				20	
gamma-BHC	ND	1.0	0.05		ND				20	
gamma-BHC [2C]	ND	1.0	0.05		ND				20	
gamma-Chlordane	ND	1.0	0.04		ND				20	
gamma-Chlordane [2C]	ND	1.0	0.04		ND				20	
Heptachlor	ND	1.0	0.07		ND				20	
Heptachlor [2C]	ND	1.0	0.07		ND				20	
Heptachlor epoxide	ND	1.0	0.04		ND				20	
Heptachlor epoxide [2C]	ND	1.0	0.04		ND				20	
Methoxychlor	ND	5.0	0.10		ND				20	
Methoxychlor [2C]	ND	5.0	0.10		ND				20	
Surrogate: Decachlorobiphenyl	*8.954*			*16.6667*		*53.7*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*9.394*			*16.6667*		*56.4*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*12.48*			*16.6667*		*74.9*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*13.14*			*16.6667*		*78.9*	*16 - 100*			
Duplicate (B8I0444-DUP2)			**Source: 1803414-04**		Prepared: 9/17/2018 Analyzed: 9/17/2018					
4,4´-DDD	ND	2.0	0.10		ND				20	
4,4´-DDD [2C]	ND	2.0	0.10		ND				20	
4,4´-DDE	0.474000	2.0	0.07		0.455167			4.05	20	
4,4´-DDE [2C]	0.513667	2.0	0.07		0.524667			2.12	20	
4,4´-DDT	0.259667	2.0	0.14		0.251500			3.20	20	
4,4´-DDT [2C]	0.323667	2.0	0.14		0.322667			0.309	20	
Aldrin	ND	1.0	0.08		ND				20	
Aldrin [2C]	ND	1.0	0.08		ND				20	
alpha-BHC	ND	1.0	0.04		ND				20	
alpha-BHC [2C]	ND	1.0	0.04		ND				20	
alpha-Chlordane	ND	1.0	0.04		ND				20	
alpha-Chlordane [2C]	ND	1.0	0.04		ND				20	
beta-BHC	ND	1.0	0.04		ND				20	
beta-BHC [2C]	ND	1.0	0.04		ND				20	
delta-BHC	ND	1.0	0.04		ND				20	
delta-BHC [2C]	ND	1.0	0.04		ND				20	
Dieldrin	ND	2.0	0.05		ND				20	
Dieldrin [2C]	ND	2.0	0.05		ND				20	
Endosulfan I	ND	1.0	0.04		ND				20	
Endosulfan I [2C]	ND	1.0	0.04		ND				20	
Endosulfan II	ND	2.0	0.10		ND				20	
Endosulfan II [2C]	ND	2.0	0.10		ND				20	

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0444 - GCSEMI_PCB/PEST_S (continued)										
Duplicate (B8I0444-DUP2) - Continued			**Source: 1803414-04**		Prepared: 9/17/2018 Analyzed: 9/17/2018					
Endosulfan sulfate	ND	2.0	0.06		ND				20	
Endosulfan Sulfate [2C]	ND	2.0	0.06		ND				20	
Endrin	ND	2.0	0.08		ND				20	
Endrin [2C]	ND	2.0	0.08		ND				20	
Endrin aldehyde	ND	2.0	0.09		ND				20	
Endrin aldehyde [2C]	ND	2.0	0.09		ND				20	
Endrin ketone	ND	2.0	0.07		ND				20	
Endrin ketone [2C]	ND	2.0	0.07		ND				20	
gamma-BHC	ND	1.0	0.05		ND				20	
gamma-BHC [2C]	ND	1.0	0.05		ND				20	
gamma-Chlordane	ND	1.0	0.04		ND				20	
gamma-Chlordane [2C]	ND	1.0	0.04		ND				20	
Heptachlor	ND	1.0	0.07		ND				20	
Heptachlor [2C]	ND	1.0	0.07		ND				20	
Heptachlor epoxide	ND	1.0	0.04		ND				20	
Heptachlor epoxide [2C]	ND	1.0	0.04		ND				20	
Methoxychlor	ND	5.0	0.10		ND				20	
Methoxychlor [2C]	ND	5.0	0.10		ND				20	
Surrogate: Decachlorobiphenyl	*9.856*			*16.6667*		*59.1*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*9.180*			*16.6667*		*55.1*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*15.67*			*16.6667*		*94.0*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*15.85*			*16.6667*		*95.1*	*16 - 100*			
Matrix Spike (B8I0444-MS1)			**Source: 1803391-AL**		Prepared: 9/17/2018 Analyzed: 9/17/2018					
4,4´-DDD	18.3052	2.0	0.10	16.6667	ND	110	0 - 127			
4,4´-DDD [2C]	13.2200	2.0	0.10	16.6667	ND	79.3	0 - 127			
4,4´-DDE	18.4052	2.0	0.07	16.6667	1.05200	104	0 - 125			
4,4´-DDE [2C]	15.0648	2.0	0.07	16.6667	1.20600	83.2	0 - 125			
4,4´-DDT	17.7933	2.0	0.14	16.6667	0.258833	105	0 - 103			M2
4,4´-DDT [2C]	14.5382	2.0	0.14	16.6667	0.330500	85.2	0 - 103			
Aldrin	16.6553	1.0	0.08	16.6667	ND	99.9	6 - 104			
Aldrin [2C]	13.6753	1.0	0.08	16.6667	ND	82.1	6 - 104			
alpha-BHC	18.4440	1.0	0.04	16.6667	ND	111	0 - 114			
alpha-BHC [2C]	15.5115	1.0	0.04	16.6667	ND	93.1	0 - 114			
alpha-Chlordane	17.0465	1.0	0.04	16.6667	ND	102	0 - 110			
alpha-Chlordane [2C]	13.3555	1.0	0.04	16.6667	ND	80.1	0 - 110			
beta-BHC	18.1690	1.0	0.04	16.6667	ND	109	0 - 129			
beta-BHC [2C]	15.8155	1.0	0.04	16.6667	ND	94.9	0 - 129			
delta-BHC	17.8508	1.0	0.04	16.6667	ND	107	18 - 99			M2
delta-BHC [2C]	15.2107	1.0	0.04	16.6667	ND	91.3	18 - 99			
Dieldrin	15.7733	2.0	0.05	16.6667	ND	94.6	0 - 124			

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Rancho Cordova , CA 95742	Reported : 09/19/2018

Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0444 - GCSEMI_PCB/PEST_S (continued)										
Matrix Spike (B8I0444-MS1) - Continued			**Source: 1803391-AL**			Prepared: 9/17/2018 Analyzed: 9/17/2018				
Dieldrin [2C]	12.7000	2.0	0.05	16.6667	ND	76.2	0 - 124			
Endosulfan I	15.6622	1.0	0.04	16.6667	ND	94.0	0 - 106			
Endosulfan I [2C]	12.2012	1.0	0.04	16.6667	ND	73.2	0 - 106			
Endosulfan II	17.0533	2.0	0.10	16.6667	ND	102	20 - 130			
Endosulfan II [2C]	13.3027	2.0	0.10	16.6667	ND	79.8	20 - 130			
Endosulfan sulfate	16.8640	2.0	0.06	16.6667	ND	101	24 - 119			
Endosulfan Sulfate [2C]	13.6098	2.0	0.06	16.6667	ND	81.7	24 - 119			
Endrin	18.1993	2.0	0.08	16.6667	ND	109	0 - 135			
Endrin [2C]	14.7013	2.0	0.08	16.6667	ND	88.2	0 - 135			
Endrin aldehyde	17.4208	2.0	0.09	16.6667	ND	105	19 - 132			
Endrin aldehyde [2C]	10.9190	2.0	0.09	16.6667	ND	65.5	19 - 132			
Endrin ketone	15.9528	2.0	0.07	16.6667	ND	95.7	7 - 141			
Endrin ketone [2C]	13.8715	2.0	0.07	16.6667	ND	83.2	7 - 141			
gamma-BHC	17.0423	1.0	0.05	16.6667	ND	102	0 - 117			
gamma-BHC [2C]	14.0237	1.0	0.05	16.6667	ND	84.1	0 - 117			
gamma-Chlordane	18.0052	1.0	0.04	16.6667	ND	108	0 - 156			
gamma-Chlordane [2C]	11.8750	1.0	0.04	16.6667	ND	71.2	0 - 156			
Heptachlor	16.6788	1.0	0.07	16.6667	ND	100	3 - 112			
Heptachlor [2C]	13.8490	1.0	0.07	16.6667	ND	83.1	3 - 112			
Heptachlor epoxide	15.7015	1.0	0.04	16.6667	ND	94.2	0 - 118			
Heptachlor epoxide [2C]	12.8952	1.0	0.04	16.6667	ND	77.4	0 - 118			
Methoxychlor	16.6043	5.0	0.10	16.6667	ND	99.6	0 - 161			
Methoxychlor [2C]	16.1153	5.0	0.10	16.6667	ND	96.7	0 - 161			
Surrogate: Decachlorobiphenyl	*13.38*			*16.6667*		*80.3*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*10.98*			*16.6667*		*65.9*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*16.05*			*16.6667*		*96.3*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*12.45*			*16.6667*		*74.7*	*16 - 100*			
Matrix Spike Dup (B8I0444-MSD1)			**Source: 1803391-AL**			Prepared: 9/17/2018 Analyzed: 9/17/2018				
4,4´-DDD	18.9198	2.0	0.10	16.6667	ND	114	0 - 127	3.30	20	
4,4´-DDD [2C]	13.5490	2.0	0.10	16.6667	ND	81.3	0 - 127	2.46	20	
4,4´-DDE	18.6988	2.0	0.07	16.6667	1.05200	106	0 - 125	1.58	20	
4,4´-DDE [2C]	15.2572	2.0	0.07	16.6667	1.20600	84.3	0 - 125	1.27	20	
4,4´-DDT	18.4655	2.0	0.14	16.6667	0.258833	109	0 - 103	3.71	20	M2
4,4´-DDT [2C]	14.8323	2.0	0.14	16.6667	0.330500	87.0	0 - 103	2.00	20	
Aldrin	17.3558	1.0	0.08	16.6667	ND	104	6 - 104	4.12	20	M2
Aldrin [2C]	13.9668	1.0	0.08	16.6667	ND	83.8	6 - 104	2.11	20	
alpha-BHC	19.1755	1.0	0.04	16.6667	ND	115	0 - 114	3.89	20	M2
alpha-BHC [2C]	15.8298	1.0	0.04	16.6667	ND	95.0	0 - 114	2.03	20	
alpha-Chlordane	17.8142	1.0	0.04	16.6667	ND	107	0 - 110	4.40	20	
alpha-Chlordane [2C]	13.6682	1.0	0.04	16.6667	ND	82.0	0 - 110	2.31	20	

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Organochlorine Pesticides by EPA 8081 - Quality Control (cont'd)

Analyte	Result (ug/kg)	PQL (ug/kg)	MDL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0444 - GCSEMI_PCB/PEST_S (continued)										
Matrix Spike Dup (B8I0444-MSD1) - Continued			**Source: 1803391-AL**		Prepared: 9/17/2018 Analyzed: 9/17/2018					
beta-BHC	19.0108	1.0	0.04	16.6667	ND	114	0 - 129	4.53	20	
beta-BHC [2C]	16.2455	1.0	0.04	16.6667	ND	97.5	0 - 129	2.68	20	
delta-BHC	17.8308	1.0	0.04	16.6667	ND	107	18 - 99	0.112	20	M2
delta-BHC [2C]	15.6312	1.0	0.04	16.6667	ND	93.8	18 - 99	2.73	20	
Dieldrin	16.4728	2.0	0.05	16.6667	ND	98.8	0 - 124	4.34	20	
Dieldrin [2C]	13.0768	2.0	0.05	16.6667	ND	78.5	0 - 124	2.92	20	
Endosulfan I	15.7475	1.0	0.04	16.6667	ND	94.5	0 - 106	0.543	20	
Endosulfan I [2C]	12.4362	1.0	0.04	16.6667	ND	74.6	0 - 106	1.91	20	
Endosulfan II	17.6910	2.0	0.10	16.6667	ND	106	20 - 130	3.67	20	
Endosulfan II [2C]	13.5740	2.0	0.10	16.6667	ND	81.4	20 - 130	2.02	20	
Endosulfan sulfate	17.5882	2.0	0.06	16.6667	ND	106	24 - 119	4.20	20	
Endosulfan Sulfate [2C]	13.8202	2.0	0.06	16.6667	ND	82.9	24 - 119	1.53	20	
Endrin	18.8963	2.0	0.08	16.6667	ND	113	0 - 135	3.76	20	
Endrin [2C]	15.1627	2.0	0.08	16.6667	ND	91.0	0 - 135	3.09	20	
Endrin aldehyde	18.0568	2.0	0.09	16.6667	ND	108	19 - 132	3.59	20	
Endrin aldehyde [2C]	11.1247	2.0	0.09	16.6667	ND	66.7	19 - 132	1.87	20	
Endrin ketone	17.0120	2.0	0.07	16.6667	ND	102	7 - 141	6.43	20	
Endrin ketone [2C]	13.6532	2.0	0.07	16.6667	ND	81.9	7 - 141	1.59	20	
gamma-BHC	17.7560	1.0	0.05	16.6667	ND	107	0 - 117	4.10	20	
gamma-BHC [2C]	14.3690	1.0	0.05	16.6667	ND	86.2	0 - 117	2.43	20	
gamma-Chlordane	19.5372	1.0	0.04	16.6667	ND	117	0 - 156	8.16	20	
gamma-Chlordane [2C]	12.2378	1.0	0.04	16.6667	ND	73.4	0 - 156	3.01	20	
Heptachlor	17.4015	1.0	0.07	16.6667	ND	104	3 - 112	4.24	20	
Heptachlor [2C]	14.2168	1.0	0.07	16.6667	ND	85.3	3 - 112	2.62	20	
Heptachlor epoxide	16.4048	1.0	0.04	16.6667	ND	98.4	0 - 118	4.38	20	
Heptachlor epoxide [2C]	13.2917	1.0	0.04	16.6667	ND	79.8	0 - 118	3.03	20	
Methoxychlor	17.2793	5.0	0.10	16.6667	ND	104	0 - 161	3.98	20	
Methoxychlor [2C]	16.4562	5.0	0.10	16.6667	ND	98.7	0 - 161	2.09	20	
Surrogate: Decachlorobiphenyl	*12.50*			*16.6667*		*75.0*	*15 - 100*			
Surrogate: Decachlorobiphenyl [	*11.05*			*16.6667*		*66.3*	*15 - 100*			
Surrogate: Tetrachloro-m-xylene	*16.28*			*16.6667*		*97.7*	*16 - 100*			
Surrogate: Tetrachloro-m-xylene	*12.57*			*16.6667*		*75.4*	*16 - 100*			

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Rancho Cordova , CA 95742	Reported : 09/19/2018

Volatile Organic Compounds by EPA 8260B - Quality Control

Analyte	Result (ug/L)	PQL (ug/L)	MDL (ug/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0323 - MSVOA_W										
Blank (B8I0323-BLK1)					Prepared: 9/13/2018 Analyzed: 9/13/2018					
1,1,1,2-Tetrachloroethane	ND	0.50	0.13							
1,1,1-Trichloroethane	ND	0.50	0.38							
1,1,2,2-Tetrachloroethane	ND	0.50	0.20							
1,1,2-Trichloroethane	ND	0.50	0.19							
1,1-Dichloroethane	ND	0.50	0.20							
1,1-Dichloroethene	ND	0.50	0.28							
1,1-Dichloropropene	ND	0.50	0.36							
1,2,3-Trichloropropane	ND	0.50	0.16							
1,2,3-Trichlorobenzene	ND	0.50	0.06							
1,2,4-Trichlorobenzene	ND	0.50	0.07							
1,2,4-Trimethylbenzene	ND	0.50	0.09							
1,2-Dibromo-3-chloropropane	ND	0.50	0.20							
1,2-Dibromoethane	ND	0.50	0.13							
1,2-Dichlorobenzene	ND	0.50	0.12							
1,2-Dichloroethane	ND	0.50	0.39							
1,2-Dichloropropane	ND	0.50	0.47							
1,3,5-Trimethylbenzene	ND	0.50	0.08							
1,3-Dichlorobenzene	ND	0.50	0.13							
1,3-Dichloropropane	ND	0.50	0.08							
1,4-Dichlorobenzene	ND	0.50	0.18							
2,2-Dichloropropane	ND	0.50	0.23							
2-Chlorotoluene	ND	0.50	0.12							
4-Chlorotoluene	ND	0.50	0.11							
4-Isopropyltoluene	ND	0.50	0.12							
Benzene	ND	0.50	0.21							
Bromobenzene	ND	0.50	0.12							
Bromochloromethane	ND	0.50	0.10							
Bromodichloromethane	ND	0.50	0.32							
Bromoform	ND	0.50	0.14							
Bromomethane	ND	0.50	0.22							
Carbon disulfide	ND	1.0	0.21							
Carbon tetrachloride	ND	0.50	0.31							
Chlorobenzene	ND	0.50	0.16							
Chloroethane	ND	0.50	0.29							
Chloroform	ND	0.50	0.16							
Chloromethane	ND	0.50	0.19							
cis-1,2-Dichloroethene	ND	0.50	0.39							
cis-1,3-Dichloropropene	ND	0.50	0.08							
Di-isopropyl ether	ND	0.50	0.14							
Dibromochloromethane	ND	0.50	0.11							
Dibromomethane	ND	0.50	0.09							

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Volatile Organic Compounds by EPA 8260B - Quality Control (cont'd)

Analyte	Result (ug/L)	PQL (ug/L)	MDL (ug/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0323 - MSVOA_W (continued)										
Blank (B8I0323-BLK1) - Continued					Prepared: 9/13/2018 Analyzed: 9/13/2018					
Dichlorodifluoromethane	ND	0.50	0.31							
Ethyl Acetate	ND	10	1.1							
Ethyl Ether	ND	10	1.4							
Ethyl tert-butyl ether	ND	0.50	0.08							
Ethylbenzene	ND	0.50	0.08							
Freon-113	ND	0.50	0.34							
Hexachlorobutadiene	ND	0.50	0.22							
Isopropylbenzene	ND	0.50	0.10							
m,p-Xylene	ND	1.0	0.18							
Methylene chloride	ND	1.0	0.26							
MTBE	ND	0.50	0.09							
n-Butylbenzene	ND	0.50	0.15							
n-Propylbenzene	ND	0.50	0.14							
Naphthalene	ND	0.50	0.09							
o-Xylene	ND	0.50	0.04							
sec-Butylbenzene	ND	0.50	0.15							
Styrene	ND	0.50	0.05							
tert-Amyl methyl ether	ND	0.50	0.10							
tert-Butanol	ND	10	3.0							
tert-Butylbenzene	ND	0.50	0.11							
Tetrachloroethene	ND	0.50	0.18							
Toluene	ND	0.50	0.14							
trans-1,2-Dichloroethene	ND	0.50	0.15							
trans-1,3-Dichloropropene	ND	0.50	0.09							
Trichloroethene	ND	0.50	0.15							
Trichlorofluoromethane	ND	0.50	0.33							
Vinyl acetate	ND	10	1.9							
Vinyl chloride	ND	0.50	0.25							
Surrogate: 1,2-Dichloroethane-d4	*23.06*			*25.0000*		*92.2*	*74 - 132*			
Surrogate: 4-Bromofluorobenzene	*23.41*			*25.0000*		*93.6*	*82 - 123*			
Surrogate: Dibromofluoromethan	*23.00*			*25.0000*		*92.0*	*76 - 135*			
Surrogate: Toluene-d8	*23.99*			*25.0000*		*96.0*	*85 - 125*			
LCS (B8I0323-BS1)					Prepared: 9/13/2018 Analyzed: 9/13/2018					
1,1,1,2-Tetrachloroethane	18.1400	0.50	0.13	20.0000		90.7	67 - 140			
1,1,1-Trichloroethane	16.2700	0.50	0.38	20.0000		81.4	74 - 136			
1,1,2,2-Tetrachloroethane	19.3600	0.50	0.20	20.0000		96.8	73 - 116			
1,1,2-Trichloroethane	19.7700	0.50	0.19	20.0000		98.8	78 - 116			
1,1-Dichloroethane	18.7000	0.50	0.20	20.0000		93.5	64 - 134			
1,1-Dichloroethene	18.3400	0.50	0.28	20.0000		91.7	72 - 123			
1,1-Dichloropropene	18.9000	0.50	0.36	20.0000		94.5	79 - 137			

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Volatile Organic Compounds by EPA 8260B - Quality Control (cont'd)

Analyte	Result (ug/L)	PQL (ug/L)	MDL (ug/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0323 - MSVOA_W (continued)										
LCS (B8I0323-BS1) - Continued					Prepared: 9/13/2018 Analyzed: 9/13/2018					
1,2,3-Trichloropropane	19.4500	0.50	0.16	20.0000		97.2	81 - 121			
1,2,3-Trichlorobenzene	20.2400	0.50	0.06	20.0000		101	71 - 114			
1,2,4-Trichlorobenzene	20.1200	0.50	0.07	20.0000		101	80 - 119			
1,2,4-Trimethylbenzene	20.6500	0.50	0.09	20.0000		103	78 - 142			
1,2-Dibromo-3-chloropropane	16.9800	0.50	0.20	20.0000		84.9	47 - 130			
1,2-Dibromoethane	19.7400	0.50	0.13	20.0000		98.7	79 - 116			
1,2-Dichlorobenzene	20.1600	0.50	0.12	20.0000		101	82 - 121			
1,2-Dichloroethane	18.1100	0.50	0.39	20.0000		90.6	71 - 126			
1,2-Dichloropropane	19.6000	0.50	0.47	20.0000		98.0	76 - 119			
1,3,5-Trimethylbenzene	20.6900	0.50	0.08	20.0000		103	78 - 144			
1,3-Dichlorobenzene	20.0200	0.50	0.13	20.0000		100	83 - 125			
1,3-Dichloropropane	20.2100	0.50	0.08	20.0000		101	78 - 117			
1,4-Dichlorobenzene	19.7000	0.50	0.18	20.0000		98.5	82 - 118			
2,2-Dichloropropane	16.3000	0.50	0.23	20.0000		81.5	67 - 144			
2-Chlorotoluene	20.2100	0.50	0.12	20.0000		101	73 - 143			
4-Chlorotoluene	20.3800	0.50	0.11	20.0000		102	72 - 143			
4-Isopropyltoluene	20.7700	0.50	0.12	20.0000		104	77 - 149			
Benzene	40.4000	0.50	0.21	40.0000		101	77 - 139			
Bromobenzene	20.0400	0.50	0.12	20.0000		100	83 - 121			
Bromochloromethane	18.1600	0.50	0.10	20.0000		90.8	73 - 121			
Bromodichloromethane	17.6500	0.50	0.32	20.0000		88.2	73 - 125			
Bromoform	17.7400	0.50	0.14	20.0000		88.7	73 - 125			
Bromomethane	15.0400	0.50	0.22	20.0000		75.2	48 - 144			
Carbon disulfide	18.8200	1.0	0.21	20.0000		94.1	73 - 132			
Carbon tetrachloride	15.6400	0.50	0.31	20.0000		78.2	75 - 151			
Chlorobenzene	19.8100	0.50	0.16	20.0000		99.0	82 - 123			
Chloroethane	20.1500	0.50	0.29	20.0000		101	55 - 170			
Chloroform	17.6300	0.50	0.16	20.0000		88.2	74 - 125			
Chloromethane	20.5100	0.50	0.19	20.0000		103	34 - 146			
cis-1,2-Dichloroethene	18.6800	0.50	0.39	20.0000		93.4	69 - 124			
cis-1,3-Dichloropropene	19.3700	0.50	0.08	20.0000		96.8	71 - 123			
Di-isopropyl ether	19.7500	0.50	0.14	20.0000		98.8	54 - 147			
Dibromochloromethane	18.0800	0.50	0.11	20.0000		90.4	57 - 140			
Dibromomethane	19.0000	0.50	0.09	20.0000		95.0	78 - 115			
Dichlorodifluoromethane	18.2500	0.50	0.31	20.0000		91.2	67 - 136			
Ethyl Acetate	202.800	10	1.1	200.000		101	49 - 121			
Ethyl Ether	217.600	10	1.4	200.000		109	62 - 120			
Ethyl tert-butyl ether	18.8800	0.50	0.08	20.0000		94.4	62 - 123			
Ethylbenzene	40.0300	0.50	0.08	40.0000		100	80 - 142			
Freon-113	18.3200	0.50	0.34	20.0000		91.6	77 - 147			
Hexachlorobutadiene	18.7700	0.50	0.22	20.0000		93.8	83 - 135			
Isopropylbenzene	21.0000	0.50	0.10	20.0000		105	75 - 147			

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Volatile Organic Compounds by EPA 8260B - Quality Control (cont'd)

Analyte	Result (ug/L)	PQL (ug/L)	MDL (ug/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0323 - MSVOA_W (continued)										
LCS (B8I0323-BS1) - Continued					Prepared: 9/13/2018 Analyzed: 9/13/2018					
m,p-Xylene	41.1200	1.0	0.18	40.0000		103	74 - 148			
Methylene chloride	19.6300	1.0	0.26	20.0000		98.2	67 - 135			
MTBE	18.5400	0.50	0.09	20.0000		92.7	55 - 128			
n-Butylbenzene	20.7500	0.50	0.15	20.0000		104	76 - 153			
n-Propylbenzene	20.8500	0.50	0.14	20.0000		104	72 - 155			
Naphthalene	22.0900	0.50	0.09	20.0000		110	69 - 113			
o-Xylene	43.3100	0.50	0.04	40.0000		108	71 - 153			
sec-Butylbenzene	20.6400	0.50	0.15	20.0000		103	74 - 154			
Styrene	21.3600	0.50	0.05	20.0000		107	75 - 143			
tert-Amyl methyl ether	18.6100	0.50	0.10	20.0000		93.0	61 - 123			
tert-Butanol	92.0600	10	3.0	100.000		92.1	40 - 112			
tert-Butylbenzene	20.5900	0.50	0.11	20.0000		103	77 - 144			
Tetrachloroethene	19.5000	0.50	0.18	20.0000		97.5	82 - 136			
Toluene	40.7900	0.50	0.14	40.0000		102	75 - 142			
trans-1,2-Dichloroethene	18.5400	0.50	0.15	20.0000		92.7	63 - 135			
trans-1,3-Dichloropropene	18.4700	0.50	0.09	20.0000		92.4	65 - 131			
Trichloroethene	19.5600	0.50	0.15	20.0000		97.8	82 - 124			
Trichlorofluoromethane	16.0400	0.50	0.33	20.0000		80.2	70 - 159			
Vinyl acetate	200.620	10	1.9	200.000		100	48 - 133			
Vinyl chloride	19.6200	0.50	0.25	20.0000		98.1	67 - 131			
Surrogate: 1,2-Dichloroethane-d4	*22.37*			*25.0000*		*89.5*	*74 - 132*			
Surrogate: 4-Bromofluorobenzene	*24.76*			*25.0000*		*99.0*	*82 - 123*			
Surrogate: Dibromofluoromethan	*22.44*			*25.0000*		*89.8*	*76 - 135*			
Surrogate: Toluene-d8	*25.42*			*25.0000*		*102*	*85 - 125*			
LCS Dup (B8I0323-BSD1)					Prepared: 9/13/2018 Analyzed: 9/13/2018					
1,1,1,2-Tetrachloroethane	18.2200	0.50	0.13	20.0000		91.1	67 - 140	0.440	20	
1,1,1-Trichloroethane	16.3000	0.50	0.38	20.0000		81.5	74 - 136	0.184	20	
1,1,2,2-Tetrachloroethane	19.6300	0.50	0.20	20.0000		98.2	73 - 116	1.38	20	
1,1,2-Trichloroethane	19.5200	0.50	0.19	20.0000		97.6	78 - 116	1.27	20	
1,1-Dichloroethane	18.1100	0.50	0.20	20.0000		90.6	64 - 134	3.21	20	
1,1-Dichloroethene	18.1800	0.50	0.28	20.0000		90.9	72 - 123	0.876	20	
1,1-Dichloropropene	18.8100	0.50	0.36	20.0000		94.0	79 - 137	0.477	20	
1,2,3-Trichloropropane	19.7200	0.50	0.16	20.0000		98.6	81 - 121	1.38	20	
1,2,3-Trichlorobenzene	20.1100	0.50	0.06	20.0000		101	71 - 114	0.644	20	
1,2,4-Trichlorobenzene	20.2200	0.50	0.07	20.0000		101	80 - 119	0.496	20	
1,2,4-Trimethylbenzene	20.7300	0.50	0.09	20.0000		104	78 - 142	0.387	20	
1,2-Dibromo-3-chloropropane	17.2600	0.50	0.20	20.0000		86.3	47 - 130	1.64	20	
1,2-Dibromoethane	19.7400	0.50	0.13	20.0000		98.7	79 - 116	0.00	20	
1,2-Dichlorobenzene	20.1700	0.50	0.12	20.0000		101	82 - 121	0.0496	20	
1,2-Dichloroethane	17.9100	0.50	0.39	20.0000		89.6	71 - 126	1.11	20	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Volatile Organic Compounds by EPA 8260B - Quality Control (cont'd)

Analyte	Result (ug/L)	PQL (ug/L)	MDL (ug/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0323 - MSVOA_W (continued)										
LCS Dup (B8I0323-BSD1) - Continued					Prepared: 9/13/2018 Analyzed: 9/13/2018					
1,2-Dichloropropane	19.6200	0.50	0.47	20.0000		98.1	76 - 119	0.102	20	
1,3,5-Trimethylbenzene	20.5900	0.50	0.08	20.0000		103	78 - 144	0.484	20	
1,3-Dichlorobenzene	19.9600	0.50	0.13	20.0000		99.8	83 - 125	0.300	20	
1,3-Dichloropropane	20.3600	0.50	0.08	20.0000		102	78 - 117	0.739	20	
1,4-Dichlorobenzene	19.8200	0.50	0.18	20.0000		99.1	82 - 118	0.607	20	
2,2-Dichloropropane	16.0800	0.50	0.23	20.0000		80.4	67 - 144	1.36	20	
2-Chlorotoluene	20.1100	0.50	0.12	20.0000		101	73 - 143	0.496	20	
4-Chlorotoluene	20.2300	0.50	0.11	20.0000		101	72 - 143	0.739	20	
4-Isopropyltoluene	20.8400	0.50	0.12	20.0000		104	77 - 149	0.336	20	
Benzene	39.9700	0.50	0.21	40.0000		99.9	77 - 139	1.07	20	
Bromobenzene	20.0800	0.50	0.12	20.0000		100	83 - 121	0.199	20	
Bromochloromethane	18.1900	0.50	0.10	20.0000		91.0	73 - 121	0.165	20	
Bromodichloromethane	17.8000	0.50	0.32	20.0000		89.0	73 - 125	0.846	20	
Bromoform	17.8300	0.50	0.14	20.0000		89.2	73 - 125	0.506	20	
Bromomethane	14.7100	0.50	0.22	20.0000		73.6	48 - 144	2.22	20	
Carbon disulfide	18.7600	1.0	0.21	20.0000		93.8	73 - 132	0.319	20	
Carbon tetrachloride	15.7000	0.50	0.31	20.0000		78.5	75 - 151	0.383	20	
Chlorobenzene	19.8500	0.50	0.16	20.0000		99.2	82 - 123	0.202	20	
Chloroethane	19.8000	0.50	0.29	20.0000		99.0	55 - 170	1.75	20	
Chloroform	17.2700	0.50	0.16	20.0000		86.4	74 - 125	2.06	20	
Chloromethane	19.3400	0.50	0.19	20.0000		96.7	34 - 146	5.87	20	
cis-1,2-Dichloroethene	18.3500	0.50	0.39	20.0000		91.8	69 - 124	1.78	20	
cis-1,3-Dichloropropene	19.4400	0.50	0.08	20.0000		97.2	71 - 123	0.361	20	
Di-isopropyl ether	19.4600	0.50	0.14	20.0000		97.3	54 - 147	1.48	20	
Dibromochloromethane	18.4400	0.50	0.11	20.0000		92.2	57 - 140	1.97	20	
Dibromomethane	18.7300	0.50	0.09	20.0000		93.6	78 - 115	1.43	20	
Dichlorodifluoromethane	18.0400	0.50	0.31	20.0000		90.2	67 - 136	1.16	20	
Ethyl Acetate	203.490	10	1.1	200.000		102	49 - 121	0.340	20	
Ethyl Ether	212.860	10	1.4	200.000		106	62 - 120	2.20	20	
Ethyl tert-butyl ether	18.6500	0.50	0.08	20.0000		93.2	62 - 123	1.23	20	
Ethylbenzene	40.0300	0.50	0.08	40.0000		100	80 - 142	0.00	20	
Freon-113	18.1900	0.50	0.34	20.0000		91.0	77 - 147	0.712	20	
Hexachlorobutadiene	18.5700	0.50	0.22	20.0000		92.8	83 - 135	1.07	20	
Isopropylbenzene	20.9600	0.50	0.10	20.0000		105	75 - 147	0.191	20	
m,p-Xylene	40.7700	1.0	0.18	40.0000		102	74 - 148	0.855	20	
Methylene chloride	19.0100	1.0	0.26	20.0000		95.0	67 - 135	3.21	20	
MTBE	18.2900	0.50	0.09	20.0000		91.4	55 - 128	1.36	20	
n-Butylbenzene	20.7300	0.50	0.15	20.0000		104	76 - 153	0.0964	20	
n-Propylbenzene	20.8100	0.50	0.14	20.0000		104	72 - 155	0.192	20	
Naphthalene	22.0900	0.50	0.09	20.0000		110	69 - 113	0.00	20	
o-Xylene	41.7200	0.50	0.04	40.0000		104	71 - 153	3.74	20	
sec-Butylbenzene	20.5400	0.50	0.15	20.0000		103	74 - 154	0.486	20	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Volatile Organic Compounds by EPA 8260B - Quality Control (cont'd)

Analyte	Result (ug/L)	PQL (ug/L)	MDL (ug/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0323 - MSVOA_W (continued)										
LCS Dup (B8I0323-BSD1) - Continued					Prepared: 9/13/2018 Analyzed: 9/13/2018					
Styrene	21.2000	0.50	0.05	20.0000		106	75 - 143	0.752	20	
tert-Amyl methyl ether	18.6200	0.50	0.10	20.0000		93.1	61 - 123	0.0537	20	
tert-Butanol	99.1400	10	3.0	100.000		99.1	40 - 112	7.41	20	
tert-Butylbenzene	20.6400	0.50	0.11	20.0000		103	77 - 144	0.243	20	
Tetrachloroethene	19.3300	0.50	0.18	20.0000		96.6	82 - 136	0.876	20	
Toluene	40.3500	0.50	0.14	40.0000		101	75 - 142	1.08	20	
trans-1,2-Dichloroethene	18.2200	0.50	0.15	20.0000		91.1	63 - 135	1.74	20	
trans-1,3-Dichloropropene	18.4500	0.50	0.09	20.0000		92.2	65 - 131	0.108	20	
Trichloroethene	19.7200	0.50	0.15	20.0000		98.6	82 - 124	0.815	20	
Trichlorofluoromethane	15.8600	0.50	0.33	20.0000		79.3	70 - 159	1.13	20	
Vinyl acetate	196.090	10	1.9	200.000		98.0	48 - 133	2.28	20	
Vinyl chloride	19.3100	0.50	0.25	20.0000		96.6	67 - 131	1.59	20	
Surrogate: 1,2-Dichloroethane-d4	*21.97*			*25.0000*		*87.9*	*74 - 132*			
Surrogate: 4-Bromofluorobenzene	*24.16*			*25.0000*		*96.6*	*82 - 123*			
Surrogate: Dibromofluoromethan	*21.90*			*25.0000*		*87.6*	*76 - 135*			
Surrogate: Toluene-d8	*25.00*			*25.0000*		*100*	*85 - 125*			

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Volatile Organic Compounds by EPA 8260B - Quality Control

Analyte	Result (ug/L)	PQL (ug/L)	MDL (ug/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0324 - MSVOA_LL_W										
Blank (B8I0324-BLK1)						Prepared: 9/13/2018 Analyzed: 9/13/2018				
Gasoline Range Organics	ND	50	15							
Surrogate: 1,2-Dichloroethane-d4	*21.84*			*25.0000*		*87.4*	*74 - 132*			
Surrogate: 4-Bromofluorobenzene	*24.14*			*25.0000*		*96.6*	*82 - 123*			
Surrogate: Dibromofluoromethan	*21.88*			*25.0000*		*87.5*	*76 - 135*			
Surrogate: Toluene-d8	*24.54*			*25.0000*		*98.2*	*85 - 125*			
LCS (B8I0324-BS1)						Prepared: 9/13/2018 Analyzed: 9/13/2018				
Gasoline Range Organics	910.000	50	15	1000.00		91.0	70 - 130			
Surrogate: 1,2-Dichloroethane-d4	*21.87*			*25.0000*		*87.5*	*74 - 132*			
Surrogate: 4-Bromofluorobenzene	*24.14*			*25.0000*		*96.6*	*82 - 123*			
Surrogate: Dibromofluoromethan	*21.27*			*25.0000*		*85.1*	*76 - 135*			
Surrogate: Toluene-d8	*25.61*			*25.0000*		*102*	*85 - 125*			
LCS Dup (B8I0324-BSD1)						Prepared: 9/13/2018 Analyzed: 9/13/2018				
Gasoline Range Organics	900.000	50	15	1000.00		90.0	70 - 130	1.10	20	
Surrogate: 1,2-Dichloroethane-d4	*22.48*			*25.0000*		*89.9*	*74 - 132*			
Surrogate: 4-Bromofluorobenzene	*24.71*			*25.0000*		*98.8*	*82 - 123*			
Surrogate: Dibromofluoromethan	*21.47*			*25.0000*		*85.9*	*76 - 135*			
Surrogate: Toluene-d8	*25.51*			*25.0000*		*102*	*85 - 125*			

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/19/2018

Notes and Definitions

S4	Surrogate was diluted out.
R3	RPD value outside acceptance criteria. Calculation is based on raw values. The analytical batch was validated by the Laboratory Control Sample (LCS).
R	RPD value outside acceptance criteria. Calculation is based on raw values.
M2	Matrix spike recovery outside of acceptance limit due to possible matrix interference. The analytical batch was validated by the laboratory control sample.
M1	Matrix spike recovery outside of acceptance limit. The analytical batch was validated by the laboratory control sample.
D6	Sample required dilution due to high concentration of target analyte.
D5	Sample diluted due to failing internal standard in the original run.
D1	Sample required dilution due to possible matrix interference.
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)

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

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

FOR LABORATORY USE ONLY

Method of Transport: Client ☐ ATL ☐ CA OverN ☐ FedEx ☐ Other: Ontrac

Sample Condition Upon Receipt:
1. CHILLED 3.0, 3.2, 3.5 Y ☑ N ☐
2. HEADSPACE (VOA) Y ☐ N ☐
3. CONTAINER INTACT Y ☐ N ☐
4. SEALED Y ☐ N ☐
5. # OF SPLS MATCH COC Y ☐ N ☐
6. PRESERVED Y ☐ N ☐

Client: Geocon Consultants, Inc
Attention: Rick Day
Address: 3160 Gold Valley Drive, Suite 800
City: Rancho Cordova State: CA Zip Code: 95742
Tel: 916-852-9118
Fax: 916-852-9132

Project Name: US-101 @ Blossom Hill Project #: E9080-02-01
Sampler: Matthew Kinney (Signature) M.K.

Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:
Matthew Kinney [signature]	9/7/18	1600	GEOCON COLD STORAGE	9/7/18	1600
Geocon Cold Storage	9/10/18	1600	Ontrac	9/10/18	1600
			[signature]	9/11/18	1110

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter: Rick Day
Print Name / Date / Signature

Send Report To: Attn: ____ Co: ____ Addr: ____ City: ____ State: ____ Zip: ____

Bill To: Attn: ____ Co: ____ Addr: ____ City: ____ State: ____ Zip: ____

Special Instructions/Comments: Homogenize samples for metals analysis

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 ☑ CT ☐ SWRCB ☐ Logcode ____ OTHER ____

ITEM	Lab No.	Sample ID / Location	Date	Time	CAM 17 Metals	Lead	TPHg/BTEX/MTBE	TPHd/mo	OCPs	VOCs	SOIL	WATER	GROUND WATER	WASTEWATER	TAT	#	Type	PRESERVATION	REMARKS
	1803391-01	B35-0	9/6/18	0922		X					X				E	1	TP		
	-02	-1	↓	0925		X					↓				↓	↓	↓		
	-03	-2		0929		X	X	X	X										
	-04	B34-0		0928		X													
	-05	-1		0929		X	X	X	X										
	-06	-2		0930	X														
	-07	B33-0		0934	X		X	X	X										
	-08	-1		0935		X													
	-09	-2		0936		X													
	-10	B32-0		0940		X													
	-11	-1		0941		X													
	-12	-2		0942		X	X	X	X										
	-13	B36-4.5		0956	X		X	X	X										
	-14	-11.5		1000	X		X	X			↓						↓		
	-15	B36-GW		1050	X		X	X		X			X			3, 4	V, G		
	-16	B23-0		1136		X					↑					1	TP		
	-17	-1		1137		X	X	X	X										
	-18	-2		1138		X													
	-19	B24-0		1142		X													
	-20	-1	↓	1143	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

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

Preservatives: H=HCl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

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 Consultants, Inc
Address: 3160 Gold Valley Drive, Suite 800
Tel: 916-852-9118
Attention: Rick Day
City: Rancho Cordova State: CA Zip Code: 95742
Fax: 916-852-9132
Project Name: US-101 @ Blossom Hill
Project #: E9080-02-01
Sampler: Matthew Kinney (Signature) M. K

Relinquished by: (Signature and Printed Name): Matthew Kinney Matthew Kinney Date: 9/7/18 Time: 1600
Received: (Signature and Printed Name) GEOCON COLD STORAGE Date: 9/7/18 Time: 1600

Relinquished by: (Signature and Printed Name) GEOCON COLD STORAGE Date: 9/10/18 Time: 1100
Received by: (Signature and Printed Name) [illegible] Date: 9/10/18 Time: 9/10/18

Relinquished by: (Signature and Printed Name) Date: Time:
Received by: (Signature and Printed Name) [illegible] Date: 9/11/18 Time: 1110

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter:
Rick Day
Print Name Date
Signature

Send Report To:
Attn:
Co:
Addr:
City: State: Zip:

Bill To:
Attn:
Co:
Addr:
City: State: Zip:

Special Instructions/Comments:
Homogenize samples for metals analysis

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

PRESERVATION

QA/QC
RTNE ☑
CT ☐
SWRCB ☐
Logcode_____
OTHER _____

ITEM	LAB USE ONLY: Lab No.	Sample Description: Sample ID / Location	Date	Time	CAM 17 Metals	Lead	TPHg/BTEX/MTBE	TPHd/mo	OCPs	VOCs	SOIL	WATER	GROUND WATER	WASTEWATER	TAT	Container(s) #	Container(s) Type	PRESERVATION	REMARKS
	1803391-21	B24-2	9/6/18	1141		X	X	X	X		X				E	1	T P		
	-22	B25-0		1150		X	X	X	X		X					1	T P		
	-23	-1		1151		X					X					1	T P		
	-24	-2		1152		X													
	-25	B26-2.5	9/6/18	1200	X		X	X			X				E	1	T P		
	-26	-4.5		1204	X		X	X											
	-27	B27-0		1234	X						X				X	1	T P		
	-28	-1		1236		X	X	X	X							1	T P		
	-29	-2		1240		X										1	T P		
	-30	B28-0 HA		1234		X	X	X	X							2	J G		
	-31	-1 HA		1236		X										1	PAGE		
	-32	-2 HA		1240	X											2	J G		
	-33	B29-0		1252		X										1	T P		
	-34	-1		1253		X													
	-35	-2		1254	X		X	X	X										
	-36	B31-4.5		1306	X		X	X											
	-37	-11.5		1312	X		X	X											
	-38	B30-0		1320		X													
	-39	-1		1321	X		X	X	X										
	-40	-2		1322		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

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

Preservatives:
H=HCl N=HNO_3 S=H_2SO_4 C=4°C
Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

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 ☐ | 2. HEADSPACE (VOA) Y ☐ N ☐ | 3. CONTAINER INTACT Y ☐ N ☐ | 4. SEALED Y ☐ N ☐ | 5. # OF SPLS MATCH COC Y ☐ N ☐ | 6. PRESERVED Y ☐ N ☐

Client: Geocon Consultants, Inc
Attention: Rick Day
Address: 3160 Gold Valley Drive, Suite 800
City: Rancho Cordova State: CA Zip Code: 95742
Tel: 916-852-9118
Fax: 916-852-9132

Project Name: US-101 @ Blossom Hill Project #: E9080-02-01 Sampler: Matthew Kinney (Signature) M Kinney

Relinquished by: (Signature and Printed Name) Matthew Kinney Matthew K Date: 9/7/18 Time: 1600 Received by: (Signature and Printed Name) Geocon cold storage Date: 9/7/18 Time: 1600

Relinquished by: (Signature and Printed Name) Geocon Cold Storage Date: 9/10/18 Time: 1000 Received by: (Signature and Printed Name) Michael Date: 9/10/18 Time: 1600

Relinquished by: (Signature and Printed Name) Date: Time: Received by: (Signature and Printed Name) Date: 9/10/18 Time: 1600

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter:
Rick Day
Print Name Date
Signature

Send Report To:
Attn:
Co:
Addr:
City: State: Zip:

Bill To:
Attn:
Co:
Addr:
City: State: Zip:

Special Instructions/Comments:
Homogenize samples for metals analysis

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

PRESERVATION

QA/QC
RTNE ☑
CT ☐
SWRCB ☐ Logcode____
OTHER _____

ITEM	LAB USE ONLY: Lab No.	Sample Description: Sample ID / Location	Date	Time	CAM 17 Metals: Lead	TPHg/BTEX/MTBE	TPHd/mo	OCPs	VOCs	SOIL	WATER	GROUND WATER	WASTEWATER	TAT	Container(s): #	Type	PRESERVATION	REMARKS
	1803391-39	B29-0	9/6/18	1326	X	X	X	X		X				E	1	T	P	
	-40	-1		1327	X													
	-41	-2		1328	X													
	-42	B24-0		1350	X													
	-43	-1		1351	X													
	-44	-2		1352	X	X	X	X										
	-45	B20-0		1358	X													
	-46	-1		1359	X	X	X	X										
	-47	-2		1400	X													
	-48	B7-0		1404	X	X	X	X										
	-49	-1		1405	X													
	-50	-2		1406	X													
	-51	B16-0		1412	X		X	X	X									
	-52	-1		1413	X													
	-53	-2		1414	X													
	-54	B15-0		1422	X													
	-55	-1		1423	X													
	-56	B9-0		1438	X	X	X	X										
	-57	-1		1439	X													
	-58	B14-0		1444	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

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

Preservatives:
H=HCl $N=HNO_3$ $S=H_2SO_4$ C=4°C
$Z=Zn(AC)_2$ O=NaOH $T=Na_2S_2O_3$

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 Consultants, Inc | Address: 3160 Gold Valley Drive, Suite 800 | Tel: 916-852-9118
Attention: Rick Day | City: Rancho Cordova State: CA Zip Code: 95742 | Fax: 916-852-9132
Project Name: US-101 @ Blossom Hill | Project #: E9080-02-01 | Sampler: Matthew Kinney (Signature) M. K

Relinquished by: (Signature and Printed Name)	Date	Time	Received by: (Signature and Printed Name)	Date	Time
Matthew Kinney Matthew K	9/7/18	1610	GEOCON COLD STORAGE	9/7/18	1600
Geocon Storage	9/10/18	1600	[illegible]	9/10/18	1600
				9/10/18	1100

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter: Rick Day
Print Name Date
Signature

Send Report To: Attn: Co: Addr: City: State: Zip:

Bill To: Attn: Co: Addr: City: State: Zip:

Special Instructions/Comments: Homogenize samples for metals analysis

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 | PRESERVATION

QA/QC: RTNE ☑ CT ☐ SWRCB ☐ Logcode _____ OTHER _____

ITEM	LAB USE ONLY: Lab No.	Sample Description: Sample ID / Location	Date	Time	CAM 17 Metals	Lead	TPHg/BTEX/MTBE	TPHd/mo	OCPs	VOCs	SOIL	WATER	GROUND WATER	WASTEWATER	TAT	Container(s) #	Type	REMARKS
	1803391-59	B14-1	9/6/18	1445	X		X	X	X		X				E	1	T P	
	-60	-2		1446		X												
	-61	B18-OHA		1456		X											BAGGIE	
	-62	-1 HA		1450		X											BAGGIE	
	-63	-2 HA		1500		X	X	X	X							2	J G	
	-64	B1-0		1514	X		X	X	X							1	T P	
	-65	-1		1515		X												
	-66	-2		1516		X												
	-67	B2-0		1520		X												
	-68	-1		1521		X	X	X	X									
	-69	-2		1522	X													
	-70	B3-0		1528		X												
	-71	-1		1529		X												
	-72	-2		1530		X	X	X	X									
	-73	B4-0		1534		X	X	X	X									
	-74	-1		1535	X													
	-75	-2		1536		X												
	-76	B40-0	9/7/18	0708		X	X	X	X									
	-77	-1		0709		X												
	-78	-2		0710	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

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

Preservatives: H=HCl $N=HNO_3$ $S=H_2SO_4$ C=4°C $Z=Zn(AC)_2$ O=NaOH $T=Na_2S_2O_3$

CHAIN OF CUSTODY RECORD

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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 ☐
2. HEADSPACE (VOA) Y ☐ N ☐
3. CONTAINER INTACT Y ☐ N ☐
4. SEALED Y ☐ N ☐
5. # OF SPLS MATCH COC Y ☐ N ☐
6. PRESERVED Y ☐ N ☐

Client: Geocon Consultants, Inc
Attention: Rick Day
Address: 3160 Gold Valley Drive, Suite 800
City: Rancho Cordova State: CA Zip Code: 95742
Tel: 916-852-9118
Fax: 916-852-9132

Project Name: US-101 @ Blossom Hill Project #: E9080-02-01
Sampler: Matthew Kinney (Signature) [signature]

Relinquished by: (Signature and Printed Name)	Date	Time	Received by: (Signature and Printed Name)	Date	Time
Matthew Kinney [signature]	9/7/18	1600	Geocon Cold Storage	9/7/18	1600
Geocon Cold Storage	9/10/18	1600	[signature]	9/10/18	1600
				9/11/18	1110

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter: Rick Day
Print Name / Date / Signature

Send Report To: Attn: Co: Addr: City: State: Zip:

Bill To: Attn: Co: Addr: City: State: Zip:

Special Instructions/Comments: Homogenize samples for metals analysis

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)

QA / QC: RTNE ☑ CT ☐ SWRCB ☐ Logcode ____ OTHER ____

Lab No.	Sample ID / Location	Date	Time	CAM 17 Metals	Lead	TPHg/BTEX/MTBE	TPHd/mo	OCPs	VOCs	Soil	Water	Ground Water	Wastewater	TAT	#	Type	Preservation	Remarks
1803391-79	B39-0	9/7/18	0716	X						X				E	1	[illegible]	M	
-80	-1		0717		X													
-81	B38-0		0720		X													
-82	-1		0721		X	X	X	X										
-83	B37-0		0724		X	X	X	X										
-84	-1		0725	X														
-85	B12-0		0738		X													
-86	-1		0739		X													
-87	-2		0740	X		X	X	X										
-88	B11-0		0748	X														
-89	-1		0749		X	X	X	X										
-90	-2		0750															
-91	B10-0		0756		X	X	X	X										
-92	B9-0		0753		X											BAGGIE		
-93	-1		0758	X	[illegible]											T P		
-94	B8-0		0814		X													
-95	-1		0815		X	X	X	X										
-96	-2		0816		X													
-97	B7-0		0820		X	X	X	X										
-98	-1		0821		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=HNO_3 S=H_2SO_4 C=4ºC Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

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

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 Consultants, Inc
Address: 3160 Gold Valley Drive, Suite 800
Tel: 916-852-9118
Attention: Rick Day
City: Rancho Cordova State: CA Zip Code: 95742
Fax: 916-852-9132
Project Name: US-101 @ Blossom Hill
Project #: E9080-02-01
Sampler: Matthew Kinney (Signature) M. Kinney

Relinquished by: (Signature and Printed Name)	Date	Time	Received by: (Signature and Printed Name)	Date	Time
Matthew Kinney Matthew K.	9/7/18	1600	Geocon Cold Storage	9/7/18	1600
Geocon Cold Storage	9/10/18	1000	Geocon Cold Storage	9/10/18	1000
				9/10/18	1010

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter:
Rick Day
Print Name Date
Signature

Send Report To:
Attn: _____
Co: _____
Addr: _____
City: State: Zip:

Bill To:
Attn: _____
Co: _____
Addr: _____
City: State: Zip:

Special Instructions/Comments:
Homogenize samples for metals analysis

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Circle or Add Analysis(es) Requested

SPECIFY APPROPRIATE MATRIX

PRESERVATION

QA/QC
RTNE ☑
CT ☐
SWRCB ☐ Logcode _____
OTHER _____

ITEM	LAB USE ONLY: Lab No.	Sample Description: Sample ID / Location	Date	Time	CAM 17 Metals	Lead	TPHg/BTEX/MTBE	TPHd/mo	OCPs	VOCs	SOIL	WATER	GROUND WATER	WASTEWATER	TAT	Container(s) #	Container(s) Type	REMARKS
	8073991-99	B7-2	9/7/18	0822	X						X				E	1	T P	
-AA		B6-0		0826	X													
-AB		-1		0827		X												
-AC		-2		0828		X	X	X	X									
-AD		B5-0		0832		X											BAG/GK	
-AE		-1		0833		X	X	X	X								T P	
-AF		B13-0		0844		X	X	X	X									
-AG		-1		0845		X												
-AH		B48-0		0900		X												
-AJ		-1		0901		X												
-AJ		-2		0902		X	X	X	X									
-AK		B47-0		0906		X												
-AL		-1		0907	X		X	X	X									
-AM		-2		0908		X	X											
-AN		B46-0HA		0918		X	X	X	X							2	J G	
-AO		-1HA		0930		X										1	BAG/GK	
-AP		-2HA		0934		X											BAG/GK	
-AQ		B45-0		0938		X											T P	
-AR		B44-0HA		0952	X											2	J G	
-AS		-1HA		0959		X	X	X	X							2	J G	

■ TAT starts 8AM the following day if samples received after 3 PM

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H=HCl $N=HNO_3$ $S=H_2SO_4$ C=4°C
$Z=Zn(AC)_2$ O=NaOH $T=Na_2S_2O_3$

CHAIN OF CUSTODY RECORD

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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 Consultants, Inc
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Tel: 916-852-9118
Fax: 916-852-9132
Project Name: US-101 @ Blossom Hill
Project #: E9080-02-01
Sampler: Matthew Kinney (Signature) M. Kinney

Relinquished by: (Signature and Printed Name)	Date	Time	Received by: (Signature and Printed Name)	Date	Time
Matthew Kinney Matthew K	9/7/18	1600	GEOCON COLD STORAGE	9/7/18	1600
GEOCON COLD STORAGE	9/10/18	1600	ATL	9/10/18	1600
				9/10/18	1115

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter:
Rick Day
Print Name Date
Signature

Send Report To:
Attn: _____
Co: _____
Addr: _____
City: State: Zip:

Bill To:
Attn: _____
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Special Instructions/Comments:
Homogenize samples for metals analysis

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Circle or Add Analysis(es) Requested

SPECIFY APPROPRIATE MATRIX

PRESERVATION

QA/QC
RTNE ☑
CT ☐
SWRCB ☐ Logcode _____
OTHER _____

ITEM	LAB USE ONLY: Lab No.	Sample Description: Sample ID / Location	Date	Time	CAM 17 Metals	Lead	TPHg/BTEX/MTBE	TPHd/mo	OCPs	VOCs	SOIL	WATER	GROUND WATER	WASTEWATER	TAT	Container(s) #	Container(s) Type	REMARKS
	803396 -AT	B44-2 HA	9/7/18	1001		X					X				E	1	[illegible]	
	-AU	B43-0 HA		1006		X	X	X	X							2	5 G	
	-AV	-1 HA		1008		X										1	BAG	
	-AW	-2 HA		1010		X												
	-AX	B42-0 HA		1020		X												
	-AY	-1 HA		1027	X											2	5 G	
	-AZ	-2 HA		1030		X	X	X	X							2	5 G	
	-BA	B41-0 HA		1036		X										1	BAG	
	-BB	-1 HA		1038		X	X	X	X							2	5 G	
	-BC	-2 HA		1040		X										1	BAG	

- TAT starts 8AM the following day if samples received after 3 PM

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

Preservatives:
H=HCl N=HNO_3 S=H_2SO_4 C=4°C
Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

ADVANCED TECHNOLOGY LABORATORIES

September 27, 2018

Rick Day
Geocon Consultants, Inc.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, CA 95742
Tel: (916) 852-9118
Fax:(916) 852-9132

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

Re: ATL Work Order Number : 1803391
Client Reference : US-101 @ Blossom Hill, E9080-02-01

Enclosed are the results for sample(s) received on September 11, 2018 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

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B34-2	1803391-06	Soil	9/06/18 9:30	9/11/18 11:10
B33-0	1803391-07	Soil	9/06/18 9:34	9/11/18 11:10
B36-11.5	1803391-14	Soil	9/06/18 10:00	9/11/18 11:10
B24-1	1803391-20	Soil	9/06/18 11:43	9/11/18 11:10
B26-2.5	1803391-24	Soil	9/06/18 12:00	9/11/18 11:10
B27-0	1803391-25	Soil	9/06/18 12:34	9/11/18 11:10
B22-2HA	1803391-30	Soil	9/06/18 12:40	9/11/18 11:10
B28-2	1803391-33	Soil	9/06/18 12:54	9/11/18 11:10
B30-1	1803391-37	Soil	9/06/18 13:21	9/11/18 11:10
B17-2	1803391-50	Soil	9/06/18 14:06	9/11/18 11:10
B16-0	1803391-51	Soil	9/06/18 14:12	9/11/18 11:10
B15-0	1803391-54	Soil	9/06/18 14:22	9/11/18 11:10
B19-1	1803391-57	Soil	9/06/18 14:39	9/11/18 11:10
B14-0	1803391-58	Soil	9/06/18 14:44	9/11/18 11:10
B14-1	1803391-59	Soil	9/06/18 14:45	9/11/18 11:10
B1-0	1803391-64	Soil	9/06/18 15:14	9/11/18 11:10
B2-2	1803391-69	Soil	9/06/18 15:22	9/11/18 11:10
B37-1	1803391-84	Soil	9/07/18 7:25	9/11/18 11:10
B12-2	1803391-87	Soil	9/07/18 7:40	9/11/18 11:10
B11-0	1803391-88	Soil	9/07/18 7:48	9/11/18 11:10
B9-1	1803391-93	Soil	9/07/18 7:59	9/11/18 11:10
B7-2	1803391-99	Soil	9/07/18 8:22	9/11/18 11:10
B6-0	1803391-AA	Soil	9/07/18 8:26	9/11/18 11:10
B44-0HA	1803391-AR	Soil	9/07/18 9:52	9/11/18 11:10
B42-1HA	1803391-AY	Soil	9/07/18 10:22	9/11/18 11:10

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B34-2

Lab ID: 1803391-06

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:19	D1
Nickel	**2.5**	1.0	20	B8I0706	09/26/2018	09/26/18 13:19	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B33-0

Lab ID: 1803391-07

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:25	D1
Nickel	**6.0**	1.0	20	B8I0706	09/26/2018	09/26/18 13:25	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B36-11.5

Lab ID: 1803391-14

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:26	D1
Nickel	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:26	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B24-1

Lab ID: 1803391-20

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:27	D1
Nickel	**8.3**	1.0	20	B8I0706	09/26/2018	09/26/18 13:27	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B26-2.5

Lab ID: 1803391-24

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:31	D1
Nickel	**10**	1.0	20	B8I0706	09/26/2018	09/26/18 13:31	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B27-0

Lab ID: 1803391-25

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:33	D1
Nickel	**3.6**	1.0	20	B8I0706	09/26/2018	09/26/18 13:33	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B22-2HA

Lab ID: 1803391-30

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:34	D1
Nickel	**3.9**	1.0	20	B8I0706	09/26/2018	09/26/18 13:34	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B28-2

Lab ID: 1803391-33

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:36	D1
Nickel	**7.2**	1.0	20	B8I0706	09/26/2018	09/26/18 13:36	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B30-1

Lab ID: 1803391-37

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:37	D1
Nickel	**7.2**	1.0	20	B8I0706	09/26/2018	09/26/18 13:37	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B17-2

Lab ID: 1803391-50

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:39	D1
Nickel	**6.1**	1.0	20	B8I0706	09/26/2018	09/26/18 13:39	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B16-0

Lab ID: 1803391-51

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:40	D1
Nickel	**2.3**	1.0	20	B8I0706	09/26/2018	09/26/18 13:40	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B15-0

Lab ID: 1803391-54

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:41	D1
Lead	**1.7**	1.0	20	B8I0706	09/26/2018	09/26/18 13:41	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B19-1

Lab ID: 1803391-57

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:43	D1
Nickel	**6.7**	1.0	20	B8I0706	09/26/2018	09/26/18 13:43	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B14-0

Lab ID: 1803391-58

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:44	D1
Lead	**4.4**	1.0	20	B8I0706	09/26/2018	09/26/18 13:44	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B14-1

Lab ID: 1803391-59

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:52	D1
Nickel	**2.4**	1.0	20	B8I0706	09/26/2018	09/26/18 13:52	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B1-0

Lab ID: 1803391-64

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:53	D1
Nickel	**1.2**	1.0	20	B8I0706	09/26/2018	09/26/18 13:53	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B2-2

Lab ID: 1803391-69

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:55	D1
Nickel	**5.1**	1.0	20	B8I0706	09/26/2018	09/26/18 13:55	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B37-1

Lab ID: 1803391-84

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:56	D1
Nickel	**1.6**	1.0	20	B8I0706	09/26/2018	09/26/18 13:56	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B12-2

Lab ID: 1803391-87

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:58	D1
Nickel	**6.6**	1.0	20	B8I0706	09/26/2018	09/26/18 13:58	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B11-0

Lab ID: 1803391-88

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0706	09/26/2018	09/26/18 13:59	D1
Nickel	**5.7**	1.0	20	B8I0706	09/26/2018	09/26/18 13:59	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B9-1

Lab ID: 1803391-93

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0707	09/26/2018	09/26/18 14:10	D1
Nickel	**9.5**	1.0	20	B8I0707	09/26/2018	09/26/18 14:10	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B7-2

Lab ID: 1803391-99

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0707	09/26/2018	09/26/18 14:16	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B6-0

Lab ID: 1803391-AA

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0707	09/26/2018	09/26/18 14:18	D1
Lead	ND	1.0	20	B8I0707	09/26/2018	09/26/18 14:18	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B44-0HA

Lab ID: 1803391-AR

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0707	09/26/2018	09/26/18 14:19	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

Client Sample ID B42-1HA

Lab ID: 1803391-AY

STLC Metals by ICP-AES by EPA 6010B **Analyst: GO**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B8I0707	09/26/2018	09/26/18 14:20	D1
Nickel	**6.4**	1.0	20	B8I0707	09/26/2018	09/26/18 14:20	D1

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

QUALITY CONTROL SECTION

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

Analyte	Result (mg/L)	PQL (mg/L)	MDL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0706 - STLC_S Extraction										
Blank (B8I0706-BLK1)					Prepared: 9/26/2018 Analyzed: 9/26/2018					
Chromium	ND	1.0	0.039							
Lead	ND	1.0	0.094							
Nickel	ND	1.0	0.092							
Blank (B8I0706-BLK2)					Prepared: 9/26/2018 Analyzed: 9/26/2018					
Chromium	ND	1.0	0.039							
Lead	ND	1.0	0.094							
Nickel	ND	1.0	0.092							
LCS (B8I0706-BS1)					Prepared: 9/26/2018 Analyzed: 9/26/2018					
Chromium	1.76814			2.00000		88.4	80 - 120			
Lead	1.69387			2.00000		84.7	80 - 120			
Nickel	1.91209			2.00000		95.6	80 - 120			
Duplicate (B8I0706-DUP1)			**Source: 1803391-06**		Prepared: 9/26/2018 Analyzed: 9/26/2018					
Chromium	0.104736	1.0	0.039		0.133458			24.1	20	R
Lead	ND	1.0	0.094		ND			NR	20	
Nickel	2.64855	1.0	0.092		2.45883			7.43	20	
Duplicate (B8I0706-DUP2)			**Source: 1803391-88**		Prepared: 9/26/2018 Analyzed: 9/26/2018					
Chromium	0.229408	1.0	0.039		0.278841			19.5	20	
Lead	1.75303	1.0	0.094		1.47141			17.5	20	
Nickel	5.39922	1.0	0.092		5.71019			5.60	20	
Matrix Spike (B8I0706-MS1)			**Source: 1803391-06**		Prepared: 9/26/2018 Analyzed: 9/26/2018					
Chromium	2.24595			2.50000	0.133458	84.5	70 - 130			
Lead	2.00871			2.50000	-0.041666	80.3	70 - 130			
Nickel	4.60890			2.50000	2.45883	86.0	70 - 130			
Matrix Spike (B8I0706-MS2)			**Source: 1803391-88**		Prepared: 9/26/2018 Analyzed: 9/26/2018					
Chromium	2.45350			2.50000	0.278841	87.0	70 - 130			
Lead	3.53948			2.50000	1.47141	82.7	70 - 130			
Nickel	7.91458			2.50000	5.71019	88.2	70 - 130			
Matrix Spike Dup (B8I0706-MSD1)			**Source: 1803391-06**		Prepared: 9/26/2018 Analyzed: 9/26/2018					
Chromium	2.24410			2.50000	0.133458	84.4	70 - 130	0.0823	20	
Lead	2.03554			2.50000	-0.041666	81.4	70 - 130	1.33	20	
Nickel	4.60353			2.50000	2.45883	85.8	70 - 130	0.116	20	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

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

Analyte	Result (mg/L)	PQL (mg/L)	MDL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0707 - STLC_S Extraction										
Blank (B8I0707-BLK1)					Prepared: 9/26/2018 Analyzed: 9/26/2018					
Chromium	ND	1.0	0.039							
Lead	ND	1.0	0.094							
Nickel	ND	1.0	0.092							
Blank (B8I0707-BLK2)					Prepared: 9/26/2018 Analyzed: 9/26/2018					
Chromium	ND	1.0	0.039							
Lead	ND	1.0	0.094							
Nickel	ND	1.0	0.092							
LCS (B8I0707-BS1)					Prepared: 9/26/2018 Analyzed: 9/26/2018					
Chromium	1.79635			2.00000		89.8	80 - 120			
Lead	1.73770			2.00000		86.9	80 - 120			
Nickel	1.90489			2.00000		95.2	80 - 120			
Duplicate (B8I0707-DUP1)			**Source: 1803391-93**		Prepared: 9/26/2018 Analyzed: 9/26/2018					
Chromium	0.277735	1.0	0.039		0.281302			1.28	20	
Lead	0.216246	1.0	0.094		0.185220			15.5	20	
Nickel	8.75834	1.0	0.092		9.53796			8.52	20	
Duplicate (B8I0707-DUP2)			**Source: 1803423-22**		Prepared: 9/26/2018 Analyzed: 9/26/2018					
Chromium	ND	1.0	0.039		ND			NR	20	
Lead	2.68774	1.0	0.094		2.44515			9.45	20	
Nickel	ND	1.0	0.092		ND			NR	20	
Duplicate (B8I0707-DUP3)			**Source: 1803482-05**		Prepared: 9/26/2018 Analyzed: 9/26/2018					
Chromium	2.63319	1.0	0.039		2.56231			2.73	20	
Lead	0.455680	1.0	0.094		0.477427			4.66	20	
Nickel	0.099622	1.0	0.092		0.094792			4.97	20	
Matrix Spike (B8I0707-MS1)			**Source: 1803391-93**		Prepared: 9/26/2018 Analyzed: 9/26/2018					
Chromium	2.40711			2.50000	0.281302	85.0	70 - 130			
Lead	2.29149			2.50000	0.185220	84.3	70 - 130			
Nickel	11.2131			2.50000	9.53796	67.0	70 - 130			M1
Matrix Spike (B8I0707-MS2)			**Source: 1803423-22**		Prepared: 9/26/2018 Analyzed: 9/26/2018					
Chromium	2.25256			2.50000	0.032869	88.8	70 - 130			
Lead	4.46142			2.50000	2.44515	80.7	70 - 130			
Nickel	2.40007			2.50000	0.091760	92.3	70 - 130			
Matrix Spike (B8I0707-MS3)			**Source: 1803482-05**		Prepared: 9/26/2018 Analyzed: 9/26/2018					
Chromium	4.31037			2.50000	2.56231	69.9	70 - 130			M1
Lead	2.52573			2.50000	0.477427	81.9	70 - 130			
Nickel	2.31647			2.50000	0.094792	88.9	70 - 130			

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

STLC Metals by ICP-AES by EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B8I0707 - STLC_S Extraction (continued)									
Matrix Spike Dup (B8I0707-MSD1)			**Source: 1803391-93**		Prepared: 9/26/2018 Analyzed: 9/26/2018				
Chromium	2.47438		2.50000	0.281302	87.7	70 - 130	2.76	20	
Lead	2.32866		2.50000	0.185220	85.7	70 - 130	1.61	20	
Nickel	11.5290		2.50000	9.53796	79.6	70 - 130	2.78	20	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number : US-101 @ Blossom Hill, E9080-02-01
3160 Gold Valley Drive, Suite 800	Report To : Rick Day
Rancho Cordova , CA 95742	Reported : 09/27/2018

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.
D1	Sample required dilution due to possible matrix interference.
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)

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.

Dominic Mata

From: Rick Day <day@geoconinc.com>
Sent: Thursday, September 20, 2018 1:27 PM
To: Dominic Mata
Cc: Luann Beadle; customer.relations@atlglobal.com
Subject: RE: Results/Invoice - US-101 @ Blossom Hill, E9080-02-01 (ATL# 1803391)

Hi, Dominic.

Please analyze for STLC lead, chromium, and/or nickel as follows:

Lead – total is 50 mg/kg or greater
Chromium – total is 50 mg/kg or greater
Nickel – total is 200 mg/kg or greater

Lab ID	Sample ID	WET Lead	WET Chromium	WET Nickel
1803391-06	B34-2	---	X	X
1803391-07	B33-0	---	X	X
1803391-14	B36-11.5	---	X	X
1803391-20	B24-1	---	X	X
1803391-24	B26-2.5	---	X	X
1803391-25	B27-0	---	X	X
1803391-30	B22-2HA	---	X	X
1803391-33	B28-2	---	X	X
1803391-37	B30-1	---	X	X
1803391-50	B17-2	---	X	X
1803391-51	B16-0	---	X	X
1803391-54	B15-0	X	X	---
1803391-57	B19-1	---	X	X
1803391-58	B14-0	X	X	---
1803391-59	B14-1	---	X	X
1803391-64	B1-0	---	X	X
1803391-69	B2-2	---	X	X
1803391-84	B37-1	---	X	X
1803391-87	B12-2	---	X	X
1803391-88	B11-0	---	X	X
1803391-93	B9-1	---	X	X
1803391-99	B7-2	---	X	---
1803391-AA	B6-0	X	X	---
1803391-AR	B44-0HA	---	X	---
1803391-AY	B42-1HA	---	X	X

Standard TAT please.

Thanks,
Rick.

EMSL Analytical, Inc.

464 McCormick Street San Leandro, CA 94577
Phone/Fax: (510) 895-3675 / (510) 895-3680
http://www.EMSL.com / sanleandrolab@emsl.com

EMSL Order:	091819816
Customer ID:	GECN80
Customer PO:	
Project ID:	

Attention:	Rebecca Silva Geocon Consultants, Inc. 3160 Gold Valley Drive Suite 800 Rancho Cordova, CA 95742	**Phone:**	(916) 852-9118
		Fax:	(916) 852-9132
		Received:	09/11/2018 9:00 AM
		Analysis Date:	09/17/2018
		Collected:	09/06/2018
Project:	E8090-02-01		

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
B35-1 NOA *091819816-0001*	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**<0.25% Chrysotile**
B33-0 NOA *091819816-0002*	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**<0.25% Chrysotile**
B36-4.5 NOA *091819816-0003*	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**None Detected**
B36-11.5 NOA *091819816-0004*	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**None Detected**
B23-2 NOA *091819816-0005*	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**<0.25% Chrysotile**
B25-0 NOA *091819816-0006*	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**<0.25% Chrysotile**
B26-2.5 NOA *091819816-0007*	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**<0.25% Chrysotile**
B28-1 NOA *091819816-0008*	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**<0.25% Chrysotile**
B31-4.5 NOA *091819816-0009*	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**None Detected**
B31-11.5 NOA *091819816-0010*	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**None Detected**

Samples analyzed by EMSL Analytical, Inc San Leandro, CA

Initial report from: 09/17/2018 11:40:15

EMSL Analytical, Inc.
464 McCormick Street San Leandro, CA 94577
Phone/Fax: (510) 895-3675 / (510) 895-3680
http://www.EMSL.com / sanleandrolab@emsl.com

EMSL Order: 091819816
Customer ID: GECN80
Customer PO:
Project ID:

Attention: Rebecca Silva
Geocon Consultants, Inc.
3160 Gold Valley Drive
Suite 800
Rancho Cordova, CA 95742
Project: E8090-02-01

Phone: (916) 852-9118
Fax: (916) 852-9132
Received: 09/11/2018 9:00 AM
Analysis Date: 09/17/2018
Collected: 09/06/2018

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
B30-2 NOA *091819816-0011*	SOIL	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**<0.25% Chrysotile**
B21-1 NOA *091819816-0012*	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**None Detected**
B17-0 NOA *091819816-0013*	SOIL	Tan Non-Fibrous Homogeneous		99.50% Non-fibrous (Other)	**0.50% Chrysotile**
B15-1 NOA NOT SUBMITTED *091819816-0014*	SOIL				**Not Submitted**
B19-0 NOA *091819816-0015*	SOIL	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**<0.25% Chrysotile**
B1-0 NOA *091819816-0016*	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**None Detected**
B3-1 NOA *091819816-0017*	SOIL	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**<0.25% Chrysotile**
B40-0 NOA *091819816-0018*	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**None Detected**
B11-2 NOA *091819816-0019*	SOIL	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**<0.25% Chrysotile**
B9-1 NOA *091819816-0020*	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**<0.25% Chrysotile**

Samples analyzed by EMSL Analytical, Inc San Leandro, CA

Initial report from: 09/17/2018 11:40:15

EMSL Analytical, Inc.
464 McCormick Street San Leandro, CA 94577
Phone/Fax: (510) 895-3675 / (510) 895-3680
http://www.EMSL.com / sanleandrolab@emsl.com

EMSL Order: 091819816
Customer ID: GECN80
Customer PO:
Project ID:

Attention: Rebecca Silva
Geocon Consultants, Inc.
3160 Gold Valley Drive
Suite 800
Rancho Cordova, CA 95742
Project: E8090-02-01

Phone: (916) 852-9118
Fax: (916) 852-9132
Received: 09/11/2018 9:00 AM
Analysis Date: 09/17/2018
Collected: 09/06/2018

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
B7-0 NOA *091819816-0021*	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**<0.25% Chrysotile**
B13-0 NOA *091819816-0022*	SOIL	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**None Detected**
B48-1 NOA *091819816-0023*	SOIL	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**None Detected**
B46-0 NOA HA *091819816-0024*	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**None Detected**
B44-2 NOA HA *091819816-0025*	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**None Detected**
B42-1 NOA HA *091819816-0026*	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	**<0.25% Chrysotile**

Analyst(s)
Shane Heisser (25)

Matthew Batongbacal
or other approved signatory

Samples analyzed by EMSL Analytical, Inc San Leandro, CA

Initial report from: 09/17/2018 11:40:15

OrderID: 091819816

EMSL Analytical, Inc.
464 McCormick Street

San Leandro, CA 94577
PHONE: (510) 895-3675
FAX: (510) 895-3680

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Chain of Custody

EMSL Order Number *(Lab Use Only)*:

#091819816

Company Name : Geocon Consultants, Inc.		**EMSL Customer ID:**	
Street: 3160 Gold Valley Drive, Suite 800		**City:** Rancho Cordova	**State/Province:** CA
Zip/Postal Code: 95742	**Country:** US	**Telephone #:** 916-852-9118	**Fax #:**
Report To (Name): Rick Day		**Please Provide Results:** ☐ Fax ☑ Email	
Email Address: day@geoconinc.com		**Purchase Order:**	
Project Name/Number: E8090-02-01		**EMSL Project ID** *(Internal Use Only)*:	
U.S. State Samples Taken: CA		**CT Samples:** ☐ Commercial/Taxable ☐ Residential/Tax Exempt	

EMSL-Bill to: ☑ Same ☐ Different - If Bill to is Different note instructions in Comments**
Third Party Billing requires written authorization from third party

Turnaround Time (TAT) Options* – Please Check

☐ 3 Hour | ☐ 6 Hour | ☐ 24 Hour | ☐ 48 Hour | ☐ 72 Hour | ☐ 96 Hour | ☒ 1 Week | ☐ 2 Week

**For TEM Air 3 hr through 6 hr, please call ahead to schedule.*There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.*

PCM - Air ☐ Check if samples are from NY
☐ NIOSH 7400
☐ w/ OSHA 8hr. TWA

PLM - Bulk (reporting limit)
☐ PLM EPA 600/R-93/116 (<1%)
☐ PLM EPA NOB (<1%)
Point Count
☐ 400 (<0.25%) ☐ 1000 (<0.1%)
Point Count w/Gravimetric
☐ 400 (<0.25%) ☐ 1000 (<0.1%)
☐ NYS 198.1 (friable in NY)
☐ NYS 198.6 NOB (non-friable-NY)
☐ NYS 198.8 SOF-V
☐ NIOSH 9002 (<1%)

TEM – Air ☐ 4-4.5hr TAT (AHERA only)
☐ AHERA 40 CFR, Part 763
☐ NIOSH 7402
☐ EPA Level II
☐ ISO 10312

TEM - Bulk
☐ TEM EPA NOB PLM 435A
☐ NYS NOB 198.4 (non-friable-NY)
☐ Chatfield SOP
☐ TEM Mass Analysis-EPA 600 sec. 2.5

TEM – Water: EPA 100.2
Fibers >10µm ☐ Waste ☐ Drinking
All Fiber Sizes ☐ Waste ☐ Drinking

TEM- Dust
☐ Microvac - ASTM D 5755
☐ Wipe - ASTM D6480
☐ Carpet Sonication (EPA 600/J-93/167)

Soil/Rock/Vermiculite
☐ PLM EPA 600/R-93/116 with milling prep (<1%)
☒ PLM EPA 600/R-93/116 with milling prep (<0.25%)
☐ TEM EPA 600/R-93/116 with milling prep (<0.1%)
☐ TEM Qualitative via Filtration Prep
☐ TEM Qualitative via Drop Mount Prep
☐ Cincinnati Method EPA 600/R-04/004 – PLM/TEM (BC only)

Other:
☐

☐ **Check For Positive Stop – Clearly Identify Homogenous Group**

Filter Pore Size (Air Samples): ☐ 0.8µm ☐ 0.45µm

Samplers Name:

Samplers Signature:

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
B35-1 NOA	Soil	N/A	9/6/18 0923
B33-0 NOA			0934
B36-4.5 NOA			0956
B35-11.5 NOA			1000
B23-2 NOA			1138

Client Sample # (s):

Total # of Samples: 26

Relinquished (Client): GEOCON CONSULTANTS **Date:** 9/10/18 **Time:** 1600

Received (Lab): MT **Date:** 9/11/18 **Time:** 9:00 AM

Comments/Special Instructions: CARB PLM 435A PLEASE BFX (1)

Page 1 of _____ pages

OrderID: 091819816

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Chain of Custody

EMSL Order Number *(Lab Use Only)*:

#091819816

EMSL Analytical, Inc.
464 McCormick Street

San Leandro, CA 94577
PHONE: (510) 895-3675
FAX: (510) 895-3680

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
B25-0 NOA	SOIL	N/A	9/6/18 1150
B26-2.5 NOA			1200
~~B26-11.5 NOA~~			~~1204~~
B28-1 NOA			1253
B31-4.5 NOA			1306
B31-11.5 NOA			1312
B30-2 NOA			1322
B21-1 NOA			1351
B17-0 NOA			1404
B15-1 NOA			1423
B19-0 NOA			1438
B1-0 NOA			1514
B3-1 NOA			1529
B40-0 NOA			9/7/18 0708
B11-2 NOA			0750
B9-1 NOA			0759
B7-0 NOA			0820
B13-0 NOA			0844
B48-1 NOA			0901
B46-0 NOA HA			0918
B44-2 NOA HA			1001
B42-1 NOA HA			1022

***Comments/Special Instructions:**

Page ____ of ____ pages

NT - 9/11/18 - 9:00 Am
EFD

APPENDIX C

PROJECT NO. **E9080-02-01** PROJECT NAME **US-101/BLOSSOM HILL ROAD INTERCHANGE**

BORING NO. B36

DATE DRILLED 9/6/2018 WATER LEVEL (ATD) 26.3'

EQUIPMENT DIRECT PUSH CONTRACTOR Geocon

DEPTH IN FEET	PENETRAT. RESIST. BLOWS/FT.	SAMPLE NO.	LITHOLOGY	SOIL DESCRIPTION	SOIL (USCS)	PID (PPM)
1				DRY, GRASSY SOIL		
1–4				Soft, dry, moderately yellow brown, Sandy SILT with gravel	ML	
5		B36-4.5 09:56		Stiff, dry, moderately yellow brown, Sandy SILT	ML	
6–11						
12		B36-11.5 10:00				
13–23				Soft, moist, moderately yellow brown, Silt with SAND	ML	
24–25				Soft, wet, moderately yellow brown, Sandy SILT	ML	
26–29		B36-GW 10:50		Loose, wet, moderately yellow brown, Silty SAND	SM	
30				BORING TERMINATED AT 30 FEET		

ENV_NO_WELL E9080-02-01.GPJ 10/01/18

BORING ELEVATION: **NA**

ENGINEER/GEOLOGIST: **Matt Kinney/Julio Esquivel**

APPENDIX D

UCL Statistics for Uncensored Full Data Sets

User Selected Options

Date/Time of Computation	ProUCL 5.19/26/2018 8:51:31 AM
From File	UCL Input.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Group 1 - 0 Depth

General Statistics

Total Number of Observations	4	Number of Distinct Observations	4
		Number of Missing Observations	0
Minimum	8.7	Mean	15.43
Maximum	**26**	Median	13.5
SD	8.266	Std. Error of Mean	4.133
Coefficient of Variation	0.536	Skewness	0.744

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.876	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.282	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	25.15	95% Adjusted-CLT UCL (Chen-1995)	23.87
		95% Modified-t UCL (Johnson-1978)	25.41

Gamma GOF Test

A-D Test Statistic	0.42	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.659	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.321	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.396	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	4.759	k star (bias corrected MLE)	1.356
Theta hat (MLE)	3.241	Theta star (bias corrected MLE)	11.37
nu hat (MLE)	38.07	nu star (bias corrected)	10.85
MLE Mean (bias corrected)	15.43	MLE Sd (bias corrected)	13.24
		Approximate Chi Square Value (0.05)	4.48
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	37.36	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.87	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.288	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.163	Mean of logged Data	2.627
Maximum of Logged Data	3.258	SD of logged Data	0.538

Assuming Lognormal Distribution

95% H-UCL	52.95	90% Chebyshev (MVUE) UCL	27.53
95% Chebyshev (MVUE) UCL	33.03	97.5% Chebyshev (MVUE) UCL	40.66
99% Chebyshev (MVUE) UCL	55.66		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	22.22	95% Jackknife UCL	25.15
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	27.82	95% Chebyshev(Mean, Sd) UCL	33.44
97.5% Chebyshev(Mean, Sd) UCL	41.23	99% Chebyshev(Mean, Sd) UCL	56.55

Suggested UCL to Use
95% Student's-t UCL **25.15**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 1 - 1 Depth

General Statistics

Total Number of Observations	4	Number of Distinct Observations	4
		Number of Missing Observations	0
Minimum	4.1	Mean	6.95
Maximum	**12**	Median	5.85
SD	3.486	Std. Error of Mean	1.743
Coefficient of Variation	0.502	Skewness	1.6

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.854	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.324	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	11.05	95% Adjusted-CLT UCL (Chen-1995)	11.31
		95% Modified-t UCL (Johnson-1978)	11.28

Gamma GOF Test

A-D Test Statistic	0.359	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.659	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.292	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.396	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	6.184	k star (bias corrected MLE)	1.713
Theta hat (MLE)	1.124	Theta star (bias corrected MLE)	4.058
nu hat (MLE)	49.47	nu star (bias corrected)	13.7
MLE Mean (bias corrected)	6.95	MLE Sd (bias corrected)	5.311
		Approximate Chi Square Value (0.05)	6.367
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	14.96	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.937	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.263	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.411	Mean of logged Data	1.856
Maximum of Logged Data	2.485	SD of logged Data	0.456

Assuming Lognormal Distribution

95% H-UCL	17.5	90% Chebyshev (MVUE) UCL	11.55
95% Chebyshev (MVUE) UCL	13.66	97.5% Chebyshev (MVUE) UCL	16.58
99% Chebyshev (MVUE) UCL	22.31		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	9.817	95% Jackknife UCL	11.05
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	12.18	95% Chebyshev(Mean, Sd) UCL	14.55
97.5% Chebyshev(Mean, Sd) UCL	17.83	99% Chebyshev(Mean, Sd) UCL	24.29

Suggested UCL to Use

95% Student's-t UCL	**11.05**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 1 - 2 Depth

General Statistics

Total Number of Observations	4	Number of Distinct Observations	4
		Number of Missing Observations	0
Minimum	3.7	Mean	6.025
Maximum	**8.6**	Median	5.9
SD	2.109	Std. Error of Mean	1.055
Coefficient of Variation	0.35	Skewness	0.286

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.99	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.17	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	8.507	95% Adjusted-CLT UCL (Chen-1995)	7.921
		95% Modified-t UCL (Johnson-1978)	8.532

Gamma GOF Test

A-D Test Statistic	0.199	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.657	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.175	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.395	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	10.57	k star (bias corrected MLE)	2.809
Theta hat (MLE)	0.57	Theta star (bias corrected MLE)	2.145
nu hat (MLE)	84.55	nu star (bias corrected)	22.47
MLE Mean (bias corrected)	6.025	MLE Sd (bias corrected)	3.595
		Approximate Chi Square Value (0.05)	12.69
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	10.67	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.992	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.165	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.308	Mean of logged Data	1.748
Maximum of Logged Data	2.152	SD of logged Data	0.362

Assuming Lognormal Distribution

95% H-UCL	11.53	90% Chebyshev (MVUE) UCL	9.276
95% Chebyshev (MVUE) UCL	10.75	97.5% Chebyshev (MVUE) UCL	12.79
99% Chebyshev (MVUE) UCL	16.8		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	7.76	95% Jackknife UCL	8.507
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	9.189	95% Chebyshev(Mean, Sd) UCL	10.62
97.5% Chebyshev(Mean, Sd) UCL	12.61	99% Chebyshev(Mean, Sd) UCL	16.52

Suggested UCL to Use

95% Student's-t UCL	**8.51**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 2 - 0 Depth

General Statistics

Total Number of Observations	9	Number of Distinct Observations	7
		Number of Missing Observations	0
Minimum	9.1	Mean	24.9
Maximum	**50**	Median	23
SD	14.26	Std. Error of Mean	4.755
Coefficient of Variation	0.573	Skewness	1.016

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use

guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test			
Shapiro Wilk Test Statistic	0.858	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.219	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	33.74	95% Adjusted-CLT UCL (Chen-1995)	34.44
		95% Modified-t UCL (Johnson-1978)	34.01
Gamma GOF Test			
A-D Test Statistic	0.415	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.211	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.281	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	3.755	k star (bias corrected MLE)	2.577
Theta hat (MLE)	6.632	Theta star (bias corrected MLE)	9.662
nu hat (MLE)	67.58	nu star (bias corrected)	46.39
MLE Mean (bias corrected)	24.9	MLE Sd (bias corrected)	15.51
		Approximate Chi Square Value (0.05)	31.76
Adjusted Level of Significance	0.0231	Adjusted Chi Square Value	29.23
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	36.37	95% Adjusted Gamma UCL (use when n<50)	39.52
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.938	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.19	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	2.208	Mean of logged Data	3.076
Maximum of Logged Data	3.912	SD of logged Data	0.558
Assuming Lognormal Distribution			
95% H-UCL	40.1	90% Chebyshev (MVUE) UCL	38.91
95% Chebyshev (MVUE) UCL	45.29	97.5% Chebyshev (MVUE) UCL	54.15
99% Chebyshev (MVUE) UCL	71.54		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	32.72	95% Jackknife UCL	33.74
95% Standard Bootstrap UCL	32.36	95% Bootstrap-t UCL	40.72
95% Hall's Bootstrap UCL	77.62	95% Percentile Bootstrap UCL	32.57
95% BCA Bootstrap UCL	33.33		
90% Chebyshev(Mean, Sd) UCL	39.16	95% Chebyshev(Mean, Sd) UCL	45.63
97.5% Chebyshev(Mean, Sd) UCL	54.59	99% Chebyshev(Mean, Sd) UCL	72.21
Suggested UCL to Use			
95% Student's-t UCL	**33.74**		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 2 - 1 Depth

General Statistics

Total Number of Observations	8	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	0.5	Mean	7.85
Maximum	**25**	Median	5.45
SD	7.842	Std. Error of Mean	2.773
Coefficient of Variation	0.999	Skewness	1.724

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.829	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.219	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	13.1	95% Adjusted-CLT UCL (Chen-1995)	14.22
		95% Modified-t UCL (Johnson-1978)	13.38

Gamma GOF Test

A-D Test Statistic	0.174	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.733	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.12	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.301	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.153	k star (bias corrected MLE)	0.804
Theta hat (MLE)	6.806	Theta star (bias corrected MLE)	9.761
nu hat (MLE)	18.45	nu star (bias corrected)	12.87
MLE Mean (bias corrected)	7.85	MLE Sd (bias corrected)	8.753
		Approximate Chi Square Value (0.05)	5.804
Adjusted Level of Significance	0.0195	Adjusted Chi Square Value	4.66

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	17.4	95% Adjusted Gamma UCL (use when n<50)	21.68

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.96	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.167	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-0.693	Mean of logged Data	1.568
Maximum of Logged Data	3.219	SD of logged Data	1.188

Assuming Lognormal Distribution

95% H-UCL	56	90% Chebyshev (MVUE) UCL	19.57
95% Chebyshev (MVUE) UCL	24.56	97.5% Chebyshev (MVUE) UCL	31.48
99% Chebyshev (MVUE) UCL	45.07		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	12.41	95% Jackknife UCL	13.1
95% Standard Bootstrap UCL	12.1	95% Bootstrap-t UCL	17.41
95% Hall's Bootstrap UCL	30.7	95% Percentile Bootstrap UCL	12.45
95% BCA Bootstrap UCL	14.08		
90% Chebyshev(Mean, Sd) UCL	16.17	95% Chebyshev(Mean, Sd) UCL	19.94
97.5% Chebyshev(Mean, Sd) UCL	25.16	99% Chebyshev(Mean, Sd) UCL	35.44

Suggested UCL to Use

95% Student's-t UCL	**13.1**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 2 - 2 Depth

General Statistics

Total Number of Observations	4	Number of Distinct Observations	4
		Number of Missing Observations	0
Minimum	3.0	Mean	4.35
Maximum	**7.1**	Median	3.65
SD	1.912	Std. Error of Mean	0.956
Coefficient of Variation	0.44	Skewness	1.562

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.822	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.748	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.281	Lilliefors GOF Test
5% Lilliefors Critical Value	0.375	Data appear Normal at 5% Significance Level
Data appear Normal at 5% Significance Level		

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	6.6	95% Adjusted-CLT UCL (Chen-1995)	6.72
		95% Modified-t UCL (Johnson-1978)	6.725

Gamma GOF Test

A-D Test Statistic	0.449	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.658	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.284	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.395	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics

k hat (MLE)	7.991	k star (bias corrected MLE)	2.164
Theta hat (MLE)	0.544	Theta star (bias corrected MLE)	2.01
nu hat (MLE)	63.92	nu star (bias corrected)	17.31
MLE Mean (bias corrected)	4.35	MLE Sd (bias corrected)	2.957
		Approximate Chi Square Value (0.05)	8.897
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	8.465	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.865	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.748	Data appear Lognormal at 5% Significance Level

Lilliefors Test Statistic	0.255	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Lognormal Statistics			
Minimum of Logged Data	1.099	Mean of logged Data	1.406
Maximum of Logged Data	1.96	SD of logged Data	0.399

Assuming Lognormal Distribution			
95% H-UCL	9.175	90% Chebyshev (MVUE) UCL	6.889
95% Chebyshev (MVUE) UCL	8.049	97.5% Chebyshev (MVUE) UCL	9.659
99% Chebyshev (MVUE) UCL	12.82		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs			
95% CLT UCL	5.923	95% Jackknife UCL	6.6
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	7.218	95% Chebyshev(Mean, Sd) UCL	8.518
97.5% Chebyshev(Mean, Sd) UCL	10.32	99% Chebyshev(Mean, Sd) UCL	13.86

Suggested UCL to Use
95% Student's-t UCL **6.6**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 3 - 0 Depth

General Statistics			
Total Number of Observations	4	Number of Distinct Observations	4
		Number of Missing Observations	0
Minimum	0.5	Mean	51.38
Maximum	**120**	Median	42.5
SD	54.02	Std. Error of Mean	27.01
Coefficient of Variation	1.052	Skewness	0.657

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test			
Shapiro Wilk Test Statistic	0.939	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.238	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	114.9	95% Adjusted-CLT UCL (Chen-1995)	105.3
		95% Modified-t UCL (Johnson-1978)	116.4

Gamma GOF Test		
A-D Test Statistic	0.28	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.679	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.247	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.409	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics

k hat (MLE)	0.544	k star (bias corrected MLE)	0.303
Theta hat (MLE)	94.42	Theta star (bias corrected MLE)	169.7
nu hat (MLE)	4.353	nu star (bias corrected)	2.422
MLE Mean (bias corrected)	51.38	MLE Sd (bias corrected)	93.38
		Approximate Chi Square Value (0.05)	0.224
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	555.6	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.88	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.258	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	-0.693	Mean of logged Data	2.787
Maximum of Logged Data	4.787	SD of logged Data	2.461

Assuming Lognormal Distribution

95% H-UCL	2.87E+12	90% Chebyshev (MVUE) UCL	311.9
95% Chebyshev (MVUE) UCL	413.3	97.5% Chebyshev (MVUE) UCL	554
99% Chebyshev (MVUE) UCL	830.5		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	95.81	95% Jackknife UCL	114.9
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	132.4	95% Chebyshev(Mean, Sd) UCL	169.1
97.5% Chebyshev(Mean, Sd) UCL	220.1	99% Chebyshev(Mean, Sd) UCL	320.1

Suggested UCL to Use
95% Student's-t UCL **115**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 3 - 1 Depth

General Statistics

Total Number of Observations	4	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	0.5	Mean	2.6
Maximum	**7.1**	Median	1.4
SD	3.118	Std. Error of Mean	1.559
Coefficient of Variation	1.199	Skewness	1.597

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.802	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Normal at 5% Significance Level	

Lilliefors Test Statistic	0.288	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	6.269	95% Adjusted-CLT UCL (Chen-1995)	6.494
		95% Modified-t UCL (Johnson-1978)	6.476

Gamma GOF Test

A-D Test Statistic	0.428	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.667	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.316	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.403	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	0.961	k star (bias corrected MLE)	0.407
Theta hat (MLE)	2.707	Theta star (bias corrected MLE)	6.391
nu hat (MLE)	7.684	nu star (bias corrected)	3.254
MLE Mean (bias corrected)	2.6	MLE Sd (bias corrected)	4.076
		Approximate Chi Square Value (0.05)	0.452
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	18.74	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.864	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.291	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	-0.693	Mean of logged Data	0.352
Maximum of Logged Data	1.96	SD of logged Data	1.291

Assuming Lognormal Distribution

95% H-UCL	1890	90% Chebyshev (MVUE) UCL	6.77
95% Chebyshev (MVUE) UCL	8.708	97.5% Chebyshev (MVUE) UCL	11.4
99% Chebyshev (MVUE) UCL	16.68		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	5.164	95% Jackknife UCL	6.269
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	7.277	95% Chebyshev(Mean, Sd) UCL	9.395
97.5% Chebyshev(Mean, Sd) UCL	12.33	99% Chebyshev(Mean, Sd) UCL	18.11

Suggested UCL to Use
95% Student's-t UCL **6.27**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 3 - 2 Depth

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	1.5	Mean	5.13
Maximum	**7.2**	Median	6.7
SD	3.156	Std. Error of Mean	1.822
Coefficient of Variation	0.615	Skewness	-1.683

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.815	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.357	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	10.45	95% Adjusted-CLT UCL (Chen-1995)	6.238
		95% Modified-t UCL (Johnson-1978)	10.16

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	2.552	k star (bias corrected MLE)	N/A
Theta hat (MLE)	2.012	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	15.31	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.784	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.371	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.405	Mean of logged Data	1.427
Maximum of Logged Data	1.974	SD of logged Data	0.886

Assuming Lognormal Distribution

95% H-UCL	8543	90% Chebyshev (MVUE) UCL	12.8
95% Chebyshev (MVUE) UCL	16.18	97.5% Chebyshev (MVUE) UCL	20.88
99% Chebyshev (MVUE) UCL	30.1		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	8.131	95% Jackknife UCL	10.45
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	10.6	95% Chebyshev(Mean, Sd) UCL	13.08
97.5% Chebyshev(Mean, Sd) UCL	16.51	99% Chebyshev(Mean, Sd) UCL	23.27

Suggested UCL to Use

95% Student's-t UCL	**10.45**

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

Group 3 - All Depths Combined

General Statistics			
Total Number of Observations	11	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	0.5	Mean	21.03
Maximum	**120**	Median	6.7
SD	38.22	Std. Error of Mean	11.52
Coefficient of Variation	1.817	Skewness	2.244
Normal GOF Test			
Shapiro Wilk Test Statistic	0.607	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.369	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.251	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	41.91	95% Adjusted-CLT UCL (Chen-1995)	48.31
		95% Modified-t UCL (Johnson-1978)	43.21
Gamma GOF Test			
A-D Test Statistic	0.681	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.795	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.253	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.271	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.429	k star (bias corrected MLE)	0.373
Theta hat (MLE)	48.97	Theta star (bias corrected MLE)	56.39
nu hat (MLE)	9.446	nu star (bias corrected)	8.203
MLE Mean (bias corrected)	21.03	MLE Sd (bias corrected)	34.44
		Approximate Chi Square Value (0.05)	2.853
Adjusted Level of Significance	0.0278	Adjusted Chi Square Value	2.364
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50)	60.46	95% Adjusted Gamma UCL (use when n<50)	72.95
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.917	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.85	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.15	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.251	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	-0.693	Mean of logged Data	1.53
Maximum of Logged Data	4.787	SD of logged Data	1.914
Assuming Lognormal Distribution			
95% H-UCL	580.4	90% Chebyshev (MVUE) UCL	58.05
95% Chebyshev (MVUE) UCL	75.09	97.5% Chebyshev (MVUE) UCL	98.74
99% Chebyshev (MVUE) UCL	145.2		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs			
95% CLT UCL	39.98	95% Jackknife UCL	41.91
95% Standard Bootstrap UCL	38.88	95% Bootstrap-t UCL	147.4
95% Hall's Bootstrap UCL	135.9	95% Percentile Bootstrap UCL	40.73
95% BCA Bootstrap UCL	48.2		
90% Chebyshev(Mean, Sd) UCL	55.6	95% Chebyshev(Mean, Sd) UCL	71.25
97.5% Chebyshev(Mean, Sd) UCL	92.99	99% Chebyshev(Mean, Sd) UCL	135.7

Suggested UCL to Use	
95% Adjusted Gamma UCL	**72.95**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 4 - 0 Depth

General Statistics			
Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	0
Minimum	0.5	Mean	19.74
Maximum	**39**	Median	18
SD	17.91	Std. Error of Mean	8.011
Coefficient of Variation	0.907	Skewness	0.102

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test		
Shapiro Wilk Test Statistic	0.874	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.232	Lilliefors GOF Test
5% Lilliefors Critical Value	0.343	Data appear Normal at 5% Significance Level
Data appear Normal at 5% Significance Level		

Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	36.82	95% Adjusted-CLT UCL (Chen-1995)	33.31
		95% Modified-t UCL (Johnson-1978)	36.88

Gamma GOF Test		
A-D Test Statistic	0.368	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.698	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.236	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.367	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics			
k hat (MLE)	0.747	k star (bias corrected MLE)	0.432
Theta hat (MLE)	26.41	Theta star (bias corrected MLE)	45.66
nu hat (MLE)	7.474	nu star (bias corrected)	4.323
MLE Mean (bias corrected)	19.74	MLE Sd (bias corrected)	30.02
		Approximate Chi Square Value (0.05)	0.853
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	0.366

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	100	95% Adjusted Gamma UCL (use when n<50)	233

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.863	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.25	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Lognormal Statistics			
Minimum of Logged Data	-0.693	Mean of logged Data	2.181
Maximum of Logged Data	3.664	SD of logged Data	1.841

Assuming Lognormal Distribution			
95% H-UCL	140710	90% Chebyshev (MVUE) UCL	85.92
95% Chebyshev (MVUE) UCL	112.3	97.5% Chebyshev (MVUE) UCL	148.9
99% Chebyshev (MVUE) UCL	220.8		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs			
95% CLT UCL	32.92	95% Jackknife UCL	36.82
95% Standard Bootstrap UCL	31.43	95% Bootstrap-t UCL	42.61
95% Hall's Bootstrap UCL	38.57	95% Percentile Bootstrap UCL	30.9
95% BCA Bootstrap UCL	31.24		
90% Chebyshev(Mean, Sd) UCL	43.77	95% Chebyshev(Mean, Sd) UCL	54.66
97.5% Chebyshev(Mean, Sd) UCL	69.77	99% Chebyshev(Mean, Sd) UCL	99.45

Suggested UCL to Use	
95% Student's-t UCL	**36.82**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 4 - 1 Depth

General Statistics			
Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	0
Minimum	2.5	Mean	12.88
Maximum	**49**	Median	4.1
SD	20.21	Std. Error of Mean	9.038
Coefficient of Variation	1.569	Skewness	2.226

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test			
Shapiro Wilk Test Statistic	0.594	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.454	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	32.15	95% Adjusted-CLT UCL (Chen-1995)	37.36
		95% Modified-t UCL (Johnson-1978)	33.65

Gamma GOF Test			
A-D Test Statistic	0.962	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.696	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.442	Kolmogorov-Smirnov Gamma GOF Test	

5% K-S Critical Value	0.366	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.82	k star (bias corrected MLE)	0.461
Theta hat (MLE)	15.71	Theta star (bias corrected MLE)	27.93
nu hat (MLE)	8.196	nu star (bias corrected)	4.612
MLE Mean (bias corrected)	12.88	MLE Sd (bias corrected)	18.97
		Approximate Chi Square Value (0.05)	0.977
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	0.434
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	60.78	95% Adjusted Gamma UCL (use when n<50)	136.8
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.746	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.382	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.343	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	0.916	Mean of logged Data	1.834
Maximum of Logged Data	3.892	SD of logged Data	1.177
Assuming Lognormal Distribution			
95% H-UCL	352.8	90% Chebyshev (MVUE) UCL	25.91
95% Chebyshev (MVUE) UCL	32.93	97.5% Chebyshev (MVUE) UCL	42.67
99% Chebyshev (MVUE) UCL	61.79		
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution (0.05)			
Nonparametric Distribution Free UCLs			
95% CLT UCL	27.75	95% Jackknife UCL	32.15
95% Standard Bootstrap UCL	26.38	95% Bootstrap-t UCL	369.5
95% Hall's Bootstrap UCL	326.3	95% Percentile Bootstrap UCL	30.68
95% BCA Bootstrap UCL	31.2		
90% Chebyshev(Mean, Sd) UCL	39.99	95% Chebyshev(Mean, Sd) UCL	52.28
97.5% Chebyshev(Mean, Sd) UCL	69.32	99% Chebyshev(Mean, Sd) UCL	102.8
Suggested UCL to Use			
95% Hall's Bootstrap UCL	**326**		

Recommended UCL exceeds the maximum observation

In Case Bootstrap t and/or Hall's Bootstrap yields an unreasonably large UCL value, use 97.5% or 99% Chebyshev (Mean, Sd) UCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 4 - 2 Depth

General Statistics			
Total Number of Observations	4	Number of Distinct Observations	4
		Number of Missing Observations	0
Minimum	5.5	Mean	8.18
Maximum	**14**	Median	6.6
SD	3.986	Std. Error of Mean	1.993
Coefficient of Variation	0.488	Skewness	1.716

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.792	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.317	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	12.87	95% Adjusted-CLT UCL (Chen-1995)	13.28
		95% Modified-t UCL (Johnson-1978)	13.15

Gamma GOF Test

A-D Test Statistic	0.499	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.658	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.286	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.396	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	6.716	k star (bias corrected MLE)	1.846
Theta hat (MLE)	1.217	Theta star (bias corrected MLE)	4.429
nu hat (MLE)	53.73	nu star (bias corrected)	14.77
MLE Mean (bias corrected)	8.175	MLE Sd (bias corrected)	6.017
		Approximate Chi Square Value (0.05)	7.099
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	17	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.844	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.259	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.705	Mean of logged Data	2.025
Maximum of Logged Data	2.639	SD of logged Data	0.432

Assuming Lognormal Distribution

95% H-UCL	19.06	90% Chebyshev (MVUE) UCL	13.31
95% Chebyshev (MVUE) UCL	15.66	97.5% Chebyshev (MVUE) UCL	18.92
99% Chebyshev (MVUE) UCL	25.33		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	11.45	95% Jackknife UCL	12.87
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	14.15	95% Chebyshev(Mean, Sd) UCL	16.86
97.5% Chebyshev(Mean, Sd) UCL	20.62	99% Chebyshev(Mean, Sd) UCL	28.01

Suggested UCL to Use

95% Student's-t UCL	**12.87**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 5 - 0 Depth

General Statistics

Total Number of Observations	4	Number of Distinct Observations	4
		Number of Missing Observations	0
Minimum	4.5	Mean	9.53
Maximum	**17**	Median	8.3
SD	6.097	Std. Error of Mean	3.048
Coefficient of Variation	0.64	Skewness	0.549

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.867	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.29	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	16.7	95% Adjusted-CLT UCL (Chen-1995)	15.43
		95% Modified-t UCL (Johnson-1978)	16.84

Gamma GOF Test

A-D Test Statistic	0.466	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.659	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.33	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.396	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	3.153	k star (bias corrected MLE)	0.955
Theta hat (MLE)	3.021	Theta star (bias corrected MLE)	9.974
nu hat (MLE)	25.23	nu star (bias corrected)	7.64
MLE Mean (bias corrected)	9.525	MLE Sd (bias corrected)	9.747
		Approximate Chi Square Value (0.05)	2.528
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	28.78	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.842	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.297	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.504	Mean of logged Data	2.087
Maximum of Logged Data	2.833	SD of logged Data	0.676

Assuming Lognormal Distribution

95% H-UCL	62.21	90% Chebyshev (MVUE) UCL	18.83
95% Chebyshev (MVUE) UCL	23.05	97.5% Chebyshev (MVUE) UCL	28.91
99% Chebyshev (MVUE) UCL	40.42		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	14.54	95% Jackknife UCL	16.7
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	18.67	95% Chebyshev(Mean, Sd) UCL	22.81
97.5% Chebyshev(Mean, Sd) UCL	28.56	99% Chebyshev(Mean, Sd) UCL	39.86

Suggested UCL to Use

95% Student's-t UCL	**16.7**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 5 - 1 Depth

General Statistics

Total Number of Observations	4	Number of Distinct Observations	4
		Number of Missing Observations	0
Minimum	3.4	Mean	9.23
Maximum	**23**	Median	5.25
SD	9.281	Std. Error of Mean	4.64
Coefficient of Variation	1.006	Skewness	1.879

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.746	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.748	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.365	Lilliefors GOF Test
5% Lilliefors Critical Value	0.375	Data appear Normal at 5% Significance Level

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	20.15	95% Adjusted-CLT UCL (Chen-1995)	21.52
		95% Modified-t UCL (Johnson-1978)	20.87

Gamma GOF Test

A-D Test Statistic	0.511	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.662	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.318	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.399	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.722	k star (bias corrected MLE)	0.597
Theta hat (MLE)	5.356	Theta star (bias corrected MLE)	15.45
nu hat (MLE)	13.78	nu star (bias corrected)	4.778
MLE Mean (bias corrected)	9.225	MLE Sd (bias corrected)	11.94
		Approximate Chi Square Value (0.05)	1.051
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	41.94	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.866	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.748	Data appear Lognormal at 5% Significance Level

Lilliefors Test Statistic	0.265	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Lognormal Statistics			
Minimum of Logged Data	1.224	Mean of logged Data	1.904
Maximum of Logged Data	3.135	SD of logged Data	0.866

Assuming Lognormal Distribution			
95% H-UCL	179.4	90% Chebyshev (MVUE) UCL	19.54
95% Chebyshev (MVUE) UCL	24.41	97.5% Chebyshev (MVUE) UCL	31.18
99% Chebyshev (MVUE) UCL	44.48		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs			
95% CLT UCL	16.86	95% Jackknife UCL	20.15
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	23.15	95% Chebyshev(Mean, Sd) UCL	29.45
97.5% Chebyshev(Mean, Sd) UCL	38.2	99% Chebyshev(Mean, Sd) UCL	55.4

Suggested UCL to Use
95% Student's-t UCL **20.15**

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 5 - 2 Depth

General Statistics			
Total Number of Observations	4	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	0.5	Mean	3.7
Maximum	**11**	Median	1.65
SD	4.986	Std. Error of Mean	2.493
Coefficient of Variation	1.348	Skewness	1.736

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test		
Shapiro Wilk Test Statistic	0.775	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.748	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.322	Lilliefors GOF Test
5% Lilliefors Critical Value	0.375	Data appear Normal at 5% Significance Level
Data appear Normal at 5% Significance Level		

Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	9.567	95% Adjusted-CLT UCL (Chen-1995)	10.11
		95% Modified-t UCL (Johnson-1978)	9.928

Gamma GOF Test		
A-D Test Statistic	0.434	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.67	Detected data appear Gamma Distributed at 5% Significance Level

K-S Test Statistic	0.313	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.405	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics			
k hat (MLE)	0.75	k star (bias corrected MLE)	0.354
Theta hat (MLE)	4.933	Theta star (bias corrected MLE)	10.45
nu hat (MLE)	6.001	nu star (bias corrected)	2.834
MLE Mean (bias corrected)	3.7	MLE Sd (bias corrected)	6.217
		Approximate Chi Square Value (0.05)	0.325
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	32.27	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.865	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.289	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Lognormal Statistics			
Minimum of Logged Data	-0.693	Mean of logged Data	0.51
Maximum of Logged Data	2.398	SD of logged Data	1.498

Assuming Lognormal Distribution			
95% H-UCL	25770	90% Chebyshev (MVUE) UCL	10.1
95% Chebyshev (MVUE) UCL	13.11	97.5% Chebyshev (MVUE) UCL	17.28
99% Chebyshev (MVUE) UCL	25.48		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs			
95% CLT UCL	7.801	95% Jackknife UCL	9.567
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	11.18	95% Chebyshev(Mean, Sd) UCL	14.57
97.5% Chebyshev(Mean, Sd) UCL	19.27	99% Chebyshev(Mean, Sd) UCL	28.5

Suggested UCL to Use
95% Student's-t UCL **9.57**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 6 - 0 Depth

General Statistics			
Total Number of Observations	3	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	0.5	Mean	2.03
Maximum	**5.1**	Median	0.5
SD	2.656	Std. Error of Mean	1.533
Coefficient of Variation	1.306	Skewness	1.732

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.75	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.385	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	6.511	95% Adjusted-CLT UCL (Chen-1995)	6.194
		95% Modified-t UCL (Johnson-1978)	6.766

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	0.927	k star (bias corrected MLE)	N/A
Theta hat (MLE)	2.195	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.559	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.75	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.385	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-0.693	Mean of logged Data	0.081
Maximum of Logged Data	1.629	SD of logged Data	1.341

Assuming Lognormal Distribution

95% H-UCL	43578135	90% Chebyshev (MVUE) UCL	5.37
95% Chebyshev (MVUE) UCL	6.97	97.5% Chebyshev (MVUE) UCL	9.19
99% Chebyshev (MVUE) UCL	13.55		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	4.555	95% Jackknife UCL	N/A
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	6.633	95% Chebyshev(Mean, Sd) UCL	8.717
97.5% Chebyshev(Mean, Sd) UCL	11.61	99% Chebyshev(Mean, Sd) UCL	17.29

Suggested UCL to Use

95% Student's-t UCL **6.51**

Recommended UCL exceeds the maximum observation

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 6 - 1 Depth

General Statistics

Total Number of Observations	3	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	0.5	Mean	3.67
Maximum	**10**	Median	0.5
SD	5.485	Std. Error of Mean	3.167
Coefficient of Variation	1.496	Skewness	1.732

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.75	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.385	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	12.91	95% Adjusted-CLT UCL (Chen-1995)	12.26
		95% Modified-t UCL (Johnson-1978)	13.44

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	0.619	k star (bias corrected MLE)	N/A
Theta hat (MLE)	5.925	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	3.713	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.75	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.385	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-0.693	Mean of logged Data	0.305
Maximum of Logged Data	2.303	SD of logged Data	1.73

Assuming Lognormal Distribution

95% H-UCL	6.13E+12	90% Chebyshev (MVUE) UCL	10.02
95% Chebyshev (MVUE) UCL	13.16	97.5% Chebyshev (MVUE) UCL	17.52
99% Chebyshev (MVUE) UCL	26.09		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	8.875	95% Jackknife UCL	N/A
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	13.17	95% Chebyshev(Mean, Sd) UCL	17.47

97.5% Chebyshev(Mean, Sd) UCL	23.44	99% Chebyshev(Mean, Sd) UCL	35.17

Suggested UCL to Use
95% Student's-t UCL **12.91**

Recommended UCL exceeds the maximum observation

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 6 - 2 Depth

General Statistics

Total Number of Observations	3	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	0.5	Mean	2.0
Maximum	**5.0**	Median	0.5
SD	2.598	Std. Error of Mean	1.5
Coefficient of Variation	1.299	Skewness	1.732

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.75	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.385	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	6.38	95% Adjusted-CLT UCL (Chen-1995)	6.07
		95% Modified-t UCL (Johnson-1978)	6.63

Gamma GOF Test
Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	0.94	k star (bias corrected MLE)	N/A
Theta hat (MLE)	2.128	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.639	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.75	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.385	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-0.693	Mean of logged Data	0.0744

Maximum of Logged Data	1.609	SD of logged Data	1.329

Assuming Lognormal Distribution

95% H-UCL	32150043	90% Chebyshev (MVUE) UCL	5.272
95% Chebyshev (MVUE) UCL	6.839	97.5% Chebyshev (MVUE) UCL	9.015
99% Chebyshev (MVUE) UCL	13.29		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	4.467	95% Jackknife UCL	N/A
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	6.5	95% Chebyshev(Mean, Sd) UCL	8.538
97.5% Chebyshev(Mean, Sd) UCL	11.37	99% Chebyshev(Mean, Sd) UCL	16.92

Suggested UCL to Use
95% Student's-t UCL **6.38**

Recommended UCL exceeds the maximum observation

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 6 - 4.5 Depth

General Statistics

Total Number of Observations	1	Number of Distinct Observations	1
		Number of Missing Observations	0
Minimum	13	Mean	13
Maximum	**13**	Median	13

Warning: This data set only has 1 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable Group 5 - 4.5 Depth was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Group 6 - 11.5 Depth

General Statistics

Total Number of Observations	1	Number of Distinct Observations	1
		Number of Missing Observations	0
Minimum	6.0	Mean	6.0
Maximum	**6.0**	Median	6

Warning: This data set only has 1 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable Group 5 - 11.5 Depth was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Group 7 - 0 Depth

General Statistics

Total Number of Observations	4	Number of Distinct Observations	4
		Number of Missing Observations	0
Minimum	6.1	Mean	10.13
Maximum	**17**	Median	8.7
SD	5.103	Std. Error of Mean	2.551
Coefficient of Variation	0.504	Skewness	1.047

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.874	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.267	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	16.13	95% Adjusted-CLT UCL (Chen-1995)	15.75
		95% Modified-t UCL (Johnson-1978)	16.35

Gamma GOF Test

A-D Test Statistic	0.386	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.659	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.307	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.396	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.651	k star (bias corrected MLE)	1.579
Theta hat (MLE)	1.792	Theta star (bias corrected MLE)	6.411
nu hat (MLE)	45.21	nu star (bias corrected)	12.64
MLE Mean (bias corrected)	10.13	MLE Sd (bias corrected)	8.057
		Approximate Chi Square Value (0.05)	5.648
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	22.65	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.891	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.275	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.808	Mean of logged Data	2.224
Maximum of Logged Data	2.833	SD of logged Data	0.486

Assuming Lognormal Distribution

95% H-UCL	28.48	90% Chebyshev (MVUE) UCL	17.31
95% Chebyshev (MVUE) UCL	20.59	97.5% Chebyshev (MVUE) UCL	25.13
99% Chebyshev (MVUE) UCL	34.05		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	14.32	95% Jackknife UCL	16.13

95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	17.78	95% Chebyshev(Mean, Sd) UCL	21.25
97.5% Chebyshev(Mean, Sd) UCL	26.06	99% Chebyshev(Mean, Sd) UCL	35.51

Suggested UCL to Use
95% Student's-t UCL **16.13**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 7 - 1 Depth

General Statistics

Total Number of Observations	4	Number of Distinct Observations	4
		Number of Missing Observations	0
Minimum	0.5	Mean	2.78
Maximum	**5.8**	Median	2.4
SD	2.279	Std. Error of Mean	1.14
Coefficient of Variation	0.821	Skewness	0.827

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.964	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.193	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	5.457	95% Adjusted-CLT UCL (Chen-1995)	5.153
		95% Modified-t UCL (Johnson-1978)	5.536

Gamma GOF Test

A-D Test Statistic	0.194	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.662	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.172	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.399	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.622	k star (bias corrected MLE)	0.572
Theta hat (MLE)	1.711	Theta star (bias corrected MLE)	4.851
nu hat (MLE)	12.97	nu star (bias corrected)	4.577
MLE Mean (bias corrected)	2.775	MLE Sd (bias corrected)	3.669
		Approximate Chi Square Value (0.05)	0.962
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	13.2	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.973	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.193	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-0.693	Mean of logged Data	0.682
Maximum of Logged Data	1.758	SD of logged Data	1.045

Assuming Lognormal Distribution

95% H-UCL	225.8	90% Chebyshev (MVUE) UCL	7.071
95% Chebyshev (MVUE) UCL	8.965	97.5% Chebyshev (MVUE) UCL	11.59
99% Chebyshev (MVUE) UCL	16.75		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	4.65	95% Jackknife UCL	5.457
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	6.194	95% Chebyshev(Mean, Sd) UCL	7.743
97.5% Chebyshev(Mean, Sd) UCL	9.893	99% Chebyshev(Mean, Sd) UCL	14.12

Suggested UCL to Use

95% Student's-t UCL	**5.46**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 7 - 2 Depth

General Statistics

Total Number of Observations	4	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	0.5	Mean	1.48
Maximum	**4.4**	Median	0.5
SD	1.95	Std. Error of Mean	0.975
Coefficient of Variation	1.322	Skewness	2

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.63	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.748	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.441	Lilliefors GOF Test
5% Lilliefors Critical Value	0.375	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	3.77	95% Adjusted-CLT UCL (Chen-1995)	4.121
		95% Modified-t UCL (Johnson-1978)	3.932

Gamma GOF Test

A-D Test Statistic	0.961	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.666	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.476	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.402	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.065	k star (bias corrected MLE)	0.433

Theta hat (MLE)	1.385	Theta star (bias corrected MLE)	3.407
nu hat (MLE)	8.519	nu star (bias corrected)	3.463
MLE Mean (bias corrected)	1.475	MLE Sd (bias corrected)	2.242
		Approximate Chi Square Value (0.05)	0.522
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	9.787	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.63	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.441	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.375	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	-0.693	Mean of logged Data	-0.149
Maximum of Logged Data	1.482	SD of logged Data	1.087

Assuming Lognormal Distribution

95% H-UCL	145	90% Chebyshev (MVUE) UCL	3.236
95% Chebyshev (MVUE) UCL	4.115	97.5% Chebyshev (MVUE) UCL	5.334
99% Chebyshev (MVUE) UCL	7.729		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	3.079	95% Jackknife UCL	N/A
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	4.4	95% Chebyshev(Mean, Sd) UCL	5.725
97.5% Chebyshev(Mean, Sd) UCL	7.564	99% Chebyshev(Mean, Sd) UCL	11.18

Suggested UCL to Use
Recommendation Provided only for 95% Confidence Coefficien

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 7 - 4.5 Depth

General Statistics

Total Number of Observations	1	Number of Distinct Observations	1
		Number of Missing Observations	0
Minimum	6.4	Mean	6.4
Maximum	**6.4**	Median	6.4

Warning: This data set only has 1 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable Group 6 - 4.5 Depth was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Group 7 - 11.5 Depth

General Statistics

Total Number of Observations	1	Number of Distinct Observations	1

		Number of Missing Observations	0
Minimum	4.5	Mean	4.5
Maximum	**4.5**	Median	4.5

Warning: This data set only has 1 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable Group 6 - 11.5 Depth was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Group 8 - 0 Depth

General Statistics

Total Number of Observations	4	Number of Distinct Observations	4
		Number of Missing Observations	0
Minimum	2.4	Mean	8.73
Maximum	**21**	Median	5.75
SD	8.334	Std. Error of Mean	4.167
Coefficient of Variation	0.955	Skewness	1.778

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.786	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.387	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Data Not Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	18.53	95% Adjusted-CLT UCL (Chen-1995)	19.54
		95% Modified-t UCL (Johnson-1978)	19.15

Gamma GOF Test

A-D Test Statistic	0.424	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.661	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.347	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.399	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.753	k star (bias corrected MLE)	0.605
Theta hat (MLE)	4.978	Theta star (bias corrected MLE)	14.42
nu hat (MLE)	14.02	nu star (bias corrected)	4.839
MLE Mean (bias corrected)	8.725	MLE Sd (bias corrected)	11.22
		Approximate Chi Square Value (0.05)	1.078
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	39.15	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.931	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.293	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.875	Mean of logged Data	1.855
Maximum of Logged Data	3.045	SD of logged Data	0.894

Assuming Lognormal Distribution

95% H-UCL	210.7	90% Chebyshev (MVUE) UCL	19.2
95% Chebyshev (MVUE) UCL	24.06	97.5% Chebyshev (MVUE) UCL	30.79
99% Chebyshev (MVUE) UCL	44.03		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	15.58	95% Jackknife UCL	18.53
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	21.23	95% Chebyshev(Mean, Sd) UCL	26.89
97.5% Chebyshev(Mean, Sd) UCL	34.75	99% Chebyshev(Mean, Sd) UCL	50.19

Suggested UCL to Use
95% Student's-t UCL **18.53**

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 8 - 1 Depth

General Statistics

Total Number of Observations	4	Number of Distinct Observations	4
		Number of Missing Observations	0
Minimum	3.0	Mean	5.1
Maximum	**8.2**	Median	4.6
SD	2.443	Std. Error of Mean	1.221
Coefficient of Variation	0.479	Skewness	0.696

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.898	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.748	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.269	Lilliefors GOF Test
5% Lilliefors Critical Value	0.375	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	7.974	95% Adjusted-CLT UCL (Chen-1995)	7.563
		95% Modified-t UCL (Johnson-1978)	8.045

Gamma GOF Test

A-D Test Statistic	0.366	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.659	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.302	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.396	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.953	k star (bias corrected MLE)	1.655
Theta hat (MLE)	0.857	Theta star (bias corrected MLE)	3.082
nu hat (MLE)	47.62	nu star (bias corrected)	13.24
MLE Mean (bias corrected)	5.1	MLE Sd (bias corrected)	3.964
		Approximate Chi Square Value (0.05)	6.054
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	11.15	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.904	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.748	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.267	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.375	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	1.099	Mean of logged Data	1.543
Maximum of Logged Data	2.104	SD of logged Data	0.479

Assuming Lognormal Distribution

95% H-UCL	14	90% Chebyshev (MVUE) UCL	8.686
95% Chebyshev (MVUE) UCL	10.31	97.5% Chebyshev (MVUE) UCL	12.57
99% Chebyshev (MVUE) UCL	17.01		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	7.109	95% Jackknife UCL	7.974
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	8.764	95% Chebyshev(Mean, Sd) UCL	10.42
97.5% Chebyshev(Mean, Sd) UCL	12.73	99% Chebyshev(Mean, Sd) UCL	17.25

Suggested UCL to Use
95% Student's-t UCL **7.97**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 8 - 2 Depth

General Statistics

Total Number of Observations	1	Number of Distinct Observations	1
		Number of Missing Observations	0
Minimum	4.8	Mean	4.8
Maximum	**4.8**	Median	4.8

Warning: This data set only has 1 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable Group 7 - 2 Depth was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Group 9 - 0 Depth

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	5.4	Mean	10.8
Maximum	**16**	Median	11
SD	5.303	Std. Error of Mean	3.062
Coefficient of Variation	0.491	Skewness	-0.169

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.999	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.182	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	19.74	95% Adjusted-CLT UCL (Chen-1995)	15.52
		95% Modified-t UCL (Johnson-1978)	19.69

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	5.485	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.969	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	32.91	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.969	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.247	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.686	Mean of logged Data	2.286
Maximum of Logged Data	2.773	SD of logged Data	0.552

Assuming Lognormal Distribution

95% H-UCL	187.7	90% Chebyshev (MVUE) UCL	20.85
95% Chebyshev (MVUE) UCL	25.38	97.5% Chebyshev (MVUE) UCL	31.67
99% Chebyshev (MVUE) UCL	44.02		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	15.84	95% Jackknife UCL	19.74
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	19.98	95% Chebyshev(Mean, Sd) UCL	24.15
97.5% Chebyshev(Mean, Sd) UCL	29.92	99% Chebyshev(Mean, Sd) UCL	41.26

Suggested UCL to Use

95% Student's-t UCL **19.74**

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

Group 9 - 1 Depth

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	0.5	Mean	3.1
Maximum	**5.2**	Median	3.6
SD	2.39	Std. Error of Mean	1.38
Coefficient of Variation	0.771	Skewness	-0.9

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.967	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.25	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	7.128	95% Adjusted-CLT UCL (Chen-1995)	4.603
		95% Modified-t UCL (Johnson-1978)	7.009

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	1.44	k star (bias corrected MLE)	N/A
Theta hat (MLE)	2.153	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	8.637	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.864	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.331	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-0.693	Mean of logged Data	0.745
Maximum of Logged Data	1.649	SD of logged Data	1.259

Assuming Lognormal Distribution

95% H-UCL	10746807	90% Chebyshev (MVUE) UCL	9.592
95% Chebyshev (MVUE) UCL	12.41	97.5% Chebyshev (MVUE) UCL	16.31
99% Chebyshev (MVUE) UCL	23.99		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	5.369	95% Jackknife UCL	7.128
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	7.239	95% Chebyshev(Mean, Sd) UCL	9.114
97.5% Chebyshev(Mean, Sd) UCL	11.72	99% Chebyshev(Mean, Sd) UCL	16.83

Suggested UCL to Use
95% Student's-t UCL 7.13

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

Group 9 - 2 Depth

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	2.5	Mean	8.03
Maximum	**18**	Median	3.6
SD	8.649	Std. Error of Mean	4.993
Coefficient of Variation	1.077	Skewness	1.701

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.803	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.363	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	22.61	95% Adjusted-CLT UCL (Chen-1995)	21.49
		95% Modified-t UCL (Johnson-1978)	23.43

Gamma GOF Test
Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	1.433	k star (bias corrected MLE)	N/A
Theta hat (MLE)	5.604	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	8.6	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.883	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.32	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.916	Mean of logged Data	1.696
Maximum of Logged Data	2.89	SD of logged Data	1.05

Assuming Lognormal Distribution

95% H-UCL	250549	90% Chebyshev (MVUE) UCL	19.95
95% Chebyshev (MVUE) UCL	25.52	97.5% Chebyshev (MVUE) UCL	33.25
99% Chebyshev (MVUE) UCL	48.44		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	16.25	95% Jackknife UCL	22.61
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	23.01	95% Chebyshev(Mean, Sd) UCL	29.8
97.5% Chebyshev(Mean, Sd) UCL	39.22	99% Chebyshev(Mean, Sd) UCL	57.72

Suggested UCL to Use

95% Student's-t UCL	**22.61**

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 10 - 0 Depth

General Statistics

Total Number of Observations	2	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	4.4	Mean	14.2
Maximum	**24**	Median	14.2

Warning: This data set only has 2 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable Group 10 - 0 Depth was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Group 10 - 1 Depth

General Statistics

Total Number of Observations	1	Number of Distinct Observations	1
		Number of Missing Observations	0
Minimum	7.1	Mean	7.1
Maximum	**7.1**	Median	7.1

Warning: This data set only has 1 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable Group 10 - 1 Depth was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Group 10 - 2 Depth

General Statistics

Total Number of Observations	1	Number of Distinct Observations	1
		Number of Missing Observations	0
Minimum	7.6	Mean	7.6
Maximum	**7.6**	Median	7.6

Warning: This data set only has 1 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable Group 10 - 2 Depth was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Group 11 - 0 Depth

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	4.1	Mean	8.43
Maximum	**15**	Median	6.2
SD	5.783	Std. Error of Mean	3.339
Coefficient of Variation	0.686	Skewness	1.479

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.888	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.317	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	18.18	95% Adjusted-CLT UCL (Chen-1995)	16.97
		95% Modified-t UCL (Johnson-1978)	18.66

Gamma GOF Test
Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	3.469	k star (bias corrected MLE)	N/A
Theta hat (MLE)	2.431	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	20.81	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.958	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.26	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.411	Mean of logged Data	1.981
Maximum of Logged Data	2.708	SD of logged Data	0.663

Assuming Lognormal Distribution

95% H-UCL	514.5	90% Chebyshev (MVUE) UCL	17.45
95% Chebyshev (MVUE) UCL	21.57	97.5% Chebyshev (MVUE) UCL	27.29
99% Chebyshev (MVUE) UCL	38.52		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	13.93	95% Jackknife UCL	18.18
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	18.45	95% Chebyshev(Mean, Sd) UCL	22.99
97.5% Chebyshev(Mean, Sd) UCL	29.28	99% Chebyshev(Mean, Sd) UCL	41.65

Suggested UCL to Use

95% Student's-t UCL	**18.18**

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 11 - 1 Depth

General Statistics

Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	4.3	Mean	4.93
Maximum	**5.7**	Median	4.8
SD	0.709	Std. Error of Mean	0.41
Coefficient of Variation	0.144	Skewness	0.816

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.973	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.241	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	6.129	95% Adjusted-CLT UCL (Chen-1995)	5.813
		95% Modified-t UCL (Johnson-1978)	6.162

Gamma GOF Test
Not Enough Data to Perform GOF Test

Gamma Statistics			
k hat (MLE)	73.89	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0668	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	443.3	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test		
Shapiro Wilk Test Statistic	0.984	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.224	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level
Data appear Lognormal at 5% Significance Level		

Lognormal Statistics			
Minimum of Logged Data	1.459	Mean of logged Data	1.589
Maximum of Logged Data	1.74	SD of logged Data	0.142

Assuming Lognormal Distribution			
95% H-UCL	6.654	90% Chebyshev (MVUE) UCL	6.144
95% Chebyshev (MVUE) UCL	6.692	97.5% Chebyshev (MVUE) UCL	7.453
99% Chebyshev (MVUE) UCL	8.948		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs			
95% CLT UCL	5.607	95% Jackknife UCL	6.129
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	6.162	95% Chebyshev(Mean, Sd) UCL	6.719
97.5% Chebyshev(Mean, Sd) UCL	7.491	99% Chebyshev(Mean, Sd) UCL	9.009

Suggested UCL to Use
95% Student's-t UCL **6.13**

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Group 11 - 2 Depth

General Statistics			
Total Number of Observations	3	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	3.2	Mean	4.63
Maximum	**7.2**	Median	3.5
SD	2.228	Std. Error of Mean	1.286
Coefficient of Variation	0.481	Skewness	1.697

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.806	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.361	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	8.389	95% Adjusted-CLT UCL (Chen-1995)	8.095
		95% Modified-t UCL (Johnson-1978)	8.599

Gamma GOF Test

Not Enough Data to Perform GOF Test

Gamma Statistics

k hat (MLE)	7.311	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.634	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	43.87	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
		Approximate Chi Square Value (0.05)	N/A
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	N/A	95% Adjusted Gamma UCL (use when n<50)	N/A

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.832	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.767	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.349	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.425	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.163	Mean of logged Data	1.463
Maximum of Logged Data	1.974	SD of logged Data	0.445

Assuming Lognormal Distribution

95% H-UCL	29.24	90% Chebyshev (MVUE) UCL	8.075
95% Chebyshev (MVUE) UCL	9.644	97.5% Chebyshev (MVUE) UCL	11.82
99% Chebyshev (MVUE) UCL	16.1		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	6.749	95% Jackknife UCL	8.389
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	8.492	95% Chebyshev(Mean, Sd) UCL	10.24
97.5% Chebyshev(Mean, Sd) UCL	12.67	99% Chebyshev(Mean, Sd) UCL	17.43

Suggested UCL to Use

95% Student's-t UCL **8.39**

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Pb - Site

General Statistics

Total Number of Observations	126	Number of Distinct Observations	72
		Number of Missing Observations	0
Minimum	0.5	Mean	10.07
Maximum	**120**	Median	5.7
SD	14.76	Std. Error of Mean	1.315
Coefficient of Variation	1.466	Skewness	4.384

Normal GOF Test

Shapiro Wilk Test Statistic	0.59	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.258	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0793	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	12.24	95% Adjusted-CLT UCL (Chen-1995)	12.78
		95% Modified-t UCL (Johnson-1978)	12.33

Gamma GOF Test

A-D Test Statistic	2.482	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.789	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.131	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0856	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	0.88	k star (bias corrected MLE)	0.864
Theta hat (MLE)	11.44	Theta star (bias corrected MLE)	11.65
nu hat (MLE)	221.7	nu star (bias corrected)	217.8
MLE Mean (bias corrected)	10.07	MLE Sd (bias corrected)	10.83
		Approximate Chi Square Value (0.05)	184.6
Adjusted Level of Significance	0.0481	Adjusted Chi Square Value	184.3

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	11.87	95% Adjusted Gamma UCL (use when n<50)	11.9

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.922	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	2.69E-08	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.115	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0793	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	-0.693	Mean of logged Data	1.643
Maximum of Logged Data	4.787	SD of logged Data	1.232

Assuming Lognormal Distribution

95% H-UCL	14.39	90% Chebyshev (MVUE) UCL	15.57
95% Chebyshev (MVUE) UCL	17.68	97.5% Chebyshev (MVUE) UCL	20.6
99% Chebyshev (MVUE) UCL	26.34		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	12.23	95% Jackknife UCL	12.24
95% Standard Bootstrap UCL	12.22	95% Bootstrap-t UCL	13.16
95% Hall's Bootstrap UCL	13.98	95% Percentile Bootstrap UCL	12.36
95% BCA Bootstrap UCL	13.09		
90% Chebyshev(Mean, Sd) UCL	14.01	95% Chebyshev(Mean, Sd) UCL	15.8
97.5% Chebyshev(Mean, Sd) UCL	18.28	99% Chebyshev(Mean, Sd) UCL	23.15

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL **15.8**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Uncensored Full Data Sets

User Selected Options

Date/Time of Computation	ProUCL 5.110/1/2018 9:04:48 AM
From File	UCL Input_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

As

General Statistics

Total Number of Observations	31	Number of Distinct Observations	19
		Number of Missing Observations	0
Minimum	0.5	Mean	2.668
Maximum	**6.2**	Median	2.4
SD	1.832	Std. Error of Mean	0.329
Coefficient of Variation	0.687	Skewness	0.367

Normal GOF Test

Shapiro Wilk Test Statistic	0.904	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.929	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.14	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.156	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	3.226	95% Adjusted-CLT UCL (Chen-1995)	3.232
		95% Modified-t UCL (Johnson-1978)	3.23

Gamma GOF Test

A-D Test Statistic	1.144	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.762	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.181	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.16	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.69	k star (bias corrected MLE)	1.548
Theta hat (MLE)	1.579	Theta star (bias corrected MLE)	1.723
nu hat (MLE)	104.8	nu star (bias corrected)	95.98
MLE Mean (bias corrected)	2.668	MLE Sd (bias corrected)	2.144
		Approximate Chi Square Value (0.05)	74.38
Adjusted Level of Significance	0.0413	Adjusted Chi Square Value	73.32

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	3.442	95% Adjusted Gamma UCL (use when n<50)	3.492

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.847	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.929	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.189	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.156	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-0.693	Mean of logged Data	0.657
Maximum of Logged Data	1.825	SD of logged Data	0.909

Assuming Lognormal Distribution

95% H-UCL	4.286	90% Chebyshev (MVUE) UCL	4.448
95% Chebyshev (MVUE) UCL	5.165	97.5% Chebyshev (MVUE) UCL	6.161
99% Chebyshev (MVUE) UCL	8.118		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	3.209	95% Jackknife UCL	3.226
95% Standard Bootstrap UCL	3.195	95% Bootstrap-t UCL	3.254
95% Hall's Bootstrap UCL	3.219	95% Percentile Bootstrap UCL	3.203
95% BCA Bootstrap UCL	3.229		
90% Chebyshev(Mean, Sd) UCL	3.655	95% Chebyshev(Mean, Sd) UCL	4.102
97.5% Chebyshev(Mean, Sd) UCL	4.723	99% Chebyshev(Mean, Sd) UCL	5.942

Suggested UCL to Use
95% Student's-t UCL **3.23**

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Co

General Statistics

Total Number of Observations	31	Number of Distinct Observations	24
		Number of Missing Observations	0
Minimum	8.2	Mean	27.4
Maximum	**79**	Median	24
SD	17.94	Std. Error of Mean	3.223
Coefficient of Variation	0.655	Skewness	1.35

Normal GOF Test

Shapiro Wilk Test Statistic	0.86	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.929	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.174	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.156	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	32.87	95% Adjusted-CLT UCL (Chen-1995)	33.54
		95% Modified-t UCL (Johnson-1978)	33

Gamma GOF Test

A-D Test Statistic	0.49	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.754	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.108	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.159	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.83	k star (bias corrected MLE)	2.578
Theta hat (MLE)	9.683	Theta star (bias corrected MLE)	10.63
nu hat (MLE)	175.5	nu star (bias corrected)	159.8
MLE Mean (bias corrected)	27.4	MLE Sd (bias corrected)	17.07
		Approximate Chi Square Value (0.05)	131.6
Adjusted Level of Significance	0.0413	Adjusted Chi Square Value	130.2

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	33.28	95% Adjusted Gamma UCL (use when n<50)	33.65

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.962	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.929	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.108	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.156	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.104	Mean of logged Data	3.124
Maximum of Logged Data	4.369	SD of logged Data	0.617

Assuming Lognormal Distribution

95% H-UCL	34.54	90% Chebyshev (MVUE) UCL	36.97
95% Chebyshev (MVUE) UCL	41.36	97.5% Chebyshev (MVUE) UCL	47.44
99% Chebyshev (MVUE) UCL	59.38		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	32.7	95% Jackknife UCL	32.87
95% Standard Bootstrap UCL	32.55	95% Bootstrap-t UCL	34.21
95% Hall's Bootstrap UCL	33.99	95% Percentile Bootstrap UCL	33.11
95% BCA Bootstrap UCL	33.42		
90% Chebyshev(Mean, Sd) UCL	37.07	95% Chebyshev(Mean, Sd) UCL	41.45
97.5% Chebyshev(Mean, Sd) UCL	47.53	99% Chebyshev(Mean, Sd) UCL	59.47

Suggested UCL to Use

95% Adjusted Gamma UCL	**33.65**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Ni

General Statistics

Total Number of Observations	31	Number of Distinct Observations	30
		Number of Missing Observations	0
Minimum	65	Mean	445.4
Maximum	**1700**	Median	370
SD	408	Std. Error of Mean	73.28
Coefficient of Variation	0.916	Skewness	1.476

Normal GOF Test

Shapiro Wilk Test Statistic	0.839	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.929	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.18	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.156	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	569.7	95% Adjusted-CLT UCL (Chen-1995)	586.6
		95% Modified-t UCL (Johnson-1978)	573

Gamma GOF Test

A-D Test Statistic	0.534	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.768	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.122	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.161	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.315	k star (bias corrected MLE)	1.21
Theta hat (MLE)	338.5	Theta star (bias corrected MLE)	368.2
nu hat (MLE)	81.56	nu star (bias corrected)	75
MLE Mean (bias corrected)	445.4	MLE Sd (bias corrected)	404.9
		Approximate Chi Square Value (0.05)	56.05
Adjusted Level of Significance	0.0413	Adjusted Chi Square Value	55.14

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	595.9	95% Adjusted Gamma UCL (use when n<50)	605.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.931	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.929	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.13	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.156	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.174	Mean of logged Data	5.673
Maximum of Logged Data	7.438	SD of logged Data	0.987

Assuming Lognormal Distribution

95% H-UCL	730.1	90% Chebyshev (MVUE) UCL	745
95% Chebyshev (MVUE) UCL	872.9	97.5% Chebyshev (MVUE) UCL	1050
99% Chebyshev (MVUE) UCL	1399		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	565.9	95% Jackknife UCL	569.7
95% Standard Bootstrap UCL	567.6	95% Bootstrap-t UCL	598.6
95% Hall's Bootstrap UCL	592.4	95% Percentile Bootstrap UCL	570.3
95% BCA Bootstrap UCL	579.5		
90% Chebyshev(Mean, Sd) UCL	665.2	95% Chebyshev(Mean, Sd) UCL	764.8
97.5% Chebyshev(Mean, Sd) UCL	903	99% Chebyshev(Mean, Sd) UCL	1174

Suggested UCL to Use

95% Adjusted Gamma UCL	**606**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

TPHd

General Statistics

Total Number of Observations	46	Number of Distinct Observations	36
		Number of Missing Observations	0
Minimum	2.8	Mean	32.23
Maximum	260	Median	9.1
SD	58.43	Std. Error of Mean	8.614
Coefficient of Variation	1.813	Skewness	2.845

Normal GOF Test

Shapiro Wilk Test Statistic	0.518	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.945	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.35	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.129	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	46.7	95% Adjusted-CLT UCL (Chen-1995)	50.26
		95% Modified-t UCL (Johnson-1978)	47.3

Gamma GOF Test

A-D Test Statistic	4.425	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.794	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.262	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.136	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	0.709	k star (bias corrected MLE)	0.677
Theta hat (MLE)	45.49	Theta star (bias corrected MLE)	47.62
nu hat (MLE)	65.19	nu star (bias corrected)	62.27
MLE Mean (bias corrected)	32.23	MLE Sd (bias corrected)	39.18
		Approximate Chi Square Value (0.05)	45.12
Adjusted Level of Significance	0.0448	Adjusted Chi Square Value	44.65

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	44.48	95% Adjusted Gamma UCL (use when n<50)	44.96

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.878	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.945	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.181	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.129	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	1.03	Mean of logged Data	2.622
Maximum of Logged Data	5.561	SD of logged Data	1.143

Assuming Lognormal Distribution

95% H-UCL	40.37	90% Chebyshev (MVUE) UCL	41.72
95% Chebyshev (MVUE) UCL	48.91	97.5% Chebyshev (MVUE) UCL	58.89
99% Chebyshev (MVUE) UCL	78.48		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	46.4	95% Jackknife UCL	46.7
95% Standard Bootstrap UCL	46.59	95% Bootstrap-t UCL	54.88
95% Hall's Bootstrap UCL	47.03	95% Percentile Bootstrap UCL	47.9
95% BCA Bootstrap UCL	50.59		
90% Chebyshev(Mean, Sd) UCL	58.08	95% Chebyshev(Mean, Sd) UCL	69.78
97.5% Chebyshev(Mean, Sd) UCL	86.03	99% Chebyshev(Mean, Sd) UCL	117.9

Suggested UCL to Use
95% Chebyshev (Mean, Sd) UCL **69.78**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Project No. E9080-02-01
October 8, 2018

APPROVED AUGUST 16, 2019

Bill Wagner
HMH Engineers
1570 Oakland Road
San Jose, California 95131

Subject: ASBESTOS AND LEAD-CONTAINING PAINT SURVEY REPORT
BLOSSOM HILL ROAD OVERCROSSING (37-0348L/R)
SANTA CLARA COUNTY, CALIFORNIA

Dear Mr. Wagner:

We have performed an asbestos and lead-containing paint (LCP) survey of the subject overcrossing (OC) on Highway 101 in Santa Clara County, California. Our scope of services included surveying the structure for suspect asbestos-containing materials and LCP, collecting bulk samples, and submitting the samples to laboratories for analyses.

PROJECT DESCRIPTION

The project consists of both spans of the Blossom Hill Road OC (37-0348L/R) (formerly identified as the Route 82 Separation or the Silver Creek Road OC) at Post Mile (PM) 28.6 on Highway 101 in Santa Clara County, California. We performed asbestos and LCP survey activities at the project location. The project location is depicted on the Vicinity Map (Figure 1), Site Plan (Figure 2), and in the attached photographs.

GENERAL OBJECTIVES

Our scope of services included determination of the presence and quantity of asbestos and LCP at the project location prior to various improvements. The information obtained from this investigation will be used by HMH Engineers for waste profiling, determining California Occupational Safety and Health Administration (Cal/OSHA) applicability, and coordinating asbestos and LCP disturbance activities.

> *It was not Geocon's intent during this inspection to conduct an evaluation of lead-based paint hazards in accordance with U.S. Department of Housing and Urban Development (HUD) guidelines.*

BACKGROUND

Asbestos

The Code of Federal Regulations (CFR), 40 CFR 61, Subpart M, NESHAP and Federal Occupational Safety and Health Administration (FED OSHA) classify asbestos-containing material (ACM) as any material or product that contains *greater than* 1% asbestos. Nonfriable ACM is classified by NESHAP as either Category I or Category II material defined as follows:

- **Category I** – asbestos-containing packings, gaskets, resilient floor coverings, and asphalt roofing products.
- **Category II** – all remaining types of nonfriable asbestos-containing material not included in Category I that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Regulated asbestos-containing material (RACM), a California hazardous waste when friable, is classified as any manufactured material that contains *greater than* 1% asbestos by dry weight *and* is:

- Friable (can be crumbled, pulverized, or reduced to powder by hand pressure); or
- Category I material that has become friable; or
- Category I material that has been subjected to sanding, grinding, cutting, or abrading; or
- Category II nonfriable material that has a high probability of becoming crumbled, pulverized, or reduced to a powder during demolition or renovation activities.

Activities that disturb materials containing *any* amount of asbestos are subject to certain requirements of the Cal/OSHA asbestos standard contained in Title 8, California Code of Regulations (CCR) §1529. Typically, removal or disturbance of more than 100 square feet of material containing more than 0.1% asbestos must be performed by a registered asbestos contractor, but associated waste labeling is not required if the material contains 1% or less asbestos. When the asbestos content of a material exceeds 1%, virtually all requirements of the standard become effective.

Materials containing more than 1% asbestos are also subject to NESHAP regulations (40 CFR Part 61, Subpart M). RACM (friable ACM and nonfriable ACM that will become friable during demolition operations) must be removed from structures prior to demolition. Certain nonfriable ACM and materials containing 1% or less asbestos may remain in structures during demolition; however, there are waste handling/disposal issues and Cal/OSHA work requirements that must be addressed. Contractors are responsible for segregating and characterizing waste streams prior to disposal.

With respect to potential worker exposure, notification, and registration requirements, Cal/OSHA defines asbestos-containing construction material (ACCM) as construction material that contains more than 0.1% asbestos (Title 8, CCR 341.6).

Lead

Construction activities (including demolition) that disturb materials or paints containing *any* amount of lead are subject to certain requirements of the Cal/OSHA lead standard contained in Title 8, CCR, §1532.1. Deteriorated paint is defined by Title 17, CCR, Division 1, Chapter 8, §35022 as a surface coating that is cracking, chalking, flaking, chipping, peeling, non-intact, failed, or otherwise separating from a substrate. Demolition of a deteriorated LCP component would require waste characterization and appropriate disposal. Intact LCP on a component is currently accepted by most landfills and recycling facilities; however, contractors are responsible for segregating and characterizing waste streams prior to disposal.

For a solid waste containing lead, the waste is classified as California hazardous when: 1) the representative total lead content equals or exceeds the respective Total Threshold Limit Concentration (TTLC) of 1,000 milligrams per kilogram (mg/kg); or 2) the representative soluble lead content equals or exceeds the respective Soluble Threshold Limit Concentration (STLC) of 5 milligrams per liter (mg/l) based on the standard Waste Extraction Test (WET). A waste has the potential for exceeding the lead STLC when the waste's representative total lead content is greater than or equal to ten times the respective STLC value since the WET uses a 1:10 dilution ratio. Hence, when total lead is detected at a concentration greater than or equal to 50 mg/kg, and assuming that 100 percent of the total lead is soluble, soluble lead analysis is required. Lead-containing waste is classified as "Resource, Conservation, and Recovery Act" (RCRA) hazardous, or Federal hazardous, when the representative soluble lead content equals or exceeds the Federal regulatory level of 5 mg/l based on the Toxicity Characteristic Leaching Procedure (TCLP).

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

Potential hazards exist to workers who remove or cut through LCP coatings during demolition. Dust containing hazardous concentrations of lead may be generated during scraping or cutting materials coated with lead-containing paint. Torching of these materials may produce lead oxide fumes. Therefore, air monitoring and/or respiratory protection may be required during the demolition of materials coated with LCP. Guidelines regarding regulatory provisions for construction work where workers may be exposed to lead are presented in Title 8, CCR, §1532.1.

SCOPE OF SERVICES

Mr. David Watts, a California-Certified Asbestos Consultant (CAC), certification No. 98-2404 (expiration September 16, 2019), and Certified Lead Paint Inspector/Assessor and Project Monitor with the California Department of Public Health (DPH), certification numbers I-1734 and M-1734 (expiration December 4, 2019), performed the asbestos and LCP survey at the project location on September 13, 2018.

Asbestos

Suspect ACM were grouped into homogeneous areas with representative samples randomly collected from each. In addition, each potential ACM was evaluated for friability. A total of nine bulk asbestos samples representing three suspect materials were collected.

Our procedures for inspection and sampling are discussed below:

- Collected bulk asbestos samples after first wetting friable materials with a light mist of water. The samples were then cut from the substrate and transferred to labeled containers.
- Relinquished bulk asbestos samples to EMSL Analytical, Inc. (EMSL), a California-licensed laboratory, for asbestos analysis in accordance with United States Environmental Protection Agency (EPA) Test Method 600/R-93/116 using polarized light microscopy (PLM) under chain-of-custody protocol. EMSL is a laboratory accredited by the National Institute of Standards and Technology National Voluntary Laboratory Accreditation Program (NIST-NVLAP) for bulk asbestos fiber analysis. The laboratory analyses were requested on a 1-week turnaround.

Approximate sample locations are presented on Figure 2. Materials represented by the samples collected are shown in the attached photographs.

Lead

A total of four bulk paint samples were collected from suspect LCP observed at the project location. Mr. Watts field composited the suspect LCP samples into two paint schemes prior to submittal to the laboratory. We did not observe deteriorated LCP during our survey. Our sampling procedures are discussed below:

- Collected bulk samples of suspect LCP using techniques presented in HUD guidelines. In addition, the painted areas were evaluated for evidence of deterioration such as flaking or cracking.

- Relinquished the composite bulk LCP sample under chain-of-custody protocol to EMSL for lead analysis in accordance with EPA Test Method 6010B. EMSL is accredited by the DPH for lead analysis. Laboratory analyses were requested on a 1-week turnaround.

Approximate sample locations are presented on Figure 2. Materials represented by the samples collected are shown in the attached photographs.

INVESTIGATIVE RESULTS

Asbestos

Asbestos was not detected in samples of the suspect materials collected during our survey. Sample identification numbers, material descriptions, approximate quantities, friability assessments, and a summary of the analytical laboratory test results for asbestos are summarized below. Reproductions of the laboratory report and chain-of-custody documentation are attached.

Polarized Light Microscopy (PLM) - EPA Test Method 600/R-93/116				
Sample Group	**Description of Material**	**Approximate Quantity**	**Friable**	**Asbestos Content**
1	Concrete	NA	NA	ND
2	Asphalt (approaches)	NA	NA	ND
3	Joint fill material	NA	NA	ND

NA = Not applicable
ND = Not detected

Lead

Representative total lead was not detected at or above the laboratory reporting limit of 100 mg/kg in samples representing intact white and yellow traffic striping. Representative soluble (WET) lead concentrations were 0.375 and 0.394 mg/l, respectively.

Sample identification numbers, descriptions, peeling and flaking quantities, and a summary of the analytical laboratory test results for paint are summarized below. Reproductions of the laboratory report and chain-of-custody documentation are attached.

Sample No.	Paint Description	Approximate Quantity Peeling/Flaking	Total Lead (mg/kg)	WET Lead (mg/l)
P1A/B	White traffic striping	Intact	<100	0.375
P2A/B	Yellow traffic striping	Intact	<100	0.394

mg/kg = milligrams per kilogram (EPA Test Method 7000B)
WET = Waste Extraction Test
mg/l = milligrams per liter

RECOMMENDATIONS

Asbestos

Since no asbestos was detected, the Cal/OSHA asbestos standard does not apply for planned activities affecting materials represented by samples collected during our survey. In addition, associated debris would not be considered a California hazardous waste based on asbestos content. Written notification to the Bay Area Air Quality Management District (BAAQMD) is required ten working days prior to commencement of *any* demolition activity (whether asbestos is present or not).

Lead

Paint sampled during our survey would not be considered a California or Federal hazardous waste based on lead content.

We recommend that all paints at the project location (graffiti, signage, etc.) be treated as lead-containing for purposes of determining the applicability of the Cal/OSHA lead standard during maintenance, renovation, and demolition activities. This recommendation is based on LCP sample results and the fact that lead was a common ingredient of paints manufactured before 1978 and is still an ingredient of some paints. In accordance with Title 8, CCR, §1532.1(p), written notification to the nearest Cal/OSHA district office is required at least 24 hours prior to certain lead-related work. Compliance and training requirements regarding construction activities where workers may be exposed to lead are presented in Title 8, CCR, §1532.1, subsections (e) and (l), respectively. Contractors are responsible for segregating and characterizing waste streams prior to disposal.

REPORT LIMITATIONS

Our asbestos and LCP survey was conducted in conformance with generally accepted standards of practice for identifying and evaluating asbestos and LCP in structures. The survey addressed only the locations and materials identified above. Due to the nature of structure surveys, asbestos and LCP use, and laboratory analytical limitations, some ACM or LCP at the project location may not have been identified. Spaces such as cavities, voids, crawlspaces, and pipe chases may have been concealed to our investigator. Previous renovation work may have concealed or covered spaces or materials or may have partially demolished materials and left debris in inaccessible areas. Additionally, renovation activities may have partially replaced ACM with indistinguishable non-ACM. Asbestos and/or LCP may exist in areas of the structure that were not accessible or sampled in conjunction with our scope of services.

During renovation or demolition operations, suspect materials may be uncovered which are different from those accessible for sampling during this assessment. Personnel in charge of renovation/demolition should be alerted to note materials uncovered during such activities that differ substantially from those included in this or previous assessment reports. If suspect ACM and/or LCP are found, additional sampling and analysis should be performed to determine if the materials contain asbestos or lead.

This report has been prepared exclusively for HMH Engineers. 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 with respect to the content of this report or any subsequent reports, correspondence or consultation. Geocon 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.

The contents of this report reflect the views of the author who is 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 should you have any questions concerning the contents of this report or if we may be of further service.

Sincerely,

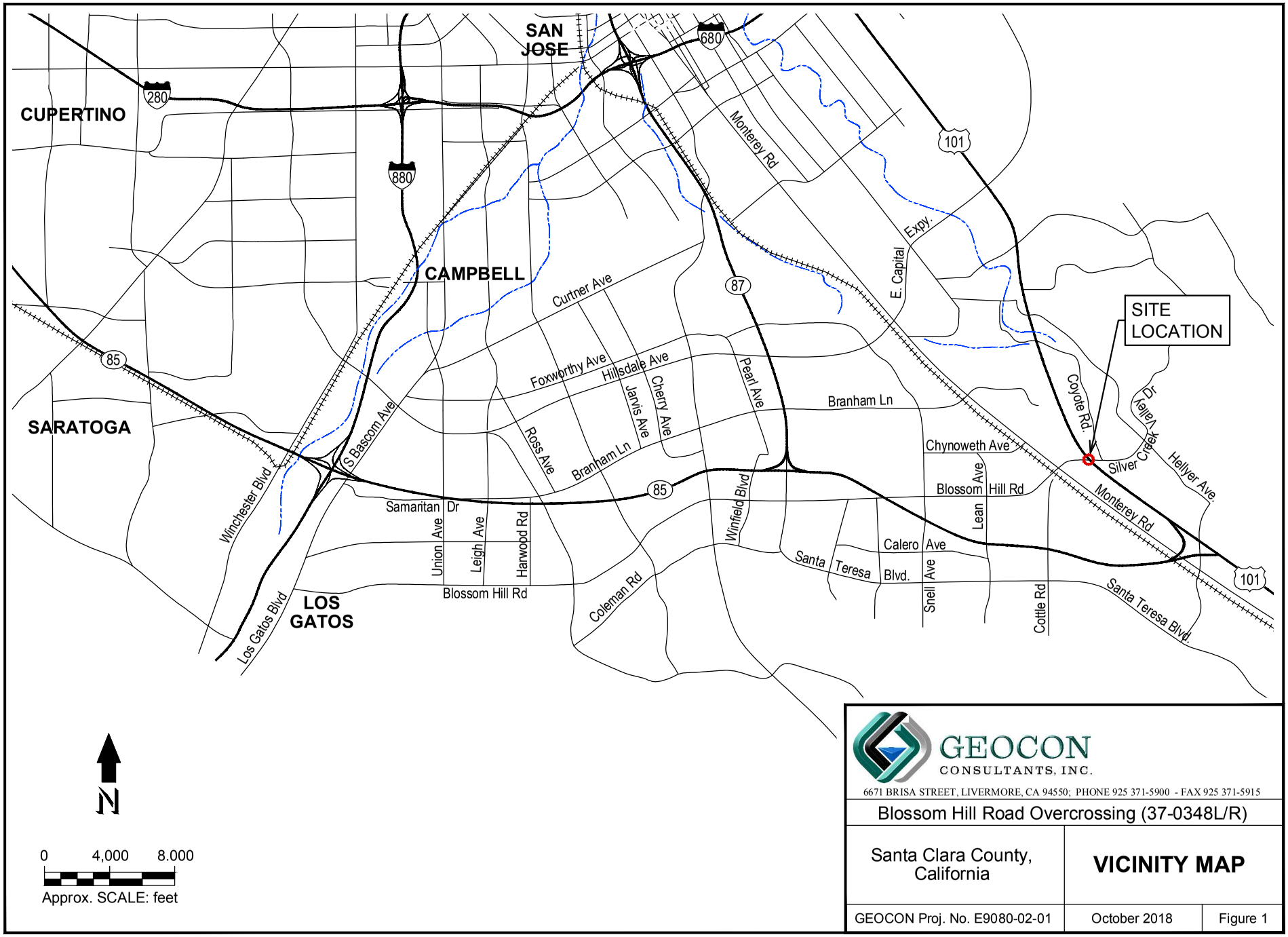
GEOCON CONSULTANTS INC.

David A. Watts, CAC
Senior Scientist

Richard Day
Principal

(2 + 1 CD) Addressee

Attachments: Figure 1, Vicinity Map
Figure 2, Site Plan
Site Photographs (1 through 6)
Analytical Laboratory Reports and Chain-of-Custody Documentation



GEOCON CONSULTANTS, INC.
6671 BRISA STREET, LIVERMORE, CA 94550; PHONE 925 371-5900 - FAX 925 371-5915

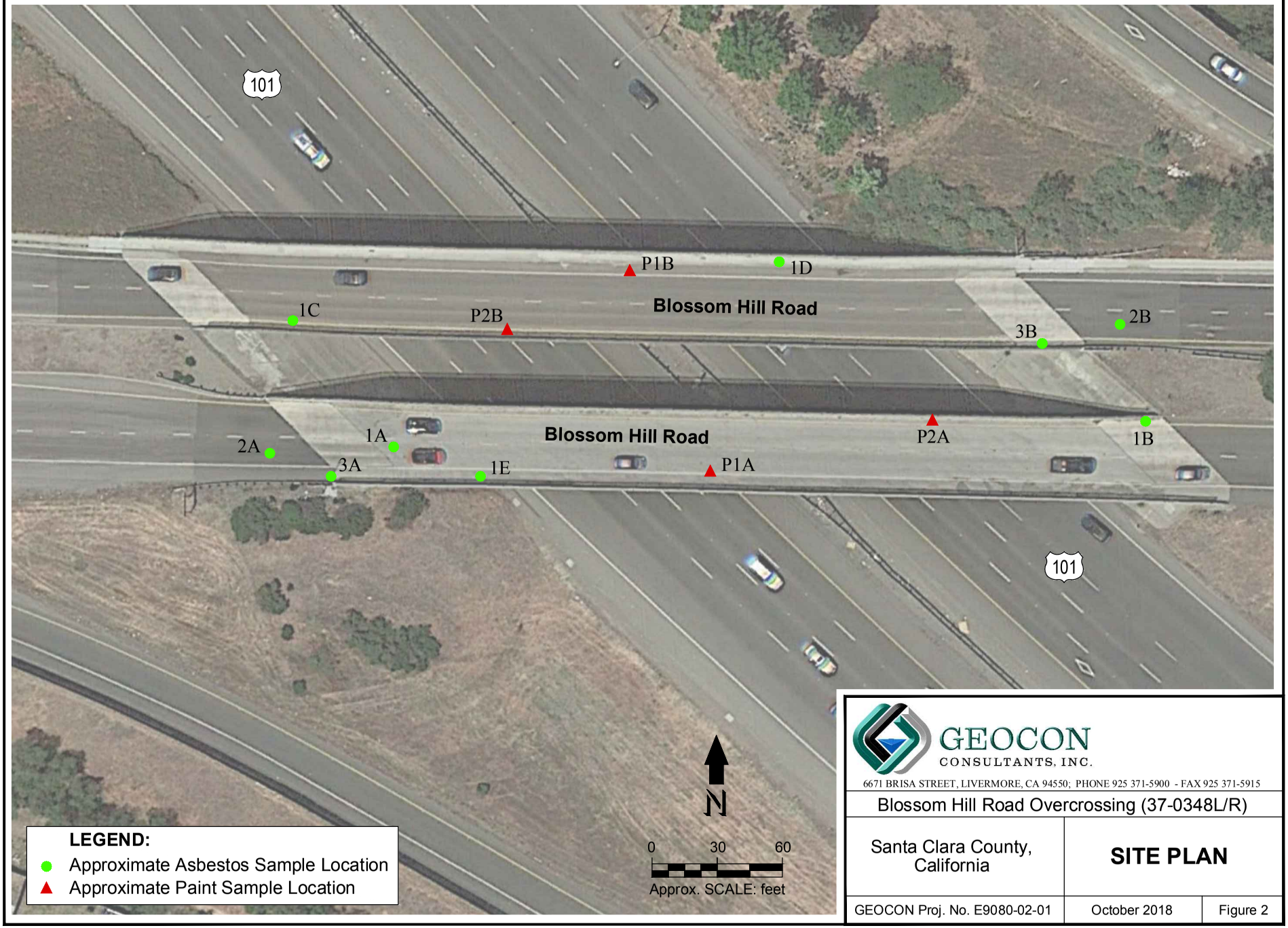
Blossom Hill Road Overcrossing (37-0348L/R)

Santa Clara County, California

VICINITY MAP

GEOCON Proj. No. E9080-02-01 | October 2018 | Figure 1

SITE0918.DWG



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CONSULTANTS, INC.
6671 BRISA STREET, LIVERMORE, CA 94550; PHONE 925 371-5900 - FAX 925 371-5915

Blossom Hill Road Overcrossing (37-0348L/R)

Santa Clara County, California	**SITE PLAN**	
GEOCON Proj. No. E9080-02-01	October 2018	Figure 2

SITE0918.DWG

Photo 1 – Blossom Hill Road OC (37-0348L/R) in Santa Clara County, California

Photo 2 – Typical abutment

Photo 3 – Bridge decks and barriers

Photo 4 – Typical bridge approach

Photo 5 – Eastbound span

Photo 6 – Westbound span

EMSL Analytical, Inc.

464 McCormick Street San Leandro, CA 94577

Tel/Fax: (510) 895-3675 / (510) 895-3680

http://www.EMSL.com / sanleandrolab@emsl.com

EMSL Order:	091820485
Customer ID:	GECN21
Customer PO:	E9080-02-01
Project ID:	

Attention:	Dave Watts	**Phone:**	(925) 785-5340
	Geocon Consultants, Inc.	**Fax:**	(925) 371-5915
	6671 Brisa Street	**Received Date:**	09/14/2018 8:00 AM
	Livermore, CA 94550	**Analysis Date:**	09/20/2018
		Collected Date:	09/13/2018
Project:	SILVER CRK RD / E9080-02-01		

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
1A	CONCRETE	Gray Non-Fibrous		20% Quartz 20% Gypsum	None Detected
091820485-0001		Homogeneous		60% Non-fibrous (Other)	
1B	CONCRETE	Gray Non-Fibrous		20% Quartz 20% Gypsum	None Detected
091820485-0002		Homogeneous		60% Non-fibrous (Other)	
1C	CONCRETE	Gray Non-Fibrous		20% Quartz 20% Gypsum	None Detected
091820485-0003		Homogeneous		60% Non-fibrous (Other)	
1D	CONCRETE	Gray Non-Fibrous		20% Quartz 20% Gypsum	None Detected
091820485-0004		Homogeneous		60% Non-fibrous (Other)	
1E	CONCRETE	Gray Non-Fibrous		20% Quartz 20% Gypsum	None Detected
091820485-0005		Homogeneous		60% Non-fibrous (Other)	
2A	ASPHALT	Black Non-Fibrous		35% Quartz 60% Matrix	None Detected
091820485-0006		Homogeneous		5% Non-fibrous (Other)	
2B	ASPHALT	Black Non-Fibrous		35% Quartz 60% Matrix	None Detected
091820485-0007		Homogeneous		5% Non-fibrous (Other)	
3A	JOINT FILL MAT'L	Black Fibrous	40% Cellulose	60% Matrix	None Detected
091820485-0008		Homogeneous			
3B	JOINT FILL MAT'L	Black Fibrous	40% Cellulose	60% Matrix	None Detected
091820485-0009		Homogeneous			

Analyst(s)

Jared Martin (9)

Matthew Batongbacal
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method"), but augmented with procedures outlined in the 1993 ("final") version of the method. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. All samples received in acceptable condition unless otherwise noted. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. EMSL recommends gravimetric reduction for all non-friable organically bound materials prior to analysis. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc San Leandro, CA NVLAP Lab Code 101048-3, WA C884

Initial report from: 09/20/2018 17:27:08

OrderID: 091820485

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Chain of Custody

EMSL Order Number (Lab Use Only):

091820485

EMSL ANALYTICAL, INC.
464 MCCORMICK STREET
SAN LEANDRO, CA 94577
PHONE: (510) 895-3675
FAX: (510) 230-3537

Company: GEOCON	EMSL-Bill to: [X] Same [ ] Different If Bill to Is Different note instructions in Comments** *Third Party Billing requires written authorization from third party*
Street: 6671 BRISA ST	
City: LIVERMORE / State/Province: CA / Zip/Postal Code: 94550 / Country: USA	
Report To (Name): D. WATTS	Fax #: 925-371-5915
Telephone #: 925-371-5900	Email Address: WATTS@GEOCONINC.COM
Project Name/Number: SILVER CRK RD / E9080-02-01	
Please Provide Results: [ ] Fax [X] Email / Purchase Order:	U.S. State Samples Taken: CA

Turnaround Time (TAT) Options* – Please Check

[ ] 3 Hour [ ] 6 Hour [ ] 24 Hour [ ] 48 Hour [ ] 72 Hour [ ] 96 Hour [X] 1 Week [ ] 2 Week

*For TEM Air 3 hr through 6 hr, please call ahead to schedule. *There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.

PCM - Air
- [ ] NIOSH 7400
- [ ] w/ OSHA 8hr. TWA

PLM - Bulk (reporting limit)
- [X] PLM EPA 600/R-93/116 (<1%)
- [ ] PLM EPA NOB (<1%)

Point Count
- [ ] 400 (<0.25%) [ ] 1000 (<0.1%)

Point Count w/Gravimetric
- [ ] 400 (<0.25%) [ ] 1000 (<0.1%)
- [ ] NYS 198.1 (friable in NY)
- [ ] NYS 198.6 NOB (non-friable-NY)
- [ ] NIOSH 9002 (<1%)

TEM – Air [ ] 4-4.5hr TAT (AHERA only)
- [ ] AHERA 40 CFR, Part 763
- [ ] NIOSH 7402
- [ ] EPA Level II
- [ ] ISO 10312

TEM - Bulk
- [ ] TEM EPA NOB
- [ ] NYS NOB 198.4 (non-friable-NY)
- [ ] Chatfield SOP
- [ ] TEM Mass Analysis-EPA 600 sec. 2.5

TEM – Water: EPA 100.2
- Fibers >10µm [ ] Waste [ ] Drinking
- All Fiber Sizes [ ] Waste [ ] Drinking

TEM- Dust
- [ ] Microvac - ASTM D 5755
- [ ] Wipe - ASTM D6480
- [ ] Carpet Sonication (EPA 600/J-93/167)

Soil/Rock/Vermiculite
- [ ] PLM CARB 435 - A (0.25% sensitivity)
- [ ] PLM CARB 435 - B (0.1% sensitivity)
- [ ] TEM CARB 435 - B (0.1% sensitivity)
- [ ] TEM CARB 435 - C (0.01% sensitivity)
- [ ] EPA Protocol (Semi-Quantitative)
- [ ] EPA Protocol (Quantitative)

Other:
- [ ]

[ ] Check For Positive Stop – Clearly Identify Homogenous Group

Samplers Name: D. WATTS / Samplers Signature: [signature]

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
1A-E	CONCRETE	NA	13 SEP 2018
2A/B	ASPHALT	↓	↓
3A/B	JOINT FILL MAT'L	↓	↓

Client Sample # (s): 1A - 3B / Total # of Samples: 9

Relinquished (Client): [signature] / Date: 13 SEP 2018 / Time: 1700

Received (Lab): RA GSO / Date: 9/14/18 13 SEP 2018 / Time: 8am 1700 DH3

Comments/Special Instructions:

EMSL Analytical, Inc
464 McCormick Street, San Leandro, CA 94577
Phone/Fax: (510) 895-3675 / (510) 895-3680
http://www.EMSL.com sanleandrolab@emsl.com

EMSL Order:	091819986
CustomerID:	GECN21
CustomerPO:	
ProjectID:	

Attn: **Dave Watts**
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Phone:	(925) 371-5900
Fax:	(925) 371-5915
Received:	09/14/18 9:00 AM
Collected:	09/13/2018

Project: **SILVER CRK RD / E9080-02-01**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Lead Concentration*
P1 A/B	*091819986-0001*	09/13/2018	09/14/2018	<100 mg/Kg
	Site: WTS			
P2 A/B	*091819986-0002*	09/13/2018	09/14/2018	<100 mg/Kg
	Site: YTS			

Julian Neagu, Lead Laboratory Manager
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Analytical, Inc San Leandro, CA A2LA Accredited Environmental Testing Cert #2845.09

Initial report from 09/14/2018 14:52:12

EMSL Analytical, Inc
464 McCormick Street, San Leandro, CA 94577
Phone/Fax: (510) 895-3675 / (510) 895-3680
http://www.EMSL.com sanleandrolab@emsl.com

EMSL Order:	091819986
CustomerID:	GECN21
CustomerPO:	
ProjectID:	

Attn: **Dave Watts**
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Phone:	(925) 371-5900
Fax:	(925) 371-5915
Received:	09/14/18 3:30 PM
Collected:	09/13/2018

Project: **SILVER CRK RD / E9080-02-01**

Test Report: Soluble Threshold Limit Concentration

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Lead* ***Concentration***
P1 A/B	*091819986-0003*	09/13/2018		0.375 mg/L
	Site: WTS			
P2 A/B	*091819986-0004*	09/13/2018		0.394 mg/L
	Site: YTS			

Julian Neagu, Lead Laboratory Manager
or other approved signatory

"<" (less than) result signifies that the analyte was not detected at or above the reporting limit.
Samples analyzed by EMSL Analytical, Inc San Leandro, CA

Initial report from 09/20/2018 16:54:58

OrderID: 091819986

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Lead (Pb) Chain of Custody

EMSL Order ID *(Lab Use Only)*: 091819986

EMSL ANALYTICAL, INC.
464 MCCORMICK STREET
SAN LEANDRO, CA 94577
PHONE: (510) 895-3675
FAX: (510) 895-3680

Company: GEOCON		EMSL-Bill to: ☒ Same ☐ Different If Bill to is Different note instructions in Comments** *Third Party Billing requires written authorization from third party*	
Street: 6671 BRISA ST			
City: LIVERMORE	State/Province: CA	Zip/Postal Code: 94550	Country: USA
Report To (Name): D. WATTS		Fax #: 925-371-5915	
Telephone #: 925-371-5900		Email Address: WATTS@GEOCONINC.COM	
Project Name/Number: SILVER CRK RD / E9080-02-01			
Please Provide Results: ☐ Fax ☒ Email	Purchase Order:	U.S. State Samples Taken: CA	

Turnaround Time (TAT) Options* - Please Check

☐ 3 Hour ☐ 6 Hour ☐ 24 Hour ☐ 48 Hour ☐ 72 Hour ☐ 96 Hour ☒ 1 Week ☐ 2 Week

**Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide*

Matrix	Method	Instrument	Reporting Limit	Check
Chips ☐ % by wt. ☐ mg/cm² ☒ ppm (mg/kg) PAINT	SW846-7000B/7420 or AOAC 974.02	Flame Atomic Absorption	0.01%	☒
Air	NIOSH 7082	Flame Atomic Absorption	4 µg/filter	☐
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter	☐
	NIOSH 7300 modified	ICP-AES	0.5 µg/filter	☐
Wipe* ☐ ASTM ☐ non ASTM *If no box is checked, non-ASTM Wipe is assumed	SW846-7000B/7420	Flame Atomic Absorption	10 µg/wipe	☐
	SW846-6010B or C	ICP-AES	0.5 µg/wipe	☐
TCLP	SW846-1311/7420/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	☐
	SW846-6010B or C	ICP-AES	0.1 mg/L (ppm)	☐
Soil	SW846-7000B/7420	Flame Atomic Absorption	40 mg/kg (ppm)	☐
	SW846-7421	Graphite Furnace AA	0.3 mg/kg (ppm)	☐
	SW846-6010B or C	ICP-AES	1 mg/kg (ppm)	☐
Wastewater	SM3111B or SW846-7000B/7420	Flame Atomic Absorption	0.4 mg/L (ppm)	☐
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	☐
	SW846-6010B or C	ICP-AES	1 mg/kg (ppm)	☐
Drinking Water	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	☐

Other:	Preservation Method (Water):
Name of Sampler: D. WATTS	Signature of Sampler:

Sample #	Location	Volume/Area	Date/Time Sampled
P1A/B	WTS	NA	13SEP2018
P2A/B	YTS	↓	↓

Client Sample #'s				Total # of Samples:	
Relinquished (Client):		Date:	13SEP2018	Time:	1700
Received (Lab):	PA 650	Date:	9/14/18 13SEP2018	Time:	8AM D/B 1700

Comments: ANTICIPATE REQUESTS FOR SOLUBLES (WET/TCLP) (SAVE BULK MATL)

Controlled Document — Lead (Pb) COC – R3 – 2/23/2011

DEPARTMENT OF INDUSTRIAL RELATIONS
DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT
1750 Howe Avenue, Suite 300
Sacramento, California 95825
DoshMTsac@dir.ca.gov

Telephone (916) 574-2540
FAX (916) 574-2542

November 13, 2019

State of California
Department of Transportation, District 4
111 Grand Avenue
Oakland, CA 94612

Attention: Fariba Zohoury, Project Management

Subject: Project: 20031 – US 101/Blossom Hill Road Interchange Improvements, Santa Clara County
Classification: Potentially Gassy With Special Conditions
Number Attached: 6 (A-F)

The information provided to this office relative to the above project has been reviewed. On the basis of this analysis, Underground Classifications of "Potentially Gassy With Special Conditions" have been assigned to the tunnels identified on your submittal. Please retain the original Classifications for your records and deliver a true and correct copy of each Classification to the tunnel contractor for posting at the job site.

When the contractor who will be performing the work is selected, please advise them to notify this office to schedule the mandated Pre-Job Conference with the Division prior to commencing any activity associated with boring of the tunnels. A Pre-Job Request Form is enclosed.

Should you have another bore under construction that is not required to have an Underground Classification (i.e.: less than 30 inches in diameter), please contact the Mining and Tunneling Unit prior to any employee entry of such a space.

If you have any questions on this subject, please contact this office at your earliest convenience.

Sincerely,

Jeffrey Wallace
Acting Senior Safety Engineer

enc: Classifications
Pre-Job Request Form

cc: fariba.zohoury@dot.ca.gov

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

20031F085CT STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION DISTRICT 4

of 111 GRAND AVENUE; OAKLAND, CA 94612

at US 101/BLOSSOM HILL ROAD INTERCHANGE IMPROVEMENTS

has been classified as *** POTENTIALLY GASSY WITH SPECIAL CONDITIONS ***

as required by the California Labor Code § 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

1. Mechanical ventilation shall be so arranged to exhaust return air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
2. The Division shall be notified immediately if a flammable gas or petroleum vapor exceeds 5 percent of the Lower Explosive Limit (LEL).

FIBER OPTIC AND COMMUNICATION LINES

The 42-inch-diameter approximately 100-feet-long bore located approximately 200-to-250 feet east of the north side of Blossom Hill Road and US 101 interchange in San Jose, Santa Clara County

This classification shall be conspicuously posted at the place of employment.

Jeffrey Wallace, Acting Senior Safety Engineer

November 13, 2019

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

20031E085CT STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION DISTRICT 4

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SPECIAL CONDITIONS

1. Mechanical ventilation shall be so arranged to exhaust return air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
2. The Division shall be notified immediately if a flammable gas or petroleum vapor exceeds 5 percent of the Lower Explosive Limit (LEL).

FIBER OPTIC AND COMMUNICATION LINES

The 72-inch-diameter by 83-feet-deep CIDH pile foundation located approximately 300 feet east of the north side of Blossom Hill Road and US 101 interchange in San Jose, Santa Clara County

This classification shall be conspicuously posted at the place of employment.

Jeffrey Wallace, Acting Senior Safety Engineer

November 13, 2019

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

20031D085CT STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION DISTRICT 4

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as required by the California Labor Code § 7955.

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SPECIAL CONDITIONS

1. Mechanical ventilation shall be so arranged to exhaust return air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
2. The Division shall be notified immediately if a flammable gas or petroleum vapor exceeds 5 percent of the Lower Explosive Limit (LEL).

FIBER OPTIC AND COMMUNICATION LINES

The 72-inch-diameter by 87-feet-deep CIDH pile foundation located approximately 260 feet east of the north side of Blossom Hill Road and US 101 interchange in San Jose, Santa Clara County

This classification shall be conspicuously posted at the place of employment.

Jeffrey Wallace, Acting Senior Safety Engineer

November 13, 2019

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

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SPECIAL CONDITIONS

1. Mechanical ventilation shall be so arranged to exhaust return air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
2. The Division shall be notified immediately if a flammable gas or petroleum vapor exceeds 5 percent of the Lower Explosive Limit (LEL).

FIBER OPTIC AND COMMUNICATION LINES

The 72-inch-diameter by 81-feet-deep CIDH pile foundation located approximately 215 feet east of the north side of Blossom Hill Road and US 101 interchange in San Jose, Santa Clara County

This classification shall be conspicuously posted at the place of employment.

Jeffrey Wallace, Acting Senior Safety Engineer

November 13, 2019

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

20031B085CT STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION DISTRICT 4

of 111 GRAND AVENUE; OAKLAND, CA 94612

at US 101/BLOSSOM HILL ROAD INTERCHANGE IMPROVEMENTS

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as required by the California Labor Code § 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

1. Mechanical ventilation shall be so arranged to exhaust return air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
2. The Division shall be notified immediately if a flammable gas or petroleum vapor exceeds 5 percent of the Lower Explosive Limit (LEL).

FIBER OPTIC AND COMMUNICATION LINES

The 72-inch-diameter by 75-feet-deep CIDH pile foundation located approximately 180 feet east of the north side of Blossom Hill Road and US 101 interchange in San Jose, Santa Clara County

This classification shall be conspicuously posted at the place of employment.

Jeffrey Wallace, Acting Senior Safety Engineer

November 13, 2019

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

20031A085CT STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION DISTRICT 4

of 111 GRAND AVENUE; OAKLAND, CA 94612

at US 101/BLOSSOM HILL ROAD INTERCHANGE IMPROVEMENTS

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as required by the California Labor Code § 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

1. Mechanical ventilation shall be so arranged to exhaust return air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
2. The Division shall be notified immediately if a flammable gas or petroleum vapor exceeds 5 percent of the Lower Explosive Limit (LEL).

FIBER OPTIC AND COMMUNICATION LINES

The 72-inch-diameter by 65-feet-deep CIDH pile foundation located approximately 80 feet east of the north side of Blossom Hill Road and US 101 interchange in San Jose, Santa Clara County

This classification shall be conspicuously posted at the place of employment.

Jeffrey Wallace, Acting Senior Safety Engineer

November 13, 2019

State of California
Department of Industrial Relations
Division of Occupational Safety & Health

REQUEST FOR PRE-JOB (TUNNEL)

ATTACH COPY OF CLASSIFICATION AND DIESEL PERMIT

Company Name: _____

Phone _____ FAX: _____

DATE FAXED: _____

PLEASE NOTE: THE BORING CONTRACTOR SHOULD SCHEDULE THE PREJOB AS FAR IN ADVANCE AS POSSIBLE – AT LEAST 3-4 DAYS IN ADVANCE. THE DIVISION REQUIRES THE JOB TO BE SET UP WHEN THE FIELD ENGINEER ARRIVES FOR THE PREJOB. THIS MEANS THAT THE BORE PIT HAS BEEN DUG AND PROPERLY GUARDED, THE CRANE IS IN PLACE AND READY TO LIFT, THE BORING MACHINE IS IN THE PIT AND READY TO GO, AND THE CREW IS READY TO BEGIN BORING THE TUNNEL. IF THERE IS A DELAY IN SETTING UP THE JOB, THE BORING CONTRACTOR SHOULD CONTACT THE DIVISION IMMEDIATELY.

PRE-JOB REQUEST DATE & TIME: _____

ON-SITE SUPERVISOR & CELL NO.: _____

CLASSIFICATION #: _____ **DIESEL PERMIT #:** _____

BORE DIAMETER AND LENGTH: _____ (Diameter) _____ (Length)

IS BORE ENTRY ANTICIPATED? **YES** **NO**
(Circle One)

You MUST contact the Division if entry is planned, REGARDLESS of the bore diameter.

MANNER OF EXCAVATION: _____

_____

JOB-SITE LOCATION AND DIRECTIONS: _____

_____

_____

GENERAL CONTRACTOR: _____

SUBMITTED BY: _____

REVIEWED BY: _____ **DATE:** _____

☐ *Mining & Tunneling Unit, District 1*
1750 Howe Ave., Suite 300
Sacramento, California 95825-2400
(916) 574-2540; ***FAX: (916) 574-2542***

☐ *Mining & Tunneling Unit, District 2*
6150 Van Nuys Blvd., Suite 310
Van Nuys, California 91401-3333
(818) 901-5420; ***FAX: (818) 901-5579***

☐ *Mining & Tunneling Unit, District 3*
464 West Fourth Street, Suite 354
San Bernardino, California 92401-1442
(909) 383-6782; ***FAX: (909) 388-7132***

PPD201803-1020
Rcvd 13 Mar 2018

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
ENCROACHMENT PERMIT

TR-0120 (REV 6/2012)

Permit No. 04-18-N-OP-0313

Sample Caltrans Encroachment Permit Issued to VTA

In compliance with (Check one):

☒ Your application of February 16, 2018

☐ Utility Notice No. _____ of _____

☒ Agreement No. Coop Agmt. No. 04-2641 of 9/11/2017

☐ R/W Contract No. _____ of _____

Dist/Co/Rte/PM: 04/SCL/237/2.7-8.4

DATE: March 2, 2018

Fee Paid	Deposit
$ Exempt	$ Exempt
Performance Bond Amount	**Payment Bond Amount**
$ By Contractor	$ By Contractor
Bond Company	
TBD	
Bond Number (1)	**Bond Number (2)**
TBD	TBD

TO: Santa Clara Valley Transportation Authority
3331 North First Street
San Jose, CA 95134-1906
Email: gene.gonzalo@vta.org
Attn: Mr. Gene Gonzalo
Phone (408) 952-4236

, **PERMITTEE**

and subject to the following, **PERMISSION IS HEREBY GRANTED** to:

Construct Phase 2 of the SR-237 Express Lane Project to convert the existing High Occupancy Vehicle (HOV) Lanes to Express Toll Lanes, per Caltrans oversight project EA 04-4H2804 (Project ID 0413000202), on State Highway 04-SCL-237, Post Miles 2.7/8.4, in the Cities of Sunnyvale, Santa Clara, San Jose, and Milpitas in Santa Clara County, for a construction cost of $9,800,000.00.

A minimum of 7 days prior to the start of work under this permit, notice must be given to the State Oversight Representative, Sergio Lugo, 1007 Knox Avenue, San Jose, CA 95122, sergio.lugo@dot.ca.gov or by phone at (510) 867-6226, weekdays between 7:00 a.m. and 3:30 p.m., excluding holidays.

Notwithstanding General Provision 35, lane closures and other activities that may cause a traffic impact requires the permittee to apply for and obtain a closure ID prior to the start of work. Requests must be submitted using the attached "Encroachment Permit Work Scheduling Request Form."

THIS PERMIT IS NOT A PROPERTY RIGHT AND DOES NOT TRANSFER WITH THE PROPERTY TO A NEW OWNER.

The following attachments are also included as part of this permit (*Check applicable*):

☒ Yes	☐ No	General Provisions (TR-0045)
☒ Yes	☐ No	Utility Maintenance Provisions TR-0162 & TR-0163
☒ Yes	☐ No	Special Provisions TR-0408 (ADL)
☐ Yes	☒ No	A Cal-OSHA permit, if required: Permit No. By Contractor
☒ Yes	☐ No	As-Built Plans Submittal Route Slip for Locally Advertised Projects
☐ Yes	☒ No	Water Pollution Control Documents (WPCP By Contractor)

In addition to fee, the permittee will be billed actual costs for:

☐ Yes	☒ No	Review
☒ Yes	☐ No	Inspection
☒ Yes	☐ No	Field Work

(If any Caltrans effort expended)

☒ Yes ☐ No The information in the environmental documentation has been reviewed and considered prior to approval of this permit.

This permit is void unless the work is completed before March 1, 2020.
This permit is to be strictly construed and no other work other than specifically mentioned is hereby authorized.
No project work must be commenced until all other necessary permits and environmental clearances have been obtained.

Permit Engineer: TWH

c: ESherman III (2), CTarokh, JFavors – LCS, D4 TMC
Dina El-Tawansy – Project Management South
Hassan Nikzad – Design Santa Clara
Tuan Le – Traffic Safety
Michelle Chan – Electrical Design
Sergio Lugo - Construction

APPROVED:
DAVID SALLADAY, District Permit Engineer

BY:
AMJAD NASEER, Senior Permit Engineer

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

In addition to the 2015 Caltrans Standard Specification & Standard Plans (both available at http://www.dot.ca.gov/des/oe/construction-contract-standards.html), approved project plans, special provisions, and cooperative agreement, the permittee must comply with the attached "General Provisions" (TR-0045) (available at http://www.dot.ca.gov/trafficops/ep/manual.html), and the following permit special provisions:

A pre-job meeting with the State Oversight Representative is required at least 7 days prior to the start of any work under this permit. Failure to do so may result in permit revocation with no prejudice.

The permittee must provide the stage construction plans, traffic handling plans, work schedule, and a list of all sub-contractors to the State Oversight Representative at the time of the pre-job meeting.

Notwithstanding General Provision 4, construction must not begin until the contractor performing the work applies for and obtains a separate encroachment permit (referred to as a Double Permit) for the work authorized herein. An initial fee/deposit of $31,160.00 is required at the time of application for permit processing and inspection. Additional inspection hours will be charged at the current State hourly rate.

If the work is interrupted for a period of 5 business days or more, the permittee must notify the State Oversight Representative a minimum of 2 days before resuming permitted work.

Certain details of work authorized herein are shown on the plans and specifications for the "State Route 237 Express Lanes Phase 2 (Contract No. 04-4H2804) Construction on State Highway from 0.3 Mile East of US 101 to 0.5 Mile East of Zanker Road Overcrossing" submitted with this application, and/or as directed by the State Oversight Representative.

The permittee must update the Construction Material and Source Inspection Quality Management Plan (SIQMP) for any changes and/or updates to the construction material verification inspections performed at the manufacturing sources or at the project site, and must submit the updated SIQMP to the State Oversight Representative for review and approval.

The permittee and the permittee's Quality Management Plan and Quality Control/Quality Assurance Plan must comply with all the requirements for local agencies in the attached Department's:

1. Oversight Resident Engineer Guidelines, dated January 2016 (available at http://www.dot.ca.gov/hq/construc/publications/OverSightGuidelines.pdf);
2. Construction Manual Supplement for Local Agency Resident Engineers, dated August 2008 (available at http://www.dot.ca.gov/hq/construc/CPDirectives/LARE.pdf);
3. Local Agency Structure Representative Guidelines, dated August 2014 (available at http://www.dot.ca.gov/hq/construc/CPDirectives/LASR_Guidelines.pdf); and
4. Construction Manual, Chapter 9, Section 2 - Projects Administered by a Local Agency on the State Highway System, dated September 2014 (available at http://www.dot.ca.gov/hq/construc/constmanual/chapter9/sec9-2.pdf).

Traffic control under this permit must also comply with 2015 Caltrans' Standard Plans T9 through T14 (available at http://www.dot.ca.gov/des/oe/construction-contract-standards.html); and flagging, apparel, temporary traffic control devices, and equipment for flaggers, must comply with the California MUTCD, Part 6, "Temporary Traffic Control" (http://www.dot.ca.gov/trafficops/camutcd/camutcd2014rev2.html).

All approved closures and placement of traffic control safety devices (e.g. signs, cones, lights) must be installed, maintained, and removed by a qualified traffic control contractor.

The permittee and the permittee's contractor must comply with the lane closure requirements in the approved project special provisions. Late pick-up of lane closures are subject to charges in Section 12-4.02 - Damage Clause Recommendations of the project special provisions.

All signs and markings must comply with the California MUTCD (available at http://www.dot.ca.gov/trafficops/camutcd/).

Signs, lights, flags or other protective devices must not obscure the visibility of, nor conflict in intent, meaning, and function of either existing signs, lights and traffic control devices, or any construction area signs.

Streets and highways in the San Francisco Bay Area contain a significant number of existing underground utilities. This includes traffic signal conduits that are installed 9 inches or less in depth. The permittee is responsible for necessary site investigations for identification of the location and depth of existing underground facilities prior to excavation (e.g., pothole or hand-dig) to avoid damage or disruption in services.

All pavement must be saw cut prior to removal, or removed by grinding.

Pavement markings obliterated must be replaced in kind.

No paint must be placed upon highway pavements, signs or markers. If pavement markings are necessary, traffic tape, chalk or crayon must be used. All tape, stakes and other obvious markers must be removed upon completion of permitted work.

Where new asphalt concrete is placed, temporary painted traffic striping and pavement markings must be installed within 24 hours. Where shown on the plans, after 30 days curing time, thermoplastic materials must be applied in accordance with the 2015 Caltrans Standard Specifications, Section 84, "Markings" (available at http://www.dot.ca.gov/des/oe/construction-contract-standards.html).

Changes to the plans and specifications are not permitted without written approval from the State Oversight Representative.

The permittee must obtain the State Oversight Representative's approval of any Contract Change Order(s) for work within the State right-of-way in accordance with the executed construction cooperative agreement.

On freeways and expressways, permittee's vehicles and equipment not involved in the permitted activities must be legally located outside the freeway right-of-way.

No vehicle or equipment must be stored overnight within the State right-of-way; it must be removed immediately at the completion of the day's work. Refueling of vehicle or equipment within the State right-of-way is strictly prohibited.

The permittee must comply with the code of safe practices (available at http://www.dot.ca.gov/hq/construc/publications/code_of_safe_practices.pdf), when working within the State right-of-way.

All the permittee's personnel must wear appropriate and approved personal protective equipment per Chapter 12 of Caltrans "Safety Manual" (available at http://www.dot.ca.gov/hq/opo/safety/safetymanual/Chap_12-Sept2012.pdf), including hard hats and bright-colored safety vests, shirts or jackets with retro-reflective material, while within the State right-of-way.

Any change or damage to any existing facilities, including landscaping and irrigation, and the cost of any repair or restoration within the State right-of-way must be the responsibility of the permittee.

If an accident or other incident (related or not related to the permitted activity) occurs within or close to the permitted activity, the permittee must immediately remove traffic controls from the highway unless public health, welfare, and safety is compromised by the permitted activity. After the free traffic flow is restored, the permitted activity may resume in accordance with the conditions of this permit.

Upon completion of work authorized by this permit, the permittee must provide the State Oversight Representative with as-built plans in accordance with the executed construction cooperative agreement.

Upon completion of work authorized permitted herein, the permittee must provide the State Oversight Representative with a completed "Notice of Completion" (Form TR-0128).

Conditional Permit Requirements

1. The permittee's contractor must submit signed and stamped temporary traffic control plans with the contractor's encroachment permit application for Caltrans review and approval.

2. The permittee's contractor must submit the project Water Pollution Control Plan (WPCP) with the contractor's encroachment permit application for Caltrans review and approval.

3. The permittee's contractor must submit the project Quality Management Plan (QMP) and Quality Control/Quality Assurance (QC/QA) Plan with the contractor's encroachment permit application for Caltrans review and approval.

4. The permittee's contractor must submit the construction material Source Inspection Quality Management Plan (SIQMP) with the contractor's encroachment permit application for Caltrans review and approval.

5. The permittee's contractor must submit a copy of the payment bond and the performance bond, each, with the contractor's encroachment permit application in accordance with the executed construction cooperative agreement.

6. The Express Lane Operation and Maintenance (O&M) Agreement must be executed prior to opening of the Express Lanes to the public.

Enclosures

NOTES:

1. Only signs related to pedestrians are shown. For all other signs see appropriate T-sheets.
2. Barricades closing sidewalk shall cover the full width of the sidewalk. Use R9-11 sign when there are destination points between the detour and the work area. Locate the R9-11 sign to allow pedestrian access.
3. Advance warning sign is not required if the work area is within the limits of a larger work zone. Sign shall be equipped with at least two flags for daytime closure. Each flag shall be orange or fluorescent red-orange in color.

NOTES:

See Revised Standard Plan RSP T9 for tables.

Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1 unless X,Y, or Z cone spacing is shown on this sheet.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

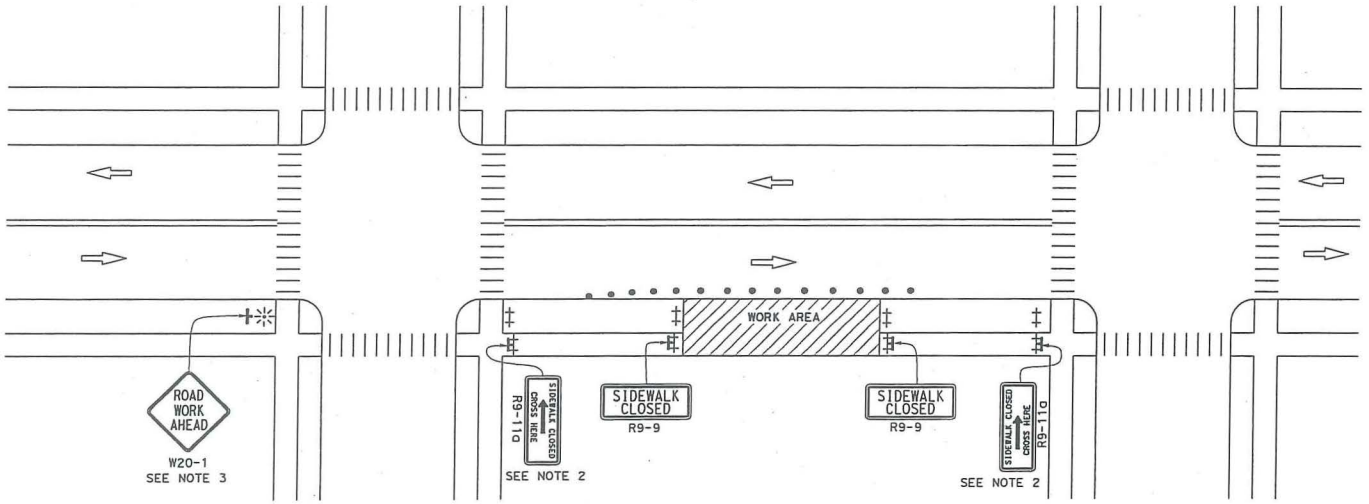
REGISTERED CIVIL ENGINEER

July 21, 2017
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
Robert D. McNew
No. C68559
Exp. 9-30-17
CIVIL
STATE OF CALIFORNIA

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

TO ACCOMPANY PLANS DATED _____



LEGEND:

- ‡ BARRICADE
- • TRAFFIC CONE
- ✳ PORTABLE FLASHING BEACON
- ⊢ SIGN
- ‡ TEMPORARY TRAFFIC CONTROL SIGN ON BARRICADE

SIGN PANEL SIZE (Min)

SIGN DESIGNATION	SIGN OR PLAQUE	SIGN SIZE
R9-9	SIDEWALK CLOSED	24" x 12"
R9-11	SIDEWALK CLOSED AHEAD CROSS HERE	24" x 18"
R9-11a	SIDEWALK CLOSED CROSS HERE	24" x 12"
W20-1	ROAD WORK AHEAD	36" x 36"

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TEMPORARY PEDESTRIAN ACCESS ROUTES TYPICAL SIDEWALK CLOSURE AND PEDESTRIAN DETOUR

NO SCALE

RSP T30 DATED JULY 21, 2017 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2015.

REVISED STANDARD PLAN RSP T30

2015 REVISED STANDARD PLAN RSP T30

6-21-17

0418-NOP0313
permitted

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

July 21, 2017
PLANS APPROVAL DATE

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

REGISTERED PROFESSIONAL ENGINEER
Robert D. Mcnew
No. C68559
Exp. 9-30-17
CIVIL
STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED _____

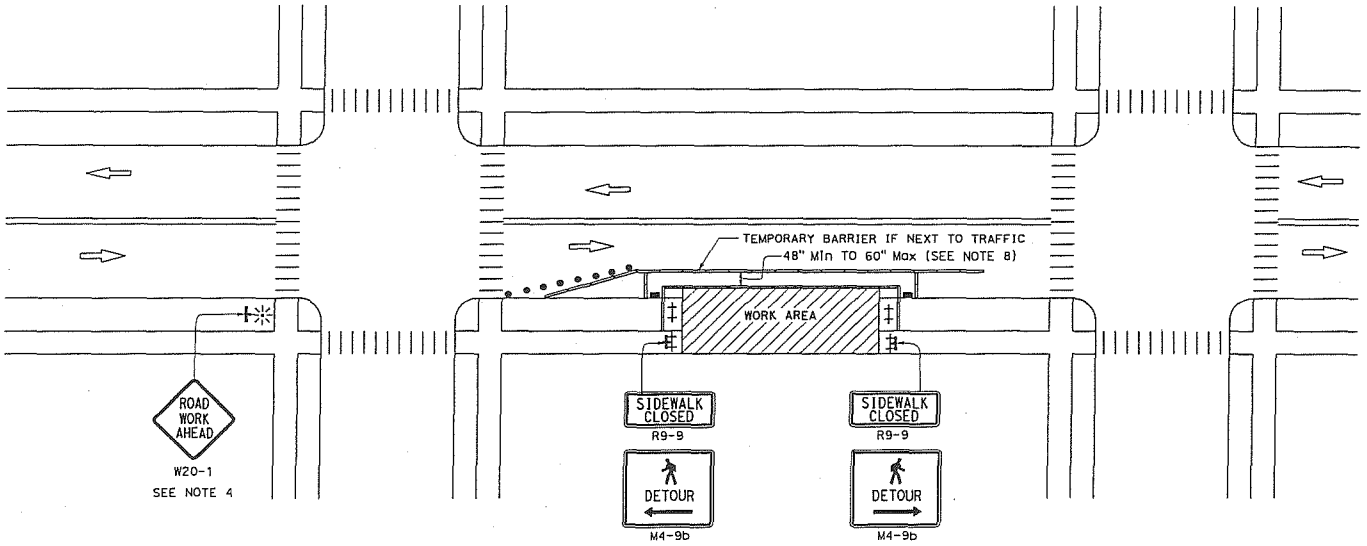
NOTES:

1. Only signs related to pedestrians are shown. For all other signs see appropriate T-sheets.
2. Separate pedestrian walkway from traffic and work zone activities, when temporary walkway is adjacent to traffic.
3. The temporary pedestrian access route must not lead into conflict with vehicles or work.
4. Advance warning sign is not required if the work area is within the limits of a larger work zone. Sign shall be equipped with at least two flags for daytime closure. Each flag shall be orange or fluorescent red-orange in color.
5. All devices used to channelize pedestrian flow must connect such that gaps do not allow pedestrians to stray from the channelized path.
6. Barricades closing sidewalk shall cover the full width of the sidewalk.
7. Separate the temporary pedestrian access route from traffic using a temporary barrier and a crash cushion if necessary.
8. When it is not possible to maintain a minumum of 60 inches throughout the length of the pedestrian route, maintain a minimum width of 48 inches and provide a 60 X 60-inch passing space at least every 200 feet.
9. See Revised Standard Plan RSP A88A for detectable warning surface for curb ramps to apply to temporary curb ramps.
10. See Revised Standard Plan RSP T34 for temporary curb ramp options.

NOTES:

See Revised Standard Plan RSP T9 for tables.

Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1 unless X,Y, or Z cone spacing is shown on this sheet.



LEGEND:

- BARRICADE
- TEMPORARY CURB RAMP
- CHANNELIZING DEVICE
- TRAFFIC CONE
- PORTABLE FLASHING BEACON
- TEMPORARY TRAFFIC CONTROL SIGN
- TEMPORARY TRAFFIC CONTROL SIGN ON BARRICADE

SIGN PANEL SIZE (Min)

SIGN DESIGNATION	SIGN OR PLAQUE	SIGN SIZE
M4-9b	PEDESTRIAN DETOUR	30" x 24"
R9-9	SIDEWALK CLOSED	24" x 12"
W20-1	ROAD WORK AHEAD	36" x 36"

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TEMPORARY PEDESTRIAN ACCESS ROUTES
TYPICAL SIDEWALK DIVERSION WITHIN ROADBED

NO SCALE

RSP T31 DATED JULY 21, 2017 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2015.

REVISED STANDARD PLAN RSP T31

2015 REVISED STANDARD PLAN RSP T31

9-27-17

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

July 21, 2017
PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER — Robert D. Mcnew — No. C68559 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED _____

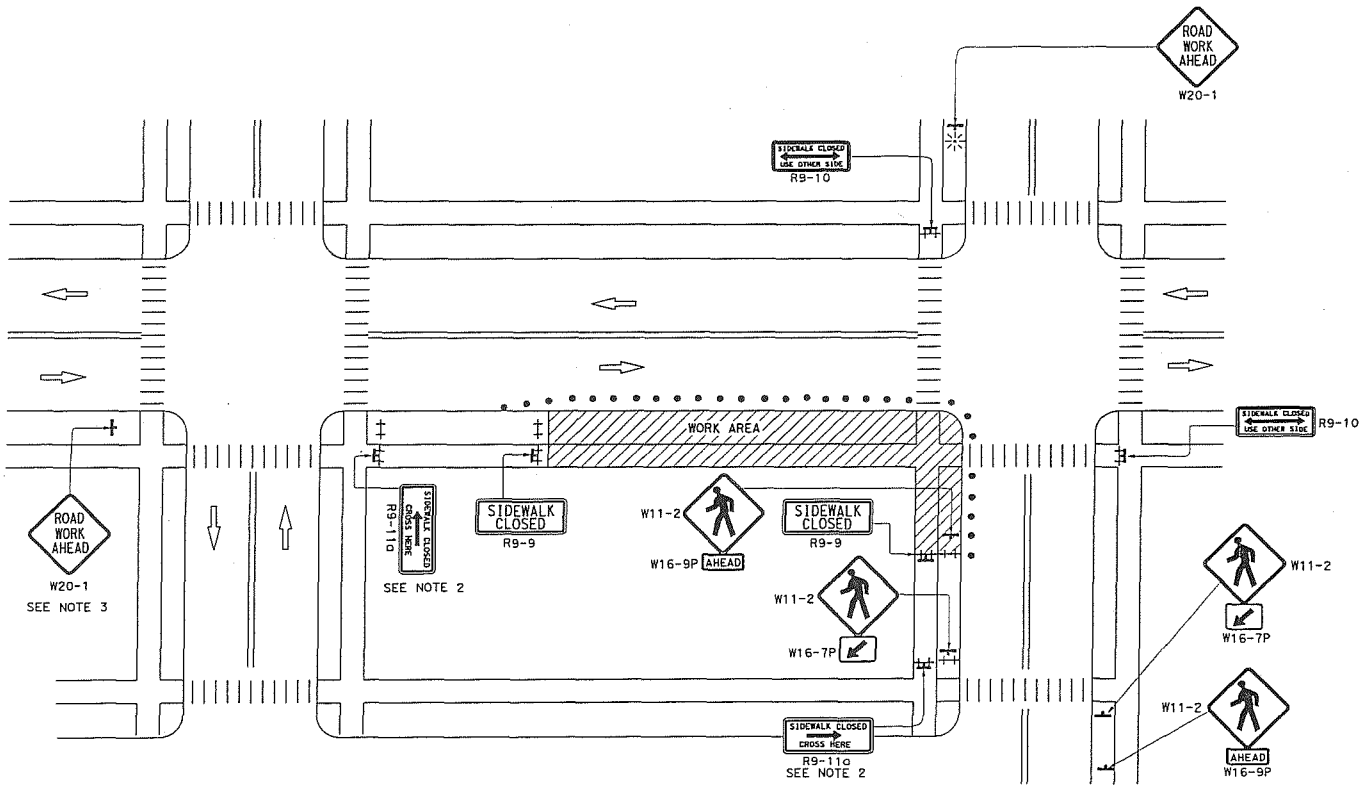
NOTES:

1. Only signs related to pedestrians are shown. For all other signs see appropriate T-sheets.
2. Barricades closing sidewalk shall cover the full width of the sidewalk. Use R9-11 sign when there are destination points between the detour and the work area. Locate the R9-11 sign to allow pedestrian access.
3. Advance warning sign is not required if the work area is within the limits of a larger work zone. Sign shall be equipped with at least two flags for daytime closure. Each flag shall be orange or fluorescent red-orange in color.

NOTES:

See Revised Standard Plan RSP T9 for tables.

Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1 unless X,Y, or Z cone spacing is shown on this sheet.



LEGEND:

- ‡ BARRICADE
- • TRAFFIC CONE
- ✳ PORTABLE FLASHING BEACON
- ⊢ TEMPORARY TRAFFIC CONTROL SIGN
- ⊣‡ TEMPORARY TRAFFIC CONTROL SIGN ON BARRICADE

SIGN PANEL SIZE (Min)

SIGN DESIGNATION	SIGN OR PLAQUE	SIGN SIZE
R9-9	SIDEWALK CLOSED	24" x 12"
R9-10	SIDEWALK CLOSED USE OTHER SIDE	24" x 12"
R9-11	SIDEWALK CLOSED AHEAD CROSS HERE	24" x 18"
R9-11a	SIDEWALK CLOSED CROSS HERE	24" x 12"
W11-2	PEDESTRIAN	36" x 36"
W16-7P	DIAGONAL DOWNWARD POINTING ARROW (PLAQUE)	24" x 12"
W16-9P	AHEAD (PLAQUE)	24" x 12"
W20-1	ROAD WORK AHEAD	36" x 36"

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TEMPORARY PEDESTRIAN ACCESS ROUTES TYPICAL SIDEWALK/CROSSWALK CLOSURE AND PEDESTRIAN DETOUR

NO SCALE

RSP T32 DATED JULY 21, 2017 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2015.

REVISED STANDARD PLAN RSP T32

2015 REVISED STANDARD PLAN RSP T32

7-27-17

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

July 21, 2017
PLANS APPROVAL DATE

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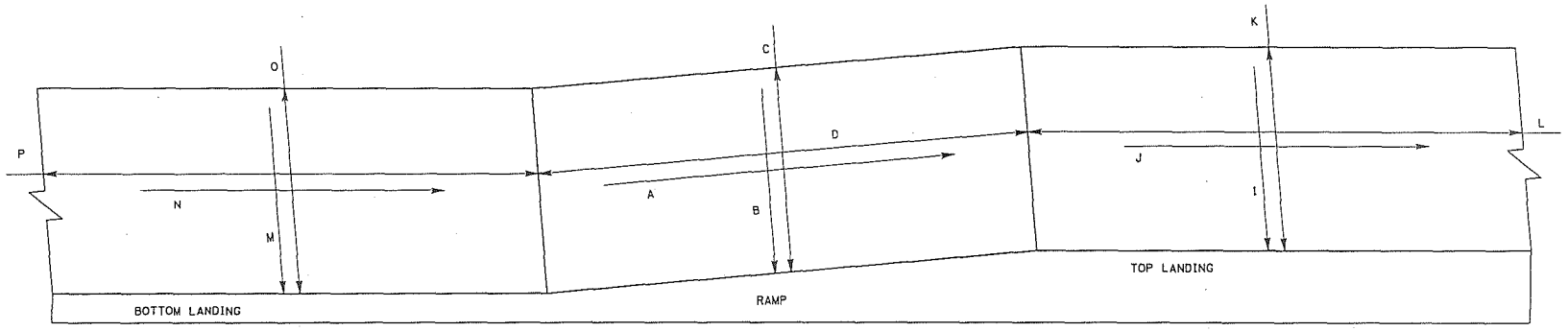
REGISTERED PROFESSIONAL ENGINEER
Robert D. McNew
No. C68559
Exp. 9-30-17
CIVIL
STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED _____

RAMP				HAND RAIL		EDGE PROTECTION	
SLOPE	CROSS SLOPE	WIDTH	LENGTH	HEIGHT RIGHT SIDE	HEIGHT LEFT SIDE	RAIL RIGHT SIDE	RAIL LEFT SIDE
A	B	C	D	E	F	G	H
8.3% OR LESS	2.0% OR LESS	48 INCHES OR GREATER	30 FEET OR LESS	34 TO 38 INCHES	34 TO 38 INCHES	WITHIN 2 INCHES FROM GROUND	WITHIN 2 INCHES FROM GROUND

TOP LANDING				BOTTOM LANDING			
CROSS SLOPE	SLOPE	WIDTH	DEPTH	CROSS SLOPE	SLOPE	WIDTH	DEPTH
I	J	K	L	M	N	O	P
2.0% OR LESS	2.0% OR LESS	48 INCHES OR GREATER	60 INCHES OR GREATER	2.0% OR LESS	2.0% OR LESS	48 INCHES OR GREATER	60 INCHES OR GREATER



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TEMPORARY PEDESTRIAN ACCESS ROUTES

RAMP

NO SCALE

RSP T33 DATED JULY 21, 2017 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2015.

REVISED STANDARD PLAN RSP T33

2015 REVISED STANDARD PLAN RSP T33

5-30-17

CURB RAMP			TOP LANDING				DETECTABLE WARNING SURFACE
SLOPE	CROSS SLOPE	WIDTH	CROSS SLOPE	SLOPE	WIDTH	DEPTH	DEPTH
A	B	C	D	E	F	G	K
8.3% OR LESS	2.0% OR LESS	48 INCHES OR GREATER	2.0% OR LESS	2.0% OR LESS	48 INCHES OR GREATER	60 INCHES OR GREATER	MINIMUM 36 INCHES

NOTES: If the above requirements cannot be met, on existing sites with space limitations, the following slopes are allowed:

For a maximum rise of 6 inches a slope between 1:12 to 1:10 is allowed.
For a maximum rise of 3 inches a slope between 1:10 to 1:8 is allowed.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

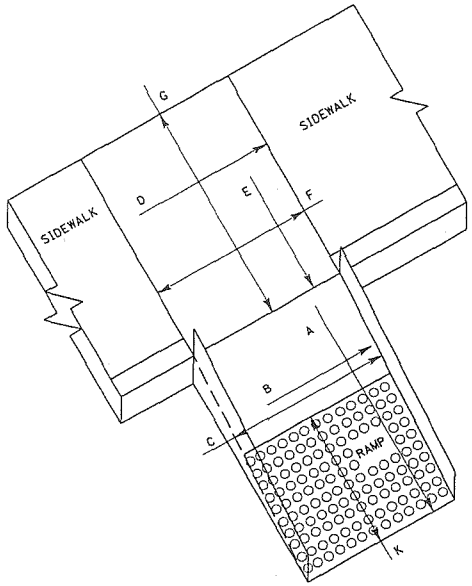
REGISTERED CIVIL ENGINEER

July 21, 2017
PLANS APPROVAL DATE

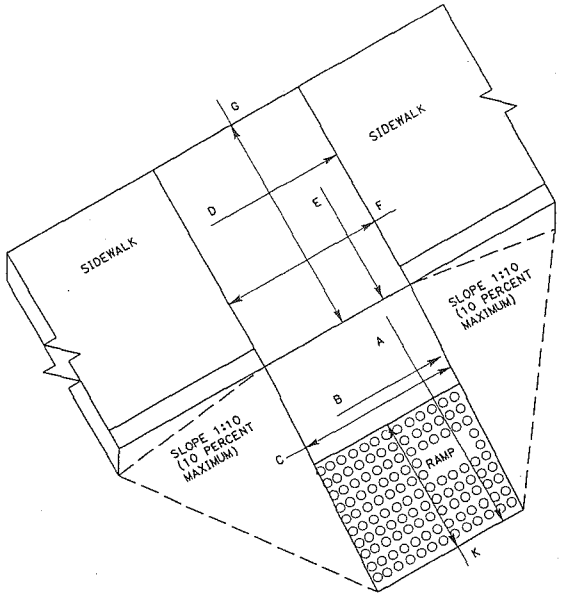
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

Registered Professional Engineer — Robert D. Michaw — C68559 — Exp. 9-30-17 — CIVIL — State of California

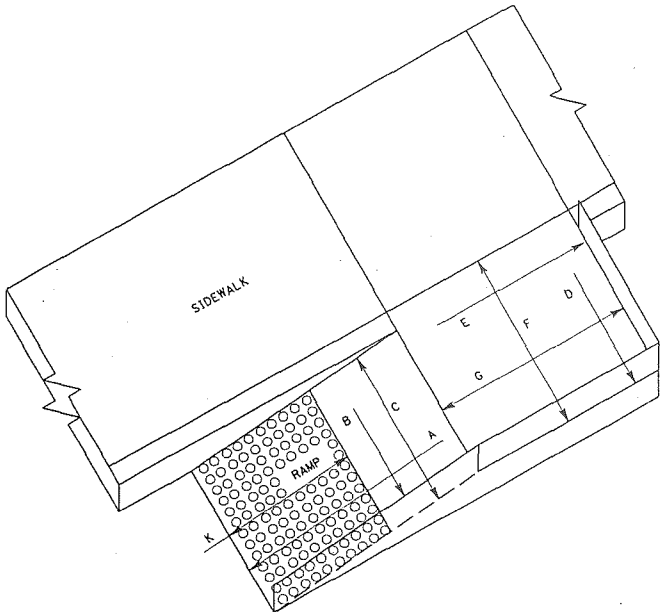
TO ACCOMPANY PLANS DATED _____



OPTION A
SHOWN WITH SIDE EDGE



OPTION B
SHOWN WITH SIDE APRON



OPTION C
PARALLEL RAMP
SHOWN WITH SIDE EDGE

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TEMPORARY PEDESTRIAN ACCESS ROUTES CURB RAMP OPTIONS

NO SCALE

RSP T34 DATED JULY 21, 2017 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2015.

REVISED STANDARD PLAN RSP T34

2015 REVISED STANDARD PLAN RSP T34

9-30-17

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

CUSTOMER SERVICE QUESTIONNAIRE

TR-0164 (REV. 02/01)

PERMIT NUMBER 18-0313

Dear Customer,

Our goal is to provide the best service possible to our customers. Please take a few minutes to complete this questionnaire. Your comments will enable us to see how we are doing overall and any areas which may need improvement.

PLEASE TELL US HOW WE'RE DOING ☑

INSIDE THE OFFICE	EXCELLENT	VERY GOOD	GOOD	POOR
Staff courteous and helpful				
Staff quick and efficient				
Explanations and instructions clear				
TELEPHONE ANSWERING				
Timely response				
Receiving information or answers				
INSPECTION				
Inspector courteous and helpfull				
Pre-construction meeting set and held in a timely manner				
Inspector at job site frequently				
Inspector able to answer questions and deal with problems				
OVERALL PERFORMANCE				
What would you say is our overall performance?				

Is there a staff person you would like to commend?	STAFF'S NAME:

COMMENTS:

NAME (Optional)	BUSINESS PHONE NUMBER	DATE
	( )	

PLEASE FOLD HERE AND STAPLE

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST- CLASS MAIL PERMIT NO. 1763 OAKLAND, CA
POSTAGE WILL BE PAID BY ADDRESSEE

State of California
DEPARTMENT OF TRANSPORTATION
P.O.Box 23660
Oakland, CA 94623-0660
Attn: Office of Encroachment Permit

1. **AUTHORITY:** The California Department of Transportation ("Department") has authority to issue encroachment permits under Division 1, Chapter 3, Article 1, Sections 660 through 734 of the Streets and Highways Code.

2. **REVOCATION:** Encroachment permits are revocable on five (5) business days' notice unless otherwise stated on the permit and except as provided by law for public corporations, franchise holders, and utilities. Notwithstanding the foregoing, in an emergency situation as determined by the Department, an encroachment permit may be revoked immediately. These General Provisions and any applicable Special Provisions are subject to modification or abrogation at any time. Permittees' joint use agreements, franchise rights, reserved rights or any other agreements for operating purposes in State of California ("State") highway right-of-way are exceptions to this revocation.

3. **DENIAL FOR NONPAYMENT OF FEES:** Failure to pay encroachment permit fees when due may result in rejection of future applications and denial of encroachment permits.

4. **ASSIGNMENT:** No party other than the permittee or permittee's authorized agent is allowed to work under this encroachment permit.

5. **ACCEPTANCE OF PROVISIONS:** Permittee understands and agrees to accept and comply with these General Provisions, the Special Provisions, any and all terms contained in this encroachment permit, and all attachments to this encroachment permit, for any work to be performed under this encroachment permit.

6. **BEGINNING OF WORK:** When traffic is not impacted (see General Provision # 35), the permittee must notify the Department's representative two (2) business days before starting permitted work. Permittee must notify the Department's representative if the work is to be interrupted for a period of five (5) business days or more, unless otherwise agreed upon. All work must be performed on weekdays during regular work hours, excluding holidays, unless otherwise specified in this encroachment permit.

7. **STANDARDS OF CONSTRUCTION:** All work performed within State highway right-of-way must conform to all applicable Departmental construction standards including but not limited to: Standard Specifications, Standard Plans, Project Development Procedures Manual, Highway Design Manual and Special Provisions.

   Other than as expressly provided by these General Provisions, the Special Provisions, the Standard Specifications, Standard Plans, and other applicable Departmental standards, nothing in these General Provisions is intended to give any third party any legal or equitable right, remedy, or claim with respect to these General Provisions or any provision herein. These General Provisions are for the sole and exclusive benefit of the permittee and the Department.

   Where reference is made in such standards to "Contractor" and "Engineer," these are amended to be read as "Permittee" and "Department's representative," respectively, for purposes of this encroachment permit.

8. **PLAN CHANGES:** Deviations from plans, specifications, and/or encroachment permit provisions are not allowed without prior approval from the Department's representative.

9. **INSPECTION AND APPROVAL:** All work is subject to monitoring and inspection. Upon completion of work, permittee must request a final inspection for acceptance and approval by the Department. The local public agency permittee must not give final construction approval to its contractor until final acceptance and approval by the Department is obtained.

10. **PERMIT AT WORKSITE:** Permittee must keep the permit package or a copy thereof at the work site at all times, and must show it upon request to any Department representative or law enforcement officer. If the permit package, or a copy thereof, is not kept and made available at the work site at all times, the work must be suspended.

11. **CONFLICTING ENCROACHMENTS:** Permittee must yield start of work to ongoing, prior authorized work adjacent to or within the limits of the permittee's project site. When existing encroachments conflict with permittee's work, the permittee must bear all cost for rearrangements (e.g., relocation, alteration, removal, etc.).

12. **PERMITS FROM OTHER AGENCIES:** This encroachment permit is invalidated if the permittee has not obtained all permits necessary and required by law, including but not limited to permits from the California Public Utilities Commission (CPUC), California Occupational Safety and Health Administration (Cal-OSHA), or any other public agency having jurisdiction. Permittee warrants all such permits have been obtained before beginning work under this encroachment permit.

13. **PEDESTRIAN AND BICYCLIST SAFETY:** A safe minimum continuous passageway of four (4) feet must be maintained through the work area at existing pedestrian or bicycle facilities. At no time must pedestrians be diverted onto a portion of the street used for vehicular traffic. At locations where safe alternate passageways cannot be provided, appropriate signs and barricades must be installed

at the limits of construction and in advance of the limits of construction at the nearest crosswalk or intersection to detour pedestrians to facilities across the street. Attention is directed to Section 7-1.04, *Public Safety*, of the Department's Standard Specifications.

14. **PUBLIC TRAFFIC CONTROL:** As required by law, the permittee must provide traffic control protection, warning signs, lights, safety devices, etc., and take all other measures necessary for the traveling public's safety. While providing traffic control, the needs of all road users, including but not limited to motorists, bicyclists and pedestrians, including persons with disabilities in accordance with the Americans with Disabilities Act, must be an essential part of the work activity.

    Lane and/or shoulder closures must comply with the Department's Standard Specifications and Standard Plans for traffic control systems, and with the applicable Special Provisions. Where issues are not addressed in the Standard Specifications, Standard Plans, and/or Special Provisions, the California Manual on Uniform Traffic Control Devices (Part 6, *Temporary Traffic Control*) must be followed.

15. **MINIMUM INTERFERENCE WITH TRAFFIC:** Permittee must plan and conduct work so as to create the least possible inconvenience to the traveling public, such that traffic is not unreasonably delayed. On conventional highways, permittee must place properly attired flagger(s) to stop or warn the traveling public in compliance with the California Manual on Uniform Traffic Control Devices (Chapter 6E, *Flagger Control*).

16. **STORAGE OF EQUIPMENT AND MATERIALS:** The storage of equipment or materials is not allowed within State highway right-of-way, unless specified within the Special Provisions of this encroachment permit. If encroachment permit Special Provisions allow for the storage of equipment or materials within the State highway right-of-way, the equipment and material storage must also comply with Section 7-1.04, *Public Safety*, of the Department's Standard Specifications.

17. **CARE OF DRAINAGE:** Permittee must provide alternate drainage for any work interfering with an existing drainage facility in compliance with the Department's Standard Specifications, Standard Plans, and/or as directed by the Department's representative.

18. **RESTORATION AND REPAIRS IN STATE HIGHWAY RIGHT-OF-WAY:** Permittee is responsible for restoration and repair of State highway right-of-way resulting from permitted work (Streets and Highways Code, section 670 et seq.).

19. **STATE HIGHWAY RIGHT-OF-WAY CLEAN UP:** Upon completion of work, permittee must remove and dispose of all scraps, refuse, brush, timber, materials, etc. off the State highway right-of-way. The aesthetics of the highway must be as it was before work started or better.

20. **COST OF WORK:** Unless stated otherwise in the encroachment permit or a separate written agreement with the Department, the permittee must bear all costs incurred for work within the State highway right-of-way and waives all claims for indemnification or contribution from the State, the Department, and from the Directors, officers, and employees of the State and/or the Department.

21. **ACTUAL COST BILLING:** When specified in the permit, the Department will bill the permittee actual costs at the currently set Standard Hourly Rate for encroachment permits.

22. **AS-BUILT PLANS:** When required, permittee must submit one (1) set of folded as-built plans within thirty (30) calendar days after completion and acceptance of work in compliance with requirements listed as follows:

    a) Upon completion of the work provided herein, the permittee must submit a paper set of As-Built plans to the Department's representative.
    b) All changes in the work will be shown on the plans, as issued with the permit, including changes approved by Encroachment Permit Rider.
    c) The plans are to be prominently stamped or otherwise noted "AS-BUILT" by the permittee's representative who was responsible for overseeing the work. Any original plan that was approved with a Department stamp, or by signature of the Department's representative, must be used for producing the As-Built plans.
    d) If construction plans include signing or striping, the dates of signing or striping removal, relocation, or installation must be shown on the As-Built plans when required as a condition of the encroachment permit. When the construction plans show signing and striping for staged construction on separate sheets, the sheet for each stage must show the removal, relocation, and installation dates of the appropriate staged striping and signing.
    e) As-Built plans must contain the Encroachment Permit Number, County, Route, and Post Mile on each sheet.
    f) The As-Built Plans must not include a disclaimer statement of any kind that differs from the obligations and protections provided by sections 6735 through 6735.6 of the California Business and Professions Code. Such statements constitute non-compliance with Encroachment Permit requirements, and may result in the Department retaining Performance Bonds or deposits until proper plans are submitted. Failure to comply may also result in denial of future encroachment permits or a provision requiring a public agency to supply additional bonding.

23. **PERMITS FOR RECORD PURPOSES ONLY:** When work in the State highway right-of-way is within an area under a Joint Use Agreement (JUA) or a Consent to Common Use Agreement (CCUA), a fee exempt encroachment permit is issued to the permittee for the purpose of providing a notice and record of work. The permittee's prior rights must be preserved without the intention of creating new or different rights or obligations. "Notice and Record Purposes Only" must be stamped across the face of the encroachment permit.

24. **BONDING:** The permittee must file bond(s), in advance, in the amount(s) set by the Department and using forms acceptable to the Department. The bonds must name the Department as obligee. Failure to maintain bond(s) in full force and effect will result in the Department stopping all work under this encroachment permit and possibly revoking other encroachment permit(s). Bonds are not required of public corporations or privately owned utilities unless permittee failed to comply with the provisions and/or conditions of a prior encroachment permit. The surety company is responsible for any latent defects as provided in California Code of Civil Procedure section 337.15. A local public agency permittee also must comply with the following requirements:

    a) In recognition that project construction work done on State property will not be directly funded and paid by State, for the purpose of protecting stop notice claimants and the interests of State relative to successful project completion, the local public agency permittee agrees to require the construction contractor to furnish both a payment and performance bond in the local public agency's name with both bonds complying with the requirements set forth in Section 3-1.05 *Contract Bonds* of the Department's Standard Specifications before performing any project construction work.
    b) The local public agency permittee must defend, indemnify, and hold harmless the State and the Department, and the Directors, officers, and employees of the State and/or Department, from all project construction related claims by contractors, subcontractors, and suppliers, and from all stop notice and/or mechanic's lien claimants. The local public agency also agrees to remedy, in a timely manner and to the Department's satisfaction, any latent defects occurring as a result of the project construction work.

25. **FUTURE MOVING OF INSTALLATIONS:** Permittee understands and agrees to relocate a permitted installation upon notice by the Department. Unless under prior property right or agreement, the permittee must comply with said notice at the permittee's sole expense.

26. **ENVIRONMENTAL:**

    a) ARCHAEOLOGICAL/HISTORICAL: If any archaeological or historical resources are identified or encountered in the work vicinity, the permittee must immediately stop work, notify the Department's representative, retain a qualified archaeologist who must evaluate the site at permittee's expense, and make recommendations to the Department's representative regarding the continuance of work.

    b) HAZARDOUS MATERIALS: If any hazardous waste or materials (such as underground storage tanks, asbestos pipes, contaminated soil, etc.) are identified or encountered in the work vicinity, the permittee must immediately stop work, notify the Department's representative, retain a qualified hazardous waste/material specialist who must evaluate the site at permittee's expense, and make recommendations to the Department's representative regarding the continuance of work.

    Attention is directed to potential aerially deposited lead (ADL) presence in unpaved areas along highways. It is the permittee's responsibility to take all appropriate measures to protect workers in conformance with California Code of Regulations Title 8, Section 1532.1, "Lead," and with Cal-OSHA Construction Safety Orders, and to ensure roadway soil management is in compliance with Department of Toxic Substances Control (DTSC) requirements.

27. **PREVAILING WAGES:** Work performed by or under an encroachment permit may require permittee's contractors and subcontractors to pay appropriate prevailing wages as set by the California Department of Industrial Relations. Inquiries or requests for interpretations relative to enforcement of prevailing wage requirements must be directed to the California Department of Industrial Relations.

28. **LIABILITY, DEFENSE, AND INDEMNITY:** The permittee agrees to indemnify and save harmless the State, the Department, and all Directors, officers, employees, agents and/or contractors of the State and/or of the Department, including but not limited to the Director of Transportation and the Deputy Directors, from any and all claims, demands, damages, costs, liability, suits, or actions of every name, kind and description brought for or on account of property damage or injury to or death of any person, including but not limited to members of the public, the permittee, persons employed by the permittee, and persons acting on behalf of the permittee, arising out of or in connection with: (a) the issuance and/or use of this encroachment permit, and/or (b) the work or other activity conducted pursuant to this encroachment permit, and/or (c) the installation, placement, subsequent operation, and/or maintenance of said encroachment, and/or (d) the failure by the permittee or anyone acting on behalf of the permittee to perform permittee's obligations under this encroachment

permit in respect to maintenance or any other obligation, and/or (e) a defect or defects in the work, or obstructions related to the work, or from any cause whatsoever. The duty of the permittee to indemnify and save harmless includes the duties to defend as set forth in Section 2778 of the Civil Code.

It is the intent of the parties that except as prohibited by law, the permittee will defend, indemnify, and hold harmless as set forth above regardless of the existence or degree of fault or negligence, whether active or passive, primary or secondary, on the part of the State, the Department, the Directors, officers, employees, agents and/or contractors of the State and/or Department, including but not limited to the Director of Transportation and the Deputy Directors, the permittee, persons employed by the permittee, and/or persons acting on behalf of the permittee.

The permittee waives any and all rights to any type of expressed or implied indemnity against the State, the Department, the Directors, officers, employees, agents, and/or contractors of the State and/or of the Department, including but not limited to the Director of Transportation and the Deputy Directors.

The permittee understands and agrees to comply with the obligations of Titles II and III of the Americans with Disabilities Act in the conduct of the permitted activity, and further agrees to defend, indemnify, and save harmless the State, the Department, the Directors, officers, employees, and/or agents of the State and/or of the Department, including but not limited to the Director of Transportation and the Deputy Directors, from any and all claims, demands, damages, costs, liability, suits, or actions of every name, kind and description arising out of or by virtue of the Americans with Disabilities Act.

Permittee understands and agrees the Directors, officers, employees, and/or agents of the State and/or of the Department, including but not limited to the Director of Transportation and the Deputy Directors, are not personally responsible for any liability arising from or by virtue of this encroachment permit.

For the purpose of this section and all paragraphs herein, "State's contractors" includes contractors and their subcontractors under contract to the State and/or the Department performing work within the same postmile limits as the work under this encroachment permit.

This section and all paragraphs herein take effect upon issuance of this encroachment permit, and apply both during and after the work or other activity contemplated under this encroachment permit, except as otherwise provided by California law.

29. **NO PRECEDENT ESTABLISHED:** This encroachment permit is issued with the understanding that it does not establish a precedent.

30. **FEDERAL CIVIL RIGHTS REQUIREMENTS FOR PUBLIC ACCOMMODATION:**

a) As part of the consideration for being issued this encroachment permit, the permittee, on behalf of permittee and on behalf of permittee's personal representatives, successors in interest, and assigns, does hereby covenant and agree that:

i. No person on the grounds of race, color, or national origin may be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities.

ii. That in connection with the construction of any improvements on said lands and the furnishings of services thereon, no discrimination must be practiced in the selection and retention of first-tier subcontractors in the selection of second-tier subcontractors.

iii. That such discrimination must not be practiced against the public in their access to and use of the facilities and services provided for public accommodations (such as eating, sleeping, rest, recreation), and operation on, over, or under the space of the State highway right-of-way.

iv. That the permittee must use the premises in compliance with all other requirements imposed pursuant to Title 15, Code of Federal Regulations, Commerce and Foreign Trade, Subtitle A. Office of the Secretary of Commerce, Part 8 (15 C.F.R. Part 8) and as said Regulations may be amended.

b) That in the event of breach of any of the above nondiscrimination covenants, the State and the Department have the right to terminate this encroachment permit and to re-enter and repossess said land and the facilities thereon, and hold the same as if said permit had never been made or issued.

31. **MAINTENANCE OF HIGHWAYS:** By accepting this encroachment permit, the permittee agrees to properly maintain any encroachment. This assurance requires the permittee to provide inspection and repair any damage, at permittee's expense, to State facilities resulting from the encroachment.

32. **SPECIAL EVENTS:** In accordance with subdivision (a) of Streets and Highways Code section 682.5, the Department is not responsible for the conduct or operation of the permitted activity, and the applicant agrees to defend, indemnify, and hold harmless the State, the Department, and the Directors, officers, employees, agents, and

contractors of the State and/or of the Department, including but not limited to the Director of Transportation and the Deputy Directors, from any and all claims, demands, damages, costs, liability, suits, or actions of every name, kind and description arising out of any activity for which this encroachment permit is issued.

The permittee understands and agrees to comply with the obligations of Titles II and III of the Americans with Disabilities Act in the conduct of the event, and further agrees to defend, indemnify, and save harmless the State and the Department, and the Directors, officers, and employees of the State and/or Department, including but not limited to the Director of the Department and the Deputy Directors, from any and all claims, demands, damages, costs, liability, suits, or actions of every name, kind and description arising out of or by virtue of the Americans with Disabilities Act.

33. **PRIVATE USE OF STATE HIGHWAY RIGHT-OF-WAY:** State highway right-of-way must not be used for private purposes without compensation to the State. The gifting of public property use and therefore public funds is prohibited under the California Constitution, Article 16.

34. **FIELD WORK REIMBURSEMENT:** Permittee must reimburse the Department for field work performed on permittee's behalf to correct or remedy hazards or damaged facilities, or to clear refuse, debris, etc. not attended to by the permittee.

35. **NOTIFICATION OF CLOSURES TO DEPARTMENT AND TRAFFIC MANAGEMENT CENTER (TMC):** The permittee must notify the Department's representative and the Transportation Management Center (TMC) at least seven (7) days before initiating a lane closure or conducting an activity that may cause a traffic impact. A confirmation notification should occur three (3) days before closure or other potential traffic impact. In emergency situations when the corrective work or the emergency itself may affect traffic, TMC and the Department's representative must be notified as soon as possible.

36. **SUSPENSION OF TRAFFIC CONTROL OPERATION:** The permittee, upon notification by the Department's representative, must immediately suspend all lane closure operations and any operation that impedes the flow of traffic. All costs associated with this suspension must be borne by the permittee.

37. **UNDERGROUND SERVICE ALERT (USA) NOTIFICATION:** Any excavation requires compliance with the provisions of Government Code section 4216 et. seq., including but not limited to notice to a regional notification center, such as Underground Service Alert (USA). The permittee must provide notification to the regional notification center at least forty-eight (48) hours before performing any excavation work within the State highway right-of-way.

38. **COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA):** All work within the State highway right-of-way to construct and/or maintain any public facility must be designed, maintained, and constructed strictly in accordance with all applicable Federal Access laws and regulations (including but not limited to Section 504 of the Rehabilitation Act of 1973, codified at 29 U.S.C. § 794), California Access laws and regulations relating to ADA, along with its implementing regulations, Title 28 of the Code of Federal Regulations Parts 35 and 36 (28 C.F.R., Ch. I, Part 35, § 35.101 et seq., and Part 36, § 36.101 et seq.), Title 36 of the Code of Federal Regulations Part 1191 (36 C.F.R., Ch. XI, Part 1191, § 1119.1 et seq.), Title 49 of the Code of Federal Regulations Part 37 (49 C.F.R., Ch. A, Part 37, § 37.1 et seq.), the United States Department of Justice Title II and Title III for the ADA, and California Government Code section 4450 et seq., which require public facilities be made accessible to persons with disabilities.

Notwithstanding the requirements of the previous paragraph, all construction, design, and maintenance of public facilities must also comply with the Department's Design Information Bulletin 82, "Pedestrian Accessibility Guidelines for Highway Projects."

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

Devinder Singh
REGISTERED CIVIL ENGINEER

October 30, 2015
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
Devinder Singh
No. C50470
Exp. 6-30-17
CIVIL
STATE OF CALIFORNIA

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TABLE 1

TAPER LENGTH CRITERIA AND CHANNELIZING DEVICE SPACING

SPEED (S)	MINIMUM TAPER LENGTH * FOR WIDTH OF OFFSET 12 FEET (W)				MAXIMUM CHANNELIZING DEVICE SPACING		
					X	Y	Z **
	TANGENT 2L	MERGING L	SHIFTING L/2	SHOULDER L/3	TAPER	TANGENT	CONFLICT
mph	ft	ft	ft	ft	ft	ft	ft
20	160	80	40	27	20	40	10
25	250	125	63	42	25	50	12
30	360	180	90	60	30	60	15
35	490	245	123	82	35	70	17
40	640	320	160	107	40	80	20
45	1080	540	270	180	45	90	22
50	1200	600	300	200	50	100	25
55	1320	660	330	220	55	110	27
60	1440	720	360	240	60	120	30
65	1560	780	390	260	65	130	32
70	1680	840	420	280	70	140	35

* - For other offsets, use the following merging taper length formula for L:
For speed of 40 mph or less, $L = WS^2/60$
For speed of 45 mph or more, $L = WS$

Where: L = Taper length in feet
W = Width of offset in feet
S = Posted speed limit, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

** - Use for taper and tangent sections where there are no pavement markings or where there is a conflict between existing pavement markings and channelizers (CA).

TABLE 2

LONGITUDINAL BUFFER SPACE AND FLAGGER STATION SPACING

SPEED *	Min D **	DOWNGRADE Min D ***		
		-3%	-6%	-9%
mph	ft	ft	ft	ft
20	115	116	120	126
25	155	158	165	173
30	200	205	215	227
35	250	257	271	287
40	305	315	333	354
45	360	378	400	427
50	425	446	474	507
55	495	520	553	593
60	570	598	638	686
65	645	682	728	785
70	730	771	825	891

* - Speed is posted speed limit, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

** - Longitudinal buffer space or flagger station spacing

*** - Use on sustained downgrade steeper than -3 percent and longer than 1 mile.

TABLE 3

ADVANCE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS *		
	A	B	C
	ft	ft	ft
URBAN - 25 mph OR LESS	100	100	100
URBAN - MORE THAN 25 mph TO 40 mph	250	250	250
URBAN - MORE THAN 40 mph	350	350	350
RURAL	500	500	500
EXPRESSWAY / FREEWAY	1000	1500	2640

* - The distances are approximate, are intended for guidance purposes only, and should be applied with engineering judgment. These distances should be adjusted by the Engineer for field conditions, if necessary, by increasing or decreasing the recommmended distances.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SYSTEM TABLES FOR LANE AND RAMP CLOSURES

NO SCALE

T9

9-22-15

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

Devinder Singh
REGISTERED CIVIL ENGINEER

October 30, 2015
PLANS APPROVAL DATE

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Devinder Singh No. C50470 Exp. 6-30-17 CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

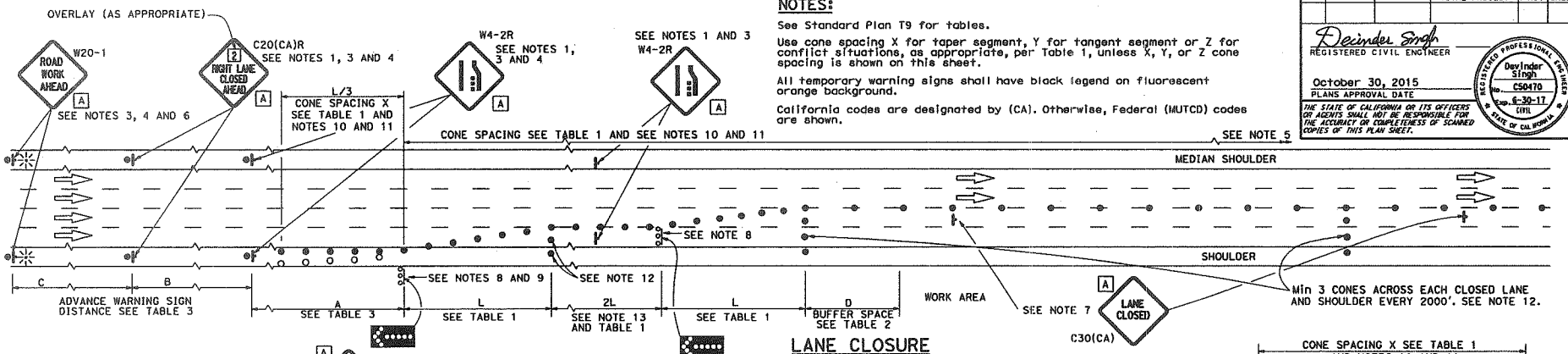
NOTES:

See Standard Plan T9 for tables.

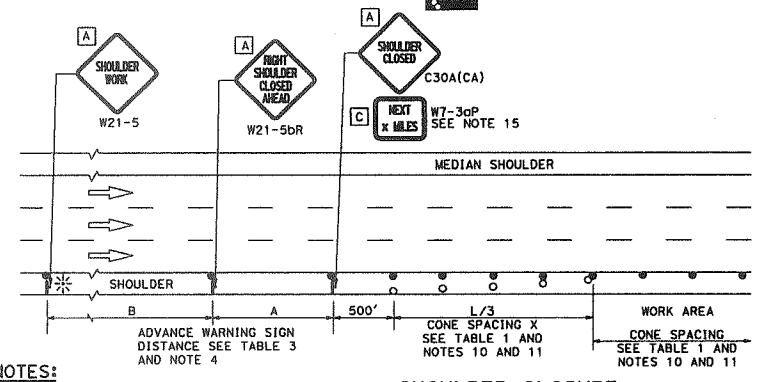
Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.

All temporary warning signs shall have black legend on fluorescent orange background.

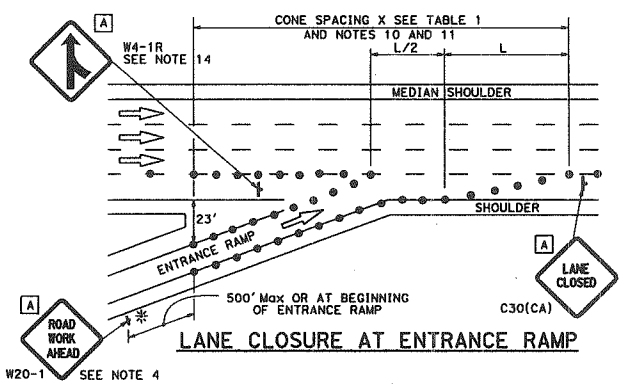
California codes are designated by (CA). Otherwise, Federal (MUTCD) codes are shown.



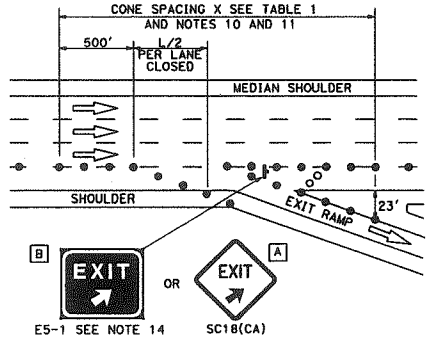
LANE CLOSURE



SHOULDER CLOSURE



LANE CLOSURE AT ENTRANCE RAMP



LANE CLOSURE AT EXIT RAMP

NOTES:

1. Median lane closures shall conform to the details as shown except that C20(CA)L and W4-2L signs shall be used.
2. At least one person shall be assigned to provide full time maintenance of traffic control devices for lane closures.
3. Duplicate sign installations are not required:
   a) On opposite shoulder if at least one-half of the available lanes remain open to traffic.
   b) In the median if the width of the median shoulder is less than 8' and the outside lanes are to be closed.
4. Each advance warning sign on each side of the roadway shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed at the locations indicated for lane closure during hours of darkness.
5. A G20-2 "END ROAD WORK" sign, with minimum size of 48" x 24" as appropriate, shall be placed at the end of the lane closure unless the end of work area is obvious or ends within a larger project's limits.
6. If the W20-1 sign would follow within 2000' of a stationary W20-1 or G20-1 "ROAD WORK NEXT _____ MILES", use a C20(CA) sign for the first advance warning sign.
7. Place a C30(CA) sign every 2000' throughout length of lane closure.
8. Use one flashing arrow sign for each lane closed. The flashing arrow signs shall be Type I.
9. A minimum 1500' of sight distance shall be provided where possible for vehicles approaching the first flashing arrow sign. Lane closures shall not begin at top of crest vertical curve or on a horizontal curve.
10. All cones used for lane closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves).
11. Portable delineators, placed at one-half the spacing indicated for traffic cones may be used instead of cones for daytime closures only.
12. A minimum of 3 cones shall be placed transversely across each closed lane and shoulder at each location where a taper across a traffic lane ends and every 2000' as shown on the "Lane Closure" detail. Two Type II barricades may be used instead of the 3 cones. The transverse alignment of the cones or barricades on the closed shoulder may be shifted from the transverse alignment to provide access to the work.
13. The 2L tangent shown along lane lines shall be used between the L tapers required for each closed traffic lane.
14. The E5-1 or SC18(CA) and W4-1 signs shall be used as shown.
15. A W7-3aP "NEXT___MILES" plaque must be used if the shoulder closure extends beyond the distance that can be perceived by road users.

LEGEND

- TRAFFIC CONE
- TRAFFIC CONE (OPTIONAL TAPER)
- TEMPORARY TRAFFIC CONTROL SIGN
- FLASHING ARROW SIGN (FAS)
- FAS SUPPORT OR TRAILER
- PORTABLE FLASHING BEACON

SIGN PANEL SIZE (Min)

A	48" x 48"
B	72" x 60"
C	36" x 30"

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE ON FREEWAYS AND EXPRESSWAYS

NO SCALE

T10

9-22-15

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

Devinder Singh
REGISTERED CIVIL ENGINEER

October 30, 2015
PLANS APPROVAL DATE

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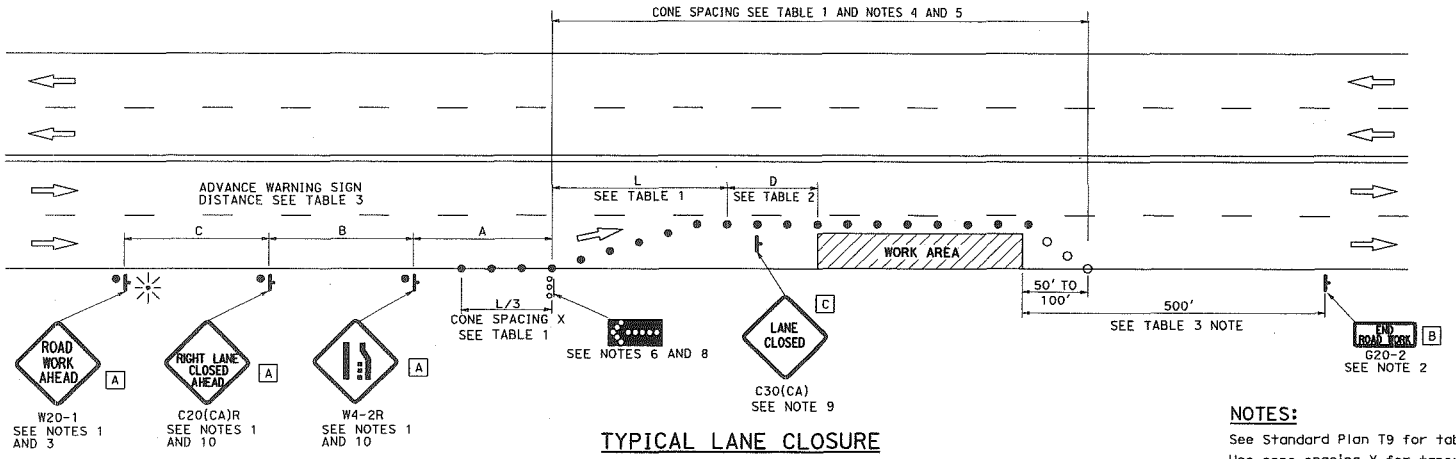
REGISTERED PROFESSIONAL ENGINEER — Devinder Singh — No. C50470 — Exp. 6-30-17 — CIVIL — STATE OF CALIFORNIA



TYPICAL LANE CLOSURE

NOTES:

See Standard Plan T9 for tables.

Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.

All temporary warning signs shall have black legend on fluorescent orange background.

California codes are designated by (CA). Otherwise, Federal (MUTCD) codes are shown.

LEGEND

- ● TRAFFIC CONE
- ○ TRAFFIC CONE (OPTIONAL TAPER)
- TEMPORARY TRAFFIC CONTROL SIGN
- FLASHING ARROW SIGN (FAS)
- FAS SUPPORT OR TRAILER
- PORTABLE FLASHING BEACON

SIGN PANEL SIZE (Min)

- [A] 48" x 48"
- [B] 36" x 18"
- [C] 30" x 30"

NOTES:

1. Each advance warning sign shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed at the locations indicated for lane closure during hours of darkness.
2. A G20-2 "END ROAD WORK" sign, as appropriate, shall be placed at the end of the lane closure unless the end of work area is obvious, or ends within a larger project's limits.
3. If the W20-1 sign would follow within 2000' of a stationary W20-1 or G20-1 "ROAD WORK NEXT _____ MILES", use a C20(CA) sign for the first advance warning sign.
4. All cones used for lane closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves).
5. Portable delineators, placed at one-half the spacing indicated for traffic cones, may be used instead of cones for daytime closures only.
6. Flashing arrow sign shall be either Type I or Type II.
7. For approach speeds over 50 mph, use the "Traffic Control System for Lane Closure On Freeways And Expressways" plan for lane closure details and requirements.
8. A minimum 1500' of sight distance shall be provided where possible for vehicles approaching the first flashing arrow sign. Lane closures shall not begin at the top of crest vertical curve or on a horizontal curve.
9. Place a C30(CA) sign every 2000' throughout length of lane closure.
10. Median lane closures shall conform to the details shown except that C20(CA)L and W4-2L signs shall be used.
11. At least one person shall be assigned to provide full time maintenance of traffic control devices for lane closure unless, otherwise directed by the Engineer.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

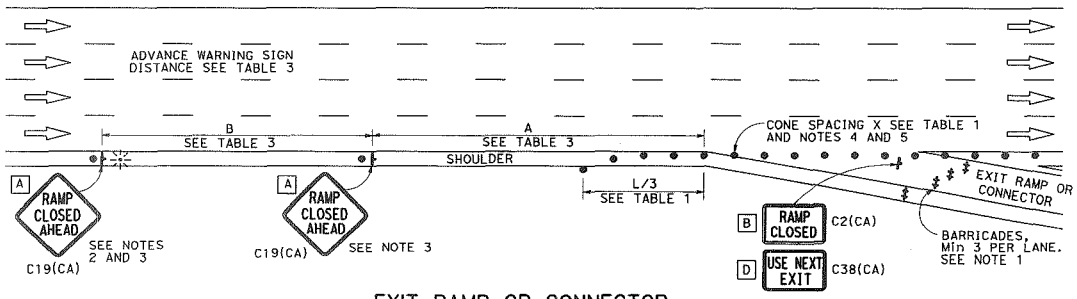
TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE ON MULTILANE CONVENTIONAL HIGHWAYS

NO SCALE

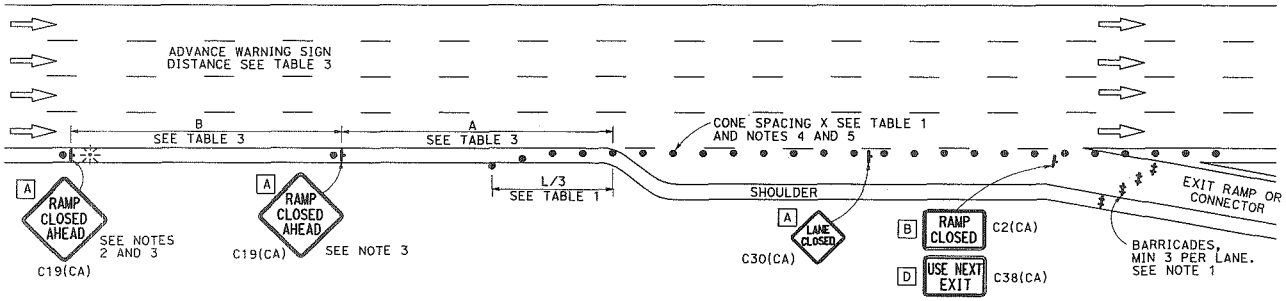
T11

9-22-15

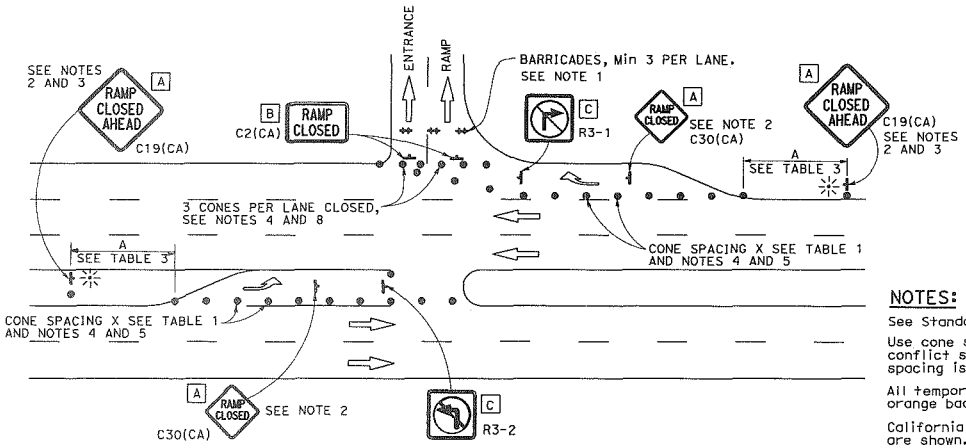
TYPICAL RAMP CLOSURES



EXIT RAMP OR CONNECTOR



EXIT RAMP OR CONNECTOR WITH ADDITIONAL LANE



ENTRANCE RAMP WITH TURNING POCKETS

SIGN PANEL SIZE (Min)

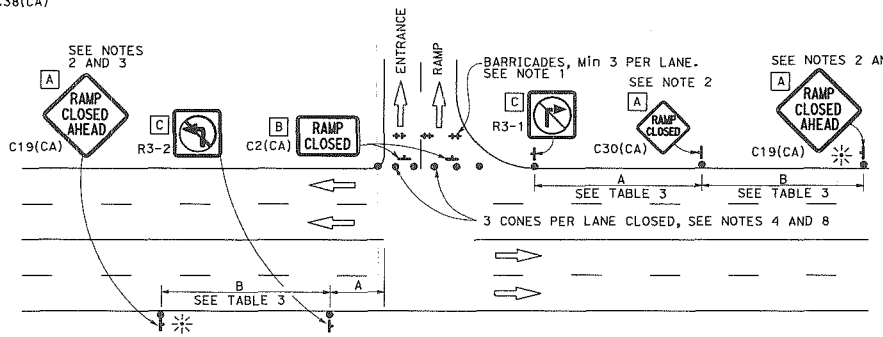
- A 48" x 48"
- B 48" x 30"
- C 36" x 36"
- D 48" x 36"

LEGEND

- TRAFFIC CONE
- TEMPORARY TRAFFIC CONTROL SIGN
- BARRICADES
- PORTABLE FLASHING BEACON

NOTES:

1. Barricades shall be Type I, II, or III for closures lasting one week or less and Type III for closures lasting longer than one week.
2. In addition to placing the C19(CA) "RAMP CLOSED AHEAD" and C30(CA) "RAMP CLOSED" signs, black on orange overlay plates with the word "CLOSED" may be mounted, as directed by the Engineer, on all guide signs that refer to the closed ramp. The letter size on the overlay shall be the same as the guide sign.
3. Each advance C19(CA) "RAMP CLOSED AHEAD" sign shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. A flashing beacon shall be placed on top of the first C19(CA) sign during hours of darkness.
4. All cones used for ramp closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves) as specified in the specifications.
5. Portable delineators, placed at one-half the spacing indicated for traffic cones, may be used instead of cones for daytime ramp closures only.
6. At least one person shall be assigned to provide full time maintenance of traffic control devices, unless otherwise directed by the Engineer.
7. The existing "EXIT" signs shall be covered during ramp closures.
8. A minimum of 3 cones shall be placed transversely across each closed lane and shoulder.



ENTRANCE RAMP WITHOUT TURNING POCKETS

NOTES:

See Standard Plan T9 for tables.

Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.

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California codes are designated by (CA). Otherwise, Federal (MUTCD) codes are shown.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

Devinder Singh
REGISTERED CIVIL ENGINEER

October 30, 2015
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
Devinder Singh
No. C50470
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STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SYSTEM FOR RAMP CLOSURE

NO SCALE

T14

9-22-15

D4 Encroachment Permit Work Scheduling Request Form

Submit your request to schedule traffic control weekly, 7 days in advance, using this form. Submit your request to State Representative (Inspector) listed on page 1 or 2 of your permit. Check special provisions for authorized work hours. Any deviation from the permit must be in writing and requires additional review and approval.

INSTRUCTIONS AND ABBREVIATIONS: See the procedures on page 2 of this form.

1. Permit No.: _____ 2. Expiration Date: _____ 3. Request Date: _____
4. Caltrans Inspector: _____ 5. Requested Work Week: _____to_____
6. Route: _____ 7. County: _____8. City or Township:_____
9. ☐ Post Miles: From: _____ To: _____10. Existing Lanes (in each Dir): Dir_____Lns_____/ Dir_____ Lns _____
11. Describe Location (use landmark if necessary): From: _____To: _____
12. Name of Conventional Highway or Surface St:_____
13. Fill in or 'x' if applicable (a through k): (a) ☐ Divided Hwy *or* ☐ Undivided Hwy (b) ☐ Full-Closure ☐ 1 dir or ☐ both dir
(c) ☐ One-Way Traffic Control: Only on "Undivided" Hwy (*Alternate use of same lane for both directions--hold traffic 5 –10 min w/flaggers*)
(d) ☐ Connector Ramp: (*State Highway #*) _____to (*State Highway #*) _____Closed ☐ *or* Lane #_____
(e) ☐ Off-ramp: (*Freeway to City St.*) Ramp Name: _____ Off-ramp Closed ☐ *or* Lane#: _____
(f) ☐ On-ramp: (*City St. to Freeway*) Ramp Name: _____ On-ramp Closed ☐ *or* Lane#: _____
(g) ☐ Divert Traffic or Contra Flow: Reconfigure Lns/divert traffic to Lane# ___in the ___ Direction; ___Lns open each dir
(h) ☐ Intermittent Traffic Control (i) ☐ Various Locations (j) ☐ Long-Term (24+ hours continuous) ETO_____

(k) Year:			Time		Dir		* * * * * * Restricted Lanes * * * * * *														Brks		Closure ID#
From DATE	To DATE	DAY(S) SU-M-T-W-TH-F-SA	24-HR CLOCK Start (10-97)	Finish (10-98)	NB EB	SB WB	Full Closure See Detour	SHLDR L	SHLDR R	1	2	3	4	5	6	V L	Aux or Coll	CD or Med	TURN PCKT(S) L	TURN PCKT(S) R	Park Strip	5 to 15 min	Roll-ing	*Caltrans will complete & return*

14. Description of work/comments: _____

_____

15. Detour (*Required for full closure*): _____

_____

16. Contingency Plan: _____
17. On-site during work (*circle if applicable*): CHP / PD / Other: _____

18. Name:	Permittee or Permittees Representative/Contractor:	
	Address including zip code:	
On-site Personnel Contact Name of person in responsible charge & phone number(s).	Name:	
	Email:	
	Office:	FAX:
	Cell:	Emergency phone number 24/7:

19. "REAL-TIME" STATUS INSTRUCTIONS – PLEASE MAKE YOUR FIELD PERSONNEL AWARE & RESPONSIBLE! Permittee must **STATUS** lane closures **DAILY** via Caltrans District 4's 24-Hour Communication Center at **(510) 286-6359.** Status using Closure ID Number when work begins, to **1097** (1st cone down), and again to **1098** (last cone picked up); OR, **1022** to cancel. Any **delay** in picking up your closure must be reported immediately.

D4 Encroachment Permit Work Scheduling Procedures

1. **INSTRUCTIONS:** Fill in blanks or check appropriate boxes. Attach maps or diagrams, if available. Enter **beginning day** through **ending day of work week** (M-T-W-TH-F-SA-SU). **Date: Month/Day**–Enter month (01-12) and day (01-31) of requested week. **Start & Finish Time:** Use 24-hour clock format. **Read** the Permit Special Provisions for **hours & days** allowed. Separate lane closure #'s are required for each direction and facility. Use separate line for each. **Lanes** are numbered in direction of travel from left to right, excluding turn pockets; left being #1 or "fast lane." Check boxes under **Restricted Lanes** to indicate lanes or parts of highway to be closed. **VL** may be checked with note in Comments Section stating number of lanes to remain open at all times.
2. **ABBREVIATIONS: Aux**=auxiliary, **CD**=Center Divide; **Coll**=Collector; **Contra Flow**=Close 1 direction of traffic and divert to lane(s) in opposite direction or a turn lane. **DAY(S)**=(M-T-W-TH-F-SA-SU); **Dir**=Direction (**NB**=Northbound, **SB**=Southbound, **WB**=Westbound, **EB**=Eastbound); **ETO**=Emergency Traffic Operations; **F/L**=fog line; **Hwy**=Highway; **Lns**=Lanes; **L**=Left; **Med**=Median; **Park Strip**=Parking area parallel to lane; **PCKT**=Pocket; **Rolling**=traffic breaks for closure such as sweeping; **R**=Right; **SHLDR**=Shoulder; **VL**=Various Lanes
3. Requests for scheduling must be submitted on this form to the Inspector listed on page 1 or 2 of your permit.
4. All permitted work (**with or without traffic control**) is subject to advance scheduling on this form, seven (7) days in advance of the work week requested. Submittals and approvals must continue on a weekly basis.
5. If work begins weekly on Sunday, the work week must be Sunday through Saturday. If work week begins on Monday, the work week must be Monday through Sunday.
6. Incomplete, illegible, or inaccurate requests may be returned for correction. Assistance for completing the request may be obtained from the designated State Representative.
7. Every attempt will be made to return timely requests with closure ID or work authorization numbers, to the Permittee by close of business on Thursday, prior to the scheduled work week. When deemed necessary to ensure public convenience, Caltrans may deny and/or reschedule the request.
8. All requests must include a contingency plan for restoring public traffic (i.e. reopening of a closed lane, ramp and/or shoulder) in the event of (1) CHP or the local authority requires opening due to an unforeseeable incident in the nearby vicinity, or (2) permitted experiences an equipment breakdown, shortage of or lack of production materials or any other failure which would otherwise delay restoring public convenience within the time limits specified in the permit. The contingency plan must include availability of any proposed standby equipment and stockpiled materials that can be utilized for the immediate opening of closures when ordered by the State representative. Acceptance of the contingency plan by the Engineer must not relieve the Contractor from the requirement of opening the restricted travel way to accommodate public traffic as specified in the lane closure hour's section of the permit provisions.
9. Caltrans will review and process the request by entering all information into the Statewide Lane Closure System (LCS). This process generates a work authorization number*. This number will be entered on the request form and returned to Permittee as approval to proceed AND will be used to **"Real-Time Status"** on a daily basis. Permittee must communicate with Caltrans 24-hour District 4 Communication Center (DCC) via telephone at **(510) 286-6359** twice daily when working, or once daily if cancelled.
   a. When work begins (1st cone down), Permittee must contact Caltrans DCC and relay: **"(Closure ID #*) is 1097."**
   b. When work ends (last cone picked up), Permittee must contact Caltrans DCC and relay: **"(Closure ID #*) is 1098."**
   c. If the work is cancelled on any scheduled day, Permittee must contact Caltrans DCC and relay; **"(Closure ID #*) is 1022."** A "10-22" (cancellation) can be phoned any time before the scheduled "10-97" time, but no later than 1 hour prior to scheduled "10-98" time.
   d. During the work, any unexpected occurrences including delayed openings, accidents, etc., must be communicated to Caltrans DCC immediately.

   Avoid possible miscommunication when calling status. Use the **PHONETIC ALPHABET** to state your Closure ID:
   A=Adam, **B**=Boy, **C**=Charles, **D**=David, **E**=Edward, **F**=Frank, **G**=George, **H**=Henry, **I**=Ida, **J**=John, **K**=King, **L**=Lincoln, **M**=Mary, **N**=Nora, **O**=Ocean, **P**=Paul, **Q**=Queen, **R**=Robert, **S**=Sam, **T**=Tom, **U**=Union, **V**=Victor, **W**=William, **X**=X-ray, **Y**=Yellow, **Z**=Zebra. *Example:* P82CA="Paul 82 Charles Adam"
10. The intent of these procedures is to help ensure public convenience by identifying planned closures on the State Highway system, resolving potential conflicts, and disseminating all available **"REAL-TIME"** information via the traffic media to all motorists, including but not limited to the public, CHP, local police and sheriffs' office, and emergency fire and rescue personnel.

* *"closure ID number" is the same as "work authorization number"*

STORM WATER SPECIAL PROVISIONS for MINIMAL or NO IMPACT

TR-0400 (Rev 09/2012)

1. **GENERAL:** The purpose of these Special Provisions is to provide the Permittee with specifications for water pollution control to minimize, prevent, or control the discharge of material into the air, surface waters, groundwater, and storm sewers owned by the State or local agencies. These provisions are not intended to take the place of the Caltrans Water Pollution Control Program (WPCP) for projects where soil disturbance from work activities less than one acre, or work activities of one acre or more subject to the preparation of the Caltrans Storm Water Pollution Prevention Plan (SWPPP) that would require a waste discharge identification number or coverage under the California Construction General Permit *(Order No. 2009-0009-DWQ, NPDES No CAS000002)*. The Permittee shall comply with the following Special Provisions and the direction of the State Representative.

2. **NPDES REQUIREMENTS:** The Permittee shall be responsible for full compliance with the Caltrans Storm Water Program and the Caltrans National Pollutant Discharge Elimination System (NPDES) Permit requirements. It is the Permitte's responsibility to install, inspect, and repair or maintain facilities and devices used for water pollution control practices before performing daily work activities. Installation and maintenance responsibilities on the job site include: 1) soil stabilization materials in work areas that are inactive or prior to storm events, 2) water pollution control devices to control sediment and erosion, 3) implementation of spill and leak prevention procedures for chemical and hazardous substances stored on the job site. 4) material storage, 5) stockpile management, 6) waste management, 7) non-stormwater management, 8) water conservation, and 9) illicit connection, illegal discharge detection and reporting. The Permittee shall report to the state representative when discharges enter into receiving waters, adjacent property, drainage systems or when discharges could be a cause or a threat for water pollution. The Permittee shall also control illicit discharges or illegal dumping prior to start of daily work schedule. Copies of written notices or orders from the Regional Water Quality Control Board or other regulatory agency shall be provided to the State representative within 48 hours of reported activity. For additional information on storm water compliance, visit the State Water Resources Control Boards storm water Website at http://www.waterboards.ca.gov/water_issues/programs/stormwater

3. **RESPONSIBILITY FOR DEBRIS REMOVAL:** The Permittee shall be responsible for preventing sediment, trash, debris, and other construction waste from entering the street, the storm drains, local creeks, or any other bodies of water.

4. **SPOILS AND RESIDUE:** The Permittee shall vacuum any saw-cut concrete waste material, debris, residue, etc. No spoils, debris, residue, etc. shall be washed into a drainage system.

5. **SWEEPING:** Sweep paved roads at construction entrance and exit locations and surrounding paved areas daily within the job site during: 1) clearing and grubbing, 2) earthwork, 3) trenching, 4) soil disturbance, 5) pavement grinding and/or cutting, and 6) after observing tracking of material onto or off the State property. Keep dust to a minimum during sweeping activities. Use vacuum whenever dust generation is excessive or sediment pickup is ineffective. Roadways or work areas shall not be washed down with water. Street sweeping operations must conform to Section 13 Water Pollution Control of the State of California standard specifications for construction (most current version) http://www.dot.ca.gov/hq/esc/oe/specifications/SSPs/2010-SSPs/ .

6. **VEHICLES AND EQUIPMENT:** Permittee shall prevent all vehicles, equipment, etc. from leakage or mud tracking onto roadways. If leaks cannot be repaired immediately, remove the vehicle or equipment from the job site.

7. **MAINTENANCE AND FUELING OF VEHICLES AND EQUIPMENT:** Maintenance and fueling of equipment shall not result in any pollution at the job site. The Permittee shall immediately clean up spills/leaks, and properly dispose of contaminated soil and materials.

8. **CLEANING VEHICLES AND EQUIPMENT:** Limit vehicle and equipment cleaning or washing at the job site except what is necessary to control vehicle tracking or hazardous waste. The Permittee shall clean all equipment within a bermed area or over a drip pan large enough to prevent run-off. No soaps, solvents, degreasers, etc shall be used in State right of way. Any water from this operation shall be collected and disposed of at an appropriate site. Containment berms or dikes shall be used for fueling, washing, maintaining and washing vehicles or equipment in outside areas. Containment must be performed at least 100 feet from concentrated flows of storm water, drainage courses, and storm drain inlets if within a flood plain, otherwise at least 50 feet if outside the floodplain. Keep adequate quantities of absorbent spill-cleanup material and spill kits in the fueling or maintenance area and on fueling trucks.

9. **DIESEL FUELS:** The use of diesel fuel from petroleum or other fossil fuel as a form-oil or solvent is not allowed.

10. **WEATHER CONDITIONS AT WORKSITE:** Any activity that would generate fine particles or dust that could be transported off site by stormwater shall be performed during dry weather.

11. **HOT MIX ASPHALT:** Runoff from washing hot mix asphalt shall not enter into any drainage conveyances.

12. **PROTECTION OF DRAINAGE FACILITIES:** The Permittee shall protect/cover gutters, ditches, drainage courses, and inlets with gravel bags, fiber rolls, State approved fabric filters, etc., to the satisfaction of the State representative during grading, paving, saw-cutting, etc. and materials must conform to Section 13-6.02 Materials for Water Pollution Control of the State of California standard specifications for construction (most current version). No such protection measures shall cause an obstruction to the traveling public. The Permittee shall implement spill and leak prevention procedures for chemicals and hazardous substances stored on the job site in accordance to section 13-4.03B(1-3) Spill Prevention and Control, Water Pollution Control, of the State of California standard specifications for construction (2010 version).

13. **PAINT:** Rinsing of painting equipment and materials is not permitted in state right-of-way. When thoroughly dry, dispose of the following as solid waste: dry latex paint, paint cans, used brushes, rags, gloves, absorbent materials, and drop cloths. Oil based paint sludge and unusable thinner shall be disposed of at an approved hazardous waste site.

14. **CONSTRUCTION MATERIALS:** Stockpile of all construction materials, including, but not limited to; pressure treated wood, asphalt concrete, cold mix asphalt concrete, concrete, grout, cement containing premixes, and mortar, shall conform to section 13-4.03C Material Management (Storage & Stockpiles), Water Pollution Control, of the State of California standard specifications for construction (2010 version).

15. **CONCRETE EQUIPMENT:** Concrete equipment shall be washed in a designated washing area in a way that does not contaminate soil, receiving waters, or storm drain systems.

16. EXISTING VEGETATION: Established existing vegetation is the best form of erosion control. Minimize disturbance to existing vegetation. Damaged or removed vegetation shall be replaced as directed by the State Representative.

17. SOIL DISTURBANCE: Soil disturbing activities shall be avoided during the wet weather season. If construction activities during wet weather are allowed in your permit, all necessary erosion control and soil stabilization measures shall be implemented in advance of soil disturbing activity.

18. SLOPE STABILIZATION AND SEDIMENT CONTROL: Consider a certified expert in Erosion and Sediment control in cases where slopes are disturbed during construction. The Permittee is directed to comply with Section 13.5 Temporary Soil Stabilization and Section 21 Erosion Control of the State of California (2010 version) standard specifications for construction during application of temporary soil stabilization measures to the soil surface. Fiber rolls or silt fences may be required down slope until permanent soil stabilization is established. Remove the accumulated sediment whenever the sediment accumulates to 1/3 of the linear sediment barrier height.

19. STOCKPILES: Stockpiles containing aggregate and/or soil shall be stored at least 100 feet from concentrated flows of storm water, drainage courses, and storm drain inlets if within a flood plain, otherwise at least 50 feet if outside the floodplain, and shall be covered and protected with a temporary perimeter sediment barrier. Cold mix stockpiles shall be stored on an impermeable surface and covered with 9mil plastic to prevent contact with water.

20. DISCOVERY OF CONTAMINATION: The State Representative shall be notified in case any unusual discoloration, odor, or texture of ground water, is found in excavated material or if abandoned, underground tanks, pipes, or buried debris are encountered.

21. SANITARY AND SEPTIC WASTE: Do not bury or discharge wastewater from a sanitary or septic system within the highway. Properly connected sewer facilities are free from leaks. With State Representative approval place portable sanitary facility at least 50 feet away from storm drains, receiving waters, and flow lines. Permittee must comply with local health agency provisions when using an on-site disposal system.

22. LIQUID WASTE: Prevent job site liquid waste from entering storm drain systems and receiving waters. Drilling slurries, grease or oil-free waste water or rinse water, dredging, wash water or rinse water running off a surface or other nonstorm water liquids not covered under separate waste water permits shall be held in structurally sound, leak-proof containers, such as portable bins or portable tanks. Store containers at least 50 feet away from moving vehicles and equipment. Liquid waste may require testing to determine hazardous material content prior to disposal

23. WATER CONTROL AND CONSERVATION: Manage water use in a way that will prevent erosion and the discharge of pollutants into storm drain systems and receiving waters. Direct runoff water, including water from water line repair from the job site to areas where it can infiltrate into the ground. Direct water from off-site sources around the job site or from contact with jobsite water.

24. PILE DRIVING: Keep spill kits and cleanup materials at pile driving locations. Park pile driving equipment over drip pans, absorbent pads, or plastic sheeting with absorbent material, and away from storm water run-on when not in use.

25. DEWATERING: Dewatering consists of discharging accumulated storm water, groundwater, or surface water from excavations or temporary containment facilities. All dewatering operations shall comply with the latest Caltrans guidelines. Contact State representative for approval of dewatering discharge by infiltration or evaporation, otherwise, any effluent discharged into a permitted storm water system requires approval from the Regional Water Quality Control Board. Prior to the start of dewatering, the Permittee shall provide the State Representative with a dewatering and discharge work plan that complies with section 13-4.01B Submittals, Water Pollution Control, of the State of California standard specifications for construction (2010 version). A copy of the Waste Discharge Permit and a copy of a valid WDID number issued by the Regional Board shall be provided to the State representative.

NOTICE OF COMPLETION

Permit No.: 18-0313

Inspector: S. LUGO

All work authorized by the above-numbered permit was completed on _____.

_____

Permittee Signature

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 1763 OAKLAND, CA

POSTAGE WILL BE PAID BY ADDRESSEE

State of California
DEPARTMENT OF TRANSPORTATION
P.O. Box 23660
Oakland, Ca 94623-9936
Attn: Encroachment Permit Division

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

STANDARD ENCROACHMENT PERMIT APPLICATION

TR-0100 (REV 12/2018)

Complete ALL fields, write "N/A" if not applicable. Type or print clearly.
This application is not complete until all requirements have been approved.

Permission is requested to encroach on the State Highway right-of-way as follows:

FOR CALTRANS USE
TRACKING NO.
DIST/CO/RTE/PM
SIMPLEX STAMP
DATE OF SIMPLEX STAMP

1. COUNTY	2. ROUTE	3. POST MILE
4. ADDRESS OR STREET NAME	5. CITY	
6. CROSS STREET (Distance and direction from project site)		

7. WORK TO BE PERFORMED BY
☐ APPLICANT ☐ CONTRACTOR

8. IS THIS APPLICATION FOR THE CONTRACTOR'S (DOUBLE) PERMIT?
☐ NO ☐ YES. If "YES", provide the Parent Permit Number

9. ESTIMATE START DATE

10. ESTIMATED COMPLETION DATE

11. ESTIMATED NUMBER OF WORKING DAYS WITHIN STATE HIGHWAY RIGHT-OF-WAY

12. ESTIMATED CONSTRUCTION COSTS WITHIN STATE HIGHWAY RIGHT-OF-WAY

13. HAS THE PROJECT BEEN REVIEWED BY ANOTHER CALTRANS BRANCH?
☐ NO ☐ YES. If "YES", which branch?

14. FUNDING SOURCE(S)
☐ FEDERAL ☐ STATE ☐ LOCAL ☐ PRIVATE ☐ SB 1 (ROAD REPAIR AND ACCOUNTABILITY ACT OF 2017)

15. CALTRANS PROJECT CODE (ID)

16. APPLICANT'S REFERENCE / UTILITY WORK ORDER NUMBER

17. DESCRIBE WORK TO BE DONE WITHIN STATE HIGHWAY RIGHT-OF-WAY (in 20 lines or less)
Attach 6 complete sets of plans (folded to 8.5" x 11") and any applicable specifications, calculations, maps, traffic control plans, etc.

18 (a). PORTION OF STATE HIGHWAY RIGHT-OF-WAY WHERE WORK IS BEING PROPOSED (check all that apply)
☐ Traffic lane ☐ Shoulder ☐ Sidewalk ☐ Median ☐ At or near an intersection ☐ Mobile work
☐ Outside of the shoulder, feet from edge of pavement ☐ Other _____

18 (b). PROPOSED TRAFFIC CONTROL PLANS AND METHOD
☐ No traffic control needed ☐ State Standard Plans (T-Sheets) # _____
☐ Project specific Traffic Control Plans included ☐ To be submitted by contractor

ADA Notice For individuals with sensory disabilities, this document is available in alternate formats. For alternate format information, contact the Forms Management Unit at (916) 445-1233, TTY 711, or write to Records and Forms Management, 1120 N Street, MS-89, Sacramento, CA 95814.

STANDARD ENCROACHMENT PERMIT APPLICATION

TR-0100 (REV 12/2018)

TRACKING NO.

19. EXCAVATION	MAX. DEPTH (in)	MIN. DEPTH (in)	AVG. WIDTH (in)	LENGTH (ft)	SURFACE TYPE (e.g. Asphalt, concrete, soil, etc.)
20. PIPES	PRODUCT BEING TRANSPORTED	CARRIER PIPE DIAMETER____(in.) MATERIAL____		CASING PIPE DIAMETER____(in.) MATERIAL____	

PROPOSED INSTALLATION METHOD (e.g. HDD, Bore & Jack, Open Cut, etc.) | VOLTAGE / PSIG

DOES THE PROPOSED PROJECT INVOLVE THE REPLACEMENT AND/OR ABANDONMENT OF AN EXISTING FACILITY?

☐ NO ☐ YES. If "YES", provide a description

21. IS A CITY, COUNTY OR OTHER PUBLIC AGENCY INVOLVED IN THE APPROVAL OF THIS PROJECT?

☐ YES (if "YES", check the type of project AND attach the environmental documentation and conditions of approval)

☐ COMMERCIAL DEVELOPMENT ☐ BUILDING ☐ GRADING ☐ OTHER _____

☐ CATEGORICALLY EXEMPT ☐ NEGATIVE DECLARATION ☐ ENVIRONMENTAL IMPACT REPORT ☐ OTHER _____

☐ NO (if "NO", check the category below which best describes the project AND answer questions A-K)

☐ DRIVEWAY OR ROAD APPROACH, RECONSTRUCTION, MAINTENANCE OR RESURFACING ☐ FENCE ☐ EROSION CONTROL

☐ PUBLIC UTILITY MODIFICATION, EXTENSIONS, HOOKUPS ☐ MAILBOX ☐ LANDSCAPING

☐ FLAGS, SIGNS, BANNERS, DECORATIONS, PARADES AND CELEBRATIONS ☐ OTHER _____

The following questions must be answered when a City, County or other public agency IS NOT involved in the approval of this project.

Your answers to these questions will assist Caltrans staff in identifying any physical, biological, social or economic resources that may be affected by your proposed project within State Highway right-of-way and to determine which type of environmental studies may be required to approve your application for an encroachment permit. It is the applicant's responsibility for the production of all required environmental documentation and supporting studies and in some cases this may be costly and time consuming. If possible, attach photographs of the location of the proposed project. Answer these questions to the best of your ability. Provide a description of any "YES" answers (type, name, number, etc.).

A. Will any existing vegetation and/or landscaping within State Highway right-of-way be disturbed?

B. Are there waterways (e.g. river, creek, pond, natural pool or dry streambed) adjacent to or within the limits of the proposed project?

C. Is the proposed project located within five miles of the coast line?

D. Will the proposed project generate construction noise levels greater than 86 decibels (dBA) (e.g. Jack-hammering, pile driving)?

E. Will the proposed project incorporate land from a public park, recreation area or wildlife refuge open to the public?

F. Are there any recreational trails or paths within the limits of the proposed project?

G. Will the proposed project impact any structures, buildings, rail lines or bridges within State Highway right-of-way?

H. Will the proposed project impact access to any businesses or residences?

I. Will the proposed project impact any existing public utilities or public services?

J. Will the proposed project impact any existing pedestrian facilities, such as sidewalks, crosswalks or overcrossings?

K. Will new lighting be constructed within or adjacent to State Highway right-of-way?

STANDARD ENCROACHMENT PERMIT APPLICATION

TR-0100 (REV 12/2018)

TRACKING NO.

22. Will the proposed project cause a substantial change in the significance of a historical resource (45 years or older), or cultural resource? ☐ YES ☐ NO (if "YES", provide a description)

23. Will the proposed project be on an existing State Highway or street where the activity involves removal of a scenic resource? (e.g. A significant tree or stand of trees, a rock outcropping or a historic building) ☐ YES ☐ NO (if "YES", provide a description)

24. Is work being done on the applicant's property in addition to State Highway right-of-way? ☐ YES ☐ NO
(If "YES", attach 6 complete sets of site and grading plans)

25. Will the proposed project require the disturbance of soil? ☐ YES ☐ NO
If "YES", estimate the area of disturbed soil within State Highway right-of-way in acres: _____
and estimate the area of disturbed soil outside State Highway right-of-way in acres: _____

26. Will the proposed project require dewatering? ☐ YES ☐ NO
If "YES", estimate Total gallons AND gallons/month. _____ (Total gallons) AND _____ (gallons/month)
SOURCE*: ☐ STORMWATER ☐ NON-STORMWATER
(*See Caltrans SWMP for definition of non-storm water discharge: http://www.dot.ca.gov/env/stormwater/)

27. How will any storm water or ground water be disposed?
☐ Storm Drain System ☐ Combined Sewer / Stormwater System ☐ Stormwater Retention Basin ☐ N/A
☐ Other (explain) _____

STANDARD ENCROACHMENT PERMIT APPLICATION

TR-0100 (REV 12/2018)

TRACKING NO.

READ THE FOLLOWING CLAUSES PRIOR TO SIGNING THIS ENCROACHMENT PERMIT APPLICATION.

The applicant's submission of this application to the California Department of Transportation constitutes the applicant's agreement and representation that the work or other activity contemplated by the encroachment permit application shall comply with all applicable standards, specifications, policies, requirements, conditions, and regulations of the California Department of Transportation, and the applicant understands the application may be denied if there is non-compliance with any of the above. An exception process exists and may result in approval of a non-compliant encroachment, in the discretion of the California Department of Transportation, but the exception process may require additional time to complete. The applicant understands and agrees all work or other activity contemplated by the encroachment permit application is subject to inspection and oversight by the California Department of Transportation. The applicant understands and agrees encroachment permit fees must still be paid if an application is withdrawn or denied. The applicant understands a denial may be appealed, in accordance with California Streets and Highways Code, Section 671.5, and the related regulations found in California Code of Regulations, Title 21, Division 2, Chapter 8, Article 2.

The applicant understands and agrees that immediately upon issuance of the encroachment permit the applicant is bound by, subject to, and must comply with the "Encroachment Permit General Provisions" (TR-0045), "Stormwater Special Provisions" (TR-0400) and any other applicable Special Provisions and Conditions of the encroachment permit. The "Encroachment Permit General Provisions" (TR-0045), and the Stormwater Special Provisions (TR-0400) are available at: http://www.dot.ca.gov/trafficops/ep/docs/Appendix_K_(WEB).pdf. If a paper copy is needed of the "Encroachment Permit General Provisions" (TR-0045) and/or "Stormwater Special Provisions" (TR-0400), please contact the District Office of Encroachment Permits. Their contact information is available at: http://www.dot.ca.gov/trafficops/ep/docs/Appendix_G_(WEB).pdf. The "Encroachment Permit General Provisions" (TR-0045) and any other applicable Special Provisions and Conditions will be provided as part of the encroachment permit. Information about Stormwater requirements is available at the Internet address: http://www.dot.ca.gov/hq/construc/stormwater/.

The applicant understands an encroachment permit may be denied, revoked, and/or a bond may be required, for non-payment of prior or present encroachment permit fees. An encroachment permit is not a property right and does not transfer with the property to a new owner. Each of the persons purporting to execute this application on behalf of the applicant and/or on behalf of the applicant's authorized agent or engineer represents and warrants such person has full and complete legal authority to do so and to thereby bind applicant to the terms and conditions herein and to the terms and/or conditions of the encroachment permit. Applicant understands and agrees this application may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Executed copies of this application and/or its counterparts may be reproduced and/or exchanged by copy machine, mailing, facsimile, or electronic means (such as e-mail), and such copies shall be deemed to be effective as originals.

28. NAME OF APPLICANT (Project or Property Owner or Organization)		
ADDRESS OF APPLICANT (Include City, State and Zip Code)		
E-MAIL ADDRESS	PHONE NUMBER	FAX NUMBER
29. NAME OF AUTHORIZED AGENT / ENGINEER (A "Letter of Authorization" is required if different from #28)		IS A LETTER OF AUTHORIZATION ATTACHED? ☐ YES ☐ NO
ADDRESS OF AUTHORIZED AGENT / ENGINEER (Include City, State and Zip Code)		
E-MAIL ADDRESS	PHONE NUMBER	FAX NUMBER
30. NAME OF BILLING CONTACT (Same as #28 ☐ Same as #29 ☐)		
BILLING ADDRESS WHERE INVOICE(S) IS / ARE TO BE MAILED (Include City, State and Zip Code)		
E-MAIL ADDRESS	PHONE NUMBER	FAX NUMBER

* I hereby certify under penalty of perjury under the laws of the State of California that the information in this application and any document submitted with or in support of this application are true and correct to the best of my knowledge and belief, and that copies of any documents submitted with or in support of this application are true and correct copies of unaltered original documents. I further understand that if I have provided information that is false, intentionally incomplete, or misleading I may be charged with a crime and subjected to fine or imprisonment, or both fine and imprisonment. (Penal Code Section 72)

31. SIGNATURE OF APPLICANT OR AUTHORIZED AGENT*	32. PRINT OR TYPE NAME	
33. TITLE		34. DATE

ADA Notice For individuals with sensory disabilities, this document is available in alternate formats. For alternate format information, contact the Forms Management Unit at (916) 445-1233, TTY 711, or write to Records and Forms Management, 1120 N Street, MS-89, Sacramento, CA 95814.

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

STANDARD ENCROACHMENT PERMIT APPLICATION

TR-0100 (REV 12/2018)

INSTRUCTIONS

Complete ALL fields, write "N/A" if not applicable. Type or print clearly. All dimensions must be in U.S. Customary (English) units.

Print your application single sided and submit all of the required attachments (See Section VII A&B of the "Encroachment Permit Application Guide Booklet" found at: http://www.dot.ca.gov/trafficops/ep/docs/EP_Application_Guide_Booklet.pdf).

1. County (e.g. Fresno, San Francisco, Los Angeles, etc.)
2. State Highway Route Number (e.g. I-5, SR-99, etc.)
3. Highway Postmile: (location of work, see https://postmile.dot.ca.gov/) If unable to determine, contact the appropriate District Encroachment Permits Office for assistance at: http://www.dot.ca.gov/trafficops/ep/docs/Appendix_G_(WEB).pdf
4. Address of project site (if the property has a physical address with a Number and Street/Road Name)
5. City (e.g. Sacramento, Redding, Irvine, etc.)
6. Distance and the direction from the nearest cross street to the project site (e.g. 500 ft. north of "C" Street).
7. Indicate whether the work will be performed by the applicant (your own forces) or by a contractor.
8. Indicate if you are applying for a "Contractor's (Double) Permit" and provide the "Parent Permit Number".
9. Estimated start date for the proposed work. (Allow a minimum of 60 calendar days from the submittal date of your application for processing)
10. Estimated completion date for the proposed work.
11. Estimated number of working days within State Highway right-of-way.
12. Estimated construction costs for all work to be done within State Highway right-of-way.
13. Has another Caltrans' branch seen or reviewed your project? Which branch? (e.g. Design, Project Management, Right-of-Way, Environmental, etc.)
14. Identify funding source(s) for the proposed work.
15. Caltrans' Project Code (ID) if this is a State project, capital project, or joint venture project.
16. Your company's reference number or utility work order number for this project.
17. Describe the proposed work to be done entirely. If applicable, attach six (6) complete sets of FOLDED plans (folded 8-½" X 11") and any applicable specifications, calculations, maps, etc.
18. (a) Identify portion(s) of State right-of-way where work will occur and (b) proposed traffic control plans to be used if any.
19. Maximum and minimum depth, average width, and length of the excavation area. Existing surface type (e.g. Asphalt, concrete, soil, etc.)
20. Product being transported (e.g. water, natural gas, etc.) Carrier pipe, diameter (inches) and material (e.g. Steel, HDPE, etc.) Casing pipe (if any), diameter and material Proposed installation method, Voltage of electrical current or pressure of liquid or gas. Replacement and/or abandonment of an existing facility (e.g. Abandoning pipe and filling it with two-sack slurry cement)
21. Check "YES", if you are getting a permit or approval from another agency (City, County, etc.), and an environmental determination has been made. Then check the Categorically Exempt, Negative Declaration, Environmental Impact Report box or Other if one has been prepared. Attach a copy of the approved document and a copy of the Notice of Determination. Skip questions A-K.

    If you checked "NO", check the box of the appropriate type of work to be done,or check "other" and fill in the type of work to be done. Also answer questions A-K.
22. A Historical Resource includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript that has historical or archaeological significance, or significance in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.
23. In this context a Scenic Resource includes, but is not limited to, trees that display outstanding features of form or age; unique, massive rock formations; historic buildings that are rare examples of their period, style, design, or which have special architectural features and details of importance.
24. Is there any work being done on the applicant's property?
25. Indicate if the proposed project will require the disturbance of soil. If "YES," estimate the area within AND outside of State Highway right-of-way in acres.
26. Indicate if the proposed project will require dewatering. If "YES," estimate volume in total gallons AND gallons per month. Also indicate the source: Stormwater or Non-Stormwater (see Caltrans Stormwater Management Plan for definitions of non-stormwater discharge at: http://www.dot.ca.gov/hq/env/stormwater).
27. Indicate how any stormwater or ground water will be disposed of from or near the limits of the proposed project.
28. Name of the applicant or organization applying for the permit. List the mailing address, e-mail address, phone and fax numbers.
29. Name of the authorized agent or engineer acting on behalf of the applicant or organization. Attach a letter of authorization signed by the applicant or organization. List the mailing address, e-mail address, phone and fax numbers.
30. Name of the billing contact. List the mailing address where invoices are to be mailed, email address, phone and fax numbers.
31. Signature of the applicant or applicant's authorized agent.
32. Name of the applicant or applicant's authorized agent.
33. Title (owner, president, etc.) of the applicant or applicant's authorized agent.
34. Date of the signature.

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCL	101	R28.4/R28.9		

LICENSED LANDSCAPE ARCHITECT

PLANS APPROVAL DATE

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

LICENSED LANDSCAPE ARCHITECT WILLIAM SOWA NO. 4466 2/28/21 Renewal Date 10/10/19 Date STATE OF CALIFORNIA

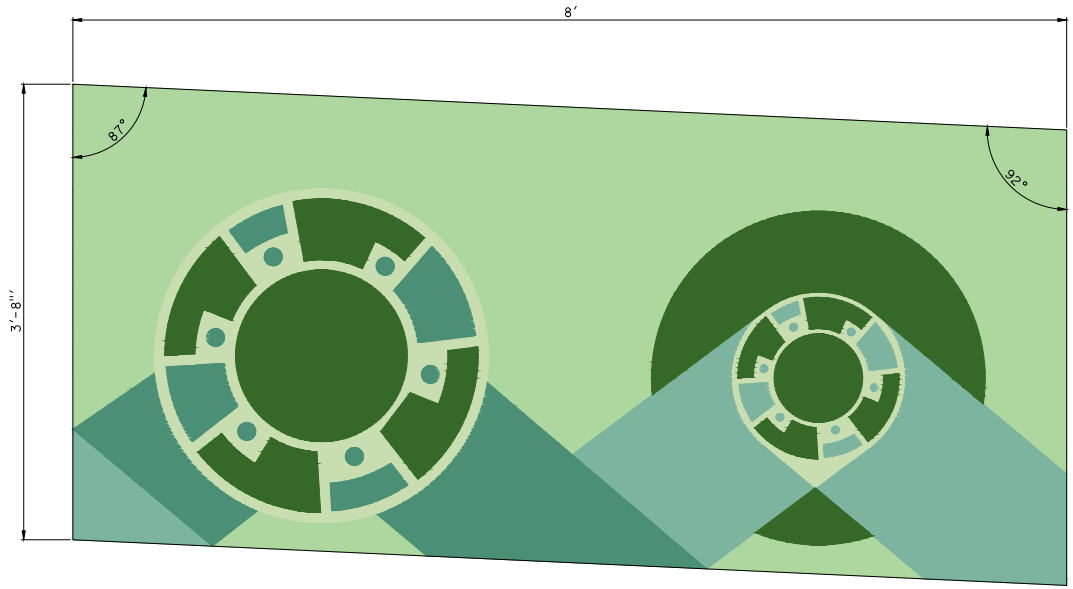
HMH
1570 OAKLAND ROAD
SAN JOSE, CA 95131

CITY OF SAN JOSE
DEPARTMENT OF TRANSPORTATION
200 E. SANTA CLARA STREET
SAN JOSE, CA 95113

REVISED BY	DATE REVISED
GINO ORLANDO WILLIAM B. SOWA	WILLIAM B. SOWA
CALCULATED-DESIGNED BY	CHECKED BY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION | CONSULTANT FUNCTIONAL SUPERVISOR: WILLIAM B. SOWA

Caltrans



RGB COLOR LEGEND

	R=201 G=222 B=176
	R=174 G=215 B=159
	R=125 G=180 B=159
	R=75 G=144 B=118
	R=54 G=104 B=39

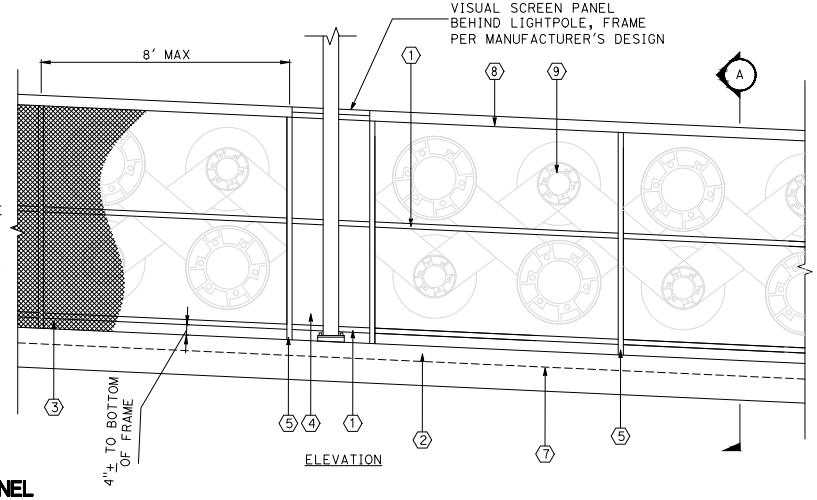
NOTE:

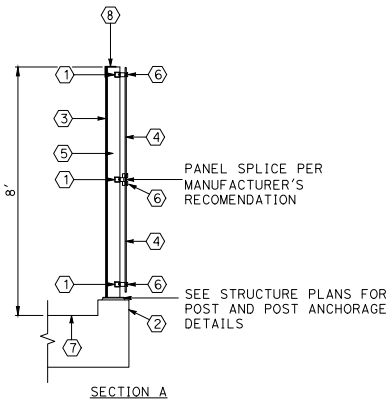
COLORS TO MATCH RGB VALUES PROVIDED OR CLOSEST PANTONE EQUIVALENT

VISUAL SCREEN PANEL GRAPHIC ENLARGEMENT

SCALE: 2"=1'-0"

1. HORIZONTAL PANEL STEEL TUBE OR ANGLE FRAME, VERTICAL PANEL FRAME OPTIONAL PER MANUFACTURER'S DESIGN.
2. CONCRETE CURB. SEE STRUCTURE PLANS
3. 1"X1" VINYL COATED MESH, SEE STRUCTURE PLANS
4. TRANSLUCENT POLYCARBONATE RESIN SCREEN PANEL
5. CHAINLINK RAILING FENCE POST, SEE STRUCTURE PLANS
6. POINT SUPPORT HARDWARE
7. BICYCLE/PEDESTRIAN PATH
8. CHAINLINK RAILING TOP RAIL 4"X4" ANGLE, SEE STRUCTURE PLANS
9. PRINTED EMBEDDED GRAPHIC





VISUAL SCREEN PANEL

SCALE: 1/2"=1'-0"

CONSTRUCTION DETAILS

AS SHOWN

C-43

LAST REVISION 10-17-18 | DATE PLOTTED => @date | TIME PLOTTED => @time

BORDER LAST REVISED 10/17/2018 | USERNAME => @USER | DGN FILE => @REQUEST | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 00000 | PROJECT NUMBER & PHASE 0416000224

California Department of Transportation
Division of Maintenance

Structure Maintenance and Investigations

BRIDGE

INSPECTION

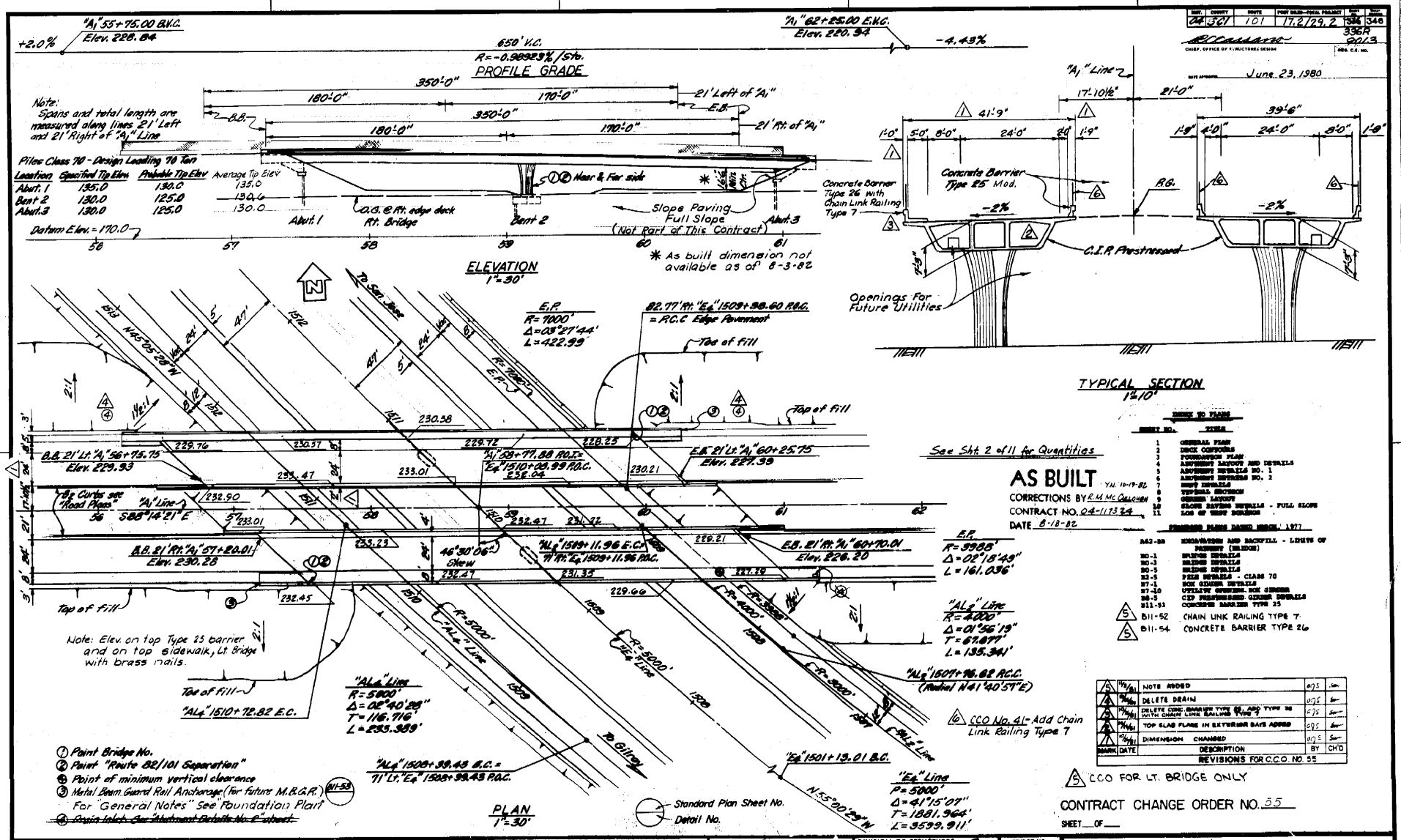
RECORDS

INFORMATION

SYSTEM

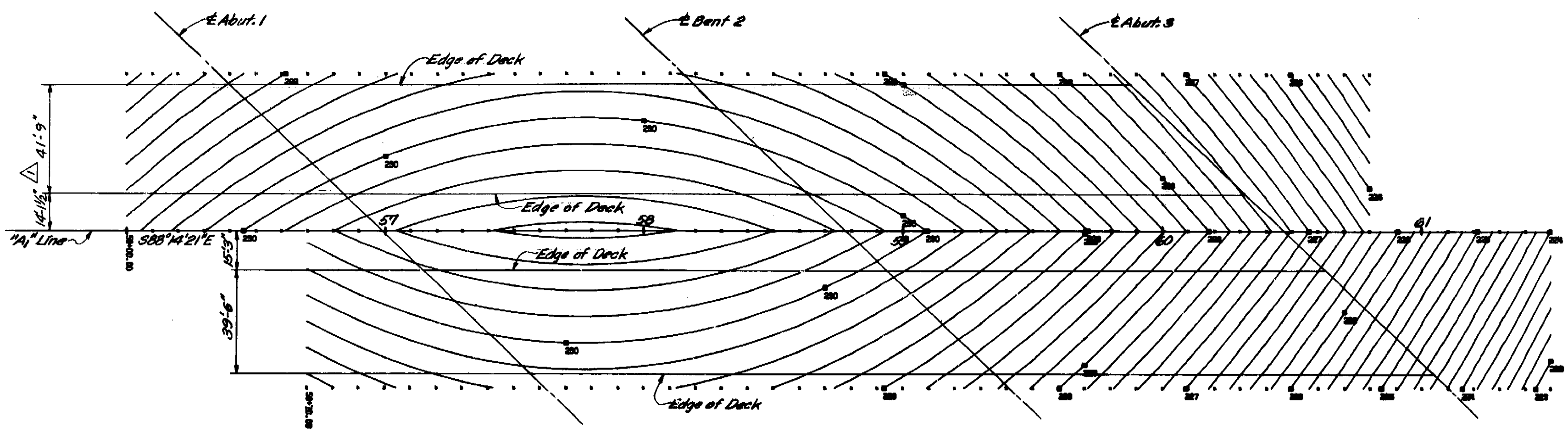
The requested documents have been generated by BIRIS.

Records for “Confidential” bridges may only be released outside the Department of Transportation upon execution of a confidentiality agreement.



AS BUILT PLANS
Contract No. 04-117324
Date Completed ___
Document No. ___

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION.
DATE 1-7-83 SIGNATURE Donald Blackford TITLE ASSISTANT CHIEF, OFFICE SERVICES



PLAN
1" = 20'

Note:
■ - Indicates even foot contours
x - 10' intervals along station line.
Contours do not include camber.

APPROXIMATE QUANTITIES

FURNISH PILING (CLASS 70)	7,952 LF
DRIVE PILE (CLASS 70)	114 EA
PRESTRESSING CAST-IN-PLACE CONCRETE	LUMP SUM
STRIP WATERSTOP	174 LF
6" PERFORATED STEEL PIPE UNDERDRAIN (.064" THICK)	166 LF
8" CORRUGATED STEEL PIPE DOWNDRAIN (.064" THICK)	216 LF
CONCRETE BARRIER (TYPE 25)	1,692 LF

FINAL PAY QUANTITIES

STRUCTURE EXCAVATION (BRIDGE)	771 CY
STRUCTURE BACKFILL (BRIDGE)	478 CY
STRUCTURAL CONCRETE, BRIDGE FOOTING	229 CY
STRUCTURAL CONCRETE, BRIDGE	2,411 CY
BAR REINFORCING STEEL (BRIDGE)	538,000 LB
MISCELLANEOUS METAL (BRIDGE)	805 LB

AS BUILT
CORRECTIONS BY R.M. McCullough Y.N. 10-19-82
CONTRACT NO. 04-117324
DATE 8-18-82

△2 CCO FOR LT. BRIDGE ONLY

CONTRACT CHANGE ORDER NO. 55
SHEET __ OF __

DIST.	COUNTY	ROUTE	POST MILES—TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SCl	101	17.2/29.2	367 337R	346

[signature] 13102
DESIGN ENGINEER — REGISTERED CIVIL ENGINEER NUMBER
DATE APPROVED June 23, 1980

MARK	DATE	DESCRIPTION	BY	CH'D
△3				
△2	11/2/81	NOTE ADDED	AJS	Sm
△1	11/17/81	DIMENSION CHANGED	AJS	Sm

REVISIONS FOR C.C.O. NO. 55

DESIGN	By A.J. Salinas 5/79	Checked D. Vandershaf 11/79
DETAILS	By T.A. Hanson 2/79	Checked D. Vandershaf 11/79
QUANTITIES	By [signature] 11-77	Checked T.A. Hanson 11/77

State of CALIFORNIA
DEPARTMENT OF TRANSPORTATION

STRUCTURES - DESIGN 1
PROJECT ENGINEER [signature] 9-79

BRIDGE NO. 37-348 R/L
POST MILE 0.0

ROUTE 82/101 SEPARATION
DECK CONTOURS

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04216
WO 117321

Disregard prints bearing earlier revision dates →

REVISION DATES (PRELIMINARY STAGE ONLY) 9/14/79

SHEET 2 OF 11

37

AS BUILT PLANS
Contract No. 04-117324
Date Completed ______

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION.
DATE 1-7-83 [signature: Donald Blackford] TITLE SUPERVISOR OF MICROFILM SERVICES

DIST.	COUNTY	ROUTE	POST MILES—TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SCI	101	17.2/29.2	338	346

C W Perkins 13102
BRIDGE SECTION SUPERVISOR — REGISTERED CIVIL ENGINEER NO. 13102
DATE APPROVED June 23, 1980

GENERAL NOTES
LOAD FACTOR DESIGN

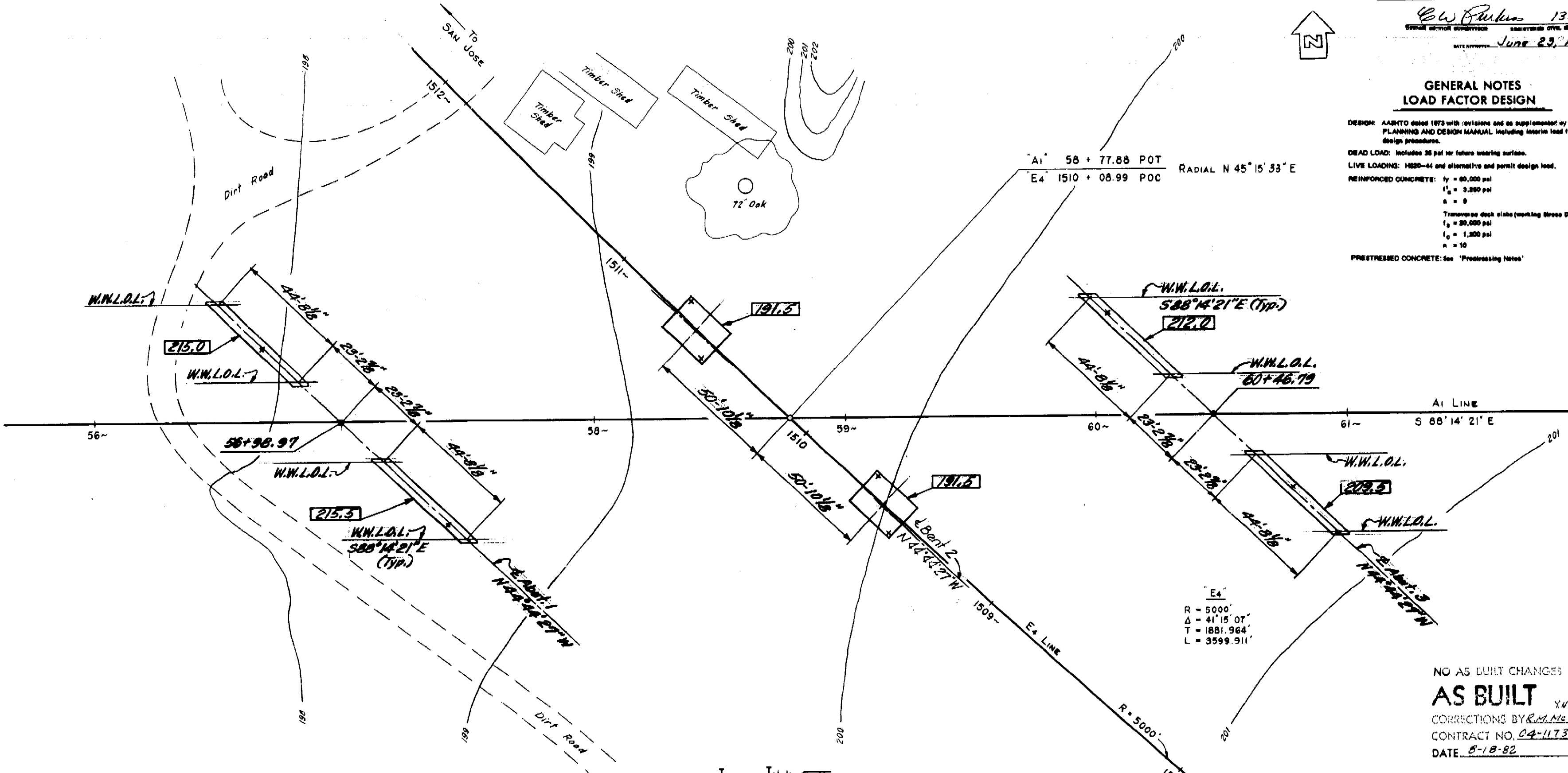
DESIGN: AASHTO dated 1973 with revisions and as supplemented by BRIDGE PLANNING AND DESIGN MANUAL including interim load factor design procedures.

DEAD LOAD: Includes 35 psf for future wearing surface.

LIVE LOADING: HS20-44 and alternative and permit design load.

REINFORCED CONCRETE: f_y = 60,000 psi
f'_c = 3,250 psi
n = 9
Transverse deck slabs (working Stress Design)
f_s = 20,000 psi
f_c = 1,200 psi
n = 10

PRESTRESSED CONCRETE: See "Prestressing Notes"



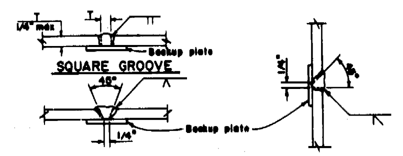
NO AS BUILT CHANGES
AS BUILT YU 10-19-82
CORRECTIONS BY R.M. McCULLOUGH
CONTRACT NO. 04-117324
DATE 8-18-82

▭ Indicates bottom footing elevation
+ Indicates concrete pile - Class 70
All piles not shown. For pile layout see "Abutment Layout & Details" sheet.

PA-7
Fd RR spike in ℄ Ford Road
42'± Rt E4 1502 + 12±
Elev 202.82'

TBM "A"
Set Top of stake ℄
A1 57 + 62±
Elev. 198.89'

SCALE	1" = 20'
LEVEL DATUM	MSL
FOR ALIGNMENT TIES SEE	PR-37348-3
CONTOURS AS OF	9-19-69
SITE PLAN FROM	DISTRICT DATA
CK'D BY DUB	DATE 9-19-69
DRAWN BY RRB	DATE 9-25-69
TRACED BY JLL	DATE 10-8-69



SQUARE GROOVE

SINGLE VEE-GROOVE — SINGLE BEVEL-GROOVE

PILE WELDING DETAIL - BUTT JOINTS

Notes:
1. Single Vee-Groove and Square Groove permitted for all positions.
2. Single Bevel-Groove permitted for horizontal joints only.

PR-37348-1

BRIDGE DEPARTMENT DESIGN SECTION 1		STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
Project Engineer	L m Stahl 9-29	ROUTE 82/101 SEPARATION
DESIGN	By G O Gebauer 11/77; Checked D. Vandershof 11/77	FOUNDATION PLAN
DETAILS	By T.A. Hanson 10/77; Checked D. Vandershof 11/77	BRIDGE NO. 37-348 R/L; POST MILE 0.0; DRAWING NO.; SHEET 3 OF 11
QUANTITIES	By Gar? P. ? 11/77; Checked T.A. Hanson 11/77	

Disregard prints bearing earlier revision dates →

WO 117321
CU 04216

338

AS BUILT PLANS
Contract No. 04-117324
Date Completed ______
Document No. ______

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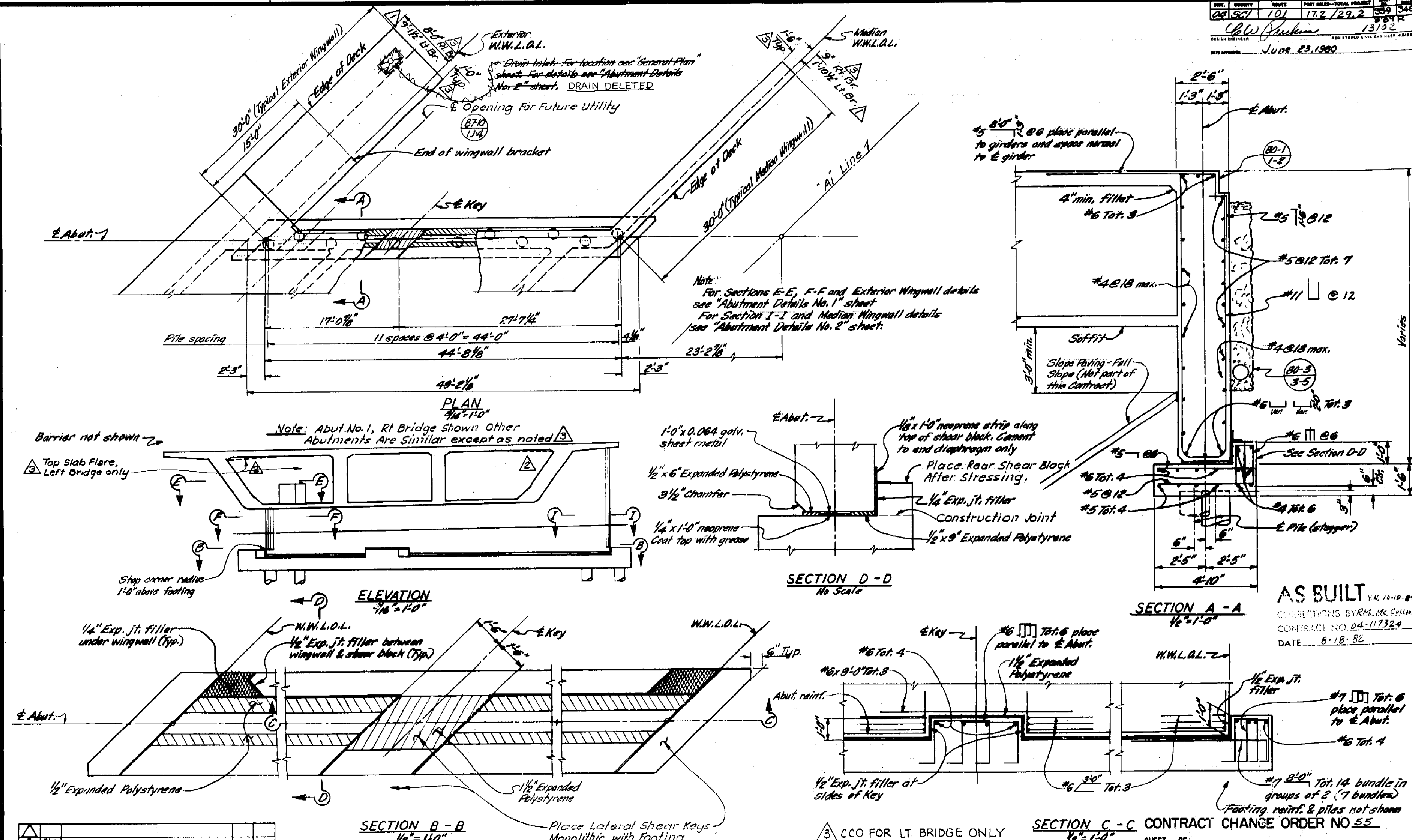
DATE 1-7-83 SIGNATURE Donald Blackford TITLE SUPERVISOR OF MICROFILM SERVICES



DIST.	COUNTY	ROUTE	POST MILES—TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SCl	101	17.2/29.2	339	346

Design Engineer: C.W. Pushkin — Registered Civil Engineer Number 13102

Date approved: June 23, 1980

AS BUILT Y.N. 10-19-82
CORRECTIONS BY R.M. McCullum
CONTRACT NO. 04-117324
DATE 8-18-82

CONTRACT CHANGE ORDER NO 55
SHEET __ OF __

MARK	DATE	DESCRIPTION	BY	CH'D
3	7/81	NOTE CHANGE / NOTE ADDED	ags	[illegible]
2	7/81	TOP SLAB FLARE IN EXTERIOR BAYS ADDED	ags	[illegible]
1	7/80	DIMENSION CHANGED	ags	[illegible]

REVISIONS FOR C.C.O. NO. 55

	By	Checked
DESIGN	G.G. Salamon 11/77	D. Vandershaf 11/77
DETAILS	T.A. Hanson 9/77	D. Vandershaf 11/77
QUANTITIES	Sol P. [illegible] 11-77	T.A. Hanson 11/77

State of CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF STRUCTURES
DESIGN SECTION 1
PROJECT ENGINEER: Lastoler 9-79

BRIDGE NO. 37-345 R/L
POST MILE 0.0

ROUTE 82/101 SEPARATION
ABUTMENT LAYOUT AND DETAILS

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04216
WO 117321

Disregard prints bearing earlier revision dates →

SHEET 4 OF 11

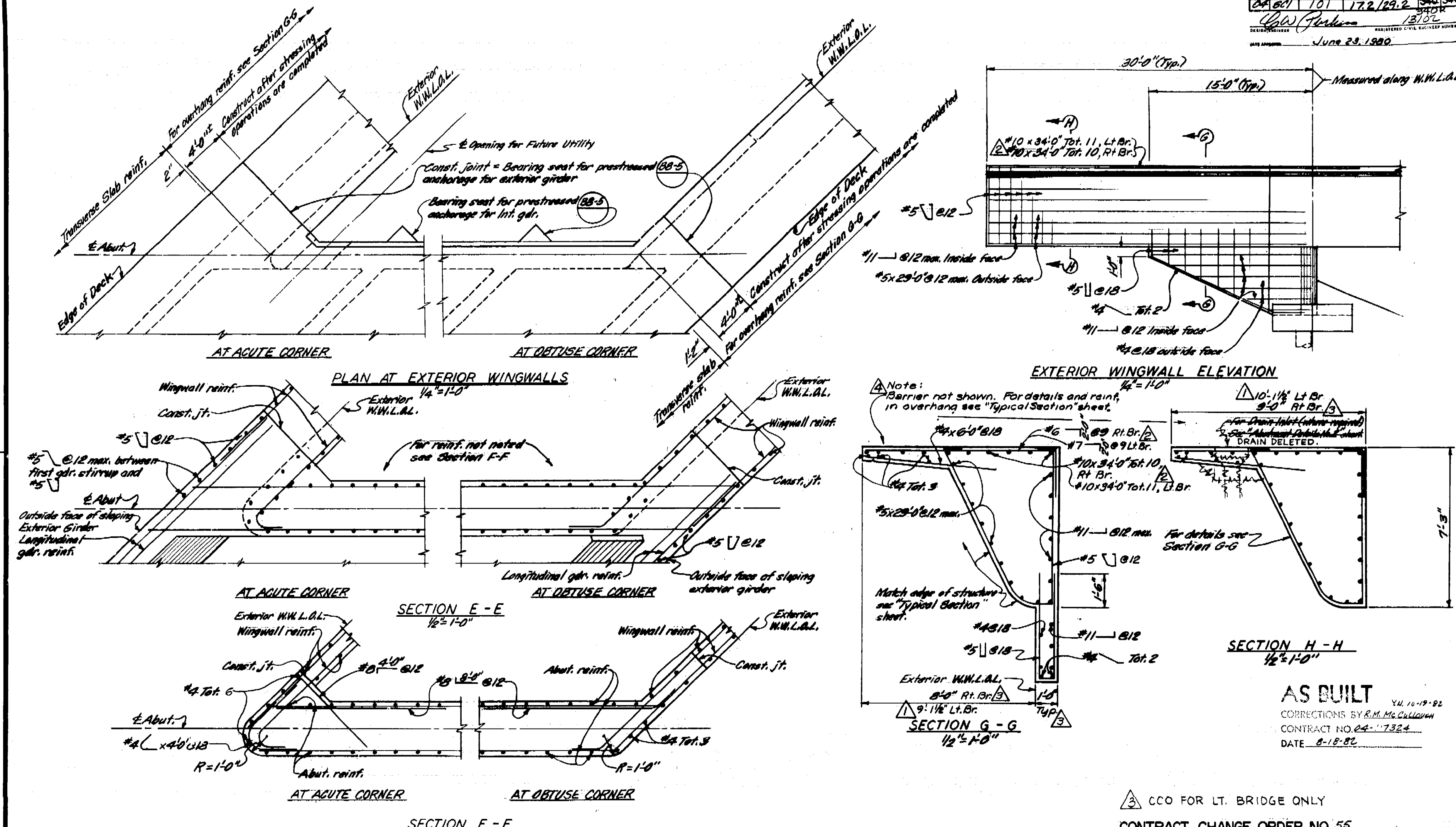
339

AS BUILT PLANS
Contract No. 04-117324
Date Completed ______
Document No. ______

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION.
DATE 1-7-83 SIGNATURE Donald Blackford TITLE SUPERVISOR OF MICROFILM SERVICES

DIST. 04	COUNTY SCL	ROUTE 101	POST MILES—TOTAL PROJECT 17.2/29.2	SHEET NO. 340	TOTAL SHEETS 346

340R
13102
June 23, 1980



AS BUILT
CORRECTIONS BY R.M. McCullough
CONTRACT NO. 04-117324
DATE 8-18-82
Y.U. 10-19-82

3 CCO FOR LT. BRIDGE ONLY

CONTRACT CHANGE ORDER NO. 55

SHEET __ OF __

4	10/19/81	BARRIER DETAILS DELETED, REPLACED BY NOTE.	40S
3	7/19/81	NOTE CHANGED / NOTE ADDED	40S
2	7/19/81	REINFORCEMENT CHANGE	40S
1	7/19/81	DIMENSION CHANGED	40S
		[redacted] FOR C.C.O. NO. 55	

DESIGN	By G.J. Salvano 11/77	Checked D. Vandershaf 11/77
DETAILS	By T.A. Hanson 9/77	Checked D. Vandershaf 11/77
QUANTITIES	By Sol. T. Ram 11-77	Checked T.A. Hanson 11/77

State of CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF STRUCTURES
DESIGN SECTION 1
PROJECT ENGINEER
BRIDGE NO. 37-348
POST MILE 0.0

ROUTE 82/101 SEPARATION
ABUTMENT DETAILS NO. 1

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS
CU 04216
WO 117321
Disregard prints bearing earlier revision dates
SHEET 5 OF 11

AS BUILT PLANS
Contract No. 04-117324
Date Completed ______
Document No. ______

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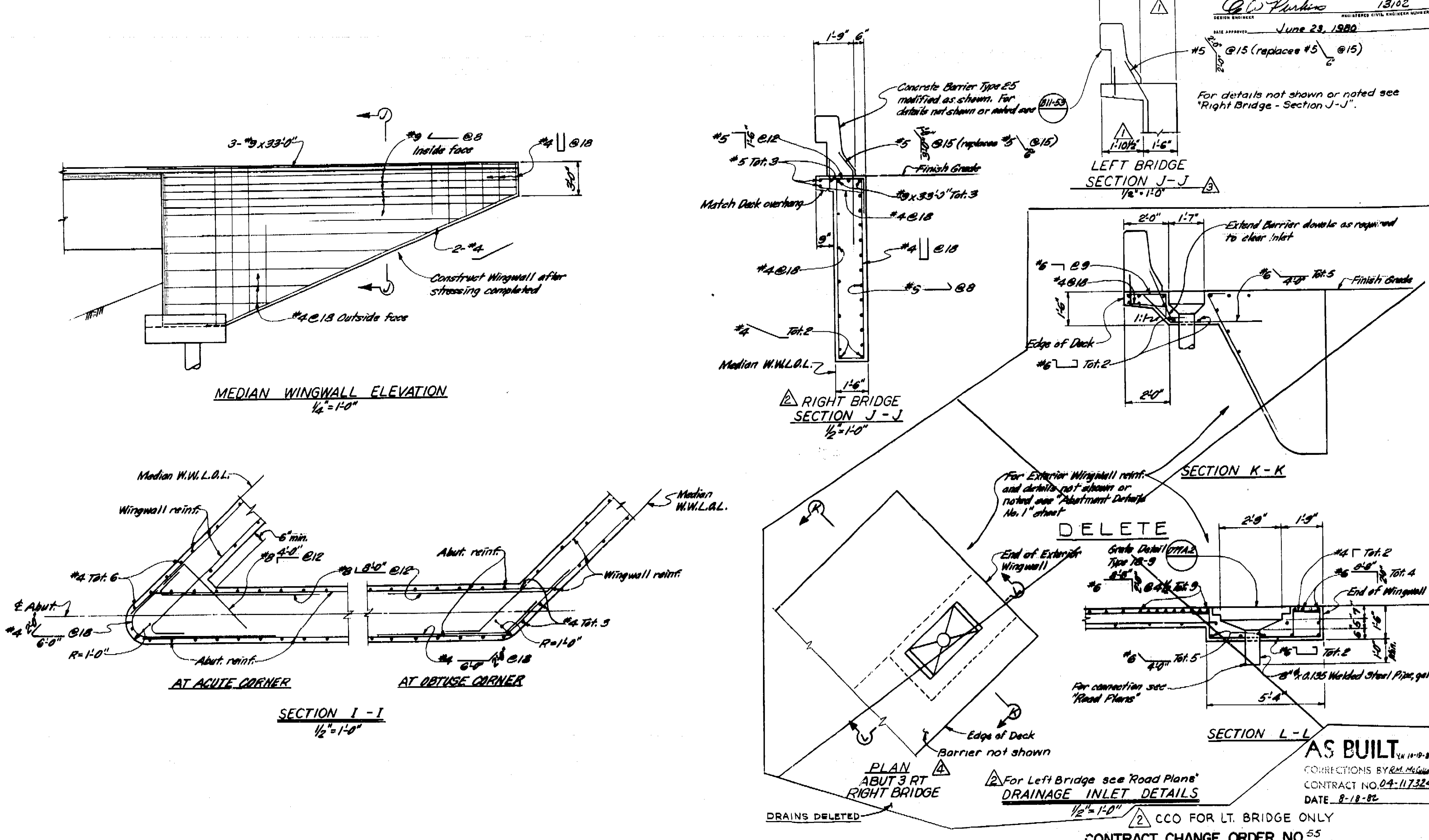
DATE 1-7-83 SIGNATURE Donald Blackford TITLE SUPERVISOR OF MICROFILM SERVICES

340



AS BUILT
CORRECTIONS BY R.M. McGuire
CONTRACT NO. 04-117324
DATE 8-18-82

2 CCO FOR LT. BRIDGE ONLY

CONTRACT CHANGE ORDER NO. 55

SHEET __ OF __

DIST.	COUNTY	ROUTE	POST MILES–TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SCl	101	17.2/29.2	341	346

DESIGN ENGINEER: [signature] — REGISTERED CIVIL ENGINEER NUMBER 13102

DATE APPROVED June 23, 1980

Mark	Date	Description	By	Chk'd
4	10/14/81	PLAN CHANGED FOR CORRECT ORIENTATION.	a.g.s	[signature]
3	10/14/81	DETAIL ADDED	a.g.s	[signature]
2	10/14/81	NOTE CHANGED / NOTE ADDED	a.g.s	[signature]
1	10/14/81	DIMENSION CHANGED	a.g.s	[signature]

REVISIONS FOR C.C.O. NO. 55

	By	Checked
DESIGN	D. Vandershaf 10/79	A.J. Salerno 10/79
DETAILS	T.A. Hanson 10/79	A.J. Salerno 10/79
QUANTITIES	[signature] 10-2-79	T.A. Hanson 10/79

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

State of CALIFORNIA
DEPARTMENT OF TRANSPORTATION

STRUCTURES - DESIGN 1
PROJECT ENGINEER [signature] 10/79
BRIDGE NO. 37-348 R/L
POST MILE 0.0
CU 04216
WO 117321

ROUTE 82/101 SEPARATION
ABUTMENT DETAILS NO. 2

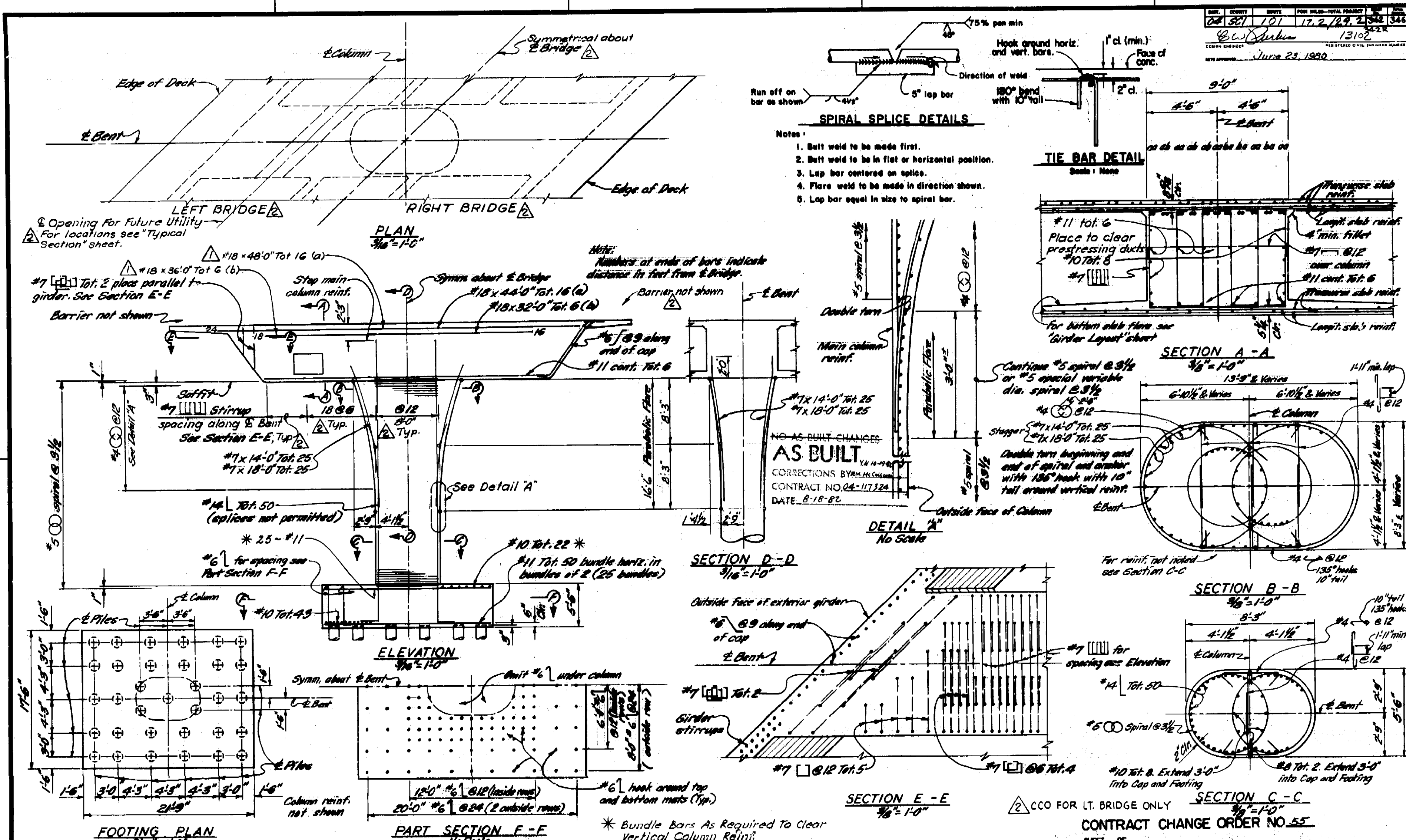
Disregard prints bearing earlier revision dates

SHEET 6 OF 11

341

AS BUILT PLANS
Contract No. 04-117324
Date Completed ______
Document No. ______

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION.
DATE 1-7-83 SIGNATURE [signature] TITLE SUPERVISOR OF MICROFILM SERVICES



CONTRACT CHANGE ORDER NO. 55

MARK	DATE	DESCRIPTION	BY	CH'D
2		NOTE CHANGE / NOTE ADDED		
1		REINFORCEMENT CHANGE		

REVISIONS FOR C.C.O. NO. 55

DESIGN		Checked	D. Vandershef 11/77
DETAILS	T.A. Hanson 10/77	Checked	D. Vandershef 11/77
QUANTITIES	11-77	Checked	T.A. Hanson 11/77

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

State of CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF STRUCTURES
DESIGN SECTION

PROJECT ENGINEER

BRIDGE NO. 37-348 R/L
POST MILE 0.0

CU 04216
WO 117321

ROUTE 82/101 SEPARATION
BENT DETAILS

Disregard prints bearing earlier revision dates

SHEET 7 OF 11

DIST.	COUNTY	ROUTE	POST MILES—TOTAL PROJECT	SHEET	TOTAL SHEETS
04	SCl	101	17.2/29.2	342	346

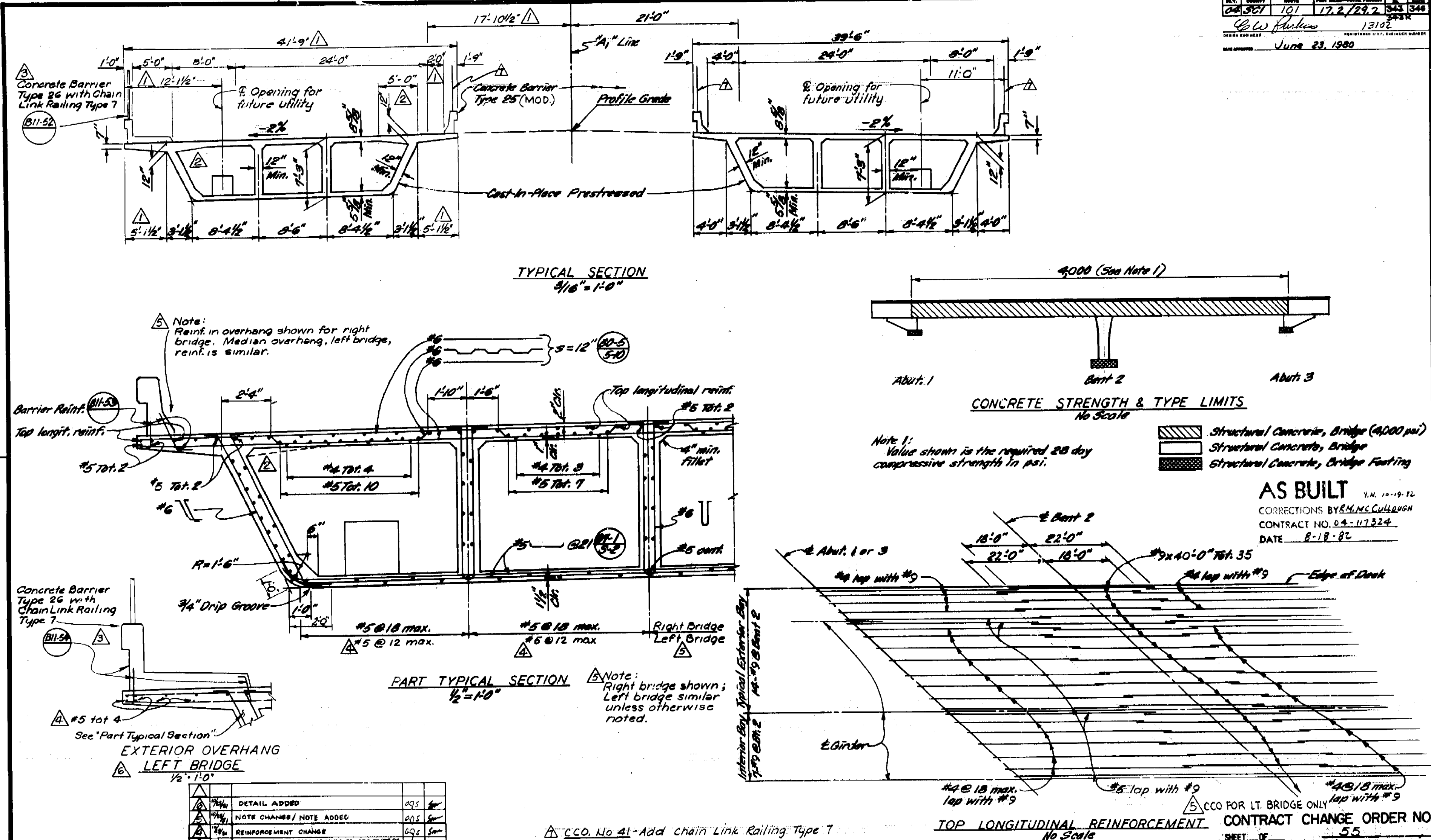
DESIGN ENGINEER
13102
REGISTERED CIVIL ENGINEER NUMBER
DATE APPROVED June 23, 1980

342

AS BUILT PLANS
Contract No 04-117324
Date Completed
Document No.

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION.
DATE 1-7-83
TITLE SUPERVISOR OF MICROFILM SERVICES

DIST. 04 | COUNTY SCl | ROUTE 101 | POST MILES—TOTAL PROJECT 17.2/29.2 | SHEET NO. 343 | TOTAL SHEETS 346
DESIGN ENGINEER: C. W. Perkins — 13102
DATE APPROVED: June 23, 1980



AS BUILT Y.N. 10-19-82
CORRECTIONS BY R.M. McCULLOUGH
CONTRACT NO. 04-117324
DATE 8-18-82

MARK	DATE	DESCRIPTION	BY	CH'D
6	9/24/81	DETAIL ADDED	AQS	
5	9/4/81	NOTE CHANGE / NOTE ADDED	AQS	
4	8/4/81	REINFORCEMENT CHANGE	AQS	
3	11/4/81	DELETE CONCRETE BARRIER TYPE 25, ADD TYPE 26 WITH CHAIN LINK RAILING TYPE 7	AQS	
2	11/4/81	TOP SLAB FLARE IN EXTERIOR BAYS ADDED	AQS	
1	11/4/81	DIMENSION CHANGED	AQS	

REVISIONS FOR C.C.O. NO. 55

△ CCO. No 41 - Add Chain Link Railing Type 7

CONTRACT CHANGE ORDER NO. 55
SHEET __ OF __

DESIGN	A.Q. Silva 11/77	Checked D. Vandershaf 11/77
DETAILS	T.A. Hanson 8/77	Checked D. Vandershaf 11/77
QUANTITIES	Sol F. Rico 11-77	Checked T.A. Hanson 11/77

State of CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF STRUCTURES
DESIGN SECTION
PROJECT ENGINEER: L. Nakata 9-79
BRIDGE NO. 37-348R/L
POST MILE 0.0
CU 04216
WO 117321

ROUTE 82/101 SEPARATION
TYPICAL SECTION

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3
Disregard prints bearing earlier revision dates →
SHEET 8 OF 11

343

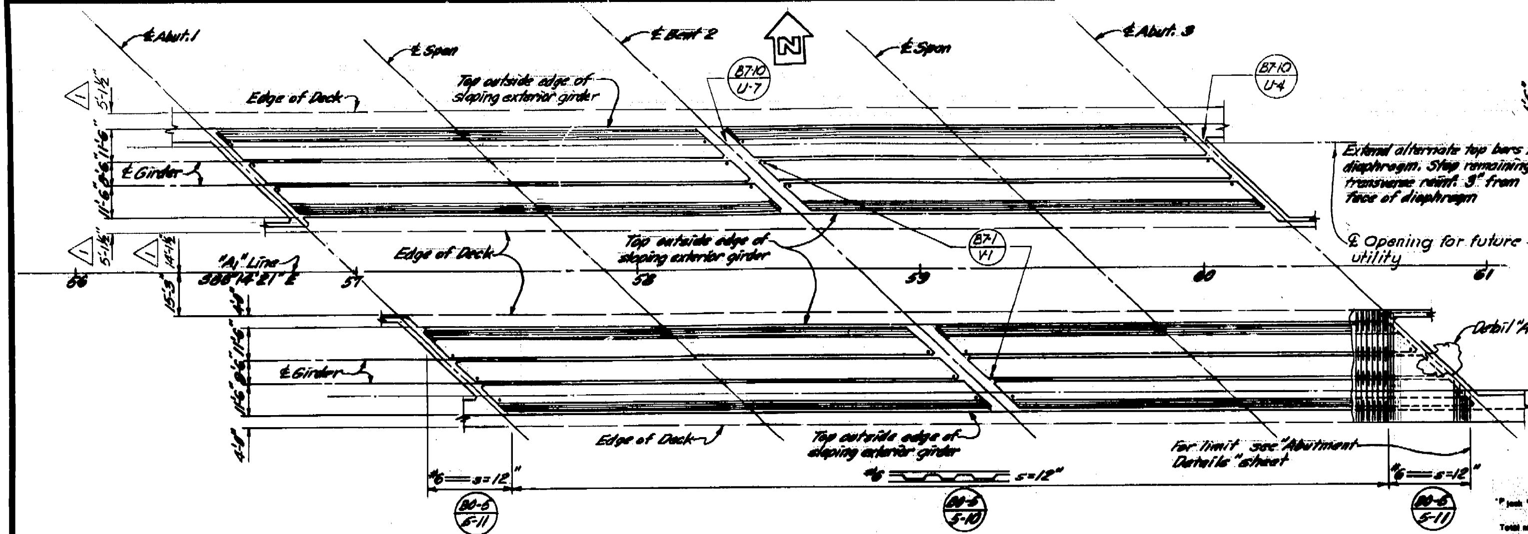
AS BUILT PLANS
Contract No 04-117324
Date Completed ______
Document No. ______

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION.
DATE 1-7-83 SIGNATURE Donald Blackford TITLE SUPERVISOR OF MICROFILM SERVICES

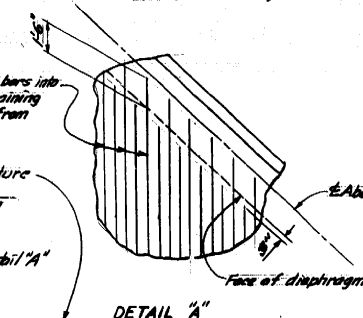
DIST.	COUNTY	ROUTE	POST MILES—TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SCI	101	17.2/29.2	344 344R	346

Design Engineer — 13102 (Registered Civil Engineer Number)

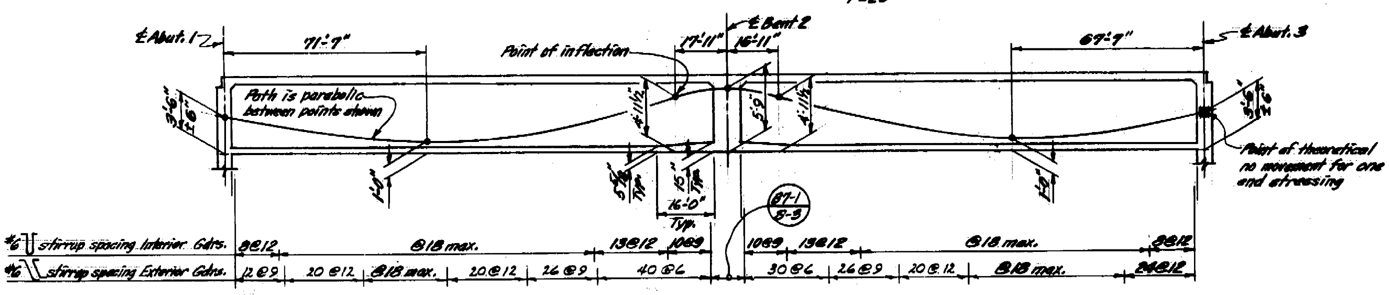
June 23, 1980



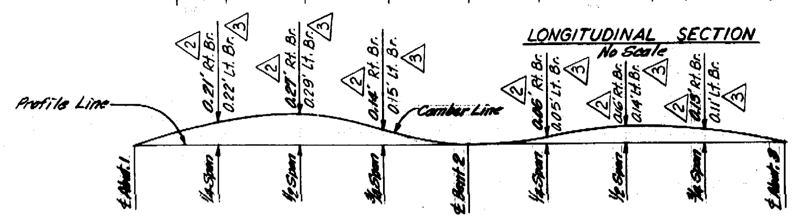
GIRDER LAYOUT
1"=20'



DETAIL "A"
No Scale



LONGITUDINAL SECTION
No Scale



CAMBER DIAGRAM
Does not include allowance for falsework settlement

LEFT BRIDGE △2

PRESTRESSING NOTES △3

*P_{jack} = 9650 kips total at jacking end(s) $A_s = \frac{P_{jack}}{.75 f'_s}$

Total number of girders = 4

Concrete: f'_c = 4000 psi @ 28 days; f'_{ci} = 3500 psi @ time of stressing

GENERAL: *1. Design is based on u = 0.25 and k = 0.0002, and modified for horizontal curved alignment, if any.

P_{jack} specified at the jacking end(s) includes friction losses and provision for 32,000 psi loss in stress.

2. Tendons to be jacked to 0.75 f'_s and anchored at an equivalent anchor set = 5/8".

3. Contractor to submit elongation and jacking calculations based on initial stress at ℄ = .820 times jacking stress.

4. [redacted] shall be performed from the [redacted]

RIGHT BRIDGE △2

PRESTRESSING NOTES

*P_{jack} = 9100 kips total at jacking end(s) $A_s = \frac{P_{jack}}{.75 f'_s}$

Total number of girders = 4

Concrete: f'_c = 4000 psi @ 28 days; f'_{ci} = 3500 psi @ time of stressing

GENERAL: *1. Design is based on u = 0.25 and k = 0.0002, and modified for horizontal curved alignment, if any.

P_{jack} specified at the jacking end(s) includes friction losses and provision for 32,000 psi loss in stress.

2. Tendons to be jacked to 0.75 f'_s and anchored at an equivalent anchor set = 5/8".

3. Contractor to submit elongation and jacking calculations based on initial stress at ℄ = .830 times jacking stress.

4. One end stressing shall be performed from the long-span end only.

BB-5

AS BUILT
CORRECTIONS BY R.M. McCULLOUGH YH. 10-19-82
CONTRACT NO. 04-117324
DATE 8-18-82

CONTRACT CHANGE ORDER NO 55
SHEET __ OF __

MARK	DATE	DESCRIPTION	BY	CH'D
3	10/9/81	Value Revision	QGS	Sm
2	10/9/81	Note Change / Note Added	QGS	Sm
1	10/9/81	Dimension Changed	QGS	Sm

REVISIONS FOR C.C.O. NO. 55

	By		Checked	
DESIGN	A.J. Salcrona	11/77	D. Vandershaf	11/77
DETAILS	T.A. Hansen	9/77	D. Vandershaf	11/77
QUANTITIES	Sal 7 Pan	11-77	T.A. Hansen	11/77

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

State of CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF STRUCTURES
DESIGN SECTION 1
PROJECT ENGINEER — 9-79

BRIDGE NO. 37-348R/L
POST MILE 0.0

CU 04216
WO 117321

ROUTE 82/101 SEPARATION
GIRDER LAYOUT

Disregard prints bearing earlier revision dates →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 9 OF 11

344

AS BUILT PLANS
Contract No. 04-117324
Date Completed ________
Document No. ________

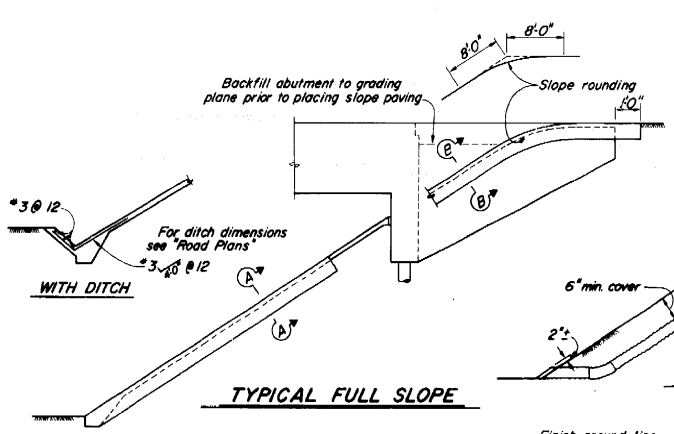
I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF TRANSPORTATION.

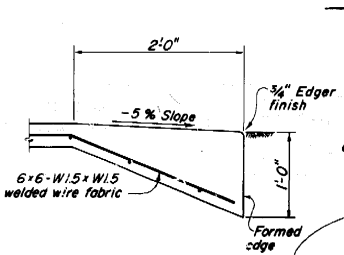
DATE 1-7-83 SIGNATURE Donald Blackford TITLE

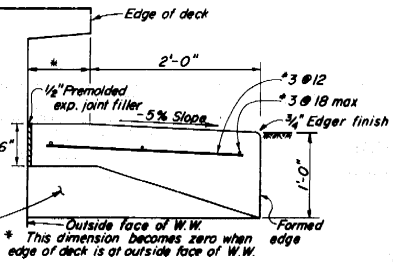
DIST.	COUNTY	ROUTE	POST MILES — TOTAL PROJECT	SHEET	TOTAL SHEETS
04	SCl	101	17.2/29.2	349	544

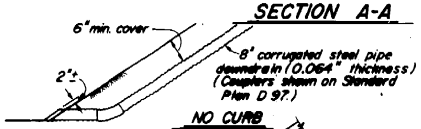
13102
DESIGN ENGINEER — REGISTERED CIVIL ENGINEER

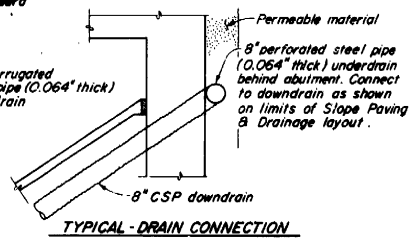
DATE APPROVED June 23, 1980

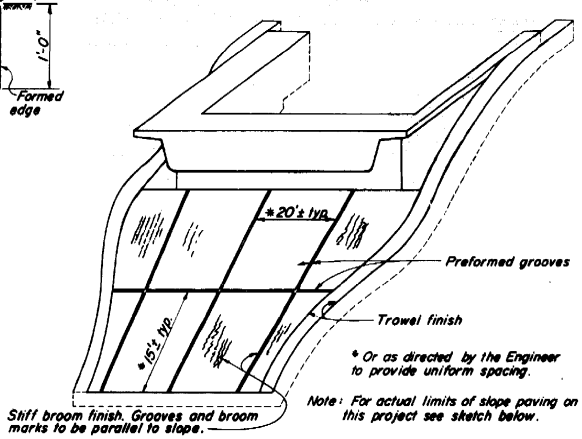


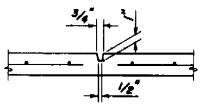


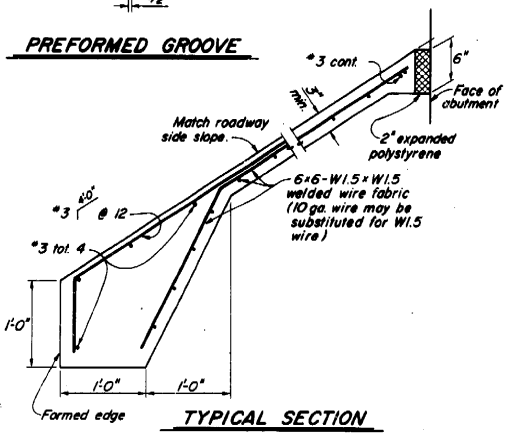


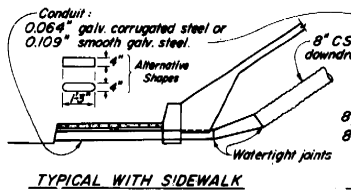


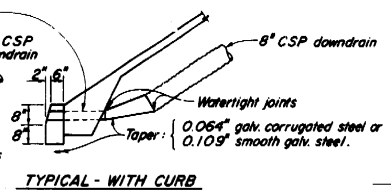


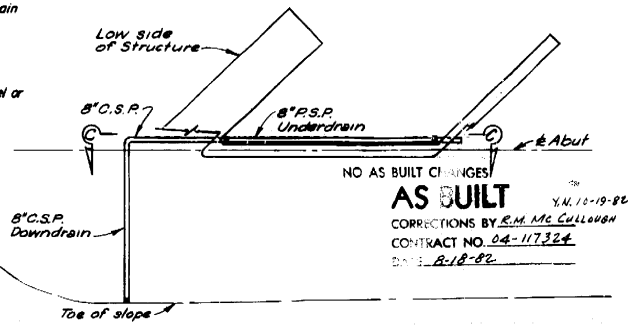






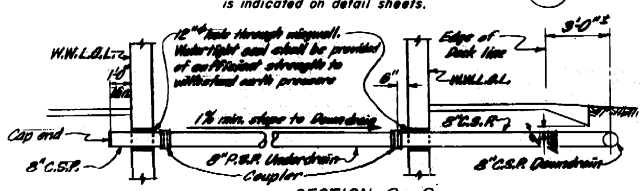






DRAINAGE DETAILS

Note: Drainage Details are only applicable when (B0-3 3-8) is indicated on detail sheets.



Note:
Abutment 1 Right shown; other abutments similar.

LIMITS OF SLOPE PAVING & DRAINAGE LAYOUT

Note: The abutment drainage system is part of this contract. The slope paving is not part of this contract; the details are shown for information only.

STANDARD DRAWING					
FILE No. XS-22-11	DESIGN	By	Checked	Approval Recommended By:	
DRAWING DATE 6/76	DETAILS	By E.A.S. 1982	Checked		
	SUBMITTED BY			REGISTERED CIVIL ENGINEER — 7989	

State of CALIFORNIA DEPARTMENT OF TRANSPORTATION

STRUCTURES-DESIGN	BRIDGE No. 37-348 R/L
PROJECT ENGINEER L.N. Stanlee 1/23	POST MILE 0.0

ROUTE 82/101 SEPARATION

SLOPE PAVING DETAILS - FULL SLOPE

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04216
WO 117321

Disregard prints bearing earlier revision dates →

REVISION DATES (PRELIMINARY PLANS ONLY) — SHEET 10 OF 11

AS BUILT PLANS
Contract No. 04-117324
Date Completed
Document No.

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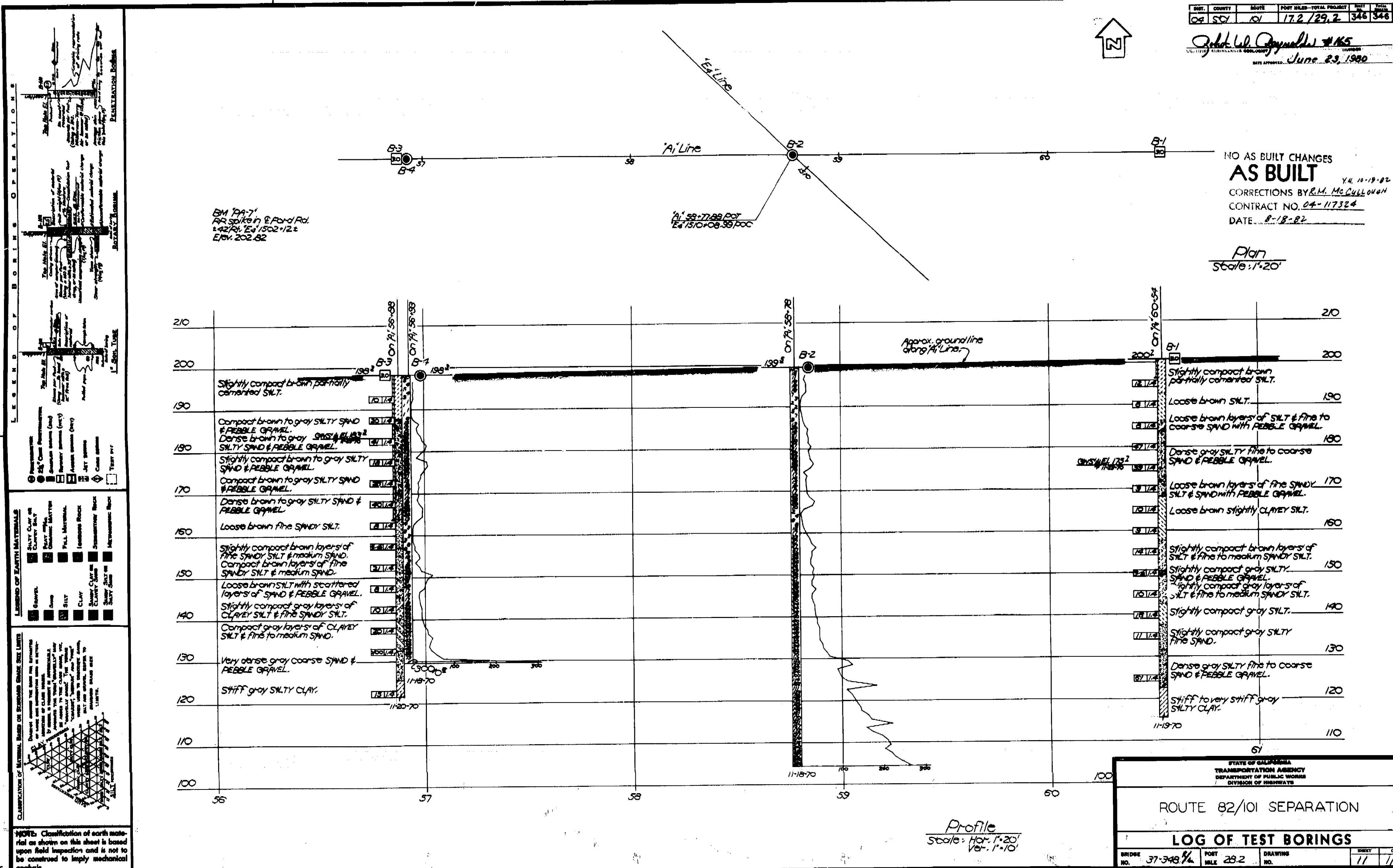
DATE 1-7-83 SIGNATURE Donald Lockford TITLE SUPERVISOR OF MICROFILM SERVICES

346



STATE OF CALIFORNIA
TRANSPORTATION AGENCY
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

ROUTE 82/101 SEPARATION

LOG OF TEST BORINGS

DIST.	COUNTY	ROUTE	POST MILES	SHEET NO.	TOTAL SHEETS
04	SCl	101	17.2/29.2	346	346

BRIDGE NO. 37-348 R/L · POST MILE 28.2 · SHEET 11 OF 11

WO 117321
CU 04216
PR 37348-2

AS BUILT PLANS
Contract No. 04-117324
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Document No. ______

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DATE 1-7-83 TITLE SUPERVISOR OF MICROFILM SERVICES