

INFORMATION HANDOUT

**For Contract No. 04-4G6404
At 04-SM-84-PM 21.6**

**Identified by
Project ID 0412000622**

MATERIALS INFORMATION

1. Foundation Report Dated May 30th, 2014
2. Preliminary Site Investigation Report Dated July 2014
3. Underground Classification and Request for Pre-Job (Tunnel) Form
4. Water Source Information

Memorandum

*Flex your power!
Be energy efficient!*

To: MS. KELLY HOLDEN
Supervising Bridge Engineer
Office of Bridge Design - West

Date: May 30, 2014

Attention: Gordon Danke
Phil Lutz

File: 04-SM-84 PM 21.6
04-4G6400
Efis#: 0412000622
Slope Failure Repair
Woodside Road

From: JOHN MOORE 
Transportation Engineer
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

MAHMOOD MOMENZADEH
Chief, Branch C
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

Subject: Foundation Report

This memo provides recommendations for the repair of the failed slope located on the north side of westbound Route 84 (Woodside Road), near the intersection of Interstate 280 (I-280) in the Town of Woodside, San Mateo County, California (Figure 1).

SCOPE OF WORK

We have performed a geotechnical investigation to determine the possible causes of the sliding slope, and developed a repair plan. The scope of work includes the following:

- Visual observations of the distressed roadway during our site visits on May 17, 2012 and September 11, 2013.
- Review of Route 84 As-built plans.
- Subsurface exploration consisting of three exploratory borings advanced to approximate depths of 90-ft., 65-ft., and 66.5-ft. in October 2013.
- Each exploratory boring was converted to a slope inclinometer and a piezometer. Periodic readings of the slope inclinometers/piezometers were recorded.
- Engineering analyses and preparation of the repair recommendations.

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PROJECT SITE DESCRIPTION AND BACKGROUND

Site Description

The subject site is located primarily along the north side of Route 84 (Woodside Road) and the northbound onramp to I-280, near the intersection of Route 84 and I-280 (Figure 1). At this location, Route 84 is a four lane highway with a center turn lane and shoulders. The roadway is constructed of asphalt concrete (AC), which has been overlaid periodically within the slide area to compensate for the roadway settlement. The subject site is located at the top of an approximately 50 ft high slope. The slope is approximately 2 (H): 1 (V), and is vegetated with grass, shrubs, and small trees. Other than a high concentration of utilities, no structures are located on the slope at the subject site. A Pacific Gas & Electric (PG&E) substation is located at the bottom of the slope. Please refer to utility plans provided by D-4 Design for the identification and locations of the buried and overhead utilities in the vicinity of the proposed retaining wall.

Site History

The current configuration of Route 84 (Woodside Road), at the subject site, was completed in the early 1970s. This section of Woodside Road was originally Route 114 according to the as-built plans. According to the Caltrans records, this location has failed and been repaired multiple times during the 1970's and 1980's. The most significant repair was completed circa 1981, and consisted of removal and re-compaction of the slide material, construction of a drainage gallery, and installation of horizontal drains. Plans showing the slide repair from 1981 are attached to this memo for review.

The subject site has been monitored and repaired by Caltrans Maintenance over the years. The repairs consist of crack sealing and AC overlays. The Office of Geotechnical Design – West was requested to investigate the settlement, and pavement cracking in 2012.

Site Observations

Site observations indicated that the distressed roadway section has signs of settlement, and cracking of the pavement in a near circular pattern. The cracking of the pavement starts on the shoulder of westbound Route 84, crosses the right lane and extends half way into the left lane, and continues back to the westbound shoulder. The length of the distressed roadway section is approximately 556 ft.

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SITE GEOLOGY AND SEISMICITY

Regional Geologic Overview

The project is located in the Coast Range Geomorphic Province of Central California, a series of northwest-trending mountain ranges (2,000 to 4,000, occasionally 6,000 feet elevation above sea level), and intermountain valleys, bounded in the east by the Great Valley and to the west by the Pacific Ocean. The Coast Ranges are composed of thick Cenozoic sedimentary and volcanic strata overlying Mesozoic metamorphic basement rock. The northern and southern ranges are separated by a depression containing the San Francisco Bay. The Coast Ranges are subparallel to the active San Andreas Fault, which is more than 600 miles long, extending from Pt. Arena to the Gulf of California.

Geology

According to the geologic map of the area, the project is underlain by upper to lower Eocene age (approximately 34 to 55 million years old) Whiskey Hill Formation (Brabb, Graymer, and Jones, 1998). The Whiskey Hill Formation is described as pale-yellowish-orange to pale-yellowish-brown, poorly to very well cemented, poorly sorted, coarse-grained, thick-bedded, feldspathic sandstone and interbedded silty claystone. The claystone/sandstone ratio is estimated to be about 3:1. Expansive clays are common in claystones and soils derived from claystones of the Whiskey Hill Formation. These highly expansive materials have caused extensive damage to structures in the general vicinity, especially in and around the Sharon Heights area of Menlo Park, southwest of the Alameda de las Pulgas in Atherton, and locally in Woodside. The relevant portion of the map is included as Figure 2, Geologic Map.

Natural Slope Stability

Extensive construction of highways and roads has obscured natural slopes. Much of the topography seen at the present is man-made. There have been several slide repairs adjacent to the proposed project location. No other slides have been observed within the project limits.

Seismicity

Geologists and seismologists recognize the San Francisco Bay Area as one of the most active seismic regions in the United States. There are three major faults that trend in a northwest direction through the Bay Area, which have generated about 12 earthquakes per century large enough to cause significant structural damage. These earthquakes occur on faults that are part of the San Andreas Fault system that extends for at least 700 miles along the California Coast, and includes the San Andreas, Hayward, and Calaveras Faults. The San Andreas Fault is located approximately 2 miles southwest of the site. The Hayward and Calaveras Faults are located

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approximately 18 and 24 miles northeast of the site, respectively (See Figure 3, San Francisco Bay Region Earthquake Probability Map).

Seismologic and geologic experts convened by the U. S. Geological Survey concluded that there is a 62 percent probability for at least one "large" earthquake of magnitude 6.7 or greater in the Bay Area before 2032. They also maintain that there could be more than one earthquake of this magnitude and that numerous "moderate" earthquakes of about magnitude 6 are probable before 2032. The San Andreas Fault is estimated to have a 21 percent probability of producing a magnitude 6.7 or larger earthquake by the Year 2032 (WGCEP, 2003). The probability of the Hayward, Calaveras, and Greenville Faults producing a similar size earthquake during the same time period is 27 percent, 11 percent and 3 percent, respectively (See Figure 3, San Francisco Bay Region Earthquake Probability Map).

The project lies in the seismically active San Francisco Bay area and is prone to strong ground shaking. Table No. 1 below lists the major faults in the region, their distance from the project site, maximum credible earthquake magnitudes, and peak bedrock accelerations anticipated at the site (Caltrans 2007 Fault Database).

(http://www.dot.ca.gov/hq/esc/earthquake_engineering/SDC_site/).

Table 1 Faults, Maximum Credible Earthquake Magnitudes, and Peak Bedrock Accelerations

FAULT	Distance (mi)*	Maximum Credible Earthquake Magnitude**	Maximum Peak Bedrock Acceleration
San Andreas	2	7.9	0.67 g
Hayward	16.5	7.3	0.23 g
Calaveras	22	7.4	0.17 g

*Closest portion of the fault, measured in miles.

** Moment Magnitude.

Geologic Hazards

The site may be affected by activity along any of the active faults discussed above. Earthquake induced hazards can be categorized as primary and secondary seismic effects.

Primary seismic effects such as ground rupture or surface deformation resulting from differential movement along a fault trace are not expected to occur on the site since there are no active faults mapped within the project limits.

Secondary seismic effects result from various soil responses to ground acceleration. These effects result from activity of any nearby active faults.

- Liquefaction of Natural Ground – Liquefaction is a process by which soil deposits below the water table temporarily lose strength and behave as a viscous liquid rather than a solid, typically during a moderate to large earthquake. In general, very loose to medium dense, clean fine- to medium-grained sand and very soft to firm; low plasticity silts that are relatively free of clay are most susceptible to liquefaction. Earthquake-induced ground shaking can cause these loose or soft materials to densify, resulting in increased pore water pressures and an upward movement of groundwater that may result in a liquefied condition. Depending on the weight of the structure, the depth to the liquefied stratum and the nature of the overlying soils, structures situated above such temporarily liquefied soils may sink or tilt, causing significant structural damage.

According to the Liquefaction Susceptibility Map, the project is not located in an area where historic occurrence of liquefaction, or local, geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) (see Figure 4, Liquefaction, Liquefaction Susceptibility Map).

- Cracking – Lurch cracks may develop in the silty and clayey soil overlying the site. The potential for lurch cracking will be higher in the rainy periods when the soil is saturated. In our opinion, the hazard from cracking will be considered minimal, provided that it is designed and constructed in accordance with the recommendations of this report.
- Differential Compaction – During moderate and large earthquakes, soft or loose, natural or fill soils can become densified and consolidate, often unevenly across a site. Based on our subsurface investigation, it appears that portions of the existing fill material below the roadway are loose and, in our opinion, may be subject to differential compaction. In our opinion, differential compaction of the fill should not have an impact on the proposed project, provided that it is designed and constructed in accordance with the recommendations of this report.
- Ground Shaking - As noted in the Seismicity section above, moderate to large earthquakes are probable along several active faults in the greater Bay Area. Therefore, strong ground shaking should be expected at some time during the design life of the proposed development. The improvements should be designed in accordance with current earthquake resistant standards.
- Shrink Swell – Since the site is underlain by bedrock of the Whiskey Hill Formation, there is a high shrink swell potential. The soil/rock expansion and/or contraction can cause

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foundations to shift and roadways to crack. Suitable base material will be needed. In cut areas, underdrains may be warranted in order to keep moisture from moving beneath roadways.

FIELD INVESTIGATION AND FINDINGS

Field Exploration and In-Situ Testing

A subsurface investigation was conducted in October 2013, and consisted of three rotary wash borings: R-13-002, R-13-004, and R-13-005. It should be noted that borings R-13-001 and R-13-003 were eliminated due to utility conflicts. The borehole locations will be shown on the Log-Of-Test Borings (LOTB), which will be furnished to your office in the near future. In the interim, the Rotary Field Notes are located in Appendix A for review. Borehole R-13-002 was drilled to a depth of 66.5 feet. Borehole R-13-004 was drilled to a depth of 65 feet. Borehole R-13-005 was drilled to a depth of 90 feet. In-situ Standard Penetration Test (SPT) blow counts were recorded at 5 ft intervals to evaluate the consistency of the on-site soils and soil samples were obtained. Rock core samples were collected in each borehole. Selected soil and rock samples were transported to the geotechnical laboratory in Sacramento for testing.

Slope inclinometers (SI's) and piezometers were installed in each borehole. Slope inclinometer and piezometric readings are also located in Appendix A.

Laboratory Testing

Selected soil and rock samples retrieved from the borings were tested to evaluate properties pertinent to our analyses. The types of laboratory tests performed include the following: Laboratory test results are located in Appendix A.

- Atterberg Limits (AASHTO T 89, AASHTO T 90).
- Moisture Content (AASHTO T 265, ASTM D 2216).
- Corrosion (Soil Resistivity and Soil pH) Content (California Test Methods (CTM) 643).
- Unconfined Compression (ASTM D 2166, ASTM D 2938).

The corrosion tests results are summarized in Table No. 6.

Subsurface Soil Conditions

The soil and rock encountered during the subsurface investigation, as interpreted from boring R-13-002, consists of very stiff lean Clay with Sand (CL) to 11.5 feet depth (FILL), overlaying very hard to very soft metamorphic rock (Serpentine) between 11.5 feet and 35 feet, followed by very soft to soft sedimentary rock (Mudstone) to the bottom of the borehole at about 66.5 ft

depth below existing ground surface. The soil and rock encountered during the subsurface investigation, as interpreted from boring R-13-004 consists of a 10 feet thick layer of Silt with Sand (ML),(Fill), overlaying Poorly-graded Sand (SP) with gravel between 10 and 20 feet, overlaying lean Clay (CL) between 20 and 46 feet, overlaying sedimentary rock (Mudstone) between 46 and 65 feet depths. The soil and rock encountered during the subsurface investigation, as interpreted from boring R-13-005 consists of Sandy lean Clay (CL) to a depth of 8 feet, overlaying Clayey Sand (SC) between 8 and 12.5 feet, overlaying hard to very stiff lean Clay (CL) between 12.5 and 47 feet, overlaying sedimentary rock (Mudstone) between 47 and 90 feet.

Groundwater Conditions

Periodic readings of the groundwater levels, from the piezometer in boring R-10-102, are shown in Table No. 2.

Table 2- Periodic Groundwater (GW) Readings

Date	RW-13-002		RW-13-004		RW-13-005	
	Depth to water level (ft)	GW elevation (ft)	Depth to water level (ft)	GW elevation (ft)	Depth to water level (ft)	GW elevation (ft)
10/29/2013	-	-	31.05	241.45	25.90	241.6
11/06/2013	57.60	219.9	36.55	235.95	28.25	239.25
11/13/2013	57.90	219.6	37.90	234.6	29.20	238.3
12/11/2013	58.30	219.2	37.90	234.6	30.75	236.75
02/15/2014	58.55	218.95	42.30	230.2	32.20	235.3
04/10/2014	58.05	219.45	36.05	236.75	23.95	243.55

Higher groundwater elevations should be anticipated depending on the amount of precipitation during the rainy season.

SLIDE MATERIAL ENGINEERING PROPERTIES

Soil/rock strength parameters of the sliding mass were determined using back-analysis of the slide. The size of the sliding mass was estimated using slip-plane location (from Slope Inclinometer, SI, data), head scarp location, and other geologic features. The soil parameters and pore water pressure parameters determined by back-analysis are summarized in Table No. 3.

Table 3. Back-calculated Soil/Rock Strength and Pore Water Pressure Parameters

Soil/Rock Type	Unit Weight (Pcf)	Internal Friction Angle (degrees)	Cohesion c, (Psf)	Pore water pressure Parameter, r_u	Safety Factor (SF)
Clay/Claystone	130	20	350	0.16	~ 0.95

GEOTECHNICAL RECOMMENDATIONS

Slope-Stability Analysis of the Proposed Repair

Wall Type

The most viable repair strategy for this location is to construct a soldier pile tie-back wall. The retaining wall will be required from Station 16+09 to Station 22+20 for a length of approximately 592 ft. The soldier beam tie-back wall shall be designed for a slide plane depth of 25 feet below ground surface (bgs), a permanent retained height of 21 feet, and a temporary height of 23 feet above the finished grade. The lagging will need to be extended at least 2 feet below the finished grade.

Stability Analysis of the Proposed Repair

We performed a slope stability analysis (see Appendix B) of the proposed repair wall section using a specified slip-plane simulated based on the SI data and the back-calculated soil/rock strength and water pressure parameters indicated above. The purpose of the analysis was to calculate the tie-back load required to increase the slide static factor of safety (FS) to 1.3 (minimum) and seismic FS to 1.1 (minimum). Our analysis shows that a retaining system that extends to the bottom of the slip-plane will require three rows of tie-backs. The results of the slope stability analysis are shown on Table No. 4. If a concrete wall facing and/or fill is placed in front of the wall horizontal drains shall be installed near the base of the wall to reduce the pore water pressure behind the wall.

Table 4. Tie-back loads and safety factors

Soil/Rock Type	Unit Weight (Pcf)	Internal Friction Angle (degrees)	Cohesion c, (Psf)	Pore water pressure Parameter, r_u	Tie-back Load in each row (3 rows) (Kips/ft)	Safety Factor (SF)	Case
Fill/Clay	130	20	350	0.16	11.28	~1.3	Static
Fill/Clay	130	20	350	0.16	14.664	~1.1	Seismic

A horizontal seismic coefficient of 0.22 was used in the seismic stability analyses.

The piles should be spaced at a maximum spacing of no more than 8 feet on center to create a more reasonable tie-back load to have full arching between the piles for this site subsurface condition and to avoid cracking the roadway backfill and surface behind the wall.

We recommend the following requirements/criteria for the proposed soldier beam pile tie-back retaining system design:

Tie-back Anchor

The minimum tie-back anchor loads per row (three rows) are given in Table No. 4, and are based on the wall slope stability analysis. The minimum unbonded length is 55 feet for each tie-back anchor. We took into account the lateral load resistance of the soldier piles in addition to the tieback load to achieve the required slope stability for both static and seismic loading conditions. We recommend the following requirements/criteria for the anchored soldier pile retaining system design:

Lateral Earth Pressures for Anchor Wall

For active earth pressure against the wall/piles, use the following:

- For anchored wall constructed from the top down and restrained by ground anchors (tieback anchors) the lateral earth pressure acting on the wall height H, may be determined using the above calculated tieback load in accordance with Bridge Design Specifications dated August 2004 (BDS) Article 5.5.5.7.1, Figure 5.5.5.7.1-1.b (Appendix B).

For passive earth pressure against the soldier piles, use the following:

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- Use passive earth coefficient (K_p) of 3.0. This K_p was computed using engineering properties of Claystone (internal friction angle $\phi = 30^\circ$, cohesion $c = 0$ psf, horizontal backfill, and total unit weight of soil/rock, $\gamma = 130$ pcf).

For Friction Factor use $\delta = 17^\circ$

For the seismic earth pressure increment against the wall/piles, use a constant pressure of 16.32 H psf (rectangular pressure diagram), where H is the full wall design height. This earth pressure increment was calculated based on the total tieback load increment between seismic and static conditions, and is related as:

$$\left(\frac{(14.7 - 11.3) \times 3}{25^2} \times 1000 \right) = 16.32$$

distributed uniformly over the retained height of 25 ft.

For traffic loading use a constant pressure of 240 psf (rectangular pressure diagram) to a maximum depth of 10 ft below the top of the wall. This pressure is equivalent to 2 feet of surcharge immediately behind the wall.

Vertical Capacity of Soldier Piles

Soldier piles should be embedded a minimum of 15 ft below slip-plane, and the pile spacing should not exceed 8 feet on center. We recommend a minimum total pile length of 50 feet.

The ultimate vertical compression and tension capacities of the piles are summarized in Table No. 5 on the following page.

Table 5 Pile Friction and Tip Compression Capacities

	Ultimate ksf	Allowable ksf
Unit pile shaft friction per unit surface area of the pile length below the full design wall height.	2.0	1.0 (SF=2)
Pile tip compression bearing pressure per unit tip area of the soldier beam piles.	15	5.0 (SF=3)

Use 60% of the compression shaft resistance values to calculate the ultimate tension (uplift) resistance of the pile.

Drains

We recommend the installation of horizontal drains 15 feet on center along the base of the soldier pile tie-back wall. The horizontal drains will be installed at a 5 degree angle upward for a length of 60 ft. The horizontal drain should consist of 1.5 inch diameter slotted PVC pipe (0.020” slots). The horizontal drains are needed to reduce pore water pressure for the tie-back anchors. If the finished grade in front of the wall is raised by the placement of fill, all horizontal drain outlets must be connected to an 8 inch PVC pipe anchored on the wall face and extended outside of the fill with a minimum grade of 2.0%. The pipe outlet shall be discharged into a down drain pipe. Please consult with District 04 Hydraulics Branch for details of the outlet requirements.

Shotcrete Facing versus Waler

Soldier beam tieback walls traditionally are designed using wood lagging and stiff walers to bridge the adjacent beams and transfer all the lateral earth pressure to the beam and tiebacks. This system has been proven to be very successful over many years due to its rigidity, load transfer mechanism between depths shallower and deeper than the slide depths assumed in the design, and drainage ability. If the use of shotcrete is proposed instead of the wood lagging and walers, we recommend that the system be designed to have the same rigidity as the system with the wood lagging and the walers; and that the structural shotcrete (excluding the sculpted shotcrete) has a minimum thickness of 13.5 inches. A minimum spacing of 50 ft for the weep

holes above the bench and the horizontal drain near the bottom of the maximum excavation depth is required. Please refer to Drains above for collecting and discharging the horizontal drains.

In addition, the structural integrity of the shotcrete during the construction for all incremental excavation stages, as well as for seismic load conditions, shall be evaluated. The required shotcrete thicknesses, based on each incremental stage or seismic load condition, shall be included in the design.

CORROSION

The pH and Resistivity test results indicate that the site is non-corrosive (per Caltrans Corrosion guide dated September 2003), and are shown in Table No. 6. Use Standard corrosion protection measures for this project. Corrosion test results are in Appendix A.

Table 6 Corrosion Test Results

Boring	Depth (ft.)	pH	Resistivity ohm-cm
R-13-002	45	7.66	931
R-13-004	35	7.78	742
R-13-005	15	7.55	1031

CONSTRUCTION CONSIDERATIONS AND REQUIREMENTS

The following construction considerations and requirements should be included in the design and construction specifications for the proposed wall:

- Rock encountered in Boring R-13-005 is described in the log of test boring as moderately hard yet unconfined compressive strength laboratory tests indicate that the rock is extremely weak to weak. Reasons for unusually low shear strength could be attributed to one or more the following; the location where the rock samples were taken, sampling disturbance, and/or stress relaxation. For purposes of construction, the contractor should consider all rock at this site to be hard and should come equipped to drill and excavate hard rock.
- The installation of the soldier beam piles must be completed prior to making any cuts or excavation of benches.

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- The installation of the soldier beam piles must be completed prior to the placing of any temporary fill required for a construction bench in the face of wall. No fill shall be placed on the slide area before all piles are in place.
- The contractor will encounter difficulties during the drilling of the soldier beam piles and tie-back anchor holes due to the high groundwater levels and/or local hard rock at the proposed site.
- During the drilling for the soldier pile beams, the contractor will encounter a drainage gallery, which consists of filter fabric and gravel. The drainage gallery was installed as part of a previous slide repair. As-built plans showing the approximate location of the drainage gallery and associated horizontal drains are located in Appendix B of this memo. Details regarding the location/position of the drainage gallery and associated horizontal drains from the as-built plans should be incorporated into the plans for the Woodside II Retaining wall.
- During the drilling operation for the proposed soldier beam piles, we believe that some caving of the drilled holes will likely occur. Thus, use of temporary casing is required. Due to the groundwater elevations, the installation of soldier piles will likely require dewatering of the borehole before the concrete is placed. The current Caltrans practice for soldier beam pile construction does not allow the use of slurry. Therefore, the use of temporary casing and dewatering is required when groundwater is encountered during construction of the soldier beam pile.
- The maximum load for testing of tie-back anchors shall not exceed 130 percent of the design load.
- Installation of the soldier beam piles should be performed in accordance with Section 49-4 of the May 2010 Caltrans Standard Specifications.
- The drilling and concrete placement for soldier beam piles construction shall be staggered. No two adjacent holes can be open at the same time. The drilled hole for the soldier beam piles can't be left open overnight.
- Contact our office immediately, if any drilled hole encounters an existing horizontal drain, so we can evaluate the need for additional measures.

* * * * *

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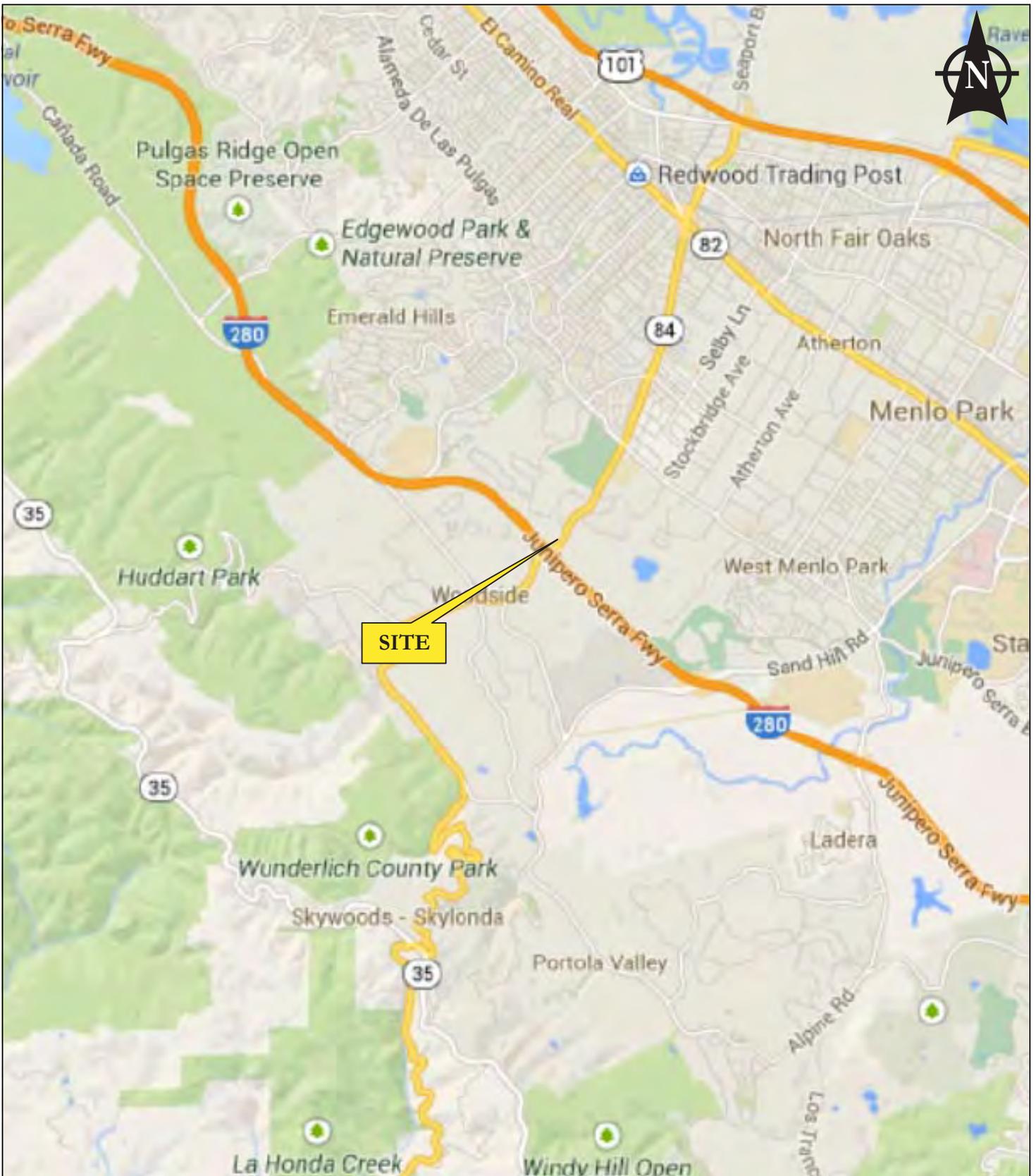
Should you have any questions, please call me at (510) 622-8742 or Mahmood Momenzadeh at (510) 286-5732.

Attachments:

c: TPokrywka, MMomenzadeh, MSuleiman, RE_Pending_File@dot.ca.gov, GSetberg, RWoo, Geotechnical Archive.

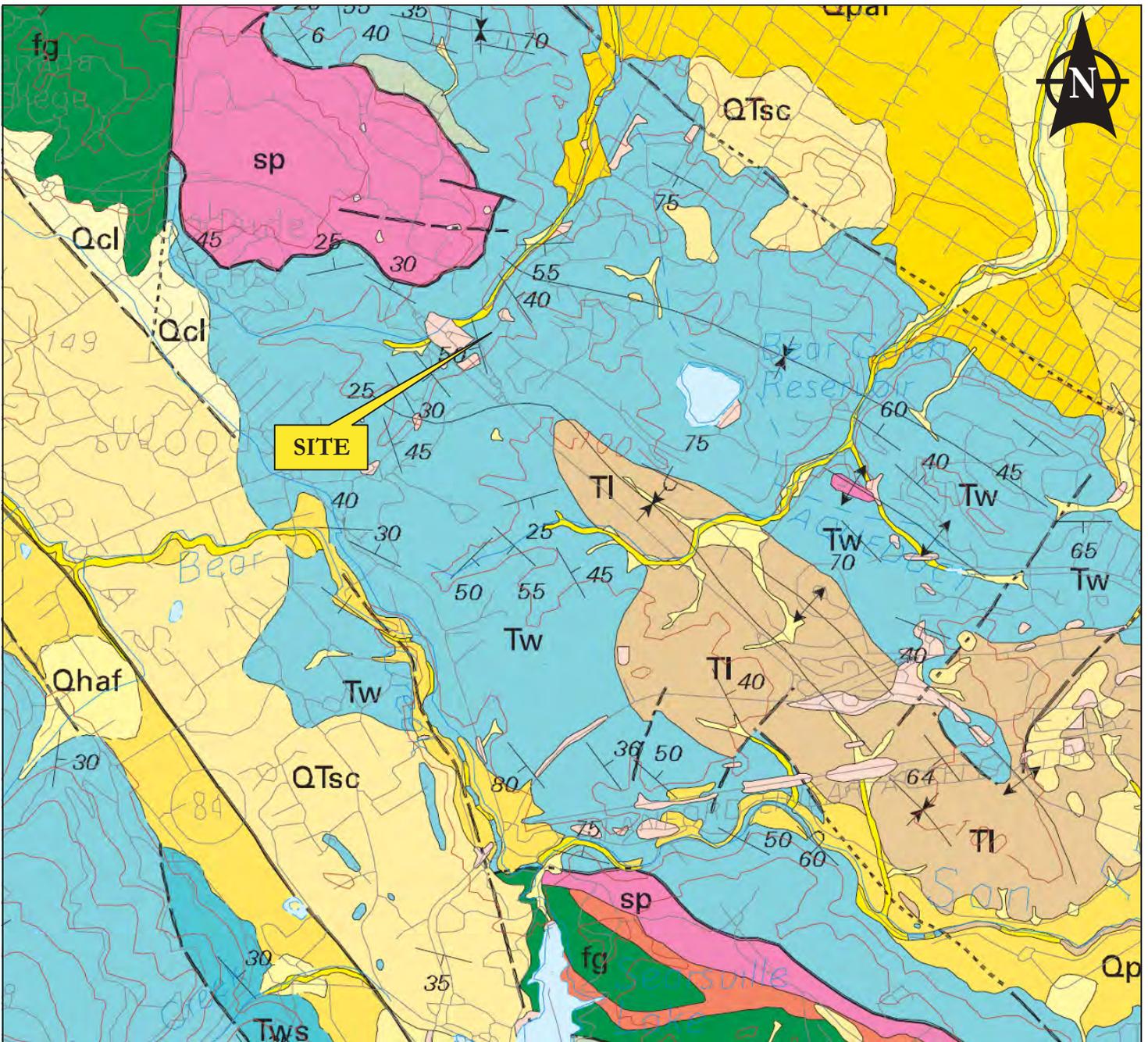
JMoore/jm





Base: Goolge Maps, 2014
 No Scale

	FOUNDATION REPORT HIGHWAY 84, POST MILE 21.6 SAN MATEO COUNTY, CALIFORNIA	LOCATION MAP
	MAY 2014	FIGURE 1

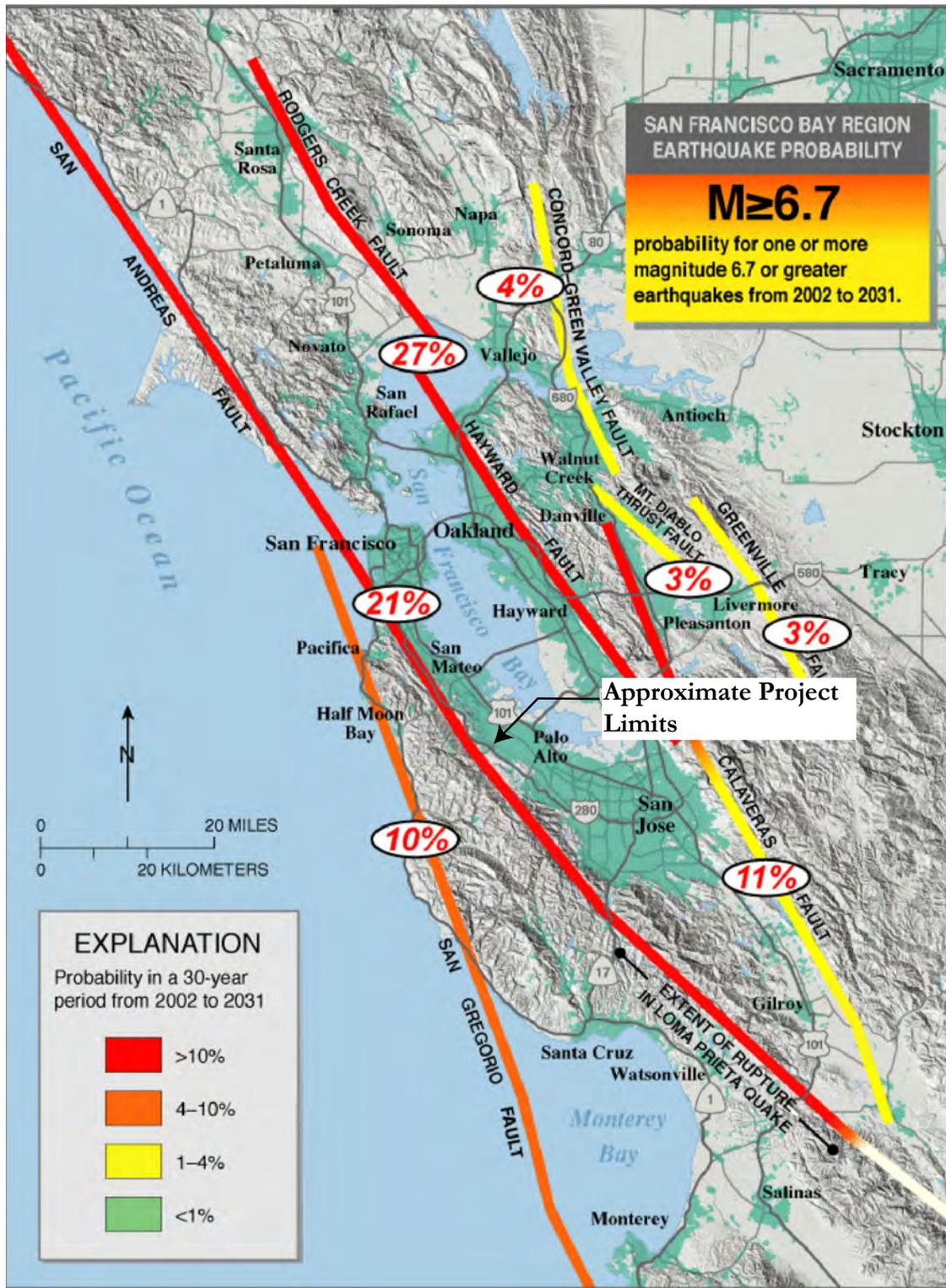


Qpaf	Alluvial Fan deposits
TI	Ladera Sandstone
Tw	Whiskey Hill Formation
sp	Serpentinite

LEGEND

Base: Geology of the Onshore Part of San Mateo County, California (Brabb, Graymer, and Jones, 1998)
 No Scale

	FOUNDATION REPORT HIGHWAY 84, POST MILE 21.6 SAN MATEO COUNTY, CALIFORNIA	GEOLOGIC MAP
	MAY 2014	FIGURE 2

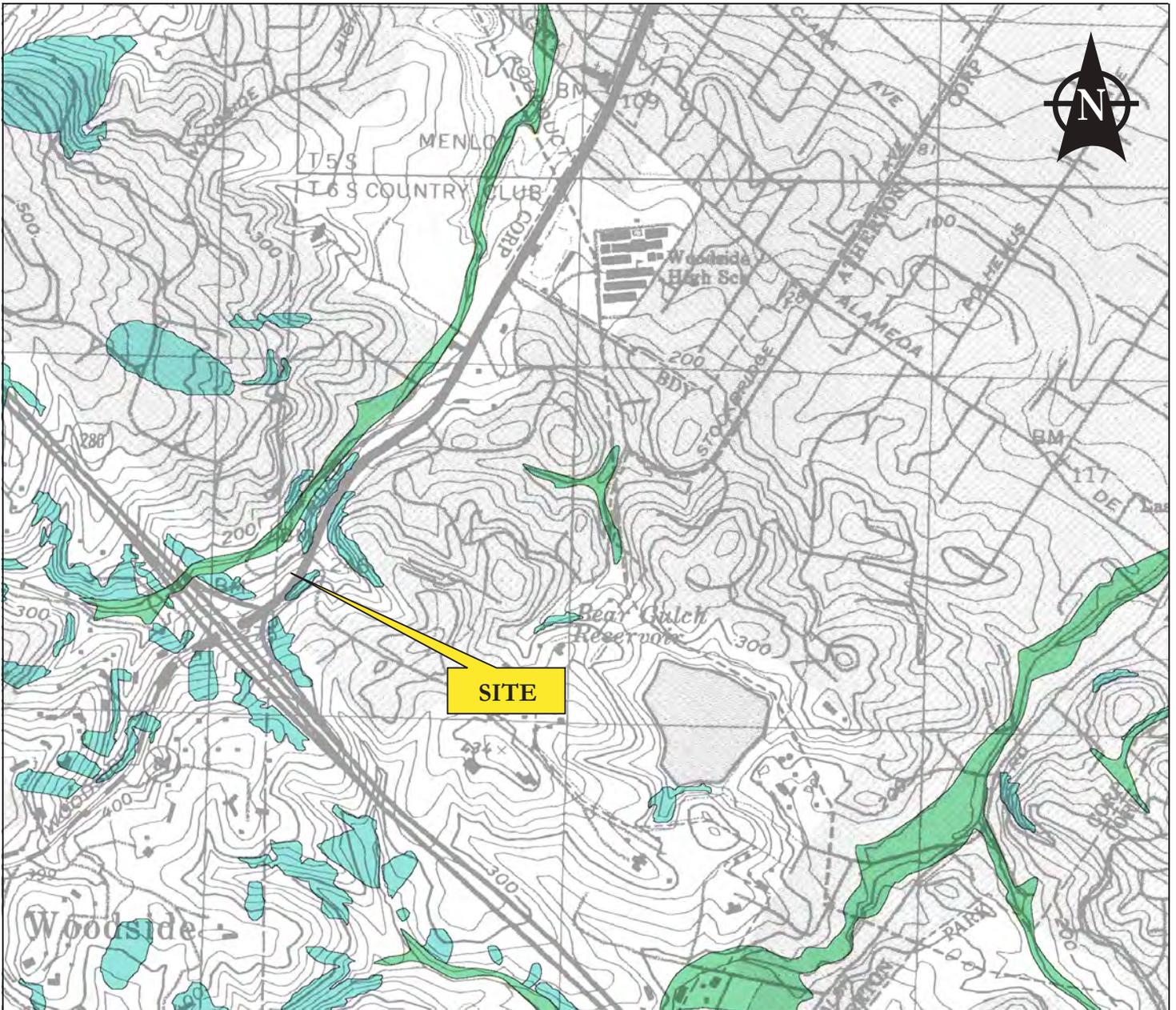


FOUNDATION REPORT
HIGHWAY 84, POST MILE 21.6
SAN MATEO COUNTY, CALIFORNIA

SF BAY REGION
EARTHQUAKE
PROBABILITY

MAY 2014

FIGURE 3



LEGEND



Areas where historic occurrence of liquefaction, or local, geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.



Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Base: State of California Seismic Hazard Zone Map for the Palo Alto 7.5 Minute Quadrangle, CGS 2006.

Scale: 1 inch = 2,000 feet

	<p>FOUNDATION REPORT HIGHWAY 84, POST MILE 21.6 SAN MATEO COUNTY, CALIFORNIA</p>	<p>STATE SEISMIC HAZARD ZONES MAP</p>
	<p>MAY 2014</p>	<p>FIGURE 4</p>

Appendix A

Rotary Field Notes

Laboratory Testing

Corrosion Testing

Slope Inclinometer Data

ROTARY FIELD NOTES

(Rev. Aug. 1, 2012)

HOLE IDENTIFICATION: RW-13-002 DATE: 10/28/2013

DIST CO. RTE P.M. PROJECT ID
04 SM 84 21.6 0412000622

LOCATION (STA/OFFSET): STATION 17+60; 8.5 Ft.

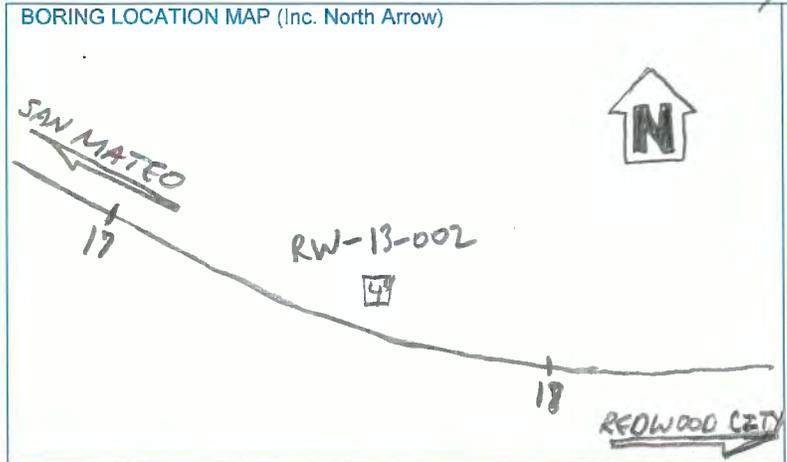
STRUCTURE/PROJECT NAME BRIDGE #
Woodside II RETAINING WALL

SUPPORT LOCATION (if applicable): LEFT OF "WR2" LINE.

EQUIPMENT EQUIP. ID# HAMMER ID# ERI
CS2000 6832 7 86%

TOP HOLE ELEVATION: 277 Ft. ±

CREW: LARRY WILSON, et. al. LOGGER: JOHN MOORE



GWS Date: 57.6 11/6/13 GWS Date: 57.9 11/13/13
 BENCHMARK: Indicate either Found or Set, BM name, BM description, Sta/Offset, Location Description, BM Elevation, Vertical Datum
 SURVEY MONUMENT: X 382
 NORTHING = 1985794.778402
 EASTING = 6055859.571327
 ELEVATION = 278.290
 DATUM - VERT = NAVD 88

DEPTH	FIELD TESTING				RECOVERY/ RQD REMARKS	GRAPHIC	DESCRIPTION
	Tool	Sample #	Blows/6"	SPT N			
0							Asphalt.
1							
2							
3							
4							
5			4				LEAN CLAY with sand (CL)
6			3				HARD, brown, moist; PP > 4th
7			15	(18)			
8							
9							
10							

ROTARY FIELD NOTES

(Rev. Aug. 1, 2012)

HOLE IDENTIFICATION: RW-13-002 DIST: 04 CO: SM RTE: 84 P.M: 21.6 PROJECT ID: 0412000622
 STA/OFFSET: Station 17+60 STRUCTURE/PROJECT NAME: 8.5' Left of "WR2" Woodside II Retaining Wall BRIDGE #: 780

DEPTH	FIELD TESTING				RECOVERY/ RQD REMARKS	GRAPHIC	DESCRIPTION <small>Soil: group name (symbol); consistency/apparent density; color; moisture; particle size, proportion; cementation; percent cobbles/boulders, description cobbles/boulders; PP/TV; other Rock: rock type (rock name); grain size; bedding; color; weathering; hardness; fracture density; other</small>
	Tool	Sample#	Blows/6"	SPT N			
10	X		8		Limited recovery		Same;
11	X		7		(shoe only). Had		
12	X		7	(14)	to insert tri- cone to advance.		
13	(1)				Did not work. Heavy vibration and chatter.		METAMORPHIC (SERPENTINE), massive bedding, dark blue/ green, moderately weathered, very hard moderately fractured, UC = 3811 psi;
14					Switched to coning. RQD = 67%		
15	X		4				
16	X		4				
17	X		8	(12)	Recovery = 20%		SAME No apparent bedding, intensely weathered, very soft, intensely fractured (BIM-rock);
18	(2)						
19							
20	X		4				SAME;
21	X		5				PP > 4 tsf;
22	X		7	(12)	Recovery = 33%		
23	(3)						
24							
25	X		4				SAME;
26	X		4				PP > 4 tsf;
27	X		4	(8)	Recovery = 23%		

4"

ROTARY FIELD NOTES

(Rev. Aug. 1, 2012)

HOLE IDENTIFICATION	DIST	CO.	RTE.	P.M.	PROJECT ID
RW-13-002	04	SM	84	21.6	6412000622
STA/OFFSET	STRUCTURE/PROJECT NAME			BRIDGE #	
17460/8.5' 1/4" of "WR2" line	WOODSIDE II RETAINING WALL T130				

DEPTH	FIELD TESTING				RECOVERY/RQD REMARKS	GRAPHIC	DESCRIPTION <small>Soil: group name (symbol); consistency/apparent density; color; moisture; particle size, proportion; cementation; percent cobbles/boulders, description cobbles/boulders; PP/TV; other Rock: rock type (rock name); grain size; bedding; color; weathering; hardness; fracture density; other</small>
	Tool	Sample#	Blows/6"	SPT N			
27							
28	(4)						
29							
30			4				
31			4	(9)			PP > 4 tsf
32			5		Recovery = 27%		
33	(5)						
34							
35			4		(UC) = 18.21 psi		Sedimentary (MUDSTONE) no apparent bedding, light brown moderately weathered, soft, moderately fractured, light brown; PP > 4 tsf; UC = 18.21 psi
36			10	(22)			
37			12				
38	(6)						
39							Very soft,
40			8				
41			8	(22)	(UC) = 6.49 psi		UC = 6.49 psi
42			14		Recovery = 40%		Soft,
43	(7)						
44							

ROTARY FIELD NOTES

(Rev. Aug. 1, 2012)

HOLE IDENTIFICATION: RW-13-002 DIST: 04 CO.: SM RTE.: 84 P.M.: 21.6 PROJECT ID: 0412 000622
 STA/OFFSET: 12+60 / 8.5' left STRUCTURE/PROJECT NAME: WOODSIDE II RETAINING WALL BRIDGE #: TBD
 of "WR2" line

DEPTH	FIELD TESTING				RECOVERY/RQD REMARKS	GRAPHIC	DESCRIPTION <small>Soil: group name (symbol); consistency/apparent density; color; moisture; particle size, proportion; cementation; percent cobbles/boulders, description cobbles/boulders; PP/TV; other Rock: rock type (rock name); grain size; bedding; color; weathering; hardness; fracture density; other</small>
	Tool	Sample#	Blows/6"	SPT N			
44							
45			10		(CR)		
46			19 24		(43)		Very soft; PP = 2.0 tSF;
47					Recovery = 80%		
48					(8)		
49							
50			8				
51			17 24		(41)		
52					Recovery = 80%		
53					(9)		
54							Soft,
55			14				
56			23 29		(52)		
57					Recovery = 90%		
58					Groundwater measured at 57.6' ± 11/6/13.		
59					Groundwater measured at 57.9' ± on 11/13/13.		
60			10				
61			19				

ROTARY FIELD NOTES

(Rev. Aug. 1, 2012)

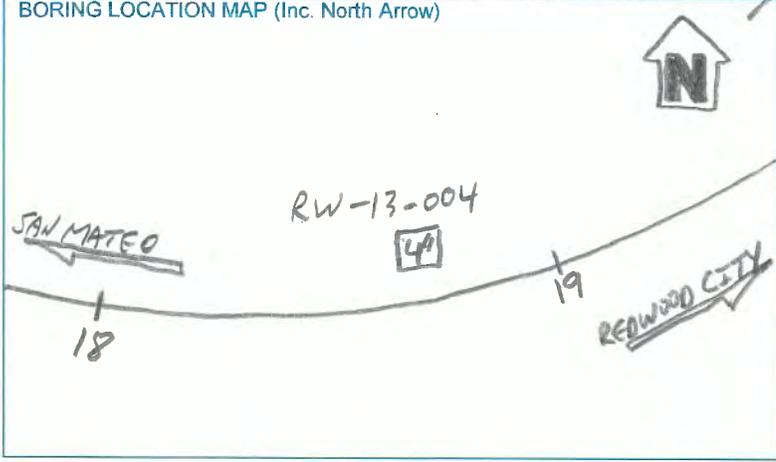
HOLE IDENTIFICATION	DIST	CO.	RTE.	P.M.	PROJECT ID
RW-13-002	04	SM	84	21.6	0412000622
STA/OFFSET	STRUCTURE/PROJECT NAME			BRIDGE #	
17+60 / 8.5' left of "WR2" IWE	Woodside II RETAINING WALL			TBD	

DEPTH	FIELD TESTING				RECOVERY/ RQD REMARKS	GRAPHIC	DESCRIPTION <small>Soil: group name (symbol); consistency/apparent density; color; moisture; particle size, proportion; cementation; percent cobbles/boulders, description cobbles/boulders; PP/TV; other Rock: rock type (rock name); grain size; bedding; color; weathering; hardness; fracture density; other</small>
	Tool	Sample#	Blows/6"	SPT N			
61	△		36				
62	—						
63	⊙						
64	—						
65	△		16				same, gray
66	△		25				
			48	73			
67							
<p>RQD WAS NOT recorded because MATERIAL WAS VERY soft.</p> <p>Boring completed to a depth of 66.5 ft. on 10/28/2013. A slope inclinometer/piezometer was installed.</p>							

ROTARY FIELD NOTES

(Rev. Aug. 1, 2012)

HOLE IDENTIFICATION RW-13-004	DATE 10/23/13	DIST 04	CO. SM	RTE 84	P.M. 21.6	PROJECT ID 0412000622
LOCATION (STA/OFFSET) STATION 18+72; 10ft aft	STRUCTURE/PROJECT NAME Woodside II Retaining Wall TSD		BRIDGE #			
SUPPORT LOCATION (if applicable) of "WR2" LINE	EQUIPMENT CS2000	EQUIP. ID# 6832	HAMMER ID#	ERI 86%		
TOP HOLE ELEVATION 272.5 ft ±	CREW Larry Wilson, et al.		LOGGER J. Moore			



GWS Date
31.05 10/29/13

GWS Date
36.55 11/6/13

BENCHMARK: Indicate either Found or Set, BM name, BM description, Sta/Offset, Location Description, BM Elevation, Vertical Datum

SURVEY MONUMENT: X382
 NORTHING = 1985794.778402
 EASTING = 6055859.591327
 ELEVATION = 278.290
 DATUM - VERT = NAVD88

DEPTH	FIELD TESTING				RECOVERY/ RQD REMARKS	GRAPHIC	DESCRIPTION
	Tool	Sample #	Blows/6"	SPT N			
4" 0							Asphalt;
1							
2							
3							
4							
5			6				
6			7				
7			6	(13)			SILT with SAND (ML) medium soft to stiff, green gray, moist, medium to coarse sand
8							
9							
10							

ROTARY FIELD NOTES

(Rev. Aug. 1, 2012)

HOLE IDENTIFICATION: **RW-13-004** DIST: **04** CO: **SM** RTE: **84** P.M.: **21.6** PROJECT ID: **0412000622**
 STA/OFFSET: **18+72/10 ft. 1. ft** STRUCTURE/PROJECT NAME: **Woodside II Retaining Wall** BRIDGE #: **TBD**
 OF "WR2" LINE.

DEPTH	FIELD TESTING				RECOVERY/ RQD REMARKS	GRAPHIC	DESCRIPTION <small>Soil: group name (symbol); consistency/apparent density; color; moisture; particle size, proportion; cementation; percent cobbles/boulders, description cobbles/boulders; PP/TV; other Rock: rock type (rock name); grain size; bedding; color; weathering; hardness; fracture density; other</small>
	Tool	Sample#	Blows/6"	SPT N			
10	X		9				Poorly-graded sand with gravel (S) medium dense, green, moist
11	X		12				
12	X		12	(24)			
13	X						
14	X						
15	X		9				
16	X		8				
17	X		6	(14) No Recovery			
18	X						
19	X						
20	X		9				Lean CLAY with sand and gravel (CL) stiff, brown, moist, PP = 1.5
21	X		5				
22	X		7	(12)			
23	X						
24	X						
25	X		9				
26	X		12				
27	X		16	(28)			

ROTARY FIELD NOTES

(Rev. Aug. 1, 2012)

HOLE IDENTIFICATION: **RW-13-004** DIST: **04** CO: **SM** RTE: **84** P.M.: **21.6** PROJECT ID: **0412000622**

STA/OFFSET: **18+72/10ft. left of "WR2" line** STRUCTURE/PROJECT NAME: **Woodside II Retaining Wall** BRIDGE #: **7130**

DEPTH	FIELD TESTING				RECOVERY/ RQD REMARKS	GRAPHIC	DESCRIPTION <small>Soil: group name (symbol); consistency/apparent density; color; moisture; particle size, proportion; cementation; percent cobbles/boulders, description cobbles/boulders; PP/TV; other Rock: rock type (rock name); grain size; bedding; color; weathering; hardness; fracture density; other</small>
	Tool	Sample#	Blows/6"	SPT N			
27							
28							
29							
30			9				
31			12		Groundwater		
			15	(29)	measured at 31.05.		
					10/29/13.		
32							
33							
34							
35			8		(CR)		SAME
36			14		Groundwater		
			20	(44)	measured at 36.55.		
					11/6/13.		
37							
38							
39							
40			12				PP > 4
41			24				
			29	(50)			
42							
43							
44							

ROTARY FIELD NOTES

(Rev. Aug. 1, 2012)

HOLE IDENTIFICATION: **RW-13-004** DIST: **04** CO: **SM** RTE: **84** P.M.: **21.6** PROJECT ID: **0412000622**

STA/OFFSET: **18+72 / 10ft. aft** STRUCTURE/PROJECT NAME: **Woodside II Retaining Wall** BRIDGE #: **TBD**
 of "WR2" line.

4"

DEPTH	FIELD TESTING				RECOVERY/ RQD REMARKS	GRAPHIC	DESCRIPTION <small>Soil: group name (symbol); consistency/apparent density; color; moisture; particle size, proportion; cementation; percent cobbles/boulders, description cobbles/boulders; PP/TV; other Rock: rock type (rock name); grain size; bedding; color; weathering; hardness; fracture density; other</small>
	Tool	Sample#	Blows/6"	SPT N			
44							
45			29				
46			50 = 5"				
47					Recovery = 85% UC = 8.093 psi.		Sedimentary (Mudstone), no apparent bedding, light brown, moderately weathered, moderately soft, UC = 8.093 psi,
48	①						
49							
50					Recovery = 90%		
51							
52	②						
53							
54							
55					Recovery = 80%		
56							
57	③						SAME; olive gray,
58							
59					UC = 22.35 psi		UC = 22.35 psi
60					Recovery = 67%		
61							

ROTARY FIELD NOTES

(Rev. Aug. 1, 2012)

HOLE IDENTIFICATION: RW-13-004 DIST: 04 CO: SM RTE: 84 P.M.: 21.6 PROJECT ID: 04/2000622

STA/OFFSET: 18+72.1044 R/A OF "WR2" LINE. STRUCTURE/PROJECT NAME: Woodside II Retaining Wall BRIDGE #: 7130

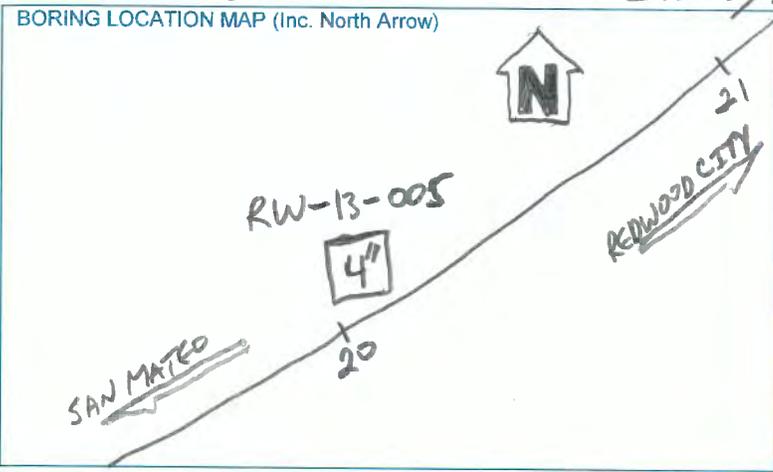
DEPTH	FIELD TESTING				RECOVERY/RQD REMARKS	GRAPHIC	DESCRIPTION <small>Soil: group name (symbol); consistency/apparent density; color; moisture; particle size, proportion; cementation; percent cobbles/boulders, description cobbles/boulders; PP/TV; other Rock: rock type (rock name); grain size; bedding; color; weathering; hardness; fracture density; other</small>
	Tool	Sample#	Blows/6"	SPT N			
61							
62	(4)						SAME,
63							
64							
65	(5)				RECOVERY = 50%		SAME,
66							
67					RQD WAS NOT RECORDED BECAUSE MATERIAL WAS VERY SOFT.		
68							
69					Boring completed to a depth of 65-ft. ON 10/23/13.		
70					A slope inclinometer/piezometer WAS INSTALLED.		

ROTARY FIELD NOTES

(Rev. Aug. 1, 2012)

HOLE IDENTIFICATION RW-13-005 DATE 10/28/2013
 LOCATION (STA/OFFSET) STATION 20+10, 8.5 ft.
 SUPPORT LOCATION (if applicable) 1 ft of "WR2" line.
 TOP HOLE ELEVATION 267.5 ±

DIST 04 CO SM RTE 84 P.M. 21.6 PROJECT ID 0412000622
 STRUCTURE/PROJECT NAME Woodside II Retaining Wall BRIDGE # TBO
 EQUIPMENT C52000 EQUIP. # 6832 HAMMER ID# — ERi 86%
 CREW CARRY Wilson, et al. J. MOORE LOGGER



GWS Date 25.90 10/29/13 GWS Date 28.25 11/6/13
 BENCHMARK: Indicate either Found or Set, BM name, BM description, Sta/Offset, Location Description, BM Elevation, Vertical Datum
 SURVEY MONUMENT: X 382
 NORTHING = 1985794.778402
 EASTING = 6055859.571327
 ELEVATION = 278.290
 DATUM - VERT = NAVD88

DEPTH	FIELD TESTING				RECOVERY/ RQD REMARKS	GRAPHIC	DESCRIPTION
	Tool	Sample #	Blows/6"	SPT N			
<u>0</u>							<u>Asphalt;</u>
<u>1</u>							
<u>2</u>							
<u>3</u>							
<u>4</u>							
<u>5</u>							
<u>6</u>			<u>4</u>				<u>SANDY LEAN CLAY with gravel (CL)</u>
<u>7</u>			<u>7</u>	<u>(14)</u>			<u>hard, brown, moist, PP > 4</u>
<u>8</u>							
<u>9</u>							
<u>10</u>							

Borehole Abandonment Method (circle one): Bentonite/ Cement Slurry Cement Slurry Bentonite Chips
 Grouted Inclinator Sanded Inclinator Piezometer Other (describe on last page).

Date 10/23/13

ROTARY FIELD NOTES

(Rev. Aug. 1, 2012)

HOLE IDENTIFICATION	DIST	CO.	RTE.	P.M.	PROJECT ID
RW-13-005	04	SM	84	21.6	0412 000622
STA/OFFSET	STRUCTURE/PROJECT NAME				BRIDGE #
20+10/8.5 ft. left of "WR2" line.	Woodside II Retaining Wall				TBD

DEPTH	FIELD TESTING				RECOVERY/ RQD REMARKS	GRAPHIC	DESCRIPTION <small>Soil: group name (symbol), consistency/apparent density; color; moisture; particle size, proportion, cementation; percent cobbles/boulders, description cobbles/boulders; PP/TV; other Rock: rock type (rock name); grain size; bedding; color; weathering; hardness; fracture density; other</small>
	Tool	Sample#	Blows/6"	SPT N			
10			6				CLAYEY SAND (SC), medium dense, light brown, moist, PP > 4
11			9 10	(19)			
12							
13							
14							
15			8		(CR)		LEAN CLAY (with sand) (CL), hard, brown, moist, PP > 4
16			7 10	(19)			
17							
18							
19							
20			5		No Recovery,		
21			5 6	(11)			
22							
23							
24							
25			7				
26			8 10	(18)	10/29/13		LEAN CLAY (CL), very stiff, orange brown, moist
27							

ROTARY FIELD NOTES

(Rev. Aug. 1, 2012)

HOLE IDENTIFICATION: **RW-13-005** DIST: **04** CO.: **SM** RTE.: **84** P.M.: **21.6** PROJECT ID: **0412 000 622**

STA/OFFSET: **20+10; 8.5 ft.** STRUCTURE/PROJECT NAME: **WOODSIDE II Retaining WALL** BRIDGE #: **TBD**

DEPTH	FIELD TESTING				RECOVERY/ RQD REMARKS	GRAPHIC	DESCRIPTION <small>Soil: group name (symbol); consistency/apparent density; color; moisture; particle size, proportion; cementation; percent cobbles/boulders, description cobbles/boulders; PP/TV; other Rock: rock type (rock name); grain size; bedding; color; weathering; hardness; fracture density; other</small>
	Tool	Sample#	Blows/6"	SPT N			
27							
28					 11/6/13		
29							
30			6				
31			6 9	(15)			SAME, PP = 3.5; OLIVE
32							
33							
34							
35			9				
36			13 18	(31)			LEAN CLAY (CL), hard, yellow brown, moist, PP > 4.0;
37							
38							
39							
40			16				
41			27 36	(63)			SAME; PP > 4.0
42							
43							
44							

ROTARY FIELD NOTES

(Rev. Aug. 1, 2012)

HOLE IDENTIFICATION	DIST	CO.	RTE.	P.M.	PROJECT ID
RW-13-005	04	SM	84	21.6	0412000622
STA/OFFSET	STRUCTURE/PROJECT NAME				BRIDGE #
20+10 / 8.5 ft. Ht of WRZ line	Woodside II Retaining Wall				T30

DEPTH	FIELD TESTING				RECOVERY/ RQD REMARKS	GRAPHIC	DESCRIPTION <small>Soil: group name (symbol); consistency/apparent density; color; moisture; particle size, proportion; cementation; percent cobbles/boulders, description cobbles/boulders; PP/TV; other Rock: rock type (rock name); grain size; bedding; color; weathering; hardness; fracture density; other</small>
	Tool	Sample#	Blows/6"	SPT N			
44							
45	X		18				SAME, PP > 4.0,
46	X		50 = 5"				
47							
48							
49							
50	X		50 = 5"				
51					Recovery = 93% RQD = 0%		Sedimentary (Mudstone); NO apparent bedding, moderately weathered; olive; moderately hard, intensely fractured;
52							
53	①						
54					UC = 210.9 psi		UC = 210.9 psi;
55							
56					Recovery = 100% RQD = 0%		SAME,
57							
58	②						
59							
60							
61					Recovery = 100% RQD = 0%		

4"

ROTARY FIELD NOTES

(Rev. Aug. 1, 2012)

HOLE IDENTIFICATION: **RW-13-005** DIST: **04** CO.: **SM** RTE.: **84** P.M.: **21.6** PROJECT ID: **0412 000622**

STA/OFFSET: **20+10/8.5 ft. 4 ft of WRZ line** STRUCTURE/PROJECT NAME: **Woodside II Retaining Wall** BRIDGE #: **730**

DEPTH	FIELD TESTING				RECOVERY/ RQD REMARKS	GRAPHIC	DESCRIPTION <small>Soil: group name (symbol); consistency/apparent density; color; moisture; particle size, proportion; cementation; percent cobbles/boulders, description cobbles/boulders; PP/TV; other Rock: rock type (rock name); grain size; bedding; color; weathering; hardness; fracture density; other</small>
	Tool	Sample#	Blows/6"	SPT N			
61							
62					UC = 413.6 psi;		UC = 413.6 psi;
63	(3)						
64							
65					RECOVERY = 100%		
66					RQD = 5%		
67	(4)						
68							
69							
70					RECOVERY = 100%		
71					RQD = 5%		
72	(5)						
73							
74							
75					RECOVERY = 100%		
76					RQD = 10%		
77					UC = 32.31 psi		UC = 32.31 psi;
78	(6)						

ROTARY FIELD NOTES

(Rev. Aug. 1, 2012)

HOLE IDENTIFICATION: RW-13-005 DIST: 04 CO: SM RTE: 84 P.M.: 21.6 PROJECT ID: 0412 000622

STA/OFFSET: 20+12.5 Sta. R/LT of WR2nd line STRUCTURE/PROJECT NAME: Woodside II Retaining Wall BRIDGE #: TBD

DEPTH	FIELD TESTING				RECOVERY/RQD REMARKS	GRAPHIC	DESCRIPTION <small>Soil: group name (symbol); consistency/apparent density; color; moisture; particle size, proportion; cementation; percent cobbles/boulders, description cobbles/boulders; PP/TV; other Rock: rock type (rock name); grain size; bedding; color; weathering; hardness; fracture density; other</small>
	Tool	Sample#	Blows/6"	SPT N			
78							
79							
80							
81					Recovery = 100%		
82							
83							
84							
85					Recovery = 100%		
86							SAME, hard;
87					UC = 39.13 psi; RQD = 50%		
88					between 87.5 and 90-ft.		slightly weathered, UC = 39.13 psi;
89							
90							
91					Boring was completed on 10/22/2013.		
92					A slope Inclinometer piezometer was installed on 10/23/2013.		
93							
94							
95							

X382

Survey Monument

Name = X382

Northing = 1985794.778402

Easting = 6056859.571327

Datum_Hor = CCS83z3f

Epoch = 1991.35

Elevation = 278.290

Datum_Vert = NAVD88

Job_Num = 98-137

Comments =

[Open Field Notes](#)

[Monuments Spreadsheet](#)

[Report Error](#)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SM	84		X	

REGISTERED CIVIL ENGINEER X DATE _____

PLANS APPROVAL DATE _____

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



CURVE DATA

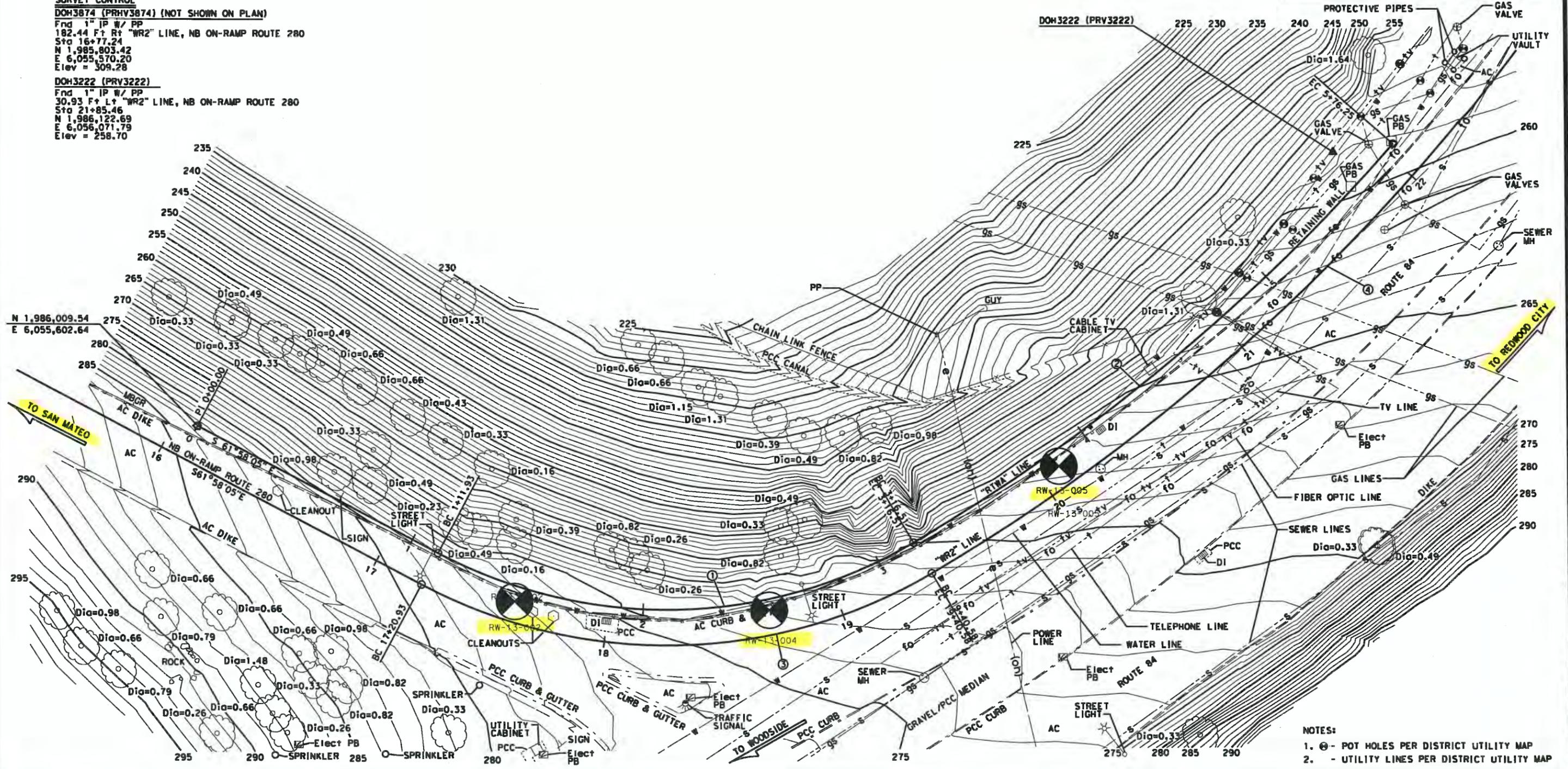
No.	R	Δ	T	L
①	200.25	58°32'06"	112.23	204.58
②	819.25	18°09'57"	130.97	259.74
③	215.00	58°32'06"	120.49	219.65
④	834.00	31°33'44"	235.70	459.42



SURVEY CONTROL

DOH3874 (PRV3874) (NOT SHOWN ON PLAN)
 Fnd 1" IP W/ PP
 182.44 Ft Rt "WR2" LINE, NB ON-RAMP ROUTE 280
 Sta 16+77.24
 N 1,985,803.42
 E 6,055,570.20
 Elev = 309.28

DOH3222 (PRV3222)
 Fnd 1" IP W/ PP
 30.93 Ft Lt "WR2" LINE, NB ON-RAMP ROUTE 280
 Sta 21+85.46
 N 1,986,122.69
 E 6,056,071.79
 Elev = 258.70



- NOTES:**
- ① - POT HOLES PER DISTRICT UTILITY MAP
 - ② - UTILITY LINES PER DISTRICT UTILITY MAP

PRELIMINARY INVESTIGATION SECTION				STATE OF CALIFORNIA		DIVISION OF ENGINEERING SERVICES		BRIDGE NO. 35-WALL		WOODSIDE WALL No 2	
SCALE VERT. DATUM NAVD88				DESIGN BY X		STRUCTURE DESIGN		POST MILE 21.60		FOUNDATION PLAN	
1"=20' HORZ. DATUM NAD83 (1991.35)				CHECKED X		PROJECT NUMBER & PHASE: 0412000622 1		CONTRACT NO.: 04-406401		REVISION DATES	
ALIGNMENT TIES DIST TRAVERSE SHEET				PHOTOGAMMETRY AS OF 1 X		DESIGN BRANCH 9		DISREGARD PRINTS BEARING EARLIER REVISION DATES		SHEET OF X X	
DRAFTED BY L. YOUNG 03/2014				SURVEYED BY DISTRICT		DEPARTMENT OF TRANSPORTATION		FILE => REQUEST		DATE PLOTTED => 8/11/16	
CHECKED BY T. ZOLNIKOV 03/2014				BY S. SOU 04/2014		ORIGINAL SCALE IN INCHES FOR REDUCED PLANS		UNIT: 3646		USER NAME => BUSER	



**DIVISION OF
ENGINEERING SERVICES
OFFICE OF GEOTECHNICAL SUPPORT
GEOTECHNICAL LABORATORY**

5900 Folsom Boulevard
Sacramento, CA 95819

Date: 12/10/2013

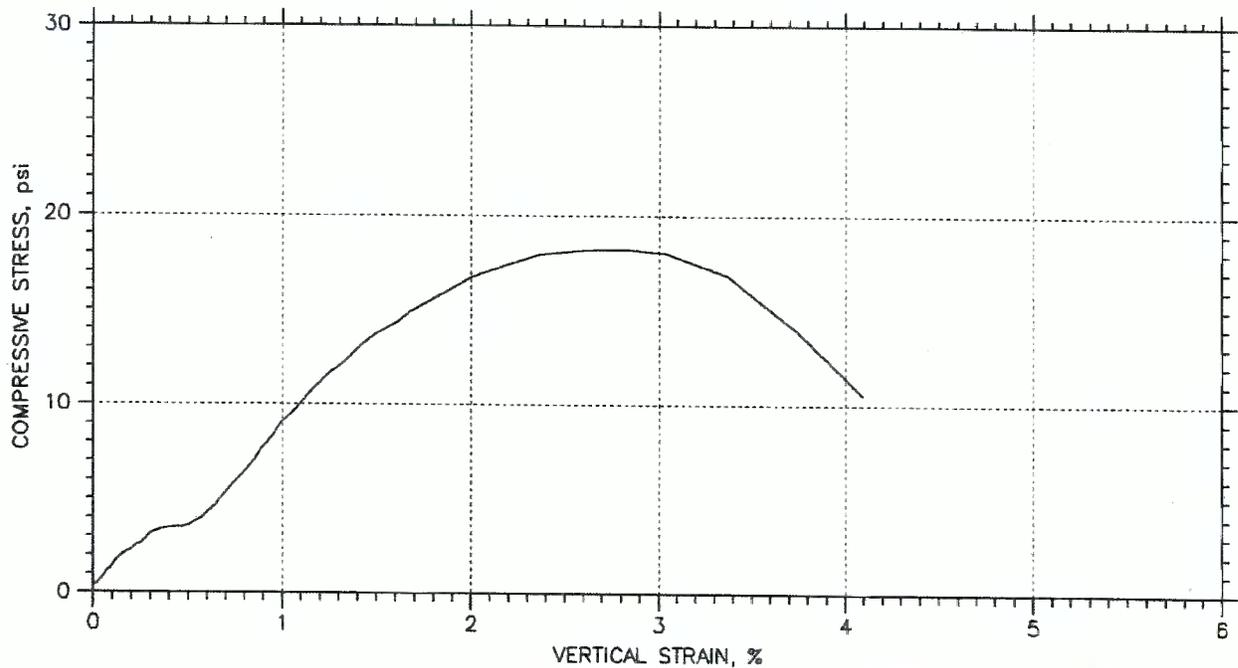
To: John Moore / GDW

From: Lilibeth C. Purta / (916) 227-5239

RE: Laboratory Test Report -- EA: 04-4G6400
GL 13-066

Partial test results.

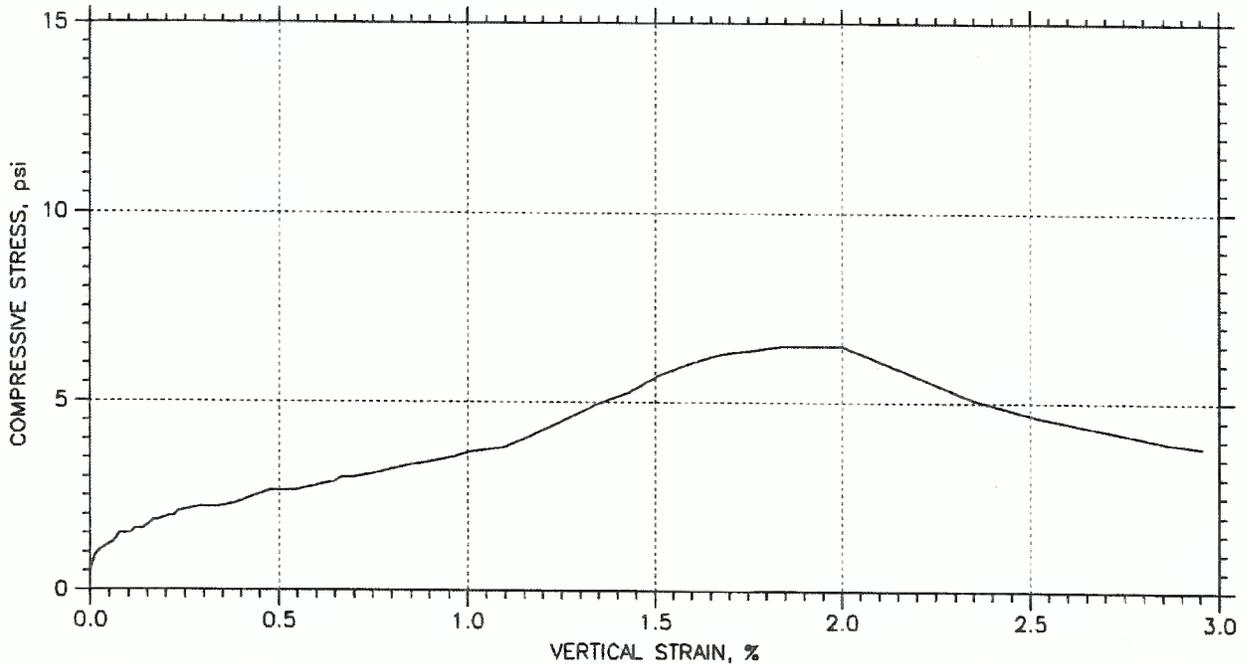
UNCONFINED COMPRESSION TEST REPORT



Symbol			
Test No.		Q13-053	
Initial	Diameter, in	2.42	
	Height, in	5.07	
	Water Content, %	24.43	
	Dry Density, pcf	100.7	
	Saturation, %		
	Void Ratio		
Unconfined Compressive Strength, psi		18.21	
Undrained Shear Strength, psi			
Time to Failure, min			
Strain Rate, %/min		1	
Implied Specific Gravity			
Liquid Limit		---	
Plastic Limit		---	
Plasticity Index		---	
Failure Sketch			

	Project: Storm Damage @R84/I280
	Location: 04-SM-84-21.6
	Project No.: 04-4G6400
	Boring No.: RW-13-002-6
	Sample Type: 2"core/soil
	Description: Moist; Brown; Clay with silt
	Remarks: ASTM D2166 11/17/6

UNCONFINED COMPRESSION TEST REPORT

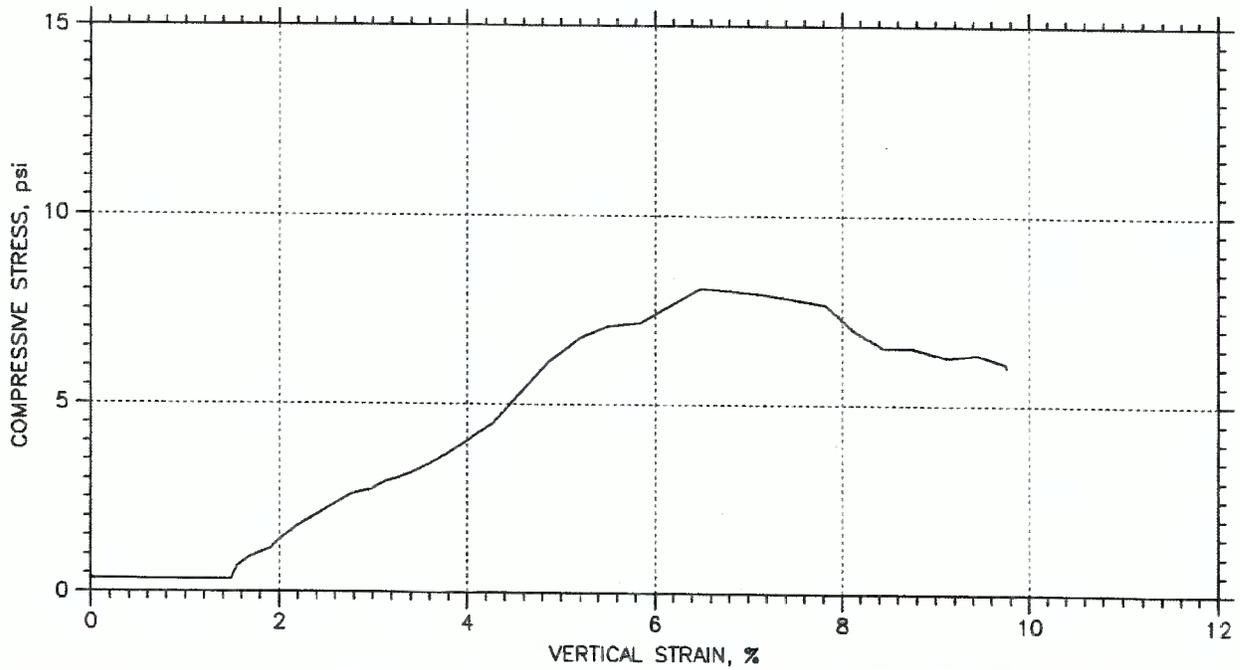


Symbol				
Test No.		Q13-054		
Initial	Diameter, in	2.43		
	Height, in	5		
	Water Content, %	17.25		
	Dry Density, pcf	112.1		
	Saturation, %			
	Void Ratio			
Unconfined Compressive Strength, psi		6.49		
Undrained Shear Strength, psi				
Time to Failure, min				
Strain Rate, %/min		1		
Implied Specific Gravity				
Liquid Limit		---		
Plastic Limit		---		
Plasticity Index		---		
Failure Sketch				



	Project: Storm Damage @ R84/I280
	Location: 04-SM-84-21.6
	Project No.: 04-4G6400
	Boring No.: RW-13-002-7
	Sample Type: CORE
	Description: Moist; Brown; Clay with silt
	Remarks: ASTM D2164 1/12/16

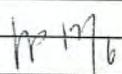
UNCONFINED COMPRESSION TEST REPORT



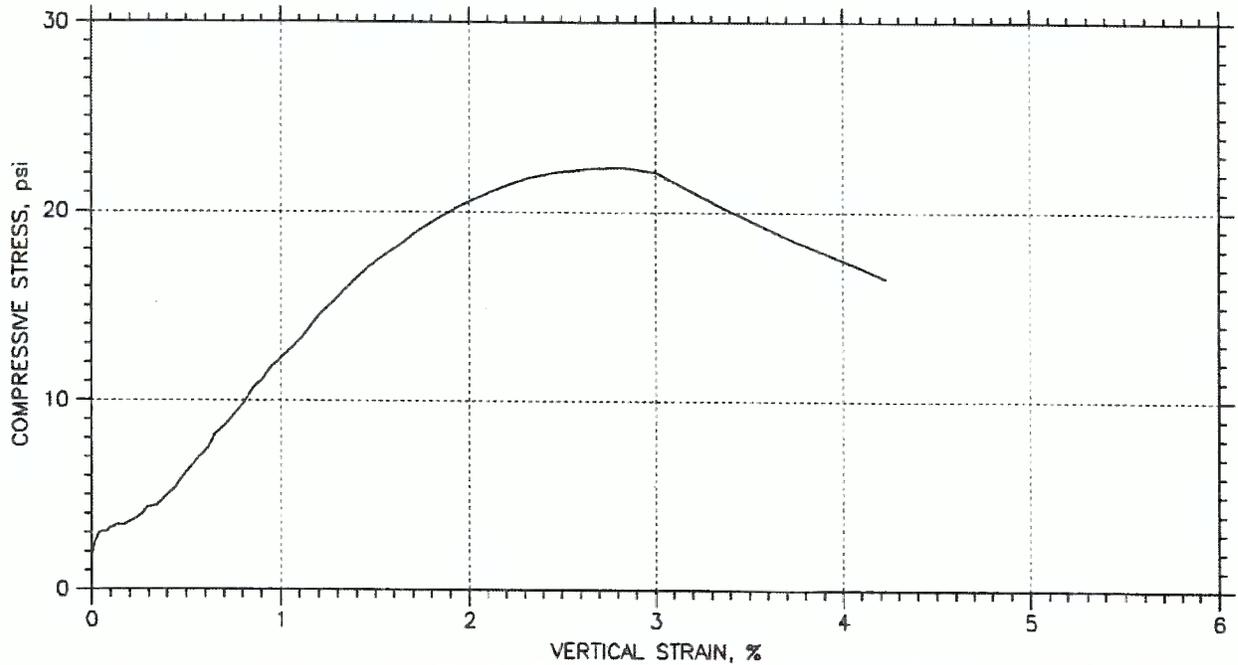
Symbol				
Test No.		Q13-055		
Initial	Diameter, in	2.42		
	Height, in	2.63		
	Water Content, %	16.06		
	Dry Density, pcf	118.5		
	Saturation, %			
	Void Ratio			
Unconfined Compressive Strength, psi		8.093		
Undrained Shear Strength, psi				
Time to Failure, min				
Strain Rate, %/min		1		
Implied Specific Gravity				
Liquid Limit		---		
Plastic Limit		---		
Plasticity Index		---		
Failure Sketch				



	Project: Storm Damage @ R84/I-280
	Location: 04-SM-84-21.6
	Project No.: 04-4G6400
	Boring No.: RW-13-004-4
	Sample Type: CORE
	Description: Moist; Gray/Brown; Clay with silt
	Remarks: Soil sample H:D is less 2" ASTM D2166



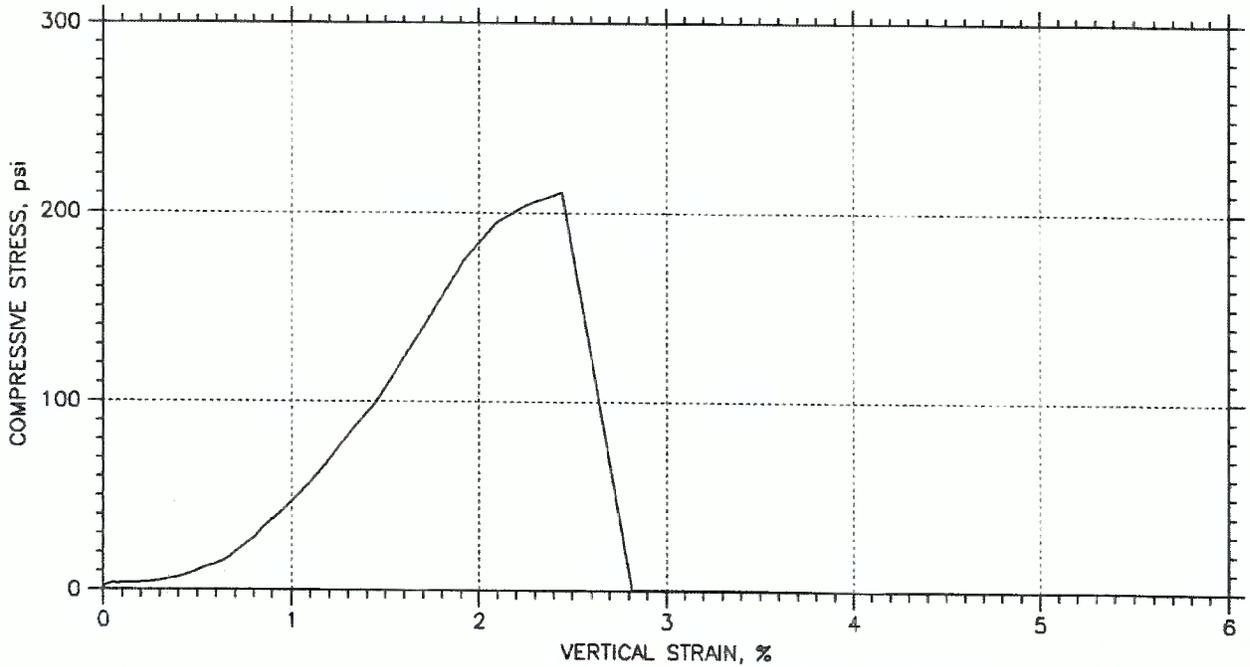
UNCONFINED COMPRESSION TEST REPORT



Symbol				
Test No.		Q13-056		
Initial	Diameter, in	2.41		4
	Height, in	5.07		21
	Water Content, %	17.54		19
	Dry Density, pcf	115.1		18
	Saturation, %			17
	Void Ratio			16
Unconfined Compressive Strength, psi		22.35		15
Undrained Shear Strength, psi				14
Time to Failure, min				13
Strain Rate, %/min		1		12
Implied Specific Gravity			11	
Liquid Limit		---	10	
Plastic Limit		---	9	
Plasticity Index		---	8	
Failure Sketch			7	
			6	
			5	
			4	

	Project: Storm Damage @ R84/I280
	Location: 04-SM-84-21.6
	Project No.: 04-4G6400
	Boring No.: RW-13-004-5
	Sample Type: CORE
	Description: Moist; Black; Clay with silt
	Remarks: ASTM 2166 WP 1976

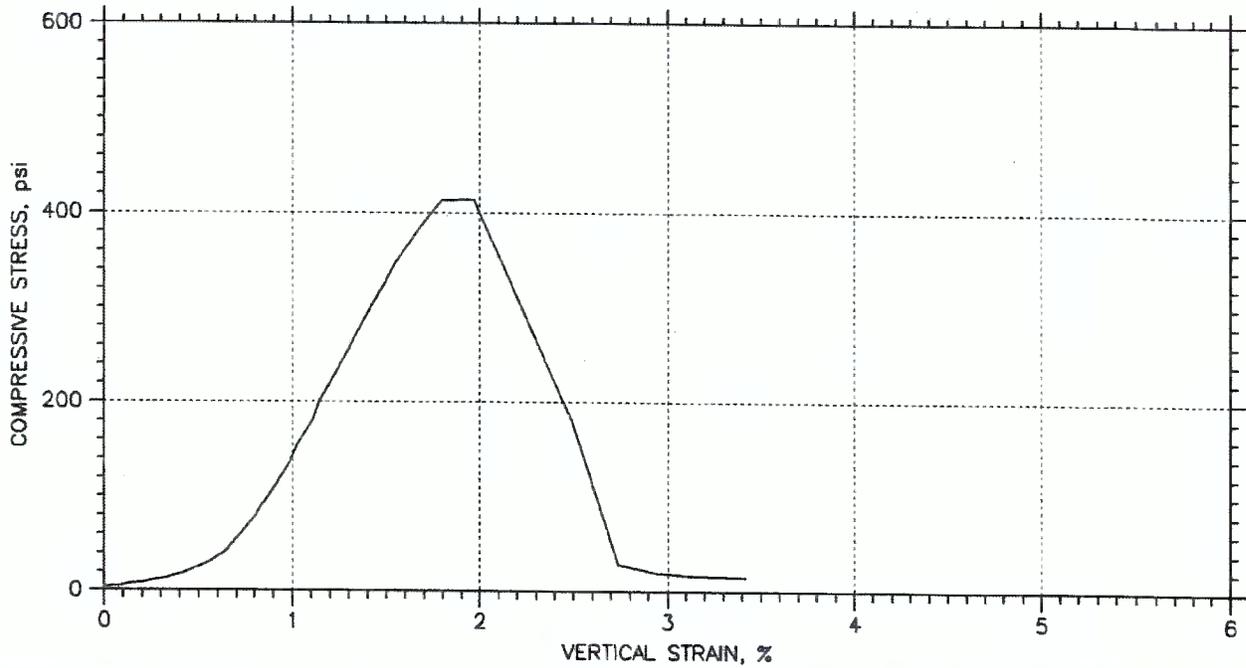
UNCONFINED COMPRESSION TEST REPORT



Symbol			
Test No.		Q13-057	
Initial	Diameter, in	2.4	
	Height, in	5.05	
	Water Content, %	11.30	
	Dry Density, pcf	130.	
	Saturation, %		
	Void Ratio		
Unconfined Compressive Strength, psi		210.7	
Undrained Shear Strength, psi			
Time to Failure, min			
Strain Rate, %/min		1	
Implied Specific Gravity			
Liquid Limit		---	
Plastic Limit		---	
Plasticity Index		---	
Failure Sketch			

	Project: Storm Damage @ R84/I280
	Location: 04-SM-84-21.6
	Project No.: 04-4G6400
	Boring No.: RW-13-005-3
	Sample Type: CORE
	Description: Moist; Black; Claystone
	Remarks: ASTM D2166 WML

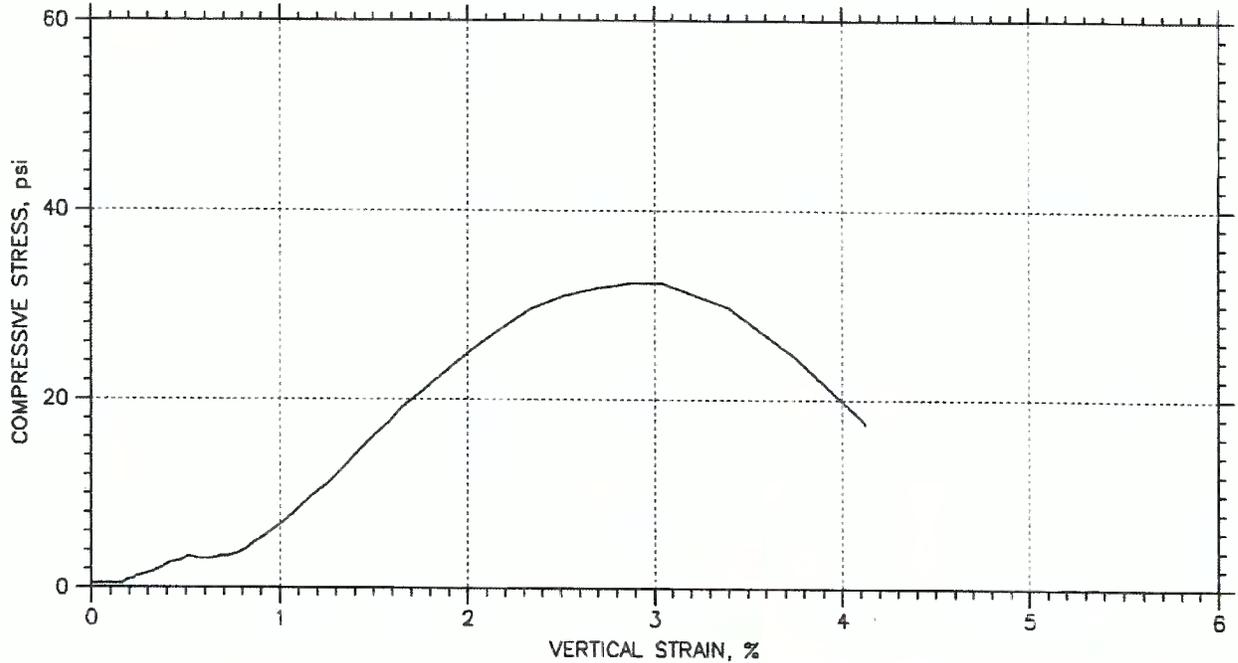
UNCONFINED COMPRESSION TEST REPORT



Symbol			
Test No.		Q13-058	
Initial	Diameter, in	2.38	
	Height, in	4.24	
	Water Content, %	11.05	
	Dry Density, pcf	131.8	
	Saturation, %		
	Void Ratio		
Unconfined Compressive Strength, psi		413.6	
Undrained Shear Strength, psi			
Time to Failure, min			
Strain Rate, %/min		1	
Implied Specific Gravity			
Liquid Limit		---	
Plastic Limit		---	
Plasticity Index		---	
Failure Sketch			

	Project: Storm Damage @ R84/1280
	Location: 04-SM-84-21.6
	Project No.: 04-4G6400
	Boring No.: RW-13-005-4
	Sample Type: CORE
	Description: Moist; Black; Claystone
	Remarks: ASTM D2166 40 < 2.0 W 10%

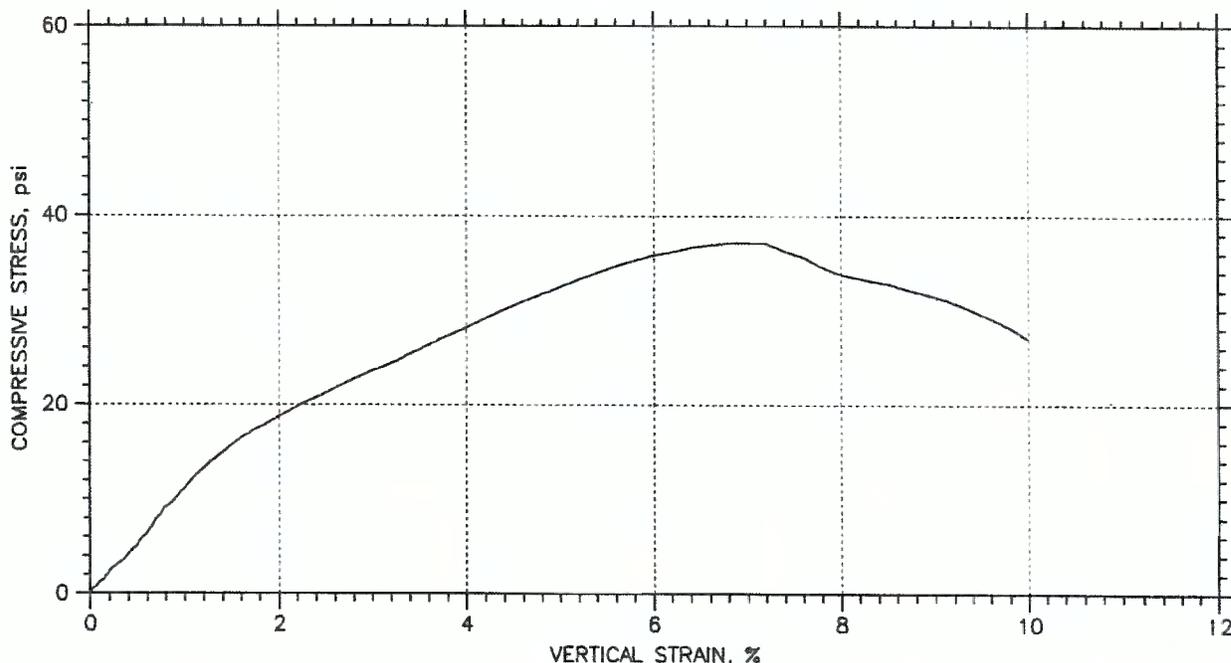
UNCONFINED COMPRESSION TEST REPORT



Symbol			
Test No.		Q13-059	
Initial	Diameter, in	2.45	
	Height, in	5.09	
	Water Content, %	12.41	
	Dry Density, pcf	124.	
	Saturation, %		
	Void Ratio		
Unconfined Compressive Strength, psi		32.31	
Undrained Shear Strength, psi			
Time to Failure, min			
Strain Rate, %/min		1	
Implied Specific Gravity			
Liquid Limit		---	
Plastic Limit		---	
Plasticity Index		---	
Failure Sketch			

	Project: Storm Damage @ R84/H280
	Location: 04-SM-84-21.6
	Project No.: 04-4G6400
	Boring No.: RW-13-005-5
	Sample Type: CORE
	Description: Moist; Gray; Clay with silt
	Remarks: <i>ASTM D2166</i> <i>HP 12/6</i>

UNCONFINED COMPRESSION TEST REPORT



Symbol		
Test No.		Q13-060
Initial	Diameter, in	2.39
	Height, in	5.03
	Water Content, %	9.12
	Dry Density, pcf	134.9
	Saturation, %	
	Void Ratio	
Unconfined Compressive Strength, psi		37.13
Undrained Shear Strength, psi		
Time to Failure, min		
Strain Rate, %/min		1
Implied Specific Gravity		
Liquid Limit		---
Plastic Limit		---
Plasticity Index		---
Failure Sketch		



	Project: Storm Damage @ R84/t280
	Location: 04-SM-84-21.6
	Project No.: 04-4G6400
	Boring No.: RW-13-005-6
	Sample Type: CORE
	Description: Moist; Gray; Clay stone
	Remarks: ASTM D2166 10/17/16

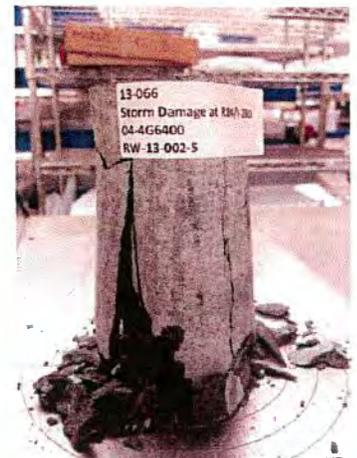


Test Summary

Counter: 2440
 Elapsed Time: 00:01:42
 Operator: jg
 Sample: RW-13-002-5
 Resident Engineer: Yung Chung
 Ticket: GL# 13-066
 E.A./CONTRACT NUMBER: 04-4G6400
 Procedure Name: Cores test for Soil lab
 Start Date: 12/5/2013
 Start Time: 9:17:25 AM
 End Date: 12/5/2013
 End Time: 9:19:07 AM
 Workstation: D1K00YB1
 Tested By: concrete
 Lab: Q13-052

Test Results

Specimen Gage Length: 5.0000 in
 Diameter: 2.3900 in
 Area: 4.4863 in²
 Maximum Load: 17096 lbf
 Compressive Strength: 3811 psi



13.0-ft.



**DIVISION OF
ENGINEERING SERVICES
OFFICE OF GEOTECHNICAL SUPPORT
GEOTECHNICAL LABORATORY**

5900 Folsom Boulevard
Sacramento, CA 95819

Date: 2/4/2014

To: John Moore / GDW

From: Lilibeth C. Purta / (916) 227-5239

RE: Laboratory Test Report -- EA: 04-4G6400

Project: 0412000622

GL 13-066

Final test results.

Note: All remaining test specimens will be disposed of in 30 calendar days from the release date of the final test results.





CALIFORNIA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL LABORATORY

GL TRACKING NO : 13-086
 Dist - EA: 04-4G6400
 Report Date: February 4, 2014
 Page: 1/1

CLASSIFICATION TEST SUMMARY

SAMPLE ID	% FINER THAN											ATTERBERG LIMITS			AS RECEIVED		Gs						
	3"	2 1/2"	2"	1 1/2"	1"	3/4"	1/2"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200	5µ		1µ	LL	PI	Yd (pcf)	%m	
RW-13-002_1																		45	21			CL	
RW-13-002_2																			NP				5
RW-13-002_3																			43	17			CL
RW-13-002_4																							40
RW-13-002_5																							
RW-13-002_6																							
RW-13-002_7																							
RW-13-004_1																		45	22				CL
RW-13-004_2							100	86	85	85	84	83	82	81	44	19							20
RW-13-004_3																							
RW-13-004_4																							
RW-13-004_5																							
RW-13-005_1																							
RW-13-005_2																		54	27				CL
RW-13-005_3																							
RW-13-005_4																							
RW-13-005_5																							
RW-13-005_6																							

Handwritten notes: 5, 40, 20, 30

Results sent to: JOHN MOORE

Division of Engineering Services
Materials Engineering and Testing Services
Corrosion and Structural Concrete Field Investigation Branch

CORROSION TEST SUMMARY REPORT - SOIL

Report Date: 11/21/2013
Reported by Michael Mirkovic

EA

EFIS: 0412000622

Dist/Co/Rte/PM 04 / SM /084 / 21.6 PM

CORROSION LAB #	TLL01 #	BORE #	DEPTH (FT) START	DEPTH (FT) END	MINIMUM RESISTIVITY ¹ (ohm-cm)	pH ¹	CHLORIDE CONTENT ² (ppm)	SULFATE CONTENT ³ (ppm)	IS SAMPLE CORROSIVE?
SOIL SAMPLE FROM: WOODSIDE ROAD									
CR20130398	C704855	RW-13-005	15	15	1031	7.55	10	190	NO
CR20130399	C704856	RW-13-004	35	35	742	7.78	28	480	NO
CR20130400	C704857	RW-13-002	45	45	931	7.66	143	128	NO

This site is not corrosive to foundation elements (see note below).

Note: For Structural Elements, the Department considers a site corrosive if one or more of the following conditions exist: pH is 5.5 or less, chloride concentration is 500 ppm or greater, sulfate concentration is 2000 ppm or greater. Resistivity is not considered for Structural Elements. MSE backfill shall conform to the requirements of section 47-2.02C Structure Backfill in the 2010 Standard Specifications.

¹CT 643, ²CT 422, ³CT 417

CR20130398 - CR20130400

11/21/2013

11/7/2013

Sample ID No. AG130359	Sampled 10/22/2013	Received 11/1/2013	Approved EP	Sample of SOIL	E.A.	District TL-101
Sample From RW-13-005	SMARA#		Location WOODSIDE RD		Depth	

Grading Analysis Test Method CT 202		Rubber		Los Angeles Rattler Test Method CT 211	Sodium Sulfate Soundness Test Method CT 214
Aggregate	Combined	Size	% Passing		
3 in	100	No. 8		Grade	Type
2 1/2 in	100	No. 10		100 Revs	Sieve Size
2 in	100	No. 16		500 Revs	2 1/2 x 2 in
1 1/2 in	100	No. 30		Relative Mortar Strength Test Method CT 515	Ratio
1 in	100	No. 50		Organic Impurities Test Method CT 213	2 x 1 1/2 in
3/4 in	93	No. 100		Quality	1 1/2 x 1 in
1/2 in	93	No. 200		Debris?	1 x 3/4 in
3/8 in	90			Cleaness Value Test Method CT 227	3/4 x 1/2 in
No. 4	99			2 1/2 x 1 1/2	1/2 x 3/8 in
No. 8				1 1/2 x 3/4	3/8 in x No. 4
No. 16				1 x No. 4	Weighted Average Loss of Sample
No. 30				1/2 max	
No. 50				Pit Run	Fine Aggregate Loss
No. 100				Combined	
No. 200					Percent Crushed Particles Test Method CT 205
Sum					
1 um					Weighted Average

Specific Gravity
Test Method CT 206, 207, 208
Retained No.4
SSD Sp Gr
Apparent
Bulk OD
% Absorption

Passing No.4
SSD Sp Gr
Apparent
% Absorption

Durability Index
Test Method CT 229

Fine Durability

Note: If destruction testing was requested, the sample has been processed and sent to Compton for CT 417, 422 and 640.

11/7/2013

Sample ID No. **AG1306961** Sampled **10/26/2013** Received **11/1/2013** Approved **EP** Sample of **SCL** E.A. **TL-101** District **CT04857**

Sample From **RW-13-002** **SMARA#** Location **WOODSIDE RD** Depth

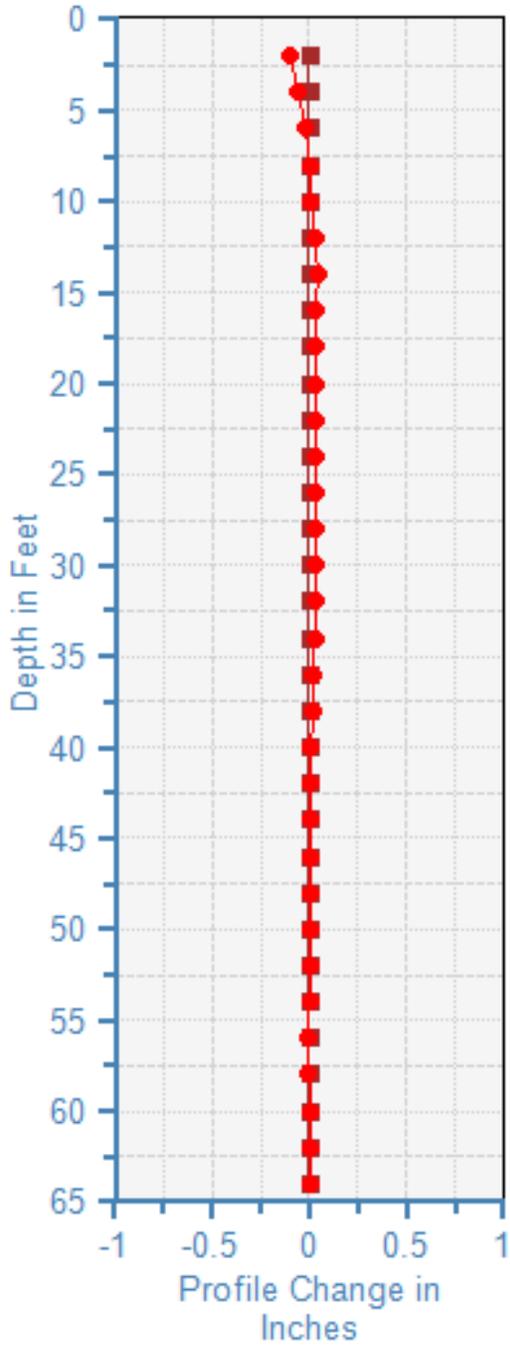
Grading Analysis Test Method CT 202				Rubber		Los Angeles Rattler Test Method CT 211		Sodium Sulfate Soundness Test Method CT 214	
Size	% Passing	Combined	Size	% Passing	Grade	Relative Mortar Strength Test Method CT 515	Ratio	Type	Individual % Loss
3 in	100		No. 8		100 Revs			Sieve Size	
2 1/2 in	100		No. 10		500 Revs			2 1/2 x 2 in	
2 in	100		No. 16					2 x 1 1/2 in	
1 1/2 in	100		No. 30					1 1/2 x 1 in	
1 in	100		No. 50					1 x 3/4 in	
3/4 in	100		No. 100						
1/2 in	100		No. 200						
3/8 in	100								
No. 4	100								
No. 8	99	99							
No. 16			Plasticity Index Test Method CT 204						
No. 30			LL						
No. 50			PL						
No. 100			PI						
No. 200			Sand Equivalent Test Method CT 217						
Sum									
1 um									
Specific Gravity Test Method CT 206, 207, 208 Retained No.4 SSD Sp Gr Apparent Bulk OD					Durability Index Test Method CT 229 Coarse Durability Fine Durability				
Passing No.4 SSD Sp Gr Apparent					Percent Crushed Particles Test Method CT 205 Weighted Average				
% Absorption					% Absorption				

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 543.

Slope Inclinometer Data for RW-13-002

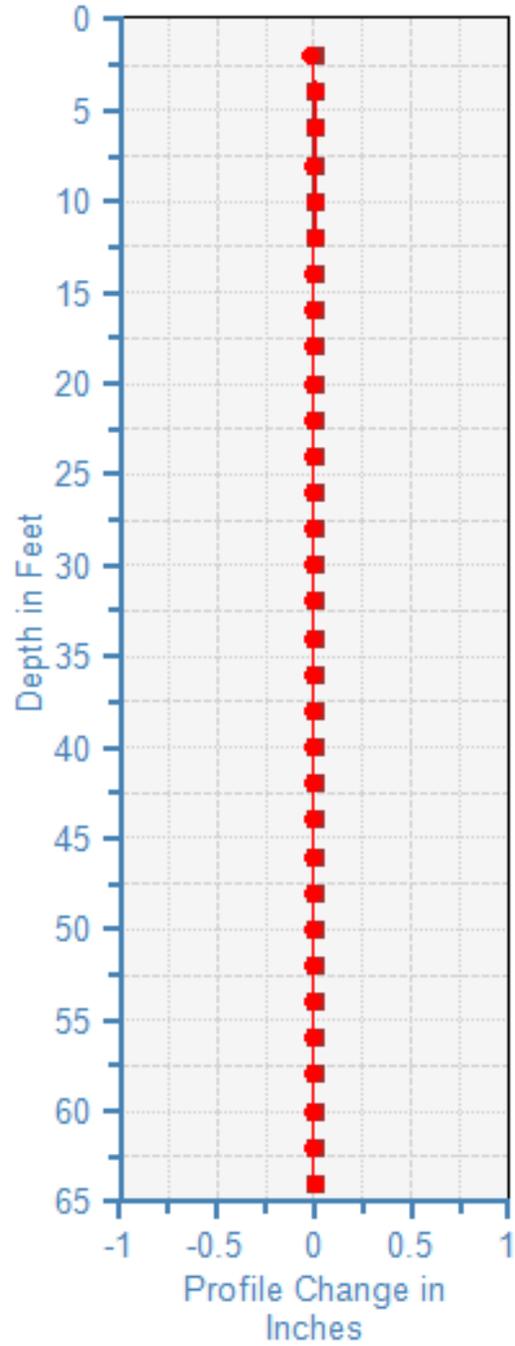
WOOD RW1303 A

11/13/2013 4/10/2014



WOOD RW1303 B

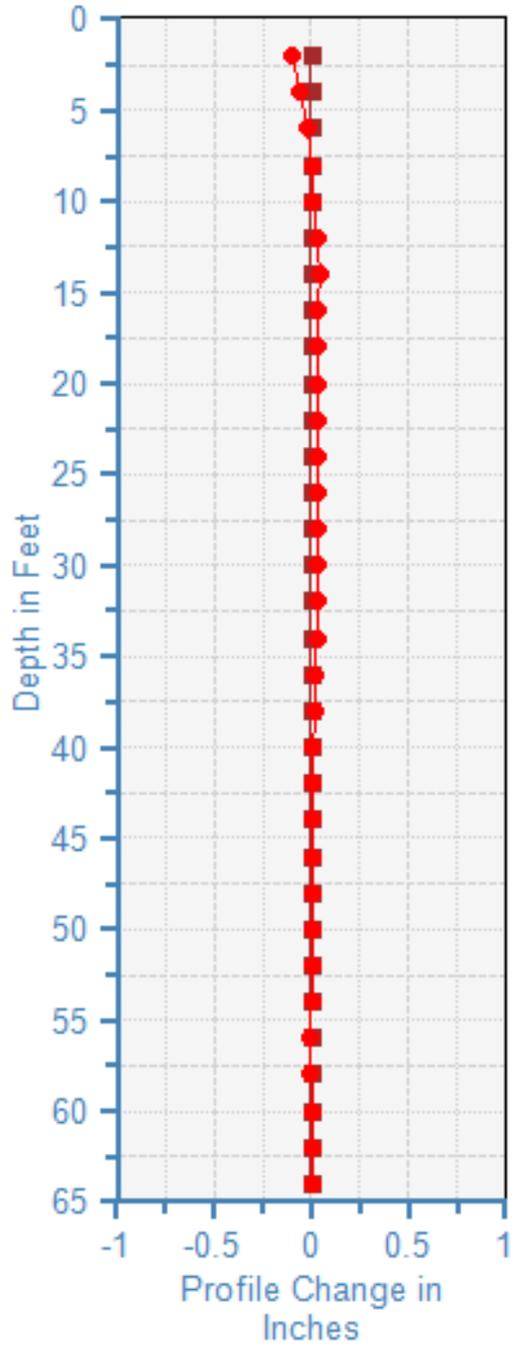
11/13/2013 4/10/2014



Slope Inclinometer Data for RW-13-004

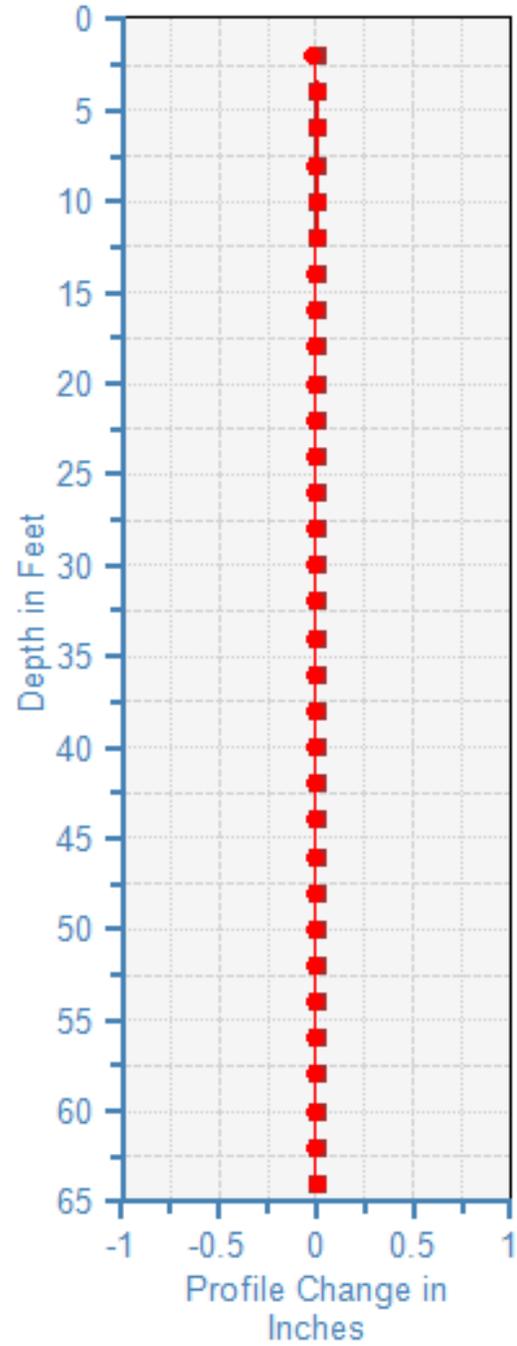
WOOD RW1303 A

11/13/2013 4/10/2014



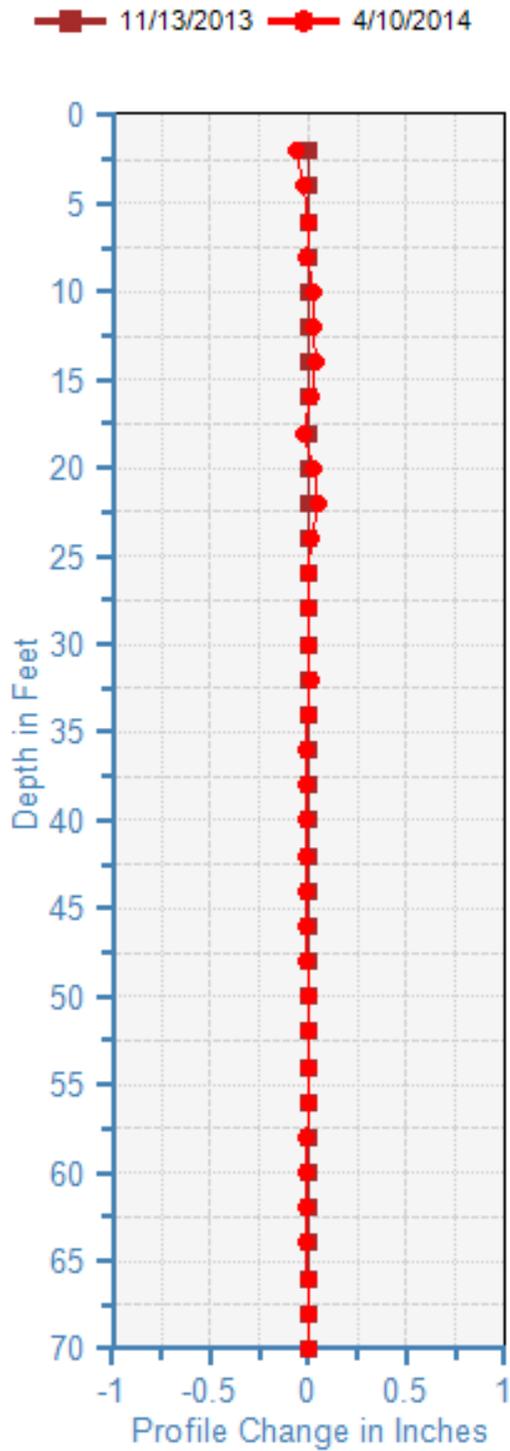
WOOD RW1303 B

11/13/2013 4/10/2014

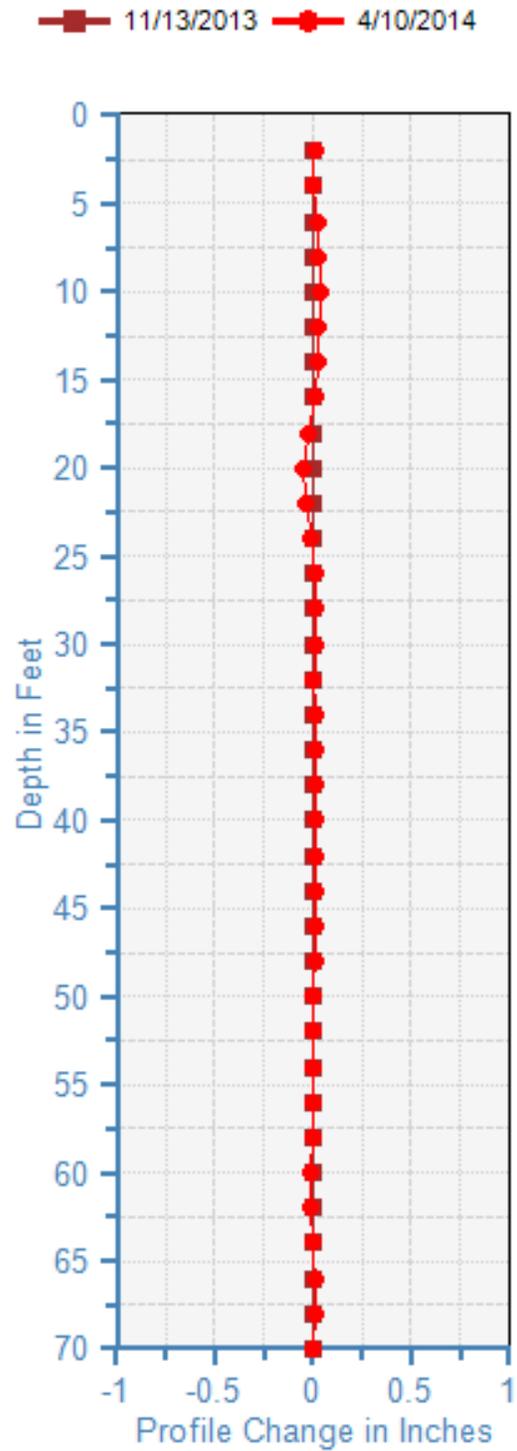


Slope Inclinometer Data for RW-13-005

WOOD RW1301 A



WOOD RW1301 B

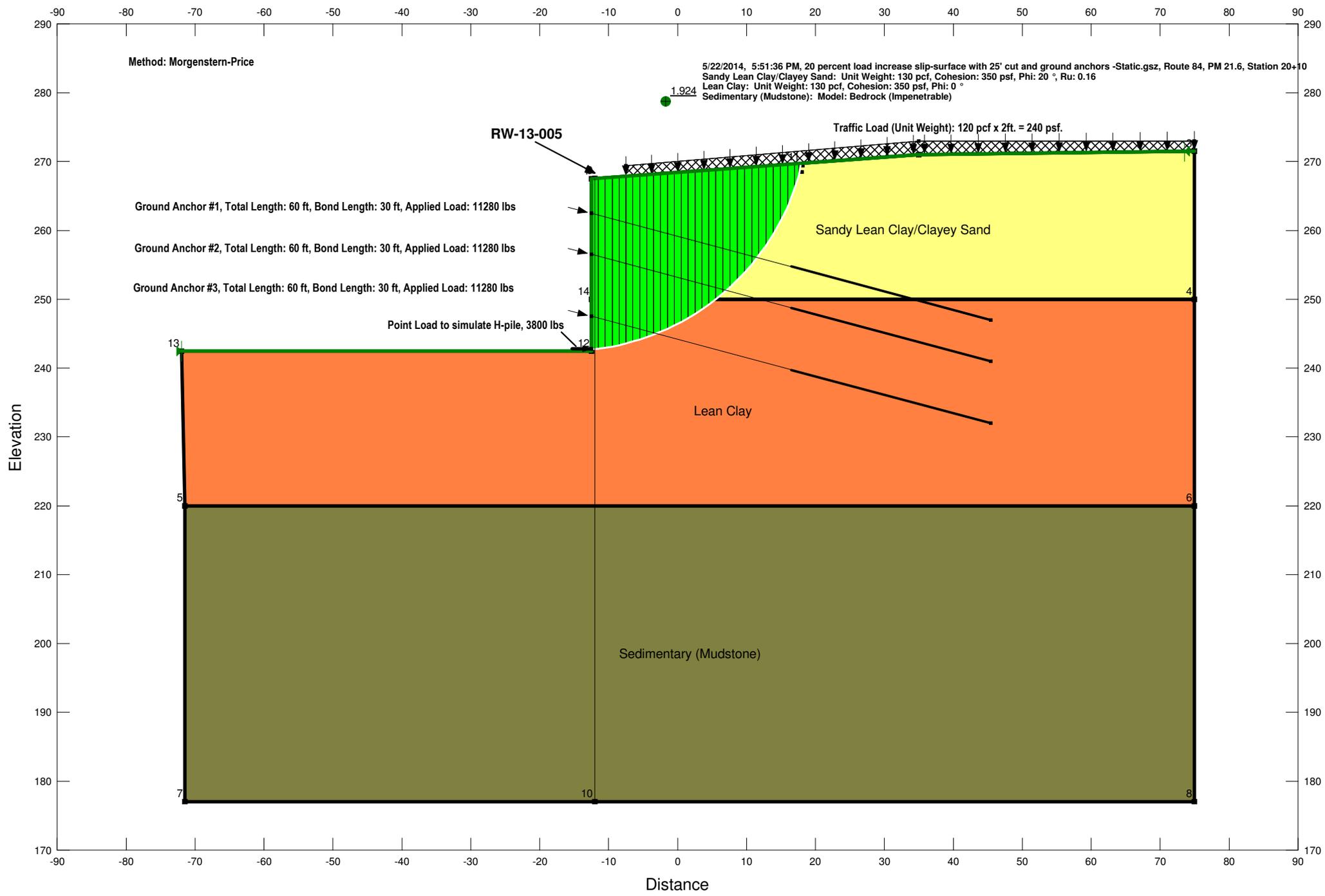


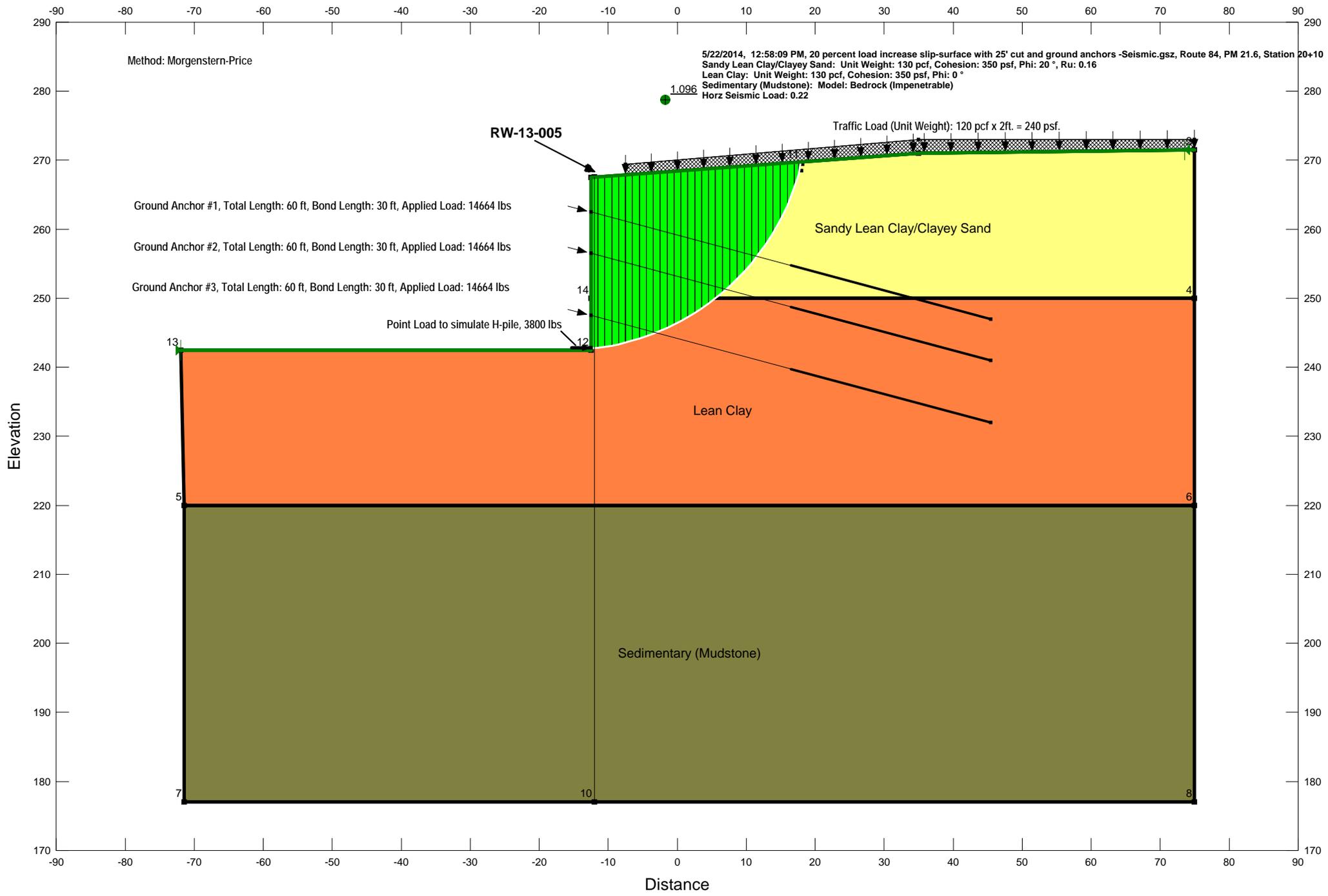
Appendix B

Slope Stability Analysis

BDS Article 5.5.5.7

As-builts to be incorporated into plans





5.5.5.7 Lateral Earth Pressures for Anchored Walls

For anchored walls restrained by tie rods and structural anchors, the lateral earth pressure acting on the wall may be determined in accordance with Article 5.5.5.6.

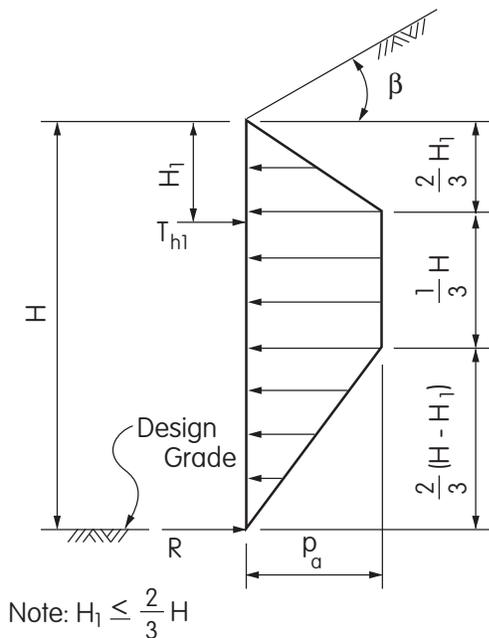
For anchored walls constructed from the top down and restrained by ground anchors (tieback anchors), the lateral earth pressure acting on the wall height, H , may be determined in accordance with Articles 5.5.5.7.1 and 5.5.5.7.2.

For anchored walls constructed from the bottom up and restrained by a single level of ground anchors located not more than one third of the wall height, H , above the bottom of the wall, the total lateral earth pressure, P_{Total} , acting on the wall height, H , may be determined in accordance with Article 5.5.5.7.1 with distribution assumed to be linearly proportional to depth and a maximum pressure equal to, $\frac{2P_{Total}}{H}$. For anchored walls constructed from the bottom up and restrained by multiple levels of ground anchors, the lateral earth pressure acting on the wall height, H , may be determined in accordance with Article 5.5.5.7.1.

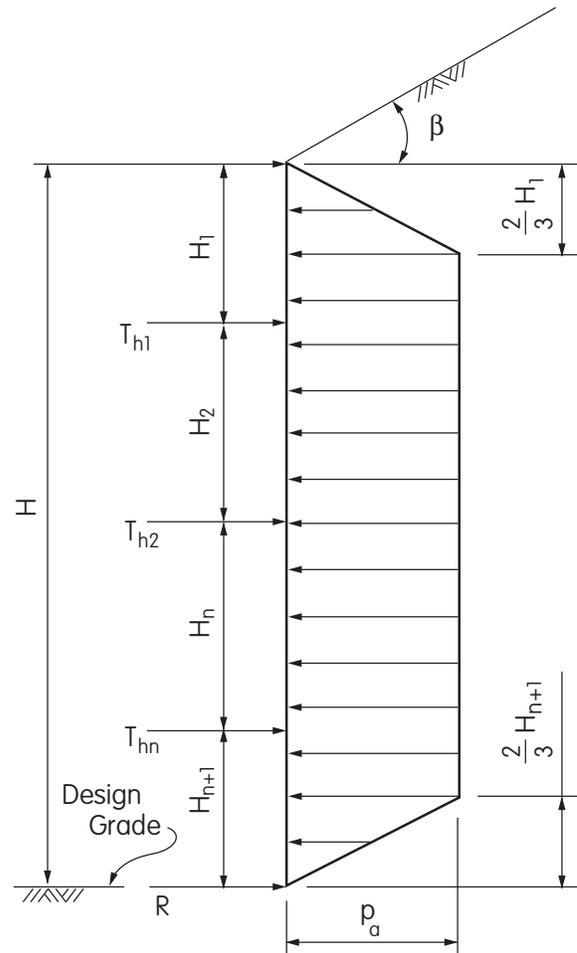
In developing the lateral earth pressure for design of an anchored wall, consideration shall be given to wall displacements that may affect adjacent structures and/or underground utilities.

C5.5.5.7

In the development of lateral earth pressures, the method and sequence of wall construction, the rigidity of the wall/anchor system, the physical characteristics and stability of the ground mass to be supported/retained, allowable wall deflections, anchor spacing and prestress and the potential for anchor yield should be considered.



a) Wall with a single level of anchors



b) Wall with multiple levels of anchors

Figure 5.5.5.7.1-1 Lateral Earth Pressure Distributions for Anchored Walls Constructed from the Top Down in Cohesionless Soils

5.5.5.7.1 Cohesionless Soils

The lateral earth pressure distribution for the design of temporary or permanent anchored walls constructed in cohesionless soils may be determined using Figure 5.5.5.7.1-1, for which the maximum ordinate, p_a , of the pressure diagram is determined as follows:

For walls with a single level of anchors :

$$p_a = \frac{P_{\text{Total}}}{\frac{2}{3} H} \quad (5.5.5.7.1-1)$$

For walls with multiple levels of anchors:

$$p_a = \frac{P_{\text{Total}}}{\left(H - \frac{1}{3} H_1 - \frac{1}{3} H_{n+1}\right)} \quad (5.5.5.7.1-2)$$

where:

p_a = maximum ordinate of pressure diagram (KSF)

P_{Total} = total lateral load required to be applied to the wall face to provide a factor of safety equal to 1.3 for the retained soil mass when stability is analyzed using an appropriate limiting equilibrium method of analysis. Except that P_{Total} shall not be less than 1.44 P_a . (KIP)

P_a = active lateral earth pressure resultant acting on the wall height, H , and determined using Coulomb's theory with a wall friction angle, δ , equal to zero. (KIP)

H = wall design height (FT)

H_1 = distance from ground surface at top of wall to uppermost level of anchors. (FT)

H_{n+1} = distance from design grade at bottom of a wall to lowermost level of anchors (FT)

T_{hi} = horizontal component of design force in anchor at level i (KIP/FT)

R = design reaction force at design grade at bottom of wall to be resisted by embedded portion of wall (KIP/FT)

5.5.5.7.2 Cohesive Soils

The lateral earth pressure distribution for cohesive soils is related to the stability number, N_s , which is defined as:

$$N_s = \frac{\gamma_s H}{S_u}$$

where:

γ_s = total unit weight of soil (KCF)

H = wall design height (FT)

S_u = average undrained shear strength of soil (KSF)

5.5.5.7.2a Stiff to Hard

For temporary anchored walls in stiff to hard cohesive soils ($N_s \leq 4$), and $\beta = \text{zero}$, the lateral earth pressure may be determined using Figure 5.5.5.7.1-1, with the maximum ordinate, p_a , of the pressure diagram determined as:

$$p_a = 0.2 \gamma_s H \text{ to } 0.4 \gamma_s H \quad (5.5.5.7.2a - 1)$$

where:

p_a = maximum ordinate of pressure diagram (KSF)

γ_s = total unit weight of soil (KCF)

H = wall design height (FT)

For permanent anchored walls in stiff to hard cohesive soils, the lateral earth pressure distributions described in Article 5.5.5.7.1 may be used with, P_{Total} based on the drained friction angle of the cohesive soil. For permanent walls, the distribution (permanent or temporary) resulting in the maximum total force shall be used for design.

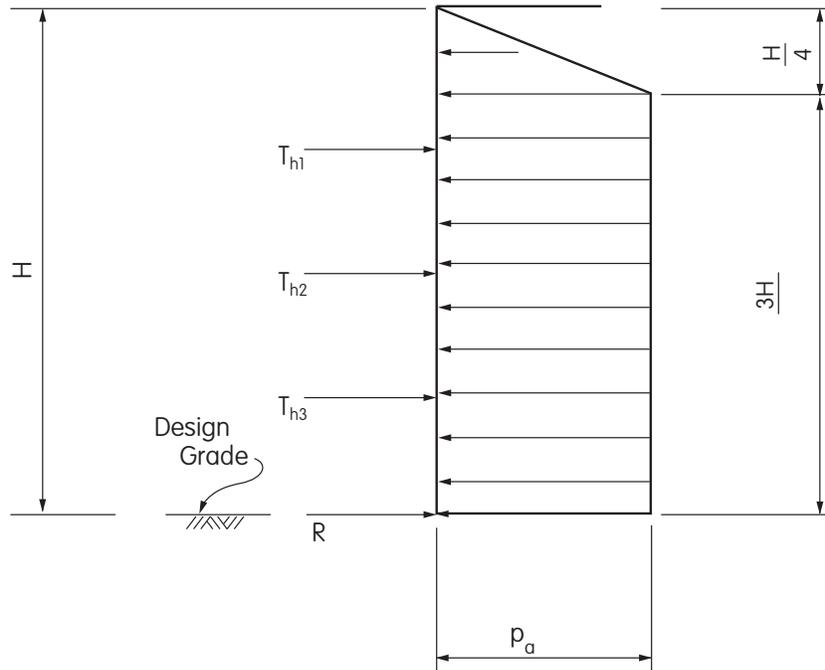


Figure 5.5.5.7.2b-1 Lateral Earth Pressure Distribution for Anchored Walls Constructed from the Top Down in Soft to Medium Stiff Cohesive Soils

C5.5.5.7.2a

In the absence of specific experience in a particular soil deposit, $p_a = 0.3\gamma_s H$ should be used for the maximum pressure ordinate when the anchors are locked off at 75 percent of the design force or less. Where anchors are to be locked off at 100 percent of the design force or greater, a maximum pressure ordinate of $p_a = 0.4\gamma_s H$ should be used.

For temporary walls the lateral earth pressure distributions in Figure 5.5.5.7.1-1 should only be used for excavations of controlled short duration, where the soil is not fissured and where there is no available free water.

5.5.5.7.2b Soft to Medium Stiff

The lateral earth pressure on temporary or permanent walls in soft to medium stiff cohesive soils ($N_s \geq 6$) and $\beta = \text{zero}$, may be determined, using Figure 5.5.5.7.2b-1 for which the maximum ordinate, p_a , of the pressure diagram is determined as:

$$p_a = k_a \gamma_s H \quad (5.5.5.7.2b-1)$$

where:

p_a = maximum ordinate of pressure diagram (KSF)

k_a = coefficient of active lateral earth pressure from Equation 5.5.5.7.2b-2

γ_s = total unit weight of soil (KCF)

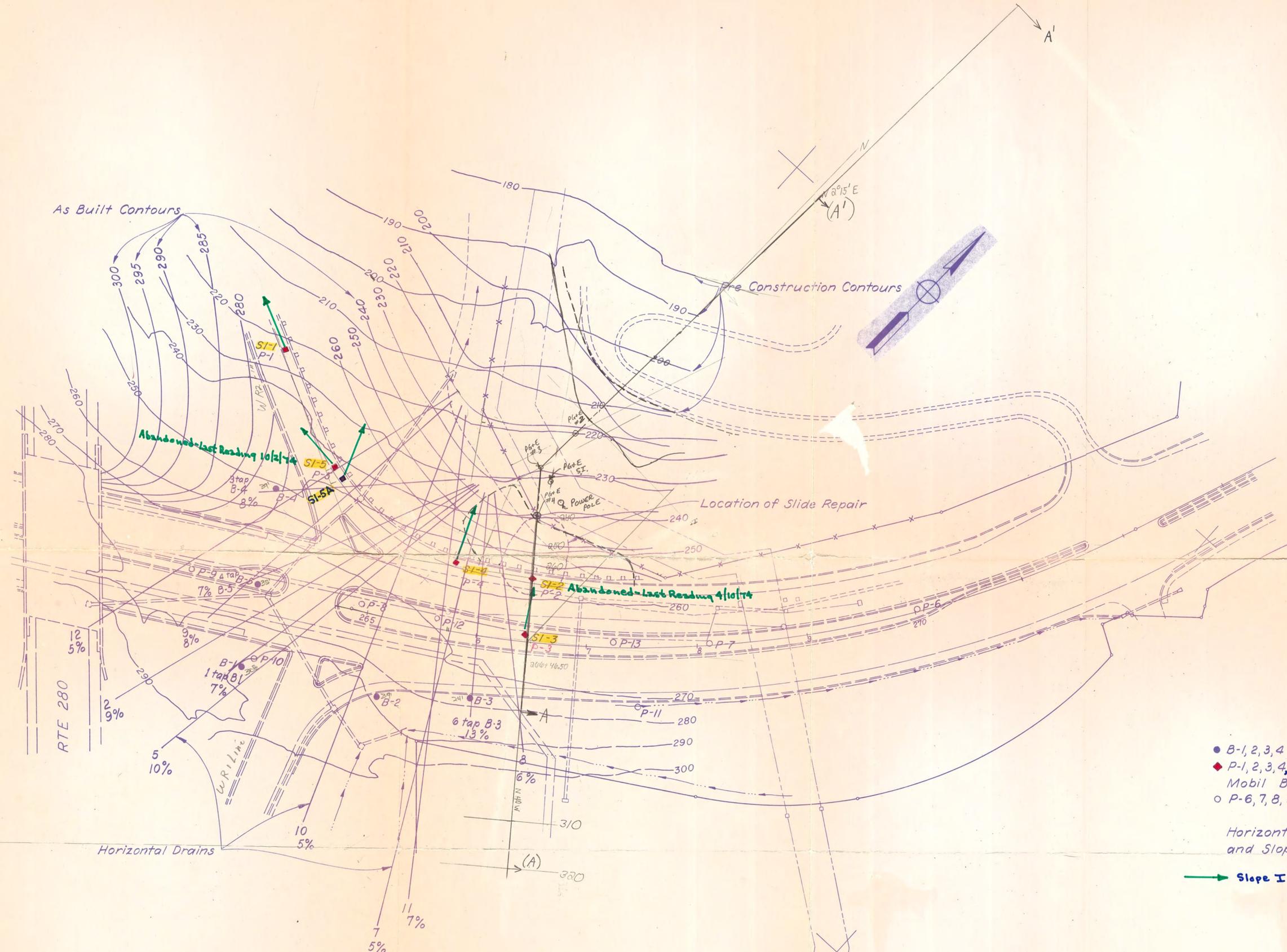
H = wall design height (FT)

The coefficient of active lateral earth pressure, k_a , may be determined by:

$$k_a = 1 - \frac{4S_u}{\gamma_s H} + 2\sqrt{2} \frac{d}{H} \left(\frac{1 - 5.14S_{ub}}{\gamma_s H} \right) \geq 0.22 \quad (5.5.5.7.2b-2)$$

04 SM 280/114
 WOODSIDE RD 1/4
 04-216-393880
 NORTHEAST QUADRANT

P.M. 32/34
 04-SM-280



LEGEND

- B-1, 2, 3, 4 & 5 Cal-Weld Bucket Drill (36" dia)
- ◆ P-1, 2, 3, 4, 5 & 5A (Slope Indicators 1 thru 5)
- Mobil B-61 Continuous Flite Auger (8" dia)
- P-6, 7, 8, 9, 10, 11, 12, 13 Texoma Auger Drill (9" dia)

Horizontal Drains show Approx. Location and Slope (in Percent)

→ Slope Indicator - North Slot Bearing
 RB 4/1/11

PLAN

1" = 50'

Pre-Construction Contours
 Post Construction

Vertical Borings
 Horizontal Borings

Copy to Legal
 4/1/11
 RB

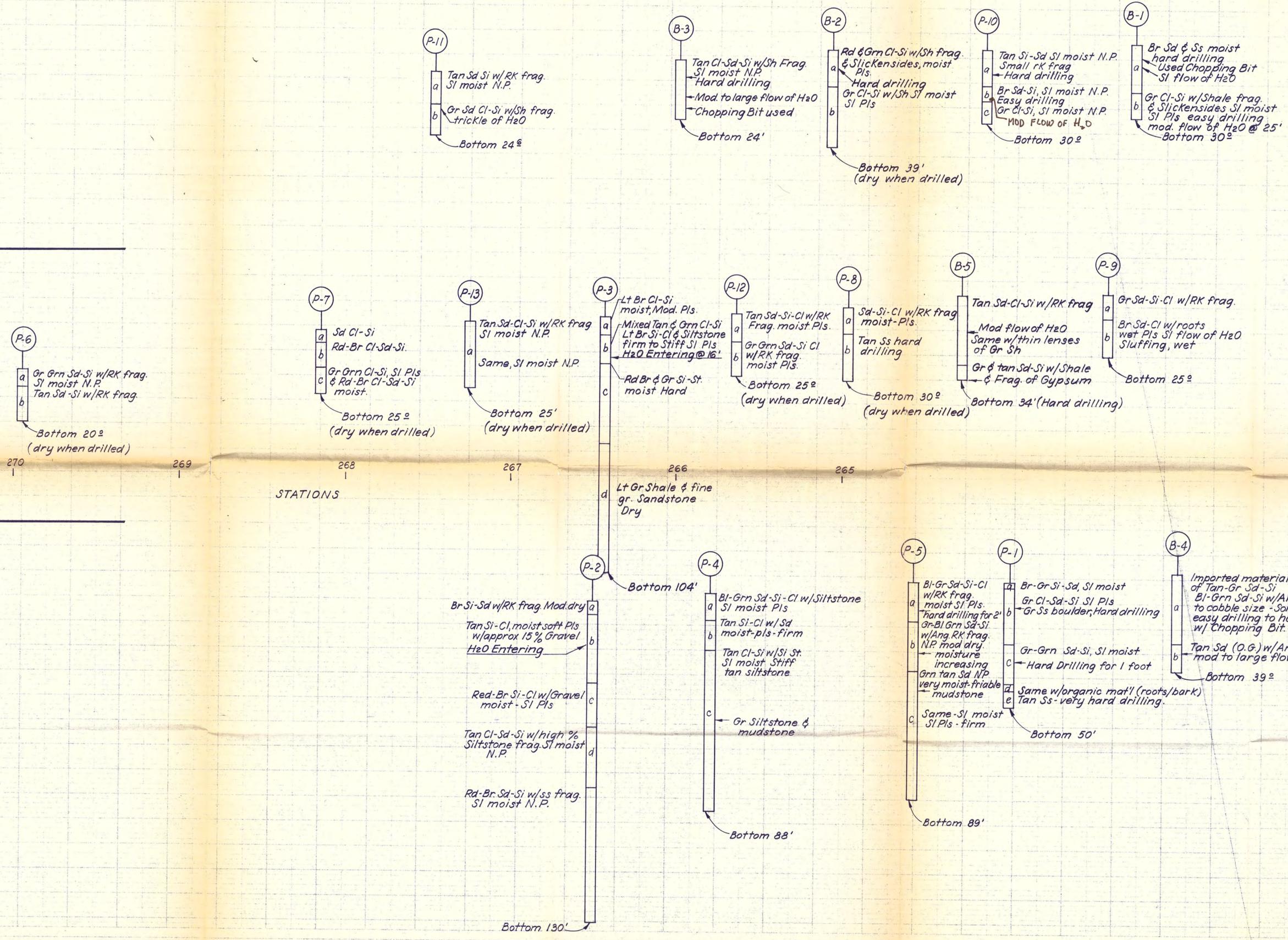
LOCATION OF POWER BORINGS IN THE NORTHEAST QUADRANT

04216-393880

270

270

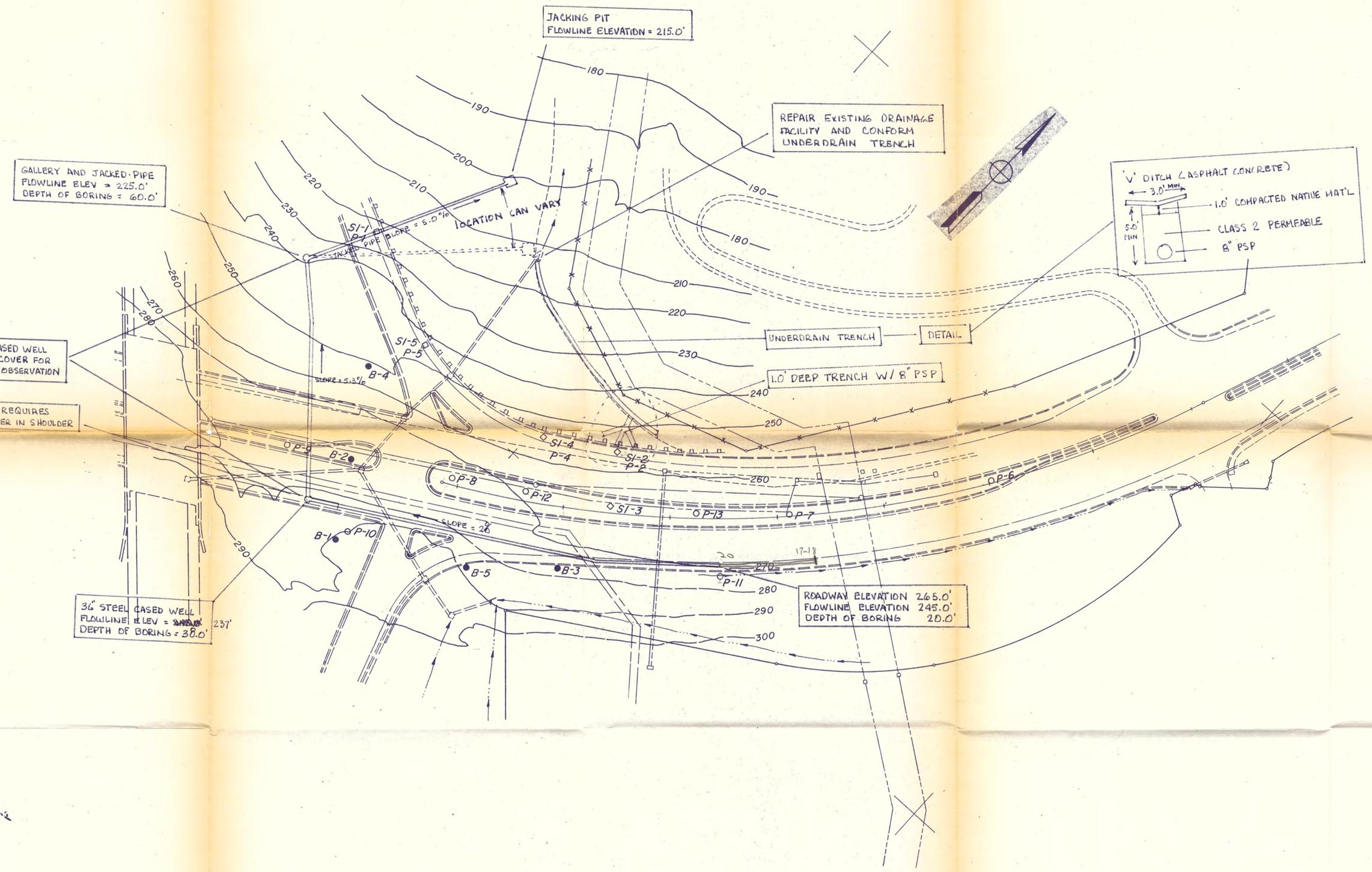
270



SCALE:
 Vertical: 1" = 20'
 Horizontal: 1" = 30'
BORING LOGS

original topo contours
 x Geometrics
 x Utilities
 toe of slope

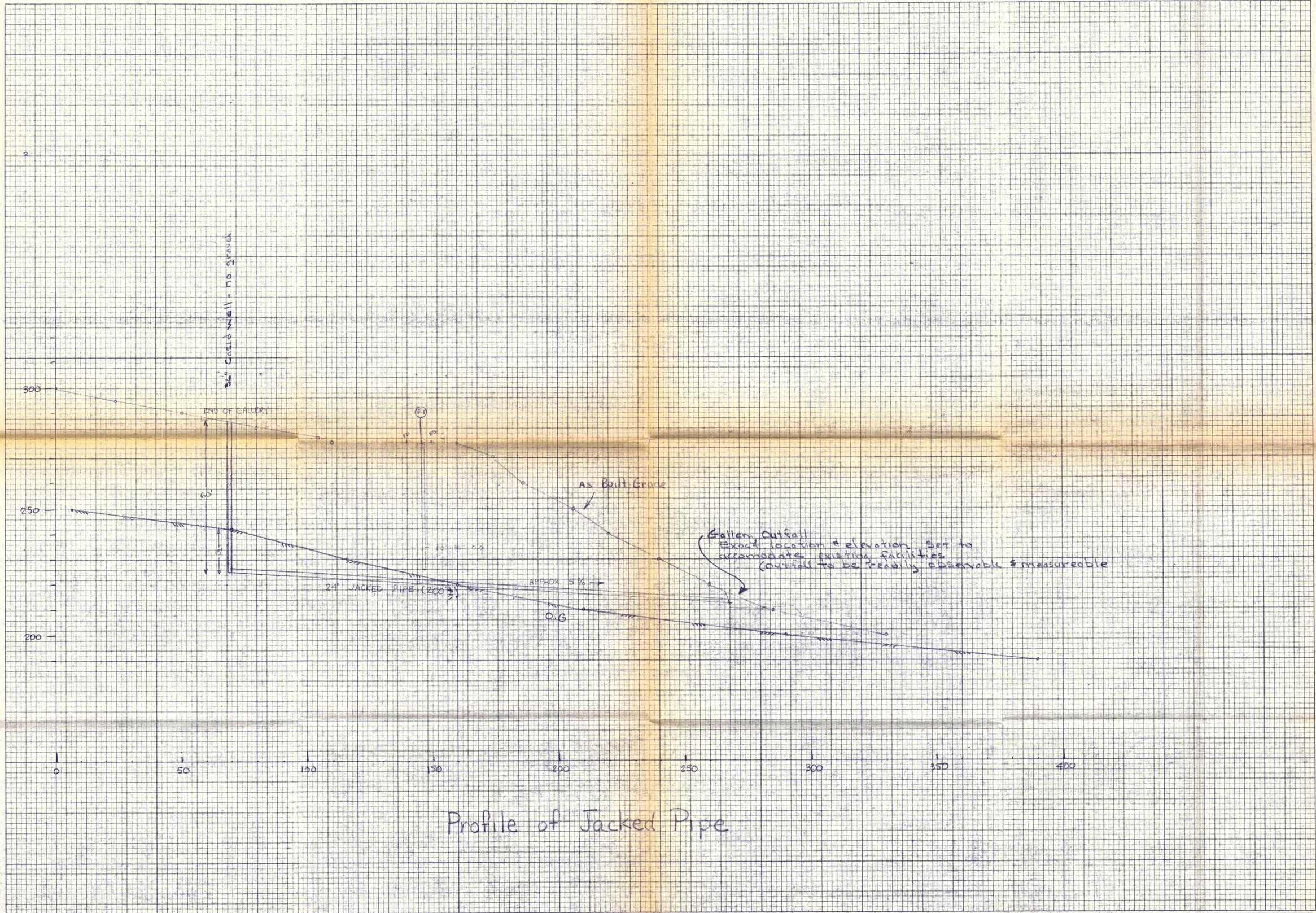
Sheet 1



Project Engineer	Date
Design Engineer	Date
Approval Recommended By	Date

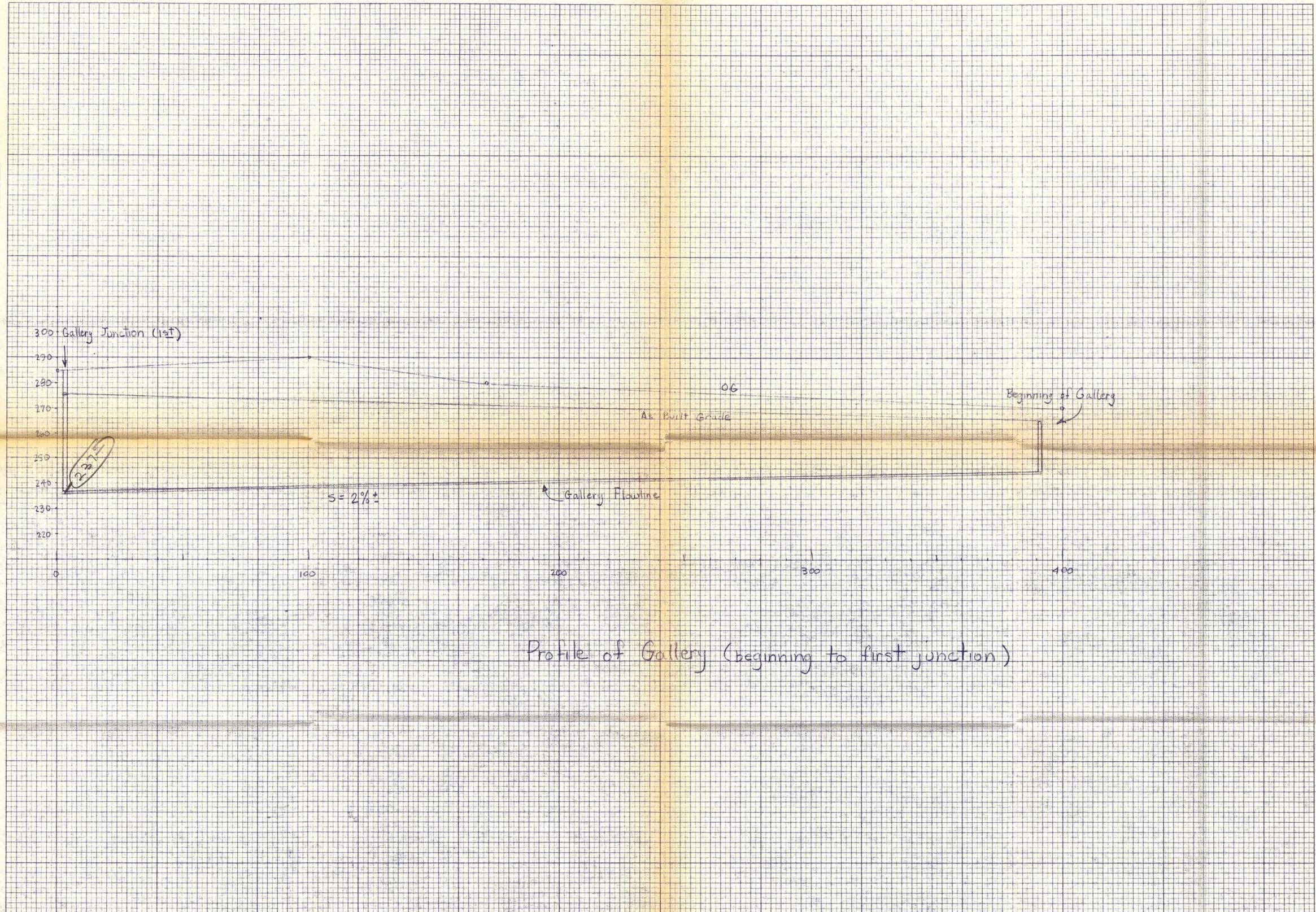
TEMPLER
POSTED BY _____ DATE _____
CHECKED BY _____ DATE _____
PLANNED BY _____ DATE _____
INVEST BY _____ DATE _____

GROUND
SURVEYED BY _____ DATE _____
CHECKED BY _____ DATE _____
FIELD BOOK NO. _____



Profile of Jacked Pipe

PLOTTED BY _____ DATE _____
 CHECKED BY _____ DATE _____
 PLANNED BY _____ DATE _____
 INSD BY _____ DATE _____
 SURVEYED BY _____ DATE _____
 FIELD BOOK NO. _____



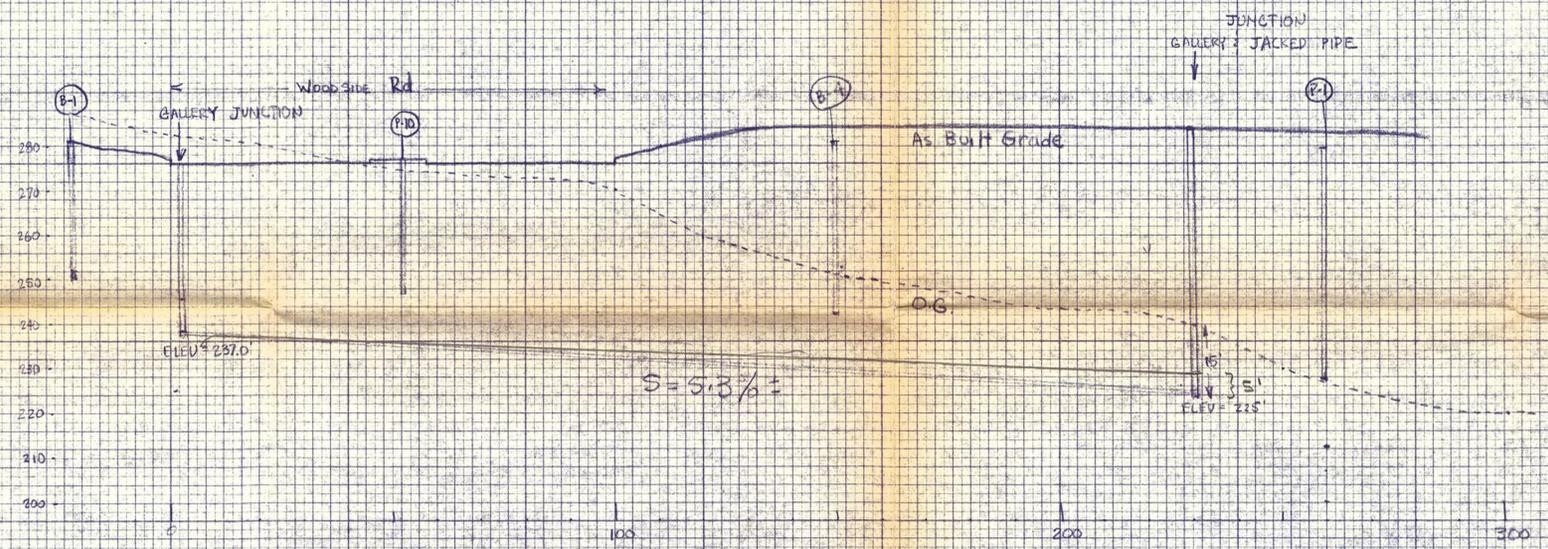
Profile of Gallery (beginning to first junction)

STATE OF CALIFORNIA—DEPARTMENT OF PUBLIC WORKS
 DIVISION OF HIGHWAYS
CROSS SECTIONS
 Scale: 1 Inch=5 Feet

Form WH 22

21
22
23
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TEMPLET
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 CHECKED BY _____ DATE _____
 PLANNED BY _____ DATE _____
 INKED BY _____ DATE _____
 GROUND
 PLOTTED BY _____ DATE _____
 CHECKED BY _____ DATE _____
 INKED BY _____ DATE _____
 SURVEYED BY _____ DATE _____
 FIELD BOOK NO. _____



Profile Across Woodside Rd.

PRELIMINARY SITE INVESTIGATION REPORT

WESTBOUND SR-84 TO NORTHBOUND I-280
WOODSIDE, CALIFORNIA

PREPARED FOR:

CALIFORNIA DEPARTMENT OF TRANSPORTATION
DISTRICT 4
OFFICE OF ENVIRONMENTAL ENGINEERING
111 GRAND AVENUE, MS8C
OAKLAND, CA 94612



PREPARED BY:

GEOCON CONSULTANTS, INC.
6671 BRISA STREET
LIVERMORE, CA 94550



GEOCON PROJECT NO. E8721-02-06
CALTRANS EA 04-4G6401
CALTRANS PROJECT # 04-1200-0622-1

JULY 2014

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1. Vicinity Map
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1. Boring Coordinates
2. Summary of Lead Results
3. Summary of CAM 17 Metals Results
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APPENDICES

- A. Laboratory Reports and Chain-of-custody Documentation
- B. Soil Boring Logs
- C. Metal and Hydrocarbon Statistical Analysis

REPORT LIMITATIONS

This report has been prepared exclusively for the State of California Department of Transportation (Caltrans) District 4. 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 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.

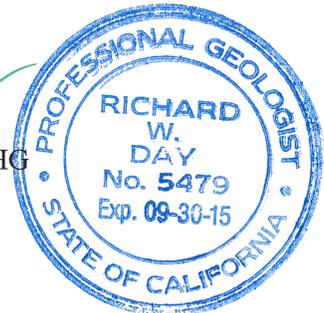
GEOCON CONSULTANTS, INC.



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Senior Staff Scientist



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PRELIMINARY SITE INVESTIGATION REPORT

1.0 INTRODUCTION

This Preliminary Site Investigation Report for the storm damage repair project along the connector ramp from westbound (WB) State Route 84 (SR-84) to northbound (NB) Interstate 280 (I-280) in San Mateo County, California was prepared by Geocon Consultants, Inc. under California Department of Transportation (Caltrans) Contract No. 04A4336 and Task Order No. 06 (TO-06), EA 04-4G6401.

1.1 Project Description and Proposed Improvements

The project includes the construction of an earth retaining system to stabilize the eastern slope of the connector ramp from WB SR-84 to NB I-280 in Woodside, California. Work will take place within Caltrans right-of-way. The project location is depicted on the attached Key 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, particularly aerielly-deposited lead (ADL), total petroleum hydrocarbons as diesel (TPHd) and as motor oil (TPHmo), and naturally-occurring asbestos (NOA) in soil within the project limits.

The information obtained from this investigation will be used by Caltrans to evaluate soil handling practices, worker health and safety, and soil reuse and disposal options.

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 ten times the respective STLC value since the WET uses a 1:10 dilution ratio. Hence, when a total metal is detected at a concentration greater than or equal to ten times the respective STLC, and assuming that 100 percent of the total metals are soluble, soluble metal analysis is required. A material is classified as RCRA hazardous, or Federal hazardous, when the representative soluble metal content equals or exceeds the Federal regulatory level based on the Toxicity Characteristic Leaching Procedure (TCLP).

The 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 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 2013* (updated December 2013), 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. "The 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, December 2013). ESLs are risk assessment tools and are "not intended to serve as a rule to determine if a waste is hazardous under the state or federal regulations."

Residential and commercial/industrial land use 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 following ESL tables were used for this characterization:

- Table A. Shallow Soil (≤ 3 m bgs), Groundwater is a Current or Potential Source of Drinking Water
- Table K-3. Direct Exposure Soil Screening Levels, Construction/Trench Worker Exposure Scenario

The respective ESLs are listed at the end of Tables 3 and 4 for comparative purposes.

2.3 Naturally Occurring Asbestos

As defined in current California Air Resources Board (CARB) rules, serpentine material refers to any material that contains at least 10% serpentine, and asbestos-containing serpentine refers to serpentine

materials with an asbestos content greater than 5% as determined by CARB Test Method 435 (CARB 435). The use of serpentine material for road surfacing is prohibited in California by Title 17 of the California Code of Regulations (CCR) Section 93106, Asbestos Airborne Toxic Control Measure (ATCM) for Surfacing Application (ATCM 93106), unless the material has been tested and determined to have an asbestos content of less than 0.25%. Materials found to contain asbestos of 0.25% or more are considered to be designated waste if transported offsite, requiring disposal at a landfill facility designated to accept asbestos waste. Alternatively, asbestos-containing materials may be reused onsite if buried beneath a minimum 6 inches of soil.

The CARB specifies mitigation practices for construction, grading, quarrying, and surface mining operations that contain natural occurrences of asbestos outlined in Title 17, Section 93105, Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations (ATCM 93105). Based on Part (e) Subpart (2) of ATCM 93105 an asbestos dust mitigation plan is required and must be implemented for a project if NOA is disturbed after the start of construction. Additionally, ATCM 93105 specifies that the air pollution control district (APCD) must be notified and an asbestos dust mitigation plan submitted to the APCD. The ATCM states that air monitoring may be required on the property. NOA potentially poses a health hazard when it becomes an airborne particulate.

The construction/maintenance activities mentioned above could disturb NOA-laden debris and soil, thereby potentially creating an airborne hazard. Mitigation practices can reduce the risk of exposure to airborne NOA containing dust. Dust suppression practices include wetting the materials being disturbed and wearing approved respirators with high-efficiency particulate air (HEPA) filters during construction activities.

3.0 SCOPE OF SERVICES

The scope of services performed under TO-06, EA 04-4G6401 included the following:

3.1 Pre-field Activities

- Prepared the *Preliminary Site Investigation Workplan* and *Health and Safety Plan*, dated June 2014.
- Retained the services of Cruz Brothers Locators to provide utility clearance services prior to field operations.
- Retained the services of Gregg Drilling & Testing, a Caltrans-approved drilling contractor, to perform drilling activities.
- Retained the services of Advanced Technology Laboratories, Signal Hill, California (ATL), a Caltrans-approved and California-certified analytical laboratory, to perform the chemical analyses of soil samples.

- Retained the services of EMSL, Inc., a Caltrans-approved and California-certified analytical laboratory, to perform the asbestos analysis of soil samples.
- Notified Underground Service Alert (USA) at least 48 hours prior to field work.

3.2 Field Activities

The field investigation was performed on June 19 through 20, 2014, by Geocon staff. The following field activities were performed during the sampling efforts:

- Advanced 5 soil borings at the project location using hand-auger drilling techniques. The borings were advanced to a maximum depth of 10.5 feet.
- Advanced 5 borings at the project location using hollow-stem auger drilling techniques. The borings were advanced to a maximum depth of 40 feet.

The following samples were collected:

- 6 for CAM 17 metals analysis
- 33 for total lead analysis
- 16 for TPHd and TPHmo analyses
- 36 for NOA analysis
- 4 equipment rinse blanks for total lead analysis

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 from the 10 boring locations identified by the Caltrans TO Manager using hand-auger and hollow-stem auger drilling techniques. Boring coordinates are presented on Table 1. A Vicinity Map, Figure 1, shows the project location, and the Site Plan, Figure 2, shows the boring locations.

Soil samples were placed in new resealable plastic bags or stainless steel tubes and sealed with Teflon tape and plastic lids prior to being stored in a chest cooled with ice.

Sample containers were labeled and transported to Caltrans-approved, certified environmental laboratories using standard COC documentation. Hand-auger soil borings were back-filled to surface with soil cuttings. Hollow-stem auger borings were back-filled with neat cement.

Geocon provided QA/QC procedures during the field activities. These procedures included washing the sampling equipment with a Liqui-Nox® solution followed by a double rinse with deionized water. Equipment rinse blank was collected by pouring deionized water over the cleaned sampling equipment and collecting it into a sample container for laboratory analysis. Decontamination water was disposed of to the ground surface within Caltrans right-of-way in a manner not to create runoff, away from drain inlets or potential water bodies.

4.2 Laboratory Analyses

Laboratory analyses were performed by ATL and EMSL under standard turnaround-time (TAT) per the Task Order Manager. The laboratory reports and COC documentation are included in Appendix A.

The samples were analyzed as follows:

- 6 samples for CAM 17 metals using EPA Test Methods 6010 ICAP and 7471.
- 33 samples were analyzed for total lead using EPA Test Method 6010 ICAP.
- 2 samples with a total chromium concentration equal to or exceeding 50 mg/kg (i.e. equal to or exceeding ten times the STLC of 5.0 mg/l) were further analyzed for WET chromium.
- 2 samples with total lead concentrations equal to or exceeding 50 mg/kg (i.e. equal to or exceeding ten times the STLC of 5.0 mg/l) were further analyzed for WET lead.
- 16 samples for TPHd using EPA Test Method 8015B.
- 16 samples for TPHmo using EPA Test Method 8015B.
- 36 samples for NOA using CARB 435.

The QA/QC equipment rinse blank samples were analyzed for total lead using EPA Test Method 6010 ICAP.

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 ten samples, batch of samples or type of matrix, whichever was more frequent.
- One sample analyzed in duplicate for every ten samples, batch of samples or type of matrix, whichever was more frequent.

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

Prior to submitting the samples to the laboratory, the COC documentation was reviewed for accuracy and completeness.

5.0 INVESTIGATIVE RESULTS

5.1 Subsurface Conditions

Borings B1, B3, B5, B7, and B9 were completed in the roadway surface using hollow-stem auger drilling techniques. Asphalt was present to a depth of approximately 4 inches. Soil to a depth of 2.5 feet consisted of gravelly fill material. Soil from 2.5 feet to 36 feet consisted primarily of dry, hard, brown to yellowish brown fine to coarse-grained sandy silt/silty sand. Underlying soil to a depth of approximately 40 feet consisted of very dense, light brown, moist, clayey sand with low plasticity. B9 was drilled to a depth of 40 feet, however, samples beyond 30.5 feet could not be recovered due to the presence of tree roots. Logs for borings B1, B3, B5, B7, and B9 are provided as Appendix B.

Borings B2, B4, B6, B8, and B10 were completed on the eastern slope using hand-auger drilling techniques. Soil consisted primarily of brown silty clay with rock present in B4 at a depth of approximately 7 feet. Possible serpentine material was present at a depth of 1.5 feet in boring B10. Groundwater was not encountered in any borings.

5.2 Laboratory Analytical Results

The analytical results are summarized in Tables 2 through 5 and are summarized below:

Sample Results:

- The following metals were not detected above their respective laboratory reporting limits: antimony, beryllium, cadmium, molybdenum, silver, and thallium.
- The following metals were reported at concentrations equal to or exceeding ten times their respective STLCS: chromium and lead.
- Total chromium was reported at concentrations ranging from 19 mg/kg to 150 mg/kg.
- WET chromium was reported at concentrations of <1.0 mg/l and 1.4 mg/l.
- Total lead was reported at concentrations ranging from <1.0 mg/kg to 64 mg/kg.
- WET lead was reported at concentrations of 3.5 mg/l and 4.7 mg/l.
- Remaining CAM 17 metals were reported in the samples at total concentrations below ten times their respective STLCS.

- TPHd was reported at concentrations ranging from 1.8 mg/kg to 2,900 mg/kg.
- TPHmo was reported at concentrations ranging from 3.4 mg/kg to 12,000 mg/kg.
- NOA was reported at concentrations up to 1.75% chrysotile asbestos.

QA/QC Sample Results:

- Total lead was not detected at or above the laboratory reporting limit of 0.0050 mg/l in the equipment rinse blank samples.

5.3 Laboratory Quality Assurance/Quality Control

We reviewed the QA/QC results provided with the laboratory analytical reports. The data indicate non-detect results for the method blanks at or above reporting limits. The surrogate was diluted out for four samples. The relative percent difference (RPD) was outside of acceptance criteria for several samples. Calculations were based on raw values. The RPD value was outside of acceptance for two samples due to possible matrix interference. The matrix spike (MS) recovery was outside of acceptance limits for four samples due to possible matrix interference. The analytical batch was validated by the laboratory control sample. The MS recovery was outside of acceptance criteria for an additional four samples; however, the analytical batch was validated by the laboratory control sample.

6.0 CONCLUSIONS

6.1 Lead in Soil

Soil samples from the site reported maximum total lead concentrations less than the TTLC of 1,000 mg/kg and maximum WET lead concentrations less than the STLC of 5 mg/l. Accordingly, soil excavated to a depth of 5.5 feet would be classified as non-hazardous based on lead content.

6.2 Remaining CAM 17 Metals in Soil

With the exception of chromium, CAM 17 metals were reported in the samples at total concentrations below ten times their respective STLCs.

WET chromium was reported at a concentrations of 1.4 mg/l and <1.0 mg/l in the samples collected from borings B7-1 and B9-1, below the STLC. Therefore, soil from this part of the site would be classified as non-hazardous based on chromium concentrations. Remaining metals were reported at concentrations below ten times their respective STLCs.

The CAM 17 metals concentrations in site soil were compared to ESLs. Arsenic and cobalt were reported at concentrations greater than one or more ESL values. Statistical methods were used to calculate the upper confidence limit (UCL) of the arithmetic mean of the total arsenic concentrations. 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. The UCL of the arithmetic mean concentration is used as the mean concentration 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 95% UCL, therefore, accounts for uncertainties due to limited sampling data. As data become less limited at a site, uncertainties decrease and the UCL moves closer to the true mean.

Non-parametric bootstrap techniques were used to calculate the 95% UCLs. The bootstrap test results are included in Appendix C. ESLs, UCLs, and published background concentrations for arsenic and cobalt are summarized in the table below.

Metal	Maximum	95% UCL	Shallow Soil Residential ESL	Shallow Soil Commercial/Industrial ESL	Worker Direct Exposure ESL	Published Background Mean¹	Published Background Range¹
Arsenic	6.5	3.99	0.39	1.6	10	3.5	0.6 to 11.0
Cobalt	24	18.3	23	80	49	14.9	2.7 to 46.9

Concentrations reported in mg/kg

¹ Kearney Foundation of Soil Science, March 1996

The 95% UCL arsenic concentration is greater than the residential and commercial land use ESLs; however, it is less than the construction exposure ESL and within the published background range. The SFRWQCB *November 2007 Update to Environmental Screening Levels (ESLs) Technical Document* states that ambient background concentrations of arsenic typically exceed risk-based screening levels. In such instances, it may be more appropriate to compare site data to regionally specific established background levels.

The 95% UCL cobalt concentration is below the residential and commercial land use ESLs, the construction exposure ESL, and within the published background range.

Based on the reported results for arsenic and cobalt, reuse or disposal of excavated soil may be restricted depending on proposed use.

Metals results for soil samples are summarized in Table 3.

6.3 Organic Compounds in Soil

TPHd was reported at concentrations ranging from 1.8 mg/kg to 2,900 mg/kg. These concentrations exceed the residential and commercial/industrial land use ESLs of 100 mg/kg and 110 mg/kg, respectively, and the construction/direct exposure ESL of 900 mg/kg. TPHd has a 95% UCL concentration of 573 mg/kg.

TPHmo was reported at concentrations ranging from 3.4 mg/kg to 12,000 mg/kg. These concentrations exceed the residential and commercial/industrial land use ESLs of 100 mg/kg and 500 mg/kg, respectively, but are below the construction/direct exposure ESL of 28,000 mg/kg. TPHmo has a 95% UCL concentration of 2,450 mg/kg.

Based on the reported TPHd and TPHmo concentrations exceeding the residential ESL and commercial/industrial ESLs, as well as the TPHd concentrations exceeding the construction exposure ESL, reuse or disposal of excavated soil may be restricted based on TPHd and TPHmo content depending on proposed use.

A summary of petroleum hydrocarbon concentrations in site soil is presented in Table 4.

6.4 Naturally-Occurring Asbestos in Soil

Thirty-six soil samples were collected from the site and analyzed for asbestos by CARB Test Method 435 using polarized light microscopy (PLM) and at a target sensitivity of 0.25% asbestos. One sample,

B9-20, contained 1.75% chrysotile asbestos. Ten samples were reported to contain trace (<0.25%) chrysotile asbestos. Asbestos fibers were not observed in the remaining 25 samples.

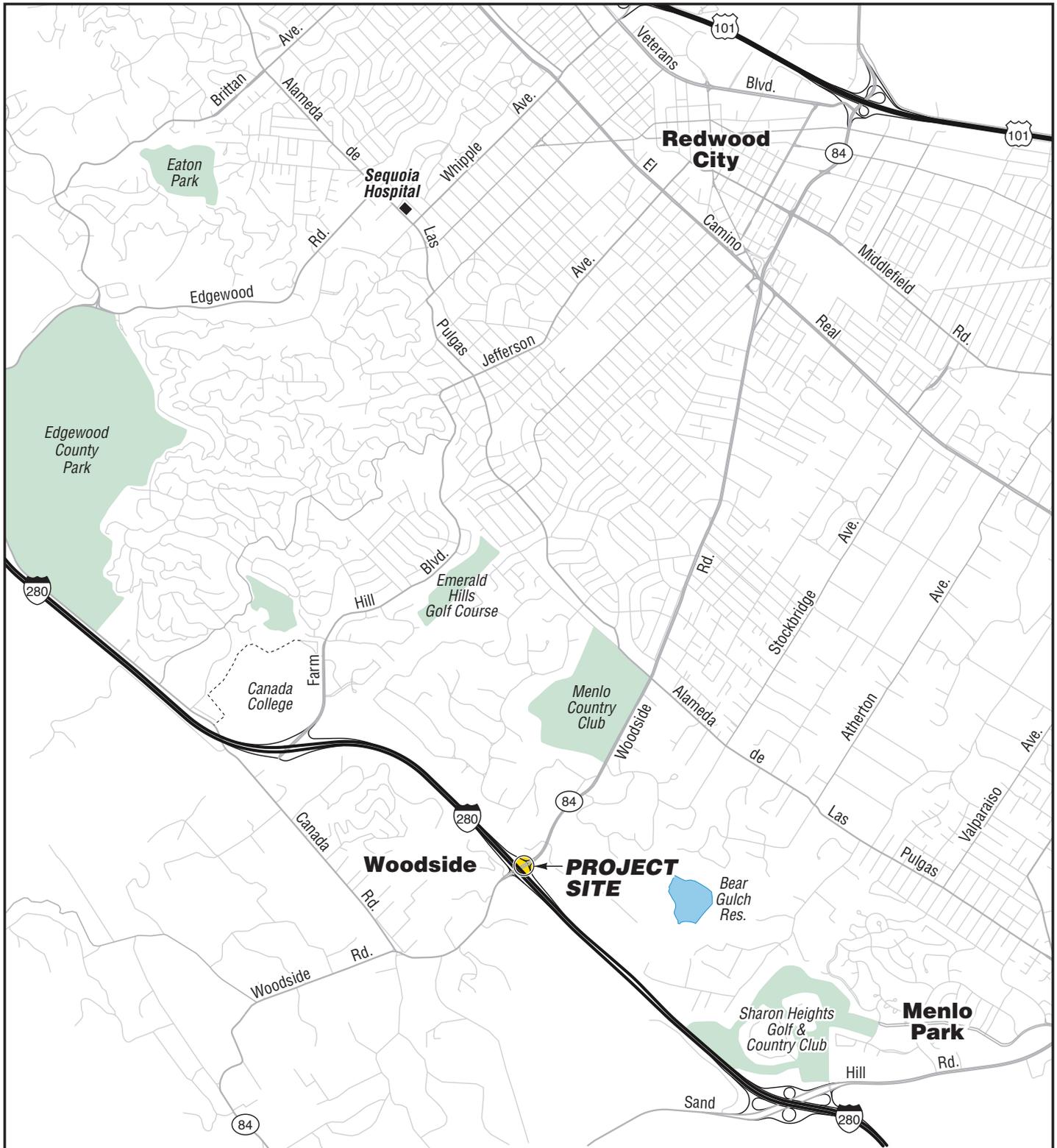
ATCM 93105 sets forth measures to be followed for the investigation and control of naturally occurring asbestos for construction sites. Because NOA was reported at concentrations exceeding the regulatory threshold of 0.25%, regulations regarding site work should be consulted. Soil reuse and disposal may be restricted based on asbestos content.

Additionally, it is Caltrans policy 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 used to minimize the potential for airborne asbestos.

A summary of NOA results is included in Table 5.

6.5 Worker Protection

The contractor(s) should prepare a project-specific health and safety plan to prevent or minimize worker exposure to metals, hydrocarbons, and NOA in soil. The plan should include protocols for environmental and personnel monitoring, requirements for personal protective equipment, and other health and safety protocols and procedures for the handling of soil.



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CONSULTANTS, INC.

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State Route 84 to Interstate 280 Storm Damage Repair

San Mateo County,
California

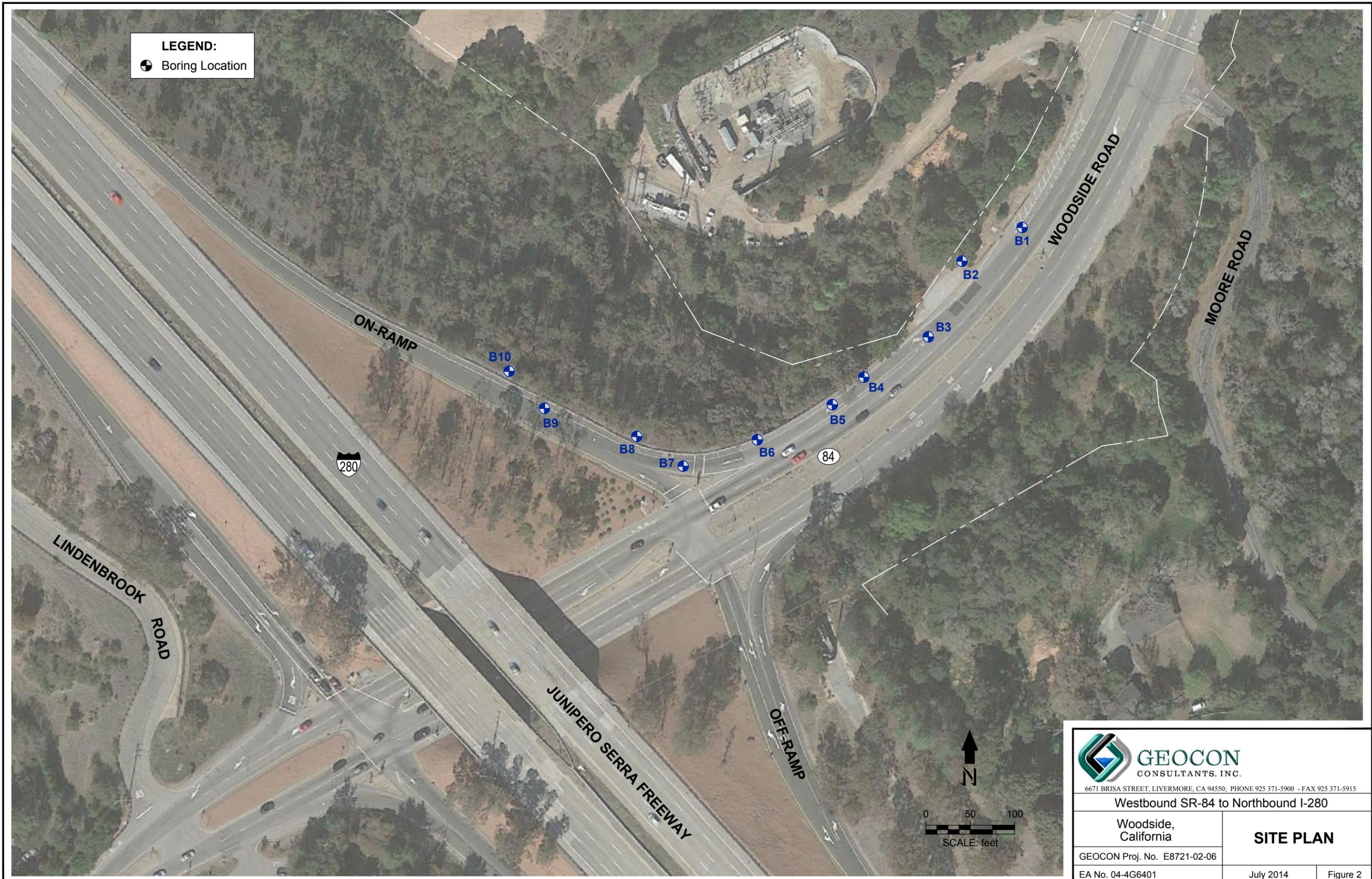
VICINITY MAP

GEOCON Proj. No. E8721-02-06

Task Order No. 6

July 2014

Figure 1



 <p>6671 BRISA STREET, LIVERMORE, CA 94550; PHONE 925 371-5900 - FAX 925 371-5915</p>	
<p>Westbound SR-84 to Northbound I-280</p>	
<p>Woodside, California</p>	<p>SITE PLAN</p>
<p>GEOCON Proj. No. E8721-02-06</p>	<p>July 2014</p>
<p>EA No. 04-4G6401</p>	<p>Figure 2</p>

TABLE 1
Boring Coordinates
Westbound I-84 to Northbound I-280
Woodside, California

Boring	Northing	Easting
B1	1,986,190.750	6,056,163.649
B2	1,986,134.259	6,056,087.049
B3	1,986,067.893	6,056,058.080
B4	1,986,021.353	6,055,984.836
B5	1,985,991.685	6,055,950.035
B6	1,985,967.227	6,055,861.378
B7	1,985,922.745	6,055,782.269
B8	1,985,983.429	6,055,698.441
B9	1,985,987.450	6,055,626.180
B10	1,986,052.787	6,055,559.439

Northing and easting coordinates shown are in feet, NAD 83, Zone 3

TABLE 2
Summary of Lead and pH Results
Westbound I-84 to Northbound I-280
Woodside, California

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)
B1-0	0 to 0.5	3.8	---
B1-1	1 to 1.5	8.1	---
B1-3	3 to 3.5	11	---
B2-0	0 to 0.5	21	---
B2-1	1 to 1.5	6.8	---
B2-3	3 to 3.5	6.7	---
B2-5	5 to 5.5	8.1	---
B3-0	0 to 0.5	3.4	---
B3-1	1 to 1.5	3.7	---
B3-3	3 to 3.5	10	---
B3-5	5 to 5.5	8.3	---
B4-0	0 to 0.5	40	---
B4-1	1 to 1.5	11	---
B4-3	3 to 3.5	31	---
B4-5	5 to 5.5	13	---
B5-0	0 to 0.5	<1.0	---
B5-1	1 to 1.5	1.3	---
B5-3	3 to 3.5	2.8	---
B5-5	5 to 5.5	17	---
B6-0	0 to 0.5	64	3.5
B6-1	1 to 1.5	19	---
B6-3	3 to 3.5	12	---
B6-5	5 to 5.5	9.4	---
B7-0	0 to 0.5	<1.0	---
B7-1	1 to 1.5	<1.0	---
B7-3	3 to 3.5	<1.0	---
B7-5	5 to 5.5	2.6	---
B8-0	0 to 0.5	50	4.7
B8-1	1 to 1.5	4.8	---
B8-3	3 to 3.5	4.4	---
B8-5	5 to 5.5	6.3	---
B9-0	0 to 0.5	3.5	---
B9-1	1 to 1.5	<1.0	---
B9-3	3 to 3.5	4.4	---
B9-5	5 to 5.5	1.2	---

TABLE 2
Summary of Lead and pH Results
Westbound I-84 to Northbound I-280
Woodside, California

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)
B10-0	0 to 0.5	19	---
B10-1	1 to 1.5	1.3	---
B10-3	3 to 3.5	5.2	---
B10-5	5 to 5.5	<1.0	---
EB1		<0.0050	---
Equip Rinse Blank #1		<0.0050	---
Equip Rinse Blank #2		<0.0050	---
Equip Rinse Blank #3		<0.0050	---
Hazardous Waste Criteria			
	TTL (mg/kg)	1,000	1,000
	STL (mg/l)	5.0	5.0
	TCLP (mg/l)	5.0	5.0

Notes:

mg/kg = Milligrams per kilogram

mg/l = Milligrams per liter

WET = Waste Extraction Test using citric acid as the extraction fluid

TCLP = Toxicity Characteristic Leaching Procedure

TTL = Total Threshold Limit Concentration

STL = Soluble Threshold Limit Concentration

TABLE 3
Summary of CAM 17 Metals Results
Westbound I-84 to Northbound I-280
Woodside, 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	3.2	210	<1.0	<1.0	36	9.9	35	3.8	<0.10	<1.0	36	<1.0	<1.0	<1.0	46	33
B2-5	5 to 5.5	<2.0	2.9	260	<1.0	<1.0	23	7.6	50	8.1	<0.10	<1.0	25	<1.0	<1.0	<1.0	39	50
B3-3	3 to 3.5	<2.0	6.5	200	<1.0	<1.0	28	8.9	48	10	0.11	<1.0	27	<1.0	<1.0	<1.0	50	59
B5-3	3 to 3.5	<2.0	1.8	150	<1.0	<1.0	19	7.1	22	2.8	<0.10	<1.0	26	<1.0	<1.0	<1.0	46	52
B7-1	1 to 1.5	<2.0	<1.0	12	<1.0	<1.0	150 <i>1.4</i>	24	62	<1.0	<0.10	<1.0	220 <i>8.0</i>	<1.0	<1.0	<1.0	73	38
B9-1	1 to 1.5	<2.0	1.0	11	<1.0	<1.0	87 <i><1.0</i>	23	90	<1.0	<0.10	<1.0	61	1.1	<1.0	<1.0	95	51
<u>ESLs</u>																		
	Residential Land Use	20	0.39	750	4.0	12	1,000	23	230	80	6.7	40	150	10	20	0.78	200	600
	Commercial/Industrial Land Use	40	1.6	1,500	8.0	12	2,500	80	230	320	10	40	150	10	40	10	200	600
	Construction Worker Exposure	120	10	61,000	180	110	460,000*	49	12,000	320	27	1,500	6,100	1,500	1,500	3.1	1,500	93,000
<u>Hazardous Waste Criteria</u>																		
	TTLIC (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	---	---	---

Notes:

Results are shown in milligrams per kilogram (mg/kg).
*Value listed is for Chromium III, as there is no construction exposure standard for total chromium.
Values listed in italics are results of WET analysis
< = Analyte was not detected above the laboratory reporting limit.
ESLs = Environmental Screening Levels, Tables A and K-3, SFRWQCB, December 2013.
TTLIC = total threshold limit concentration
STLC = soluble threshold limit concentration
TCLP = toxicity characteristic leaching procedure

TABLE 4
Summary of Petroleum Hydrocarbons Results
Westbound I-84 to Northbound I-280
Woodside, California

Sample ID	Sample Depth (ft)	TPHd (mg/kg)	TPHmo (mg/kg)
B1-0	0 to 0.5	660	3,300
B1-1	1 to 1.5	3.4	11
B1-3	3 to 3.5	1.8	3.4
B3-0	0 to 0.5	13	59
B3-1	1 to 1.5	8.9	44
B3-3	3 to 3.5	2.7	7.9
B5-0	0 to 0.5	2,900	12,000
B5-1	1 to 1.5	2.2	5.9
B5-3	3 to 3.5	590	2,300
B7-0	0 to 0.5	12	57
B7-1	1 to 1.5	31	170
B7-3	3 to 3.5	270	1,500
B10-0	0 to 0.5	5.5	13
B10-1	1 to 1.5	8.9	11
B10-3	3 to 3.5	15	13
B10-5	5 to 5.5	3.4	4.6

ESLs

Residential	100	100
Commercial/Industrial	110	500
Construction Exposure	900	28,000

Notes:

- mg/kg = milligrams per kilogram
- TPHd = Total petroleum hydrocarbons as diesel
- TPHmo = Total petroleum hydrocarbons as motor oil
- ND = Not Detected
- = Not analyzed
- < = Not detected above the stated laboratory reporting limit
- ESLs = Environmental Screening Levels, Tables A and K-3, SFRWQCB, Decen

TABLE 5
Summary of NOA Results
Westbound I-84 to Northbound I-280
Woodside, California

Sample ID	Sample Depth (feet)	Asbestos Content (% dry weight)
B1-0	0 to 0.5	ND
B1-10	10 to 10.5	ND
B1-20	20 to 20.5	ND
B1-30	30 to 30.5	ND
B1-40	40 to 40.5	ND
B2-0	0 to 0.5	ND
B2-5	5 to 5.5	ND
B2-10	10 to 10.5	ND
B3-0	0 to 0.5	ND
B3-10	10 to 10.5	ND
B3-20	20 to 20.5	ND
B3-30	30 to 30.5	ND
B3-40	40 to 40.5	ND
B4-0	0 to 0.5	<0.25% Chrysotile
B4-5	5 to 5.5	ND
B4-7	7 to 7.5	<0.25% Chrysotile
B5-0	0 to 0.5	ND
B5-10	10 to 10.5	ND
B5-20	20 to 20.5	ND
B5-30	30 to 30.5	ND
B5-40	40 to 40.5	ND
B6-0	0 to 0.5	ND
B6-5	5 to 5.5	<0.25% Chrysotile
B7-0	0 to 0.5	ND
B7-10	10 to 10.5	<0.25% Chrysotile
B7-20	20 to 20.5	ND
B7-30	30 to 30.5	ND
B7-40	40 to 40.5	ND
B8-0	0 to 0.5	<0.25% Chrysotile
B8-5	5 to 5.5	<0.25% Chrysotile

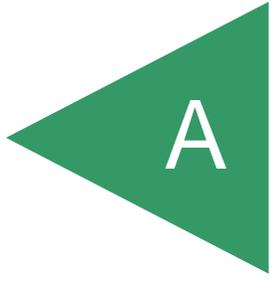
TABLE 5
Summary of NOA Results
Westbound I-84 to Northbound I-280
Woodside, California

Sample ID	Sample Depth (feet)	Asbestos Content (% dry weight)
B9-0	0 to 0.5	ND
B9-10	10 to 10.5	<0.25% Chrysotile
B9-20	20 to 20.5	1.75% Chrysotile
B9-30	30 to 30.5	<0.25% Chrysotile
B10-0	0 to 0.5	<0.25% Chrysotile
B10-5	5 to 5.5	<0.25% Chrysotile

ND = None detected at 0.25% target analytical sensitivity.

APPENDIX

A



June 30, 2014

Luann Beadle
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550
Tel: (925) 371-5900
Fax:(925) 371-5915

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

Re: ATL Work Order Number : 1401867
Client Reference : SR-84/I-280, E8721-02-06

Enclosed are the results for sample(s) received on June 24, 2014 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

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

Sincerely,



Eddie Rodriguez
Laboratory Director

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



Certificate of Analysis

Geocon Consultants, Inc.

Project Number : SR-84/I-280, E8721-02-06

6671 Brisa Street

Report To : Luann Beadle

Livermore , CA 94550

Reported : 06/30/2014

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B2-0	1401867-01	Soil	6/20/14 7:10	6/24/14 9:47
B2-1	1401867-02	Soil	6/20/14 7:12	6/24/14 9:47
B2-3	1401867-03	Soil	6/20/14 7:15	6/24/14 9:47
B2-5	1401867-04	Soil	6/20/14 7:20	6/24/14 9:47
B4-0	1401867-05	Soil	6/20/14 8:00	6/24/14 9:47
B4-1	1401867-06	Soil	6/20/14 8:02	6/24/14 9:47
B4-3	1401867-07	Soil	6/20/14 8:25	6/24/14 9:47
B4-5	1401867-08	Soil	6/20/14 8:30	6/24/14 9:47
B6-0	1401867-09	Soil	6/20/14 8:55	6/24/14 9:47
B6-1	1401867-10	Soil	6/20/14 9:00	6/24/14 9:47
B6-3	1401867-11	Soil	6/20/14 9:10	6/24/14 9:47
B6-5	1401867-12	Soil	6/20/14 9:20	6/24/14 9:47
B8-0	1401867-13	Soil	6/20/14 9:35	6/24/14 9:47
B8-1	1401867-14	Soil	6/20/14 9:42	6/24/14 9:47
B8-3	1401867-15	Soil	6/20/14 9:50	6/24/14 9:47
B8-5	1401867-16	Soil	6/20/14 10:00	6/24/14 9:47
B10-0	1401867-17	Soil	6/20/14 10:20	6/24/14 9:47
B10-1	1401867-18	Soil	6/20/14 10:24	6/24/14 9:47
B10-3	1401867-19	Soil	6/20/14 10:35	6/24/14 9:47
B10-5	1401867-20	Soil	6/20/14 10:45	6/24/14 9:47
EB1	1401867-21	Water	6/20/14 8:00	6/24/14 9:47



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : SR-84/I-280, E8721-02-06
Report To : Luann Beadle
Reported : 06/30/2014

Lead by ICP-AES EPA 6010B

Analyte: Lead

Analyst: CB

Laboratory ID	Client Sample ID	Result	Units	PQL	Dilution	Batch	Prepared	Date/Time		Notes
								Analized		
1401867-01	B2-0	21	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 15:36		
1401867-02	B2-1	6.8	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 15:38		
1401867-03	B2-3	6.7	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 15:40		
1401867-05	B4-0	40	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 15:43		
1401867-06	B4-1	11	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 15:45		
1401867-07	B4-3	31	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 15:48		
1401867-08	B4-5	13	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 15:50		
1401867-09	B6-0	64	mg/kg	0.99	1	B4F0518	06/27/2014	06/27/14 15:56		
1401867-10	B6-1	19	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 15:58		
1401867-11	B6-3	12	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 16:00		
1401867-12	B6-5	9.4	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 16:07		
1401867-13	B8-0	50	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 16:09		
1401867-14	B8-1	4.8	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 16:12		
1401867-15	B8-3	4.4	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 16:14		
1401867-16	B8-5	6.3	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 16:17		
1401867-17	B10-0	19	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 16:23		
1401867-18	B10-1	1.3	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 16:25		
1401867-19	B10-3	5.2	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 16:27		
1401867-20	B10-5	ND	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 16:29		

Lead by ICP-AES EPA 6010B

Analyte: Lead

Analyst: CB

Laboratory ID	Client Sample ID	Result	Units	PQL	Dilution	Batch	Prepared	Date/Time		Notes
								Analized		
1401867-21	EB1	ND	mg/L	0.0050	1	B4F0482	06/26/2014	06/26/14 17:22		



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : SR-84/I-280, E8721-02-06
Report To : Luann Beadle
Reported : 06/30/2014

Mercury by AA (Cold Vapor) EPA 7471A

Analyte: Mercury

Analyst: SB

Laboratory ID	Client Sample ID	Result	Units	PQL	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1401867-04	B2-5	ND	mg/kg	0.10	1	B4F0476	06/26/2014	06/26/14 16:05	

Client Sample ID B2-5

Lab ID: 1401867-04

Title 22 Metals by ICP-AES EPA 6010B

Analyst: CB

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B4F0471	06/26/2014	06/27/14 11:17	
Arsenic	2.9	1.0	1	B4F0471	06/26/2014	06/27/14 11:17	
Barium	260	1.0	1	B4F0471	06/26/2014	06/27/14 11:17	
Beryllium	ND	1.0	1	B4F0471	06/26/2014	06/27/14 11:17	
Cadmium	ND	1.0	1	B4F0471	06/26/2014	06/27/14 11:17	
Chromium	23	1.0	1	B4F0471	06/26/2014	06/27/14 11:17	
Cobalt	7.6	1.0	1	B4F0471	06/26/2014	06/27/14 11:17	
Copper	50	2.0	1	B4F0471	06/26/2014	06/27/14 11:17	
Lead	8.1	1.0	1	B4F0471	06/26/2014	06/27/14 11:17	
Molybdenum	ND	1.0	1	B4F0471	06/26/2014	06/27/14 11:17	
Nickel	25	1.0	1	B4F0471	06/26/2014	06/27/14 11:17	
Selenium	ND	1.0	1	B4F0471	06/26/2014	06/27/14 11:17	
Silver	ND	1.0	1	B4F0471	06/26/2014	06/27/14 11:17	
Thallium	ND	1.0	1	B4F0471	06/26/2014	06/27/14 11:17	
Vanadium	39	1.0	1	B4F0471	06/26/2014	06/27/14 11:17	
Zinc	50	1.0	1	B4F0471	06/26/2014	06/27/14 11:17	

Client Sample ID B10-0

Lab ID: 1401867-17

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	5.5	1.0	1	B4F0459	06/25/2014	06/26/14 20:43	
ORO	13	1.0	1	B4F0459	06/25/2014	06/26/14 20:43	
Surrogate: p-Terphenyl	55.7 %	26 - 145		B4F0459	06/25/2014	06/26/14 20:43	



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : SR-84/I-280, E8721-02-06
Report To : Luann Beadle
Reported : 06/30/2014

Client Sample ID B10-1 Lab ID: 1401867-18

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	B4F0459	06/25/2014	06/26/14 20:26	
ORO	11	1.0	1	B4F0459	06/25/2014	06/26/14 20:26	
<i>Surrogate: p-Terphenyl</i>	<i>76.0 %</i>	<i>26 - 145</i>		B4F0459	06/25/2014	06/26/14 20:26	

Client Sample ID B10-3 Lab ID: 1401867-19

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	15	1.0	1	B4F0459	06/25/2014	06/26/14 20:59	
ORO	13	1.0	1	B4F0459	06/25/2014	06/26/14 20:59	
<i>Surrogate: p-Terphenyl</i>	<i>81.4 %</i>	<i>26 - 145</i>		B4F0459	06/25/2014	06/26/14 20:59	

Client Sample ID B10-5 Lab ID: 1401867-20

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	3.4	1.0	1	B4F0459	06/25/2014	06/26/14 20:09	
ORO	4.6	1.0	1	B4F0459	06/25/2014	06/26/14 20:09	
<i>Surrogate: p-Terphenyl</i>	<i>71.0 %</i>	<i>26 - 145</i>		B4F0459	06/25/2014	06/26/14 20:09	



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : SR-84/I-280, E8721-02-06
Report To : Luann Beadle
Reported : 06/30/2014

QUALITY CONTROL SECTION

Title 22 Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
---------	-------------------	----------------	----------------	------------------	-------	-----------------	-----	--------------	-------

Batch B4F0471 - EPA 3050B

Blank (B4F0471-BLK1)

Prepared: 6/26/2014 Analyzed: 6/26/2014

Antimony	ND	2.0		NR					
Arsenic	ND	1.0		NR					
Barium	ND	1.0		NR					
Beryllium	ND	1.0		NR					
Cadmium	ND	1.0		NR					
Chromium	ND	1.0		NR					
Cobalt	ND	1.0		NR					
Copper	ND	2.0		NR					
Lead	ND	1.0		NR					
Molybdenum	ND	1.0		NR					
Nickel	ND	1.0		NR					
Selenium	ND	1.0		NR					
Silver	ND	1.0		NR					
Thallium	ND	1.0		NR					
Vanadium	ND	1.0		NR					
Zinc	ND	1.0		NR					

LCS (B4F0471-BS1)

Prepared: 6/26/2014 Analyzed: 6/26/2014

Antimony	47.5540	2.0	50.0000	95.1	80 - 120				
Arsenic	46.5570	1.0	50.0000	93.1	80 - 120				
Barium	48.6271	1.0	50.0000	97.3	80 - 120				
Beryllium	47.9301	1.0	50.0000	95.9	80 - 120				
Cadmium	46.9588	1.0	50.0000	93.9	80 - 120				
Chromium	49.5198	1.0	50.0000	99.0	80 - 120				
Cobalt	49.0192	1.0	50.0000	98.0	80 - 120				
Copper	47.5332	2.0	50.0000	95.1	80 - 120				
Lead	47.8740	1.0	50.0000	95.7	80 - 120				
Molybdenum	49.2416	1.0	50.0000	98.5	80 - 120				
Nickel	47.9171	1.0	50.0000	95.8	80 - 120				
Selenium	42.4864	1.0	50.0000	85.0	80 - 120				
Silver	45.8770	1.0	50.0000	91.8	80 - 120				
Thallium	48.0566	1.0	50.0000	96.1	80 - 120				
Vanadium	47.8783	1.0	50.0000	95.8	80 - 120				
Zinc	48.8029	1.0	50.0000	97.6	80 - 120				

Duplicate (B4F0471-DUP1)

Source: 1401860-01

Prepared: 6/26/2014 Analyzed: 6/26/2014

Antimony	ND	100	ND	NR				20	
Arsenic	ND	50	ND	NR				20	
Beryllium	ND	50	ND	NR				20	
Cadmium	ND	50	ND	NR				20	
Chromium	7.49625	50	2.91868	NR		87.9		20	R
Cobalt	ND	50	ND	NR				20	
Copper	16.5706	100	17.5872	NR		5.95		20	



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : SR-84/I-280, E8721-02-06
Report To : Luann Beadle
Reported : 06/30/2014

Title 22 Metals by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B4F0471 - EPA 3050B (continued)									
Duplicate (B4F0471-DUP1) - Continued			Source: 1401860-01			Prepared: 6/26/2014 Analyzed: 6/26/2014			
Lead	ND	50		ND	NR			20	
Molybdenum	5.06534	50		7.61212	NR		40.2	20	R
Nickel	11.8296	50		7.11007	NR		49.8	20	R
Selenium	ND	50		ND	NR			20	
Silver	72.5143	50		82.5088	NR		12.9	20	
Thallium	ND	50		ND	NR			20	
Vanadium	ND	50		ND	NR			20	
Zinc	502.176	50		421.710	NR		17.4	20	
Duplicate (B4F0471-DUP2)			Source: 1401860-01RE1			Prepared: 6/26/2014 Analyzed: 6/26/2014			
Barium	35732.1	100		32020.7	NR		11.0	20	
Matrix Spike (B4F0471-MS1)			Source: 1401860-01			Prepared: 6/26/2014 Analyzed: 6/26/2014			
Antimony	100.287	100	125.000	ND	80.2	21 - 109			
Arsenic	114.087	50	125.000	ND	91.3	55 - 102			
Beryllium	116.326	50	125.000	ND	93.1	60 - 104			
Cadmium	140.993	50	125.000	ND	113	52 - 100			M1
Chromium	175.604	50	125.000	2.91868	138	53 - 113			M1
Cobalt	97.3808	50	125.000	ND	77.9	53 - 104			
Copper	148.077	100	125.000	17.5872	104	51 - 122			
Lead	135.234	50	125.000	ND	108	51 - 106			M1
Molybdenum	130.230	50	125.000	7.61212	98.1	55 - 103			
Nickel	171.639	50	125.000	7.11007	132	48 - 112			M1
Selenium	86.9662	50	125.000	ND	69.6	53 - 104			
Silver	205.131	50	125.000	82.5088	98.1	61 - 109			
Thallium	124.715	50	125.000	ND	99.8	44 - 103			
Vanadium	77.2844	50	125.000	ND	61.8	55 - 115			
Zinc	576.602	50	125.000	421.710	124	24 - 130			
Matrix Spike (B4F0471-MS2)			Source: 1401860-01RE1			Prepared: 6/26/2014 Analyzed: 6/26/2014			
Barium	45566.5	100	125.000	32020.7	10800	40 - 130			M3
Matrix Spike Dup (B4F0471-MSD1)			Source: 1401860-01			Prepared: 6/26/2014 Analyzed: 6/26/2014			
Antimony	102.588	100	125.000	ND	82.1	21 - 109	2.27	20	
Arsenic	105.317	50	125.000	ND	84.3	55 - 102	7.99	20	
Beryllium	112.565	50	125.000	ND	90.1	60 - 104	3.29	20	
Cadmium	135.212	50	125.000	ND	108	52 - 100	4.19	20	M1
Chromium	130.516	50	125.000	2.91868	102	53 - 113	29.5	20	M1
Cobalt	93.3273	50	125.000	ND	74.7	53 - 104	4.25	20	
Copper	137.599	100	125.000	17.5872	96.0	51 - 122	7.34	20	
Lead	127.656	50	125.000	ND	102	51 - 106	5.76	20	
Molybdenum	125.849	50	125.000	7.61212	94.6	55 - 103	3.42	20	
Nickel	144.159	50	125.000	7.11007	110	48 - 112	17.4	20	
Selenium	76.7320	50	125.000	ND	61.4	53 - 104	12.5	20	
Silver	201.386	50	125.000	82.5088	95.1	61 - 109	1.84	20	
Thallium	120.433	50	125.000	ND	96.3	44 - 103	3.49	20	
Vanadium	78.9391	50	125.000	ND	63.2	55 - 115	2.12	20	



Certificate of Analysis

Geocon Consultants, Inc.
 6671 Brisa Street
 Livermore, CA 94550

Project Number : SR-84/I-280, E8721-02-06
 Report To : Luann Beadle
 Reported : 06/30/2014

Title 22 Metals by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B4F0471 - EPA 3050B (continued)									
Matrix Spike Dup (B4F0471-MSD1) - Continued			Source: 1401860-01			Prepared: 6/26/2014 Analyzed: 6/26/2014			
Zinc	571.270	50	125.000	421.710	120	24 - 130	0.929	20	
Matrix Spike Dup (B4F0471-MSD2)			Source: 1401860-01RE1			Prepared: 6/26/2014 Analyzed: 6/26/2014			
Barium	44144.4	100	125.000	32020.7	9700	40 - 130	3.17	20	M3



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : SR-84/I-280, E8721-02-06
Report To : Luann Beadle
Reported : 06/30/2014

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B4F0482 - EPA 3010A								
Blank (B4F0482-BLK1)				Prepared: 6/26/2014 Analyzed: 6/26/2014				
Lead	ND	0.0050			NR			
LCS (B4F0482-BS1)				Prepared: 6/26/2014 Analyzed: 6/26/2014				
Lead	1.01694	0.0050	1.00000		102 80 - 120			
Duplicate (B4F0482-DUP1)				Source: 1401867-21 Prepared: 6/26/2014 Analyzed: 6/26/2014				
Lead	ND	0.0050		ND	NR		20	
Matrix Spike (B4F0482-MS1)				Source: 1401867-21 Prepared: 6/26/2014 Analyzed: 6/26/2014				
Lead	2.54782	0.0050	2.50000	ND	102 81 - 105			
Matrix Spike Dup (B4F0482-MSD1)				Source: 1401867-21 Prepared: 6/26/2014 Analyzed: 6/26/2014				
Lead	2.52846	0.0050	2.50000	ND	101 81 - 105	0.763	20	
Batch B4F0518 - EPA 3050 Modified								
Blank (B4F0518-BLK1)				Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	ND	1.0			NR			
Blank (B4F0518-BLK2)				Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	ND	1.0			NR			
LCS (B4F0518-BS1)				Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	101.366	1.0	100.000		101 80 - 120			
Duplicate (B4F0518-DUP1)				Source: 1401868-02 Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	12.0942	1.0		8.06646	NR	40.0	20	R
Duplicate (B4F0518-DUP2)				Source: 1401867-11 Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	12.7805	1.0		11.5235	NR	10.3	20	
Matrix Spike (B4F0518-MS1)				Source: 1401868-02 Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	174.064	1.0	250.000	8.06646	66.4 51 - 106			
Matrix Spike (B4F0518-MS2)				Source: 1401867-11 Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	166.417	1.0	250.000	11.5235	62.0 51 - 106			
Matrix Spike Dup (B4F0518-MSD1)				Source: 1401868-02 Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	161.000	0.99	247.525	8.06646	61.8 51 - 106	7.80	20	



Certificate of Analysis

Geocon Consultants, Inc.
 6671 Brisa Street
 Livermore, CA 94550

Project Number : SR-84/I-280, E8721-02-06
 Report To : Luann Beadle
 Reported : 06/30/2014

Mercury by AA (Cold Vapor) EPA 7471A - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B4F0476 - EPA 7471								
Blank (B4F0476-BLK1)								
Mercury	ND	0.10			NR			Prepared: 6/26/2014 Analyzed: 6/26/2014
LCS (B4F0476-BS1)								
Mercury	0.815761	0.10	0.833333		97.9 80 - 120			Prepared: 6/26/2014 Analyzed: 6/26/2014
Matrix Spike (B4F0476-MS1)								
Mercury	0.861226	0.10	0.833333	0.037706	98.8 70 - 130			Prepared: 6/26/2014 Analyzed: 6/26/2014
Matrix Spike Dup (B4F0476-MSD1)								
Mercury	0.895348	0.10	0.833333	0.037706	103 70 - 130	3.89	20	Prepared: 6/26/2014 Analyzed: 6/26/2014
Post Spike (B4F0476-PS1)								
Mercury	0.005936		5.00000E-3	0.000452	110 85 - 115			Prepared: 6/26/2014 Analyzed: 6/26/2014



Certificate of Analysis

Geocon Consultants, Inc.
 6671 Brisa Street
 Livermore, CA 94550

Project Number : SR-84/I-280, E8721-02-06

Report To : Luann Beadle

Reported : 06/30/2014

Diesel Range Organics by EPA 8015B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes	
Batch B4F0459 - GCSEMI_DRO_SOIL_LL									
Blank (B4F0459-BLK1)				Prepared: 6/25/2014 Analyzed: 6/26/2014					
DRO	ND	1.0			NR				
ORO	ND	1.0			NR				
<hr/>									
<i>Surrogate: p-Terphenyl</i>	2.201		2.66667		82.5	26 - 145			
LCS (B4F0459-BS1)				Prepared: 6/25/2014 Analyzed: 6/26/2014					
DRO	26.8153	1.0	33.3333		80.4	28 - 138			
<hr/>									
<i>Surrogate: p-Terphenyl</i>	2.319		2.66667		87.0	26 - 145			
Duplicate (B4F0459-DUP1)				Source: 1401868-15		Prepared: 6/25/2014 Analyzed: 6/26/2014			
DRO	12.4850	1.0		31.4393	NR	86.3	20	R2	
<hr/>									
<i>Surrogate: p-Terphenyl</i>	0.9303		2.66667		34.9	26 - 145			
Matrix Spike (B4F0459-MS1)				Source: 1401868-15		Prepared: 6/25/2014 Analyzed: 6/26/2014			
DRO	20.2530	1.0	33.3333	31.4393	-33.6	18 - 122		M2	
<hr/>									
<i>Surrogate: p-Terphenyl</i>	0.9333		2.66667		35.0	26 - 145			
Matrix Spike Dup (B4F0459-MSD1)				Source: 1401868-15		Prepared: 6/25/2014 Analyzed: 6/26/2014			
DRO	21.6070	1.0	33.3333	31.4393	-29.5	18 - 122	6.47	20	M2
<hr/>									
<i>Surrogate: p-Terphenyl</i>	0.8030		2.66667		30.1	26 - 145			



Certificate of Analysis

Geocon Consultants, Inc.

6671 Brisa Street

Livermore, CA 94550

Project Number : SR-84/I-280, E8721-02-06

Report To : Luann Beadle

Reported : 06/30/2014

Notes and Definitions

R2	RPD value outside acceptance criteria due to possible matrix interference.
R	RPD value outside acceptance criteria. Calculation is based on raw values.
M3	Matrix spike recovery outside of acceptance limit due to disproportionate concentration of the analyte to spike level. The analytical batch was validated by the laboratory control sample.
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.
ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

Notes:

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

CHAIN OF CUSTODY RECORD



Advanced Technology Laboratories

3275 Walnut Avenue
Signal Hill, CA 90755

Tel: (562) 989-4045 • Fax: (562) 989-4040

FOR LABORATORY USE ONLY

Method of Transport
 Client
 ATL
 CA OverN
 FedEx
 Other: _____

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

Client: Geocoin
 Attention: Luann Beadle
 Project Name: SR-8411-280
 Project #: E8721-02-06
 Address: 6671 Brisa Street
 City: Livermore
 State: CA
 Zip Code: 94550
 Date: 6/20/14
 Time: 10:50
 Received by: *J. Low*
 Signature and Printed Name: *J. Low*
 Date: 6/23/14
 Time: 16:45
 Received by: *ATL*
 Signature and Printed Name: _____
 Date: _____
 Time: _____

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

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

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

Special Instructions/Comments:
 Caltrans Contract 04A4336
 Homogenize metals samples

Bill To: _____
 Attn: _____
 Co: *SAM*
 Addr: _____
 City: _____
 State: _____
 Zip: _____

Send Report To:
 Attn: _____
 Co: *SAM*
 Addr: _____
 City: _____
 State: _____
 Zip: _____

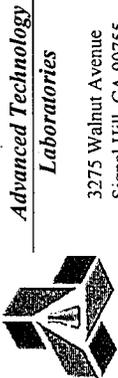
Circle or Add Analysis(es) Requested:
 CAN T7 Metals
 Total lead (6010B)
 TPH/TPHMO
 SOIL
 WATER
 GROUND WATER
 WASTEWATER

LAB USE ONLY:	Lab No.	Sample ID / Location	Sample Description	Date		Time	CONTAINERIZATION	QA/QC	REMARKS
				Date	Time				
	1401867-1	B2-0		6/20/14	710		X		
		1			712		X		
		3			715		X		
		5			720		X		
		B4-0			800		X		
		1			802		X		
		3			825		X		
		5			830		X		
		B6-0			855		X		
		1			900		X		
		3			910		X		
		5			920		X		
		B8-0			935		X		
		1			942		X		
		3			950		X		
		5			1000		X		
		B10-0			1020		X		
		1			1024		X		
		3			1035		X		
		5			1045		X		

Container Types: T=Tube V=VOA L=Liter P=Pinnt J=Jar B=Beadlar
 Container Types: T=Tube V=VOA L=Liter P=Pinnt J=Jar B=Beadlar
 TAT: A = Overnight 5 24 hrs
 B = Emergency Next Workday
 C = Critical 2 Workdays
 D = Urgent 3 Workdays
 E = Routine 7 Workdays
 Preservatives: H=HCl N=HNO₃ S=H₂SO₄ C=4°C
 Z=Zn(Ac)₂ O=NaOH T=Na₂S₂O₃
 M=Metal P=Plastic G=Glass

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY



3275 Walnut Avenue
Signal Hill, CA 90755

Tel: (562) 989-4045 • Fax: (562) 989-4040

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

Address: 6671 Brisa Street
 City: Livermore State: CA Zip Code: 94550
 Tel: 916-852-9118
 Fax: 916-852-9132

Client: Geocoin
 Attention: Luann Beadle
 Project Name: SR-841-280
 Project #: E8721-02-06
 Sampler: Mike O'Brien
 Date: 6/20/14
 Time: 10:50

Relinquished by: (Signature and Printed Name)
 Relinquished by: (Signature and Printed Name)
 Relinquished by: (Signature and Printed Name)
 Date: 6/23/14
 Time: 16:40
 Date: 6/23/14
 Time: 09:47

Send Report To:
 Attn: sun
 Co: sun
 Addr: sun
 City: sun State: sun Zip: sun

Special Instructions/Comments:
 Calltrans Contract 04A4336
 Homogenize metals samples

LAB USE ONLY:	Sample ID / Location	Sample Description	Date	Time
LAB No.	EB1		6/20/14	800
140187-01				

LAB USE ONLY:	Sample ID / Location	Sample Description	Date	Time
LAB No.	EB1		6/20/14	800
140187-01				

LAB USE ONLY:	Sample ID / Location	Sample Description	Date	Time
LAB No.	EB1		6/20/14	800
140187-01				

Container Types: T=Tube V=VOA L=Liter P=Plastic M=Metal
 TAT: A = Overnight ≤ 24 hrs B = Emergency Next Workday C = Critical 2 Workdays D = Urgent 3 Workdays E = Routine 7 Workdays
 Preservatives: H=HCl N=HNO₃ S=H₂SO₄ C=4°C
 Z=Zn(AC)₂ O=NaOH T=Na₂S₂O₃

LAB USE ONLY:	Sample ID / Location	Sample Description	Date	Time
LAB No.	EB1		6/20/14	800
140187-01				

July 14, 2014

Luann Beadle
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550
Tel: (925) 371-5900
Fax:(925) 371-5915

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

Re: ATL Work Order Number : 1401867
Client Reference : SR-84/I-280, E8721-02-06

Enclosed are the results for sample(s) received on June 24, 2014 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

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

Sincerely,



Eddie Rodriguez
Laboratory Director

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



Certificate of Analysis

Geocon Consultants, Inc.

6671 Brisa Street

Livermore, CA 94550

Project Number : SR-84/I-280, E8721-02-06

Report To : Luann Beadle

Reported : 07/14/2014

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B6-0	1401867-09	Soil	6/20/14 8:55	6/24/14 9:47
B8-0	1401867-13	Soil	6/20/14 9:35	6/24/14 9:47



Certificate of Analysis

Geocon Consultants, Inc.

6671 Brisa Street

Livermore, CA 94550

Project Number : SR-84/I-280, E8721-02-06

Report To : Luann Beadle

Reported : 07/14/2014

STLC Metals by ICP-AES by EPA 6010B

Analyte: Lead

Analyst: CB

Laboratory ID	Client Sample ID	Result	Units	PQL	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1401867-09	B6-0	3.5	mg/L	1.0	20	B4G0174	07/11/2014	07/11/14 13:37	
1401867-13	B8-0	4.7	mg/L	1.0	20	B4G0174	07/11/2014	07/11/14 13:45	



Certificate of Analysis

Geocon Consultants, Inc.
 6671 Brisa Street
 Livermore, CA 94550

Project Number : SR-84/I-280, E8721-02-06
 Report To : Luann Beadle
 Reported : 07/14/2014

QUALITY CONTROL SECTION

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

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B4G0174 - STLC Extraction									
Blank (B4G0174-BLK1)					Prepared: 7/11/2014 Analyzed: 7/11/2014				
Lead	ND	1.0					NR		
LCS (B4G0174-BS1)					Prepared: 7/11/2014 Analyzed: 7/11/2014				
Lead	2.02884		2.00000		101	80 - 120			
Duplicate (B4G0174-DUP1)					Prepared: 7/11/2014 Analyzed: 7/11/2014				
Lead	3.14262			3.51147	NR		11.1	20	
Matrix Spike (B4G0174-MS1)					Prepared: 7/11/2014 Analyzed: 7/11/2014				
Lead	5.64276		2.50000	3.51147	85.3	41 - 136			
Matrix Spike Dup (B4G0174-MSD1)					Prepared: 7/11/2014 Analyzed: 7/11/2014				
Lead	5.74505		2.50000	3.51147	89.3	41 - 136	1.80	20	



Certificate of Analysis

Geocon Consultants, Inc.

6671 Brisa Street

Livermore, CA 94550

Project Number : SR-84/I-280, E8721-02-06

Report To : Luann Beadle

Reported : 07/14/2014

Notes and Definitions

ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

Notes:

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

Diane Galvan

From: Luann Beadle [beadle@geoconinc.com]
Sent: Monday, July 07, 2014 2:53 PM
To: Diane Galvan
Subject: Lab Order 1401867 SR-84 to I-280

Hi Diane,
Please run WET lead on samples B6-0 and B8-0 on a regular TAT.
Thanks,
Luann



Luann Beadle | *Senior Staff Scientist*
Geocon Consultants, Inc.
6671 Brisa Street, Livermore, California 94550
Tel 925.371.5900 Cell 925.395.1669
www.geoconinc.com

June 30, 2014

Luann Beadle
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550
Tel: (925) 371-5900
Fax:(925) 371-5915

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

Re: ATL Work Order Number : 1401868
Client Reference : WB SR-84 to NB I-280, E8721-02-06

Enclosed are the results for sample(s) received on June 24, 2014 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

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

Sincerely,



Eddie Rodriguez
Laboratory Director

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



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : WB SR-84 to NB I-280, E8721-02-06
Report To : Luann Beadle
Reported : 06/30/2014

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B1 / 0'	1401868-01	Soil	6/19/14 10:08	6/24/14 9:47
B1 / 1'	1401868-02	Soil	6/19/14 10:12	6/24/14 9:47
B1 / 3'	1401868-03	Soil	6/19/14 10:15	6/24/14 9:47
B3 / 0'	1401868-05	Soil	6/19/14 12:16	6/24/14 9:47
B3 / 1'	1401868-06	Soil	6/19/14 12:16	6/24/14 9:47
B3 / 3'	1401868-07	Soil	6/19/14 12:25	6/24/14 9:47
B3 / 5'	1401868-08	Soil	6/19/14 12:29	6/24/14 9:47
Equip Rinse Blank #1	1401868-09	Water	6/19/14 12:40	6/24/14 9:47
B5 / 0'	1401868-10	Soil	6/20/14 8:35	6/24/14 9:47
B5 / 1'	1401868-11	Soil	6/20/14 8:40	6/24/14 9:47
B5 / 3'	1401868-12	Soil	6/20/14 8:43	6/24/14 9:47
B5 / 5'	1401868-13	Soil	6/20/14 8:47	6/24/14 9:47
B7 / 0'	1401868-14	Soil	6/20/14 10:05	6/24/14 9:47
B7 / 1'	1401868-15	Soil	6/20/14 10:08	6/24/14 9:47
B7 / 3'	1401868-16	Soil	6/20/14 10:12	6/24/14 9:47
B7 / 5'	1401868-17	Soil	6/20/14 10:18	6/24/14 9:47
Equip Rinse Blank #2	1401868-18	Water	6/20/14 10:21	6/24/14 9:47
B9 / 0'	1401868-19	Soil	6/20/14 12:12	6/24/14 9:47
B9 / 1'	1401868-20	Soil	6/20/14 12:16	6/24/14 9:47
B9 / 3'	1401868-21	Soil	6/20/14 12:18	6/24/14 9:47
B9 / 5'	1401868-22	Soil	6/20/14 12:22	6/24/14 9:47
Equip Rinse Blank #3	1401868-23	Water	6/20/14 12:35	6/24/14 9:47



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Lead by ICP-AES EPA 6010B

Analyte: Lead

Analyst: CB

Laboratory ID	Client Sample ID	Result	Units	PQL	Dilution	Batch	Prepared	Date/Time	Notes
								Analyzed	
1401868-02	B1 / 1'	8.1	mg/kg	1.0	1	B4F0518	06/27/2014	06/27/14 17:39	
1401868-03	B1 / 3'	11	mg/kg	0.99	1	B4F0519	06/27/2014	06/27/14 16:55	
1401868-05	B3 / 0'	3.4	mg/kg	1.0	1	B4F0519	06/27/2014	06/27/14 16:57	
1401868-06	B3 / 1'	3.7	mg/kg	1.0	1	B4F0519	06/27/2014	06/27/14 17:00	
1401868-08	B3 / 5'	8.3	mg/kg	1.0	1	B4F0519	06/27/2014	06/27/14 17:02	
1401868-10	B5 / 0'	ND	mg/kg	1.0	1	B4F0519	06/27/2014	06/27/14 17:04	
1401868-11	B5 / 1'	1.3	mg/kg	1.0	1	B4F0519	06/27/2014	06/27/14 17:06	
1401868-13	B5 / 5'	17	mg/kg	1.0	1	B4F0519	06/27/2014	06/27/14 17:09	
1401868-14	B7 / 0'	ND	mg/kg	1.0	1	B4F0519	06/27/2014	06/27/14 17:11	
1401868-16	B7 / 3'	ND	mg/kg	1.0	1	B4F0519	06/27/2014	06/27/14 17:14	
1401868-17	B7 / 5'	2.6	mg/kg	1.0	1	B4F0519	06/27/2014	06/27/14 17:20	
1401868-19	B9 / 0'	3.5	mg/kg	1.0	1	B4F0519	06/27/2014	06/27/14 17:28	
1401868-21	B9 / 3'	4.4	mg/kg	1.0	1	B4F0519	06/27/2014	06/27/14 17:30	
1401868-22	B9 / 5'	1.2	mg/kg	1.0	1	B4F0519	06/27/2014	06/27/14 17:31	

Lead by ICP-AES EPA 6010B

Analyte: Lead

Analyst: CB

Laboratory ID	Client Sample ID	Result	Units	PQL	Dilution	Batch	Prepared	Date/Time	Notes
								Analyzed	
1401868-09	Equip Rinse Blank #1	ND	mg/L	0.0050	1	B4F0482	06/26/2014	06/26/14 17:30	
1401868-18	Equip Rinse Blank #2	ND	mg/L	0.0050	1	B4F0482	06/26/2014	06/26/14 17:32	
1401868-23	Equip Rinse Blank #3	ND	mg/L	0.0050	1	B4F0482	06/26/2014	06/26/14 17:34	



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Project Number : WB SR-84 to NB I-280, E8721-02-06
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Mercury by AA (Cold Vapor) EPA 7471A

Analyte: Mercury

Analyst: SB

Laboratory ID	Client Sample ID	Result	Units	PQL	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1401868-01	B1 / 0'	ND	mg/kg	0.10	1	B4F0511	06/27/2014	06/27/14 14:33	
1401868-07	B3 / 3'	0.11	mg/kg	0.10	1	B4F0511	06/27/2014	06/27/14 14:43	
1401868-12	B5 / 3'	ND	mg/kg	0.10	1	B4F0511	06/27/2014	06/27/14 14:49	
1401868-15	B7 / 1'	ND	mg/kg	0.10	1	B4F0511	06/27/2014	06/27/14 14:51	
1401868-20	B9 / 1'	ND	mg/kg	0.10	1	B4F0511	06/27/2014	06/27/14 14:53	

Client Sample ID B1 / 0'

Lab ID: 1401868-01

Title 22 Metals by ICP-AES EPA 6010B

Analyst: CB

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B4F0500	06/26/2014	06/27/14 19:36	
Arsenic	3.2	1.0	1	B4F0500	06/26/2014	06/27/14 19:36	
Barium	210	1.0	1	B4F0500	06/26/2014	06/27/14 19:36	
Beryllium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:36	
Cadmium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:36	
Chromium	36	1.0	1	B4F0500	06/26/2014	06/27/14 19:36	
Cobalt	9.9	1.0	1	B4F0500	06/26/2014	06/27/14 19:36	
Copper	35	2.0	1	B4F0500	06/26/2014	06/27/14 19:36	
Lead	3.8	1.0	1	B4F0500	06/26/2014	06/27/14 19:36	
Molybdenum	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:36	
Nickel	36	1.0	1	B4F0500	06/26/2014	06/27/14 19:36	
Selenium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:36	
Silver	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:36	
Thallium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:36	
Vanadium	46	1.0	1	B4F0500	06/26/2014	06/27/14 19:36	
Zinc	33	1.0	1	B4F0500	06/26/2014	06/27/14 19:36	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	660	50	50	B4F0458	06/25/2014	06/26/14 17:24	
ORO	3300	50	50	B4F0458	06/25/2014	06/26/14 17:24	
Surrogate: p-Terphenyl	0%	26 - 145		B4F0458	06/25/2014	06/26/14 17:24	S4



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Project Number : WB SR-84 to NB I-280, E8721-02-06
Report To : Luann Beadle
Reported : 06/30/2014

Client Sample ID B1 / 1'

Lab ID: 1401868-02

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	3.4	1.0	1	B4F0458	06/25/2014	06/26/14 15:59	
ORO	11	1.0	1	B4F0458	06/25/2014	06/26/14 15:59	
<i>Surrogate: p-Terphenyl</i>	<i>82.0 %</i>	<i>26 - 145</i>		B4F0458	06/25/2014	06/26/14 15:59	

Client Sample ID B1 / 3'

Lab ID: 1401868-03

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	1.8	1.0	1	B4F0458	06/25/2014	06/26/14 15:09	
ORO	3.4	1.0	1	B4F0458	06/25/2014	06/26/14 15:09	
<i>Surrogate: p-Terphenyl</i>	<i>70.7 %</i>	<i>26 - 145</i>		B4F0458	06/25/2014	06/26/14 15:09	

Client Sample ID B3 / 0'

Lab ID: 1401868-05

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	B4F0458	06/25/2014	06/26/14 16:50	
ORO	59	1.0	1	B4F0458	06/25/2014	06/26/14 16:50	
<i>Surrogate: p-Terphenyl</i>	<i>66.1 %</i>	<i>26 - 145</i>		B4F0458	06/25/2014	06/26/14 16:50	



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Project Number : WB SR-84 to NB I-280, E8721-02-06
Report To : Luann Beadle
Reported : 06/30/2014

Client Sample ID B3 / 1'

Lab ID: 1401868-06

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	B4F0458	06/25/2014	06/26/14 16:16	
ORO	44	1.0	1	B4F0458	06/25/2014	06/26/14 16:16	
<i>Surrogate: p-Terphenyl</i>	<i>71.2 %</i>	<i>26 - 145</i>		B4F0458	06/25/2014	06/26/14 16:16	

Client Sample ID B3 / 3'

Lab ID: 1401868-07

Title 22 Metals by ICP-AES EPA 6010B

Analyst: CB

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B4F0500	06/26/2014	06/27/14 19:43	
Arsenic	6.5	1.0	1	B4F0500	06/26/2014	06/27/14 19:43	
Barium	200	1.0	1	B4F0500	06/26/2014	06/27/14 19:43	
Beryllium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:43	
Cadmium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:43	
Chromium	28	1.0	1	B4F0500	06/26/2014	06/27/14 19:43	
Cobalt	8.9	1.0	1	B4F0500	06/26/2014	06/27/14 19:43	
Copper	48	2.0	1	B4F0500	06/26/2014	06/27/14 19:43	
Lead	10	1.0	1	B4F0500	06/26/2014	06/27/14 19:43	
Molybdenum	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:43	
Nickel	27	1.0	1	B4F0500	06/26/2014	06/27/14 19:43	
Selenium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:43	
Silver	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:43	
Thallium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:43	
Vanadium	50	1.0	1	B4F0500	06/26/2014	06/27/14 19:43	
Zinc	59	1.0	1	B4F0500	06/26/2014	06/27/14 19:43	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	2.7	1.0	1	B4F0458	06/25/2014	06/26/14 15:26	
ORO	7.9	1.0	1	B4F0458	06/25/2014	06/26/14 15:26	
<i>Surrogate: p-Terphenyl</i>	<i>69.0 %</i>	<i>26 - 145</i>		B4F0458	06/25/2014	06/26/14 15:26	



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Project Number : WB SR-84 to NB I-280, E8721-02-06
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Reported : 06/30/2014

Client Sample ID B5 / 0' Lab ID: 1401868-10

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	2900	200	100	B4F0458	06/25/2014	06/26/14 17:41	
ORO	12000	200	100	B4F0458	06/25/2014	06/26/14 17:41	
<i>Surrogate: p-Terphenyl</i>	<i>0%</i>	<i>26 - 145</i>		B4F0458	06/25/2014	06/26/14 17:41	S4

Client Sample ID B5 / 1' Lab ID: 1401868-11

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	2.2	1.0	1	B4F0458	06/25/2014	06/26/14 15:43	
ORO	5.9	1.0	1	B4F0458	06/25/2014	06/26/14 15:43	
<i>Surrogate: p-Terphenyl</i>	<i>65.1 %</i>	<i>26 - 145</i>		B4F0458	06/25/2014	06/26/14 15:43	



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Project Number : WB SR-84 to NB I-280, E8721-02-06
Report To : Luann Beadle
Reported : 06/30/2014

Client Sample ID B5 / 3'
Lab ID: 1401868-12

Title 22 Metals by ICP-AES EPA 6010B

Analyst: CB

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B4F0500	06/26/2014	06/27/14 19:44	
Arsenic	1.8	1.0	1	B4F0500	06/26/2014	06/27/14 19:44	
Barium	150	1.0	1	B4F0500	06/26/2014	06/27/14 19:44	
Beryllium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:44	
Cadmium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:44	
Chromium	19	1.0	1	B4F0500	06/26/2014	06/27/14 19:44	
Cobalt	7.1	1.0	1	B4F0500	06/26/2014	06/27/14 19:44	
Copper	22	2.0	1	B4F0500	06/26/2014	06/27/14 19:44	
Lead	2.8	1.0	1	B4F0500	06/26/2014	06/27/14 19:44	
Molybdenum	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:44	
Nickel	26	1.0	1	B4F0500	06/26/2014	06/27/14 19:44	
Selenium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:44	
Silver	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:44	
Thallium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:44	
Vanadium	46	1.0	1	B4F0500	06/26/2014	06/27/14 19:44	
Zinc	52	1.0	1	B4F0500	06/26/2014	06/27/14 19:44	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	590	20	10	B4F0458	06/25/2014	06/26/14 17:07	
ORO	2300	20	10	B4F0458	06/25/2014	06/26/14 17:07	
<i>Surrogate: p-Terphenyl</i>	<i>0%</i>	<i>26 - 145</i>		B4F0458	06/25/2014	<i>06/26/14 17:07</i>	S4

Client Sample ID B7 / 0'
Lab ID: 1401868-14

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	B4F0458	06/25/2014	06/26/14 16:33	
ORO	57	1.0	1	B4F0458	06/25/2014	06/26/14 16:33	
<i>Surrogate: p-Terphenyl</i>	<i>73.2 %</i>	<i>26 - 145</i>		B4F0458	06/25/2014	<i>06/26/14 16:33</i>	



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Project Number : WB SR-84 to NB I-280, E8721-02-06
Report To : Luann Beadle
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Client Sample ID B7 / 1' Lab ID: 1401868-15

Title 22 Metals by ICP-AES EPA 6010B

Analyst: CB

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B4F0500	06/26/2014	06/27/14 19:45	
Arsenic	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:45	
Barium	12	1.0	1	B4F0500	06/26/2014	06/27/14 19:45	
Beryllium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:45	
Cadmium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:45	
Chromium	150	1.0	1	B4F0500	06/26/2014	06/27/14 19:45	
Cobalt	24	1.0	1	B4F0500	06/26/2014	06/27/14 19:45	
Copper	62	2.0	1	B4F0500	06/26/2014	06/27/14 19:45	
Lead	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:45	
Molybdenum	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:45	
Nickel	220	1.0	1	B4F0500	06/26/2014	06/27/14 19:45	
Selenium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:45	
Silver	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:45	
Thallium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:45	
Vanadium	73	1.0	1	B4F0500	06/26/2014	06/27/14 19:45	
Zinc	38	1.0	1	B4F0500	06/26/2014	06/27/14 19:45	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	31	2.0	2	B4F0459	06/25/2014	06/26/14 22:06	
ORO	170	2.0	2	B4F0459	06/25/2014	06/26/14 22:06	
<i>Surrogate: p-Terphenyl</i>	<i>74.2 %</i>	<i>26 - 145</i>		B4F0459	06/25/2014	<i>06/26/14 22:06</i>	

Client Sample ID B7 / 3' Lab ID: 1401868-16

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	270	20	10	B4F0459	06/25/2014	06/26/14 22:23	
ORO	1500	20	10	B4F0459	06/25/2014	06/26/14 22:23	
<i>Surrogate: p-Terphenyl</i>	<i>0%</i>	<i>26 - 145</i>		B4F0459	06/25/2014	<i>06/26/14 22:23</i>	<i>S4</i>



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Project Number : WB SR-84 to NB I-280, E8721-02-06
Report To : Luann Beadle
Reported : 06/30/2014

Client Sample ID B9 / 1'
Lab ID: 1401868-20

Title 22 Metals by ICP-AES EPA 6010B

Analyst: CB

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B4F0500	06/26/2014	06/27/14 19:47	
Arsenic	1.0	1.0	1	B4F0500	06/26/2014	06/27/14 19:47	
Barium	11	1.0	1	B4F0500	06/26/2014	06/27/14 19:47	
Beryllium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:47	
Cadmium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:47	
Chromium	87	1.0	1	B4F0500	06/26/2014	06/27/14 19:47	
Cobalt	23	1.0	1	B4F0500	06/26/2014	06/27/14 19:47	
Copper	90	2.0	1	B4F0500	06/26/2014	06/27/14 19:47	
Lead	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:47	
Molybdenum	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:47	
Nickel	61	1.0	1	B4F0500	06/26/2014	06/27/14 19:47	
Selenium	1.1	1.0	1	B4F0500	06/26/2014	06/27/14 19:47	
Silver	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:47	
Thallium	ND	1.0	1	B4F0500	06/26/2014	06/27/14 19:47	
Vanadium	95	1.0	1	B4F0500	06/26/2014	06/27/14 19:47	
Zinc	51	1.0	1	B4F0500	06/26/2014	06/27/14 19:47	



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : WB SR-84 to NB I-280, E8721-02-06

Report To : Luann Beadle

Reported : 06/30/2014

QUALITY CONTROL SECTION

Title 22 Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
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Batch B4F0500 - EPA 3050B

Blank (B4F0500-BLK1)

Prepared: 6/26/2014 Analyzed: 6/27/2014

Antimony	ND	2.0		NR
Arsenic	ND	1.0		NR
Barium	ND	1.0		NR
Beryllium	ND	1.0		NR
Cadmium	ND	1.0		NR
Chromium	ND	1.0		NR
Cobalt	ND	1.0		NR
Copper	ND	2.0		NR
Lead	ND	1.0		NR
Molybdenum	ND	1.0		NR
Nickel	ND	1.0		NR
Selenium	ND	1.0		NR
Silver	ND	1.0		NR
Thallium	ND	1.0		NR
Vanadium	ND	1.0		NR
Zinc	ND	1.0		NR

LCS (B4F0500-BS1)

Prepared: 6/26/2014 Analyzed: 6/27/2014

Antimony	48.8488	2.0	50.0000	97.7	80 - 120
Arsenic	47.5614	1.0	50.0000	95.1	80 - 120
Barium	50.7270	1.0	50.0000	101	80 - 120
Beryllium	51.2884	1.0	50.0000	103	80 - 120
Cadmium	49.3366	1.0	50.0000	98.7	80 - 120
Chromium	52.3922	1.0	50.0000	105	80 - 120
Cobalt	51.2024	1.0	50.0000	102	80 - 120
Copper	50.4630	2.0	50.0000	101	80 - 120
Lead	49.5762	1.0	50.0000	99.2	80 - 120
Molybdenum	51.3642	1.0	50.0000	103	80 - 120
Nickel	49.9790	1.0	50.0000	100	80 - 120
Selenium	45.0989	1.0	50.0000	90.2	80 - 120
Silver	47.0683	1.0	50.0000	94.1	80 - 120
Thallium	50.0975	1.0	50.0000	100	80 - 120
Vanadium	49.4769	1.0	50.0000	99.0	80 - 120
Zinc	51.6098	1.0	50.0000	103	80 - 120

Duplicate (B4F0500-DUP1)

Source: 1401868-01

Prepared: 6/26/2014 Analyzed: 6/27/2014

Antimony	ND	2.0	ND	NR	20
Arsenic	3.15129	1.0	3.19128	NR	1.26 20
Barium	176.967	1.0	212.658	NR	18.3 20
Beryllium	0.362856	1.0	0.304530	NR	17.5 20
Cadmium	ND	1.0	ND	NR	20
Chromium	40.4514	1.0	35.7752	NR	12.3 20
Cobalt	11.5240	1.0	9.86488	NR	15.5 20



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : WB SR-84 to NB I-280, E8721-02-06

Report To : Luann Beadle

Reported : 06/30/2014

Title 22 Metals by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
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Batch B4F0500 - EPA 3050B (continued)

Duplicate (B4F0500-DUP1) - Continued

Source: 1401868-01

Prepared: 6/26/2014 Analyzed: 6/27/2014

Copper	56.1744	2.0		35.3545	NR		45.5	20	R
Lead	3.20906	1.0		3.77956	NR		16.3	20	
Molybdenum	0.286457	1.0		0.264455	NR		7.99	20	
Nickel	39.9577	1.0		36.3979	NR		9.32	20	
Selenium	ND	1.0		ND	NR			20	
Silver	ND	1.0		ND	NR			20	
Thallium	ND	1.0		ND	NR			20	
Vanadium	59.9356	1.0		45.8396	NR		26.7	20	R
Zinc	41.5182	1.0		33.4275	NR		21.6	20	R

Matrix Spike (B4F0500-MS1)

Source: 1401868-01

Prepared: 6/26/2014 Analyzed: 6/27/2014

Antimony	57.4638	2.0	125.000	ND	46.0	21 - 109			
Arsenic	90.6213	1.0	125.000	3.19128	69.9	55 - 102			
Barium	276.688	1.0	125.000	212.658	51.2	40 - 130			
Beryllium	87.4874	1.0	125.000	0.304530	69.7	60 - 104			
Cadmium	78.9108	1.0	125.000	ND	63.1	52 - 100			
Chromium	135.797	1.0	125.000	35.7752	80.0	53 - 113			
Cobalt	97.0496	1.0	125.000	9.86488	69.7	53 - 104			
Copper	143.893	2.0	125.000	35.3545	86.8	51 - 122			
Lead	80.7264	1.0	125.000	3.77956	61.6	51 - 106			
Molybdenum	84.5708	1.0	125.000	0.264455	67.4	55 - 103			
Nickel	130.574	1.0	125.000	36.3979	75.3	48 - 112			
Selenium	84.1074	1.0	125.000	ND	67.3	53 - 104			
Silver	96.4638	1.0	125.000	ND	77.2	61 - 109			
Thallium	75.8072	1.0	125.000	ND	60.6	44 - 103			
Vanadium	148.047	1.0	125.000	45.8396	81.8	55 - 115			
Zinc	117.181	1.0	125.000	33.4275	67.0	24 - 130			

Matrix Spike Dup (B4F0500-MSD1)

Source: 1401868-01

Prepared: 6/26/2014 Analyzed: 6/27/2014

Antimony	59.8934	2.0	125.000	ND	47.9	21 - 109	4.14	20	
Arsenic	89.4816	1.0	125.000	3.19128	69.0	55 - 102	1.27	20	
Barium	250.308	1.0	125.000	212.658	30.1	40 - 130	10.0	20	M1
Beryllium	86.5190	1.0	125.000	0.304530	69.0	60 - 104	1.11	20	
Cadmium	76.3814	1.0	125.000	ND	61.1	52 - 100	3.26	20	
Chromium	127.197	1.0	125.000	35.7752	73.1	53 - 113	6.54	20	
Cobalt	94.8863	1.0	125.000	9.86488	68.0	53 - 104	2.25	20	
Copper	129.997	2.0	125.000	35.3545	75.7	51 - 122	10.1	20	
Lead	80.3972	1.0	125.000	3.77956	61.3	51 - 106	0.409	20	
Molybdenum	83.4030	1.0	125.000	0.264455	66.5	55 - 103	1.39	20	
Nickel	123.170	1.0	125.000	36.3979	69.4	48 - 112	5.84	20	
Selenium	82.8382	1.0	125.000	ND	66.3	53 - 104	1.52	20	
Silver	93.4645	1.0	125.000	ND	74.8	61 - 109	3.16	20	
Thallium	76.4600	1.0	125.000	ND	61.2	44 - 103	0.857	20	
Vanadium	137.463	1.0	125.000	45.8396	73.3	55 - 115	7.41	20	
Zinc	111.579	1.0	125.000	33.4275	62.5	24 - 130	4.90	20	



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : WB SR-84 to NB I-280, E8721-02-06
Report To : Luann Beadle
Reported : 06/30/2014

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B4F0482 - EPA 3010A								
Blank (B4F0482-BLK1)				Prepared: 6/26/2014 Analyzed: 6/26/2014				
Lead	ND	0.0050			NR			
LCS (B4F0482-BS1)				Prepared: 6/26/2014 Analyzed: 6/26/2014				
Lead	1.01694	0.0050	1.00000		102 80 - 120			
Duplicate (B4F0482-DUP1)				Source: 1401867-21 Prepared: 6/26/2014 Analyzed: 6/26/2014				
Lead	ND	0.0050		ND	NR		20	
Matrix Spike (B4F0482-MS1)				Source: 1401867-21 Prepared: 6/26/2014 Analyzed: 6/26/2014				
Lead	2.54782	0.0050	2.50000	ND	102 81 - 105			
Matrix Spike Dup (B4F0482-MSD1)				Source: 1401867-21 Prepared: 6/26/2014 Analyzed: 6/26/2014				
Lead	2.52846	0.0050	2.50000	ND	101 81 - 105	0.763	20	
Batch B4F0518 - EPA 3050 Modified								
Blank (B4F0518-BLK1)				Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	ND	1.0			NR			
Blank (B4F0518-BLK2)				Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	ND	1.0			NR			
LCS (B4F0518-BS1)				Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	101.366	1.0	100.000		101 80 - 120			
Duplicate (B4F0518-DUP1)				Source: 1401868-02 Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	12.0942	1.0		8.06646	NR	40.0	20	R
Duplicate (B4F0518-DUP2)				Source: 1401867-11 Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	12.7805	1.0		11.5235	NR	10.3	20	
Matrix Spike (B4F0518-MS1)				Source: 1401868-02 Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	174.064	1.0	250.000	8.06646	66.4 51 - 106			
Matrix Spike (B4F0518-MS2)				Source: 1401867-11 Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	166.417	1.0	250.000	11.5235	62.0 51 - 106			
Matrix Spike Dup (B4F0518-MSD1)				Source: 1401868-02 Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	161.000	0.99	247.525	8.06646	61.8 51 - 106	7.80	20	
Batch B4F0519 - EPA 3050 Modified								
Blank (B4F0519-BLK1)				Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	ND	1.0			NR			
Blank (B4F0519-BLK2)				Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	ND	1.0			NR			
LCS (B4F0519-BS1)				Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	103.290	1.0	100.000		103 80 - 120			



Certificate of Analysis

Geocon Consultants, Inc.
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 Livermore, CA 94550

Project Number : WB SR-84 to NB I-280, E8721-02-06
 Report To : Luann Beadle
 Reported : 06/30/2014

Lead by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B4F0519 - EPA 3050 Modified (continued)									
LCS (B4F0519-BS1) - Continued					Prepared: 6/27/2014 Analyzed: 6/27/2014				
Duplicate (B4F0519-DUP1)					Source: 1401868-22 Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	1.51280	1.0		1.15920	NR		26.5	20	R
Duplicate (B4F0519-DUP2)					Source: 1401868-17 Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	3.68674	0.99		2.62743	NR		33.6	20	R
Matrix Spike (B4F0519-MS1)					Source: 1401868-22 Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	173.705	1.0	250.000	1.15920	69.0	51 - 106			
Matrix Spike (B4F0519-MS2)					Source: 1401868-17 Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	138.302	0.99	247.525	2.62743	54.8	51 - 106			
Matrix Spike Dup (B4F0519-MSD1)					Source: 1401868-22 Prepared: 6/27/2014 Analyzed: 6/27/2014				
Lead	169.986	1.0	252.525	1.15920	66.9	51 - 106	2.16	20	



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : WB SR-84 to NB I-280, E8721-02-06
Report To : Luann Beadle
Reported : 06/30/2014

Mercury by AA (Cold Vapor) EPA 7471A - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B4F0511 - EPA 7471								
Blank (B4F0511-BLK1)								
Mercury	ND	0.10			NR			Prepared: 6/27/2014 Analyzed: 6/27/2014
LCS (B4F0511-BS1)								
Mercury	0.823863	0.10	0.833333		98.9 80 - 120			Prepared: 6/27/2014 Analyzed: 6/27/2014
Duplicate (B4F0511-DUP1)								
Mercury	0.030583	0.10		0.055832	NR	58.4	20	Prepared: 6/27/2014 Analyzed: 6/27/2014 R
Matrix Spike (B4F0511-MS1)								
Mercury	0.916130	0.10	0.833333	0.055832	103	70 - 130		Prepared: 6/27/2014 Analyzed: 6/27/2014
Matrix Spike Dup (B4F0511-MSD1)								
Mercury	0.939494	0.10	0.833333	0.055832	106	70 - 130	2.52	Prepared: 6/27/2014 Analyzed: 6/27/2014 20
Post Spike (B4F0511-PS1)								
Mercury	0.006581		5.00000E-3	0.000670	118	85 - 115		Prepared: 6/27/2014 Analyzed: 6/27/2014 M1



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : WB SR-84 to NB I-280, E8721-02-06

Report To : Luann Beadle

Reported : 06/30/2014

Diesel Range Organics by EPA 8015B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B4F0458 - GCSEMI_DRO_SOIL_LL								
Blank (B4F0458-BLK1)				Prepared: 6/25/2014 Analyzed: 6/26/2014				
DRO	ND	1.0			NR			
ORO	ND	1.0			NR			
<i>Surrogate: p-Terphenyl</i>	2.386		2.66667		89.5	26 - 145		
LCS (B4F0458-BS1)				Prepared: 6/25/2014 Analyzed: 6/26/2014				
DRO	26.6103	1.0	33.3333		79.8	28 - 138		
<i>Surrogate: p-Terphenyl</i>	2.122		2.66667		79.6	26 - 145		
Duplicate (B4F0458-DUP1)		Source: 1401868-03			Prepared: 6/25/2014 Analyzed: 6/26/2014			
DRO	2.05967	1.0		1.83167	NR		11.7	20
<i>Surrogate: p-Terphenyl</i>	2.096		2.66667		78.6	26 - 145		
Matrix Spike (B4F0458-MS1)		Source: 1401868-03			Prepared: 6/25/2014 Analyzed: 6/26/2014			
DRO	23.7417	1.0	33.3333	1.83167	65.7	18 - 122		
<i>Surrogate: p-Terphenyl</i>	2.305		2.66667		86.4	26 - 145		
Matrix Spike Dup (B4F0458-MSD1)		Source: 1401868-03			Prepared: 6/25/2014 Analyzed: 6/26/2014			
DRO	24.3813	1.0	33.3333	1.83167	67.6	18 - 122	2.66	20
<i>Surrogate: p-Terphenyl</i>	1.987		2.66667		74.5	26 - 145		
Batch B4F0459 - GCSEMI_DRO_SOIL_LL								
Blank (B4F0459-BLK1)				Prepared: 6/25/2014 Analyzed: 6/26/2014				
DRO	ND	1.0			NR			
ORO	ND	1.0			NR			
<i>Surrogate: p-Terphenyl</i>	2.201		2.66667		82.5	26 - 145		
LCS (B4F0459-BS1)				Prepared: 6/25/2014 Analyzed: 6/26/2014				
DRO	26.8153	1.0	33.3333		80.4	28 - 138		
<i>Surrogate: p-Terphenyl</i>	2.319		2.66667		87.0	26 - 145		
Duplicate (B4F0459-DUP1)		Source: 1401868-15			Prepared: 6/25/2014 Analyzed: 6/26/2014			
DRO	12.4850	1.0		31.4393	NR		86.3	20
<i>Surrogate: p-Terphenyl</i>	0.9303		2.66667		34.9	26 - 145		
Matrix Spike (B4F0459-MS1)		Source: 1401868-15			Prepared: 6/25/2014 Analyzed: 6/26/2014			
DRO	20.2530	1.0	33.3333	31.4393	-33.6	18 - 122		M2
<i>Surrogate: p-Terphenyl</i>	0.9333		2.66667		35.0	26 - 145		
Matrix Spike Dup (B4F0459-MSD1)		Source: 1401868-15			Prepared: 6/25/2014 Analyzed: 6/26/2014			
DRO	21.6070	1.0	33.3333	31.4393	-29.5	18 - 122	6.47	20
<i>Surrogate: p-Terphenyl</i>	0.8030		2.66667		30.1	26 - 145		



Certificate of Analysis

Geocon Consultants, Inc.

6671 Brisa Street

Livermore, CA 94550

Project Number : WB SR-84 to NB I-280, E8721-02-06

Report To : Luann Beadle

Reported : 06/30/2014

Notes and Definitions

S4	Surrogate was diluted out.
R2	RPD value outside acceptance criteria due to possible matrix interference.
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.
ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

Notes:

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

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY:

Advanced Technology Laboratories
 3275 Walnut Avenue
 Signal Hill, CA 90755
 (562) 989-4045 • Fax (562) 989-4040

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

Method of Transport:
 Client
 ATL
 CA OverN
 FEDEX
 Other: _____

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

Address: 6671 Brisa Street
 City: Livemore State: CA Zip Code: 94550
 TEL: (925) 371-5900
 FAX: (925) 371-5915

Project Name: **WB SR-84 to NS I-280**
 Relinquished by: *J. Love* (Signature and Printed Name)
 Relinquished by: *J. Love* (Signature and Printed Name)
 Relinquished by: *J. Love* (Signature and Printed Name)

Project #: **F8721-02-06** Sampler: *J. Love* (Printed Name)
 Date: **6/23/14** Time: **16:45** Received by: *J. Love* (Signature and Printed Name)
 Date: **6/24/14** Time: **09:47** Received by: *J. Love* (Signature and Printed Name)

Special Instructions/Comments:

Send Report To:
 Attn: _____
 Co: **SAME AS ABOVE**
 Address _____ City _____ State _____ Zip _____

Bill To:
 Attn: _____
 Co: **SAME AS ABOVE**
 Address _____ City _____ State _____ Zip _____

LAB USE ONLY:
 Batch #: _____
 Lab No. _____

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 : \$1.00 / ATL workorder / mo (after 1 year)

ITEM	LAB USE ONLY: Batch # / Lab No.	Sample Description	Sample I.D. / Location	Date	Time	SPECIFY APPROPRIATE MATRIX				CONTAINER(S)		TAT	Type	REMARKS
						SOIL	GROUND WATER	WASTEWATER	WATER	#				
	140186Y - 01	B1/0'	B1/0'	6/16/14	10:06	X	X	X	X	1	1	ETM		
	-2	B1/1'	B1/1'	10:12		X	X	X	X	1	1	ETM		
	-3	B1/3'	B1/3'	10:15		X	X	X	X	1	1	ETM		
	-4	B1/5'	B1/5'	10:20		X	X	X	X	1	1	ETM	ziploc bag	
	-5	B3/0'	B3/0'	12:16		X	X	X	X	1	1	ETM		
	-6	B3/1'	B3/1'	12:16		X	X	X	X	1	1	ETM		
	-7	B3/3'	B3/3'	12:25		X	X	X	X	1	1	ETM		
	-8	B3/5'	B3/5'	12:29		X	X	X	X	1	1	ETM	ziploc bag	
	-9	Equip. Rinse Blank #1		12:40		X	X	X	X	1	1	PPN		

Preservatives:
 H=HCl N=HNO₃ S=H₂SO₄ C=4°C
 Z=Zn(AC)₂ O=NaOH T=Na₂SO₄

Container Types: T=Tube V=VOA L=Liter P=Plastic M=Metal
 B=Next workday J=Jar B=Tedlar G=Glass E=7 Workdays
 C=Critical 2 Workdays D=3 Workdays U=Urgent 3 Workdays R=Routine 7 Workdays

TAT: A=Overnight ≤ 24 hr
 B=Next workday
 C=Critical 2 Workdays
 D=3 Workdays
 E=7 Workdays
 R=Routine 7 Workdays

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY:

Advanced Technologies Laboratories
 3275 Walnut Avenue
 Signal Hill, CA 90755
 (562) 989-4045 • Fax (562) 989-4040

Client: GEOCON CONSULTANTS, INC.
 Attn: LuAnn Beadle / Rick Day

Method of Transport: Client ATL CA OverN FEDEX Other:

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

Address: 6671 Brisa Street
 City: Livemore State: CA Zip Code: 94550
 TEL: (925) 371-5900 FAX: (925) 371-5915

Project Name: WB SR-84 to NB I-280 Sampler: J. Love (Printed Name)
 Relinquished by: J. Love (Signature and Printed Name) Received by: J. Love (Signature and Printed Name)
 Relinquished Date: 6/23/14 Time: 16:45 Received by Date: 6/24/14 Time: 09:47

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

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

I hereby authorize ATL to perform the work indicated below:
 Project Mgr / Submitter: J. Love (Signature)
 Date: 6/23/14

Send Report To: _____
 Attn: _____
 Co: SAME AS ABOVE
 Address: _____
 City: _____ State: _____ Zip: _____

Bill To: _____
 Attn: _____
 Co: SAME AS ABOVE
 Address: _____
 City: _____ State: _____ Zip: _____

Special Instructions/Comments: _____

LAB USE ONLY: Batch #	Lab No.	Sample I.D. / Location	Sample Description	Date	Time	SPECIFY APPROPRIATE MATRIX						CONTAINER(S)		QA/QC RTNE <input type="checkbox"/> CT <input type="checkbox"/> SWRCB <input type="checkbox"/> Logcode <input type="checkbox"/> OTHER _____	REMARKS	
						SOIL	GROUND WATER	WASTEWATER	WATER	TAT	Type	#	Type			
140186	-10	B5 / 0'		8:35		X	X	X	X	X	X	X	1	TM		
	-11	B5 / 1'		8:40		X	X	X	X	X	X	X	1	TM		
	-12	B5 / 3'		8:43		X	X	X	X	X	X	X	1	TM		
	-13	B5 / 5'		8:47		X	X	X	X	X	X	X	1	2. place bags		
	-14	B7 / 0'		10:05		X	X	X	X	X	X	X	1	TM		
	-15	B7 / 1'		10:08		X	X	X	X	X	X	X	1	TM		
	-16	B7 / 3'		10:12		X	X	X	X	X	X	X	1	TM		
	-17	B7 / 5'		10:18		X	X	X	X	X	X	X	1	2. place bags		
	-18	Equip. Rinse Blank #2		10:21									1	PPN		

Preservatives: H=HCl N=HNO₃ S=H₂SO₄ C=4°C
 Z=Zn(Ac)₂ O=NaOH T=Na₂SO₄

TAT: A= Overnight 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

July 14, 2014

Luann Beadle
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550
Tel: (925) 371-5900
Fax: (925) 371-5915

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

Re: ATL Work Order Number : 1401868
Client Reference : WB SR-84 to NB I-280, E8721-02-06

Enclosed are the results for sample(s) received on June 24, 2014 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

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

Sincerely,



Eddie Rodriguez
Laboratory Director

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



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : WB SR-84 to NB I-280, E8721-02-06
Report To : Luann Beadle
Reported : 07/14/2014

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B7 / 1'	1401868-15	Soil	6/20/14 10:08	6/24/14 9:47
B9 / 1'	1401868-20	Soil	6/20/14 12:16	6/24/14 9:47



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : WB SR-84 to NB I-280, E8721-02-06
Report To : Luann Beadle
Reported : 07/14/2014

Client Sample ID B7 / 1'

Lab ID: 1401868-15

STLC Metals by ICP-AES by EPA 6010B

Analyst: CB

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	1.4	1.0	20	B4G0174	07/11/2014	07/11/14 13:48	
Nickel	8.0	1.0	20	B4G0174	07/11/2014	07/11/14 13:48	



Certificate of Analysis

Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

Project Number : WB SR-84 to NB I-280, E8721-02-06

Report To : Luann Beadle

Reported : 07/14/2014

Client Sample ID B9 / 1'

Lab ID: 1401868-20

STLC Metals by ICP-AES by EPA 6010B

Analyst: CB

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B4G0174	07/11/2014	07/11/14 13:54	

QUALITY CONTROL SECTION

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

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
---------	---------------	------------	-------------	---------------	-------	--------------	-----	-----------	-------

Batch B4G0174 - STLC Extraction

Blank (B4G0174-BLK1)

Prepared: 7/11/2014 Analyzed: 7/11/2014

Chromium	ND	1.0		NR				
Nickel	ND	1.0		NR				

LCS (B4G0174-BS1)

Prepared: 7/11/2014 Analyzed: 7/11/2014

Chromium	2.05992		2.00000	103	80 - 120			
Nickel	2.13999		2.00000	107	80 - 120			

Duplicate (B4G0174-DUP1)

Source: 1401867-09

Prepared: 7/11/2014 Analyzed: 7/11/2014

Chromium	0.206778	1.0		0.210522	NR	1.79	20	
Nickel	2.34339	1.0		2.15175	NR	8.53	20	

Matrix Spike (B4G0174-MS1)

Source: 1401867-09

Prepared: 7/11/2014 Analyzed: 7/11/2014

Chromium	2.57582		2.50000	0.210522	94.6	83 - 115		
Nickel	4.46074		2.50000	2.15175	92.4	86 - 116		

Matrix Spike Dup (B4G0174-MSD1)

Source: 1401867-09

Prepared: 7/11/2014 Analyzed: 7/11/2014

Chromium	2.68424		2.50000	0.210522	98.9	83 - 115	4.12	20
Nickel	4.55926		2.50000	2.15175	96.3	86 - 116	2.18	20



Certificate of Analysis

Geocon Consultants, Inc.

6671 Brisa Street

Livermore, CA 94550

Project Number : WB SR-84 to NB I-280, E8721-02-06

Report To : Luann Beadle

Reported : 07/14/2014

Notes and Definitions

ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

Notes:

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

Diane Galvan

From: Luann Beadle [beadle@geoconinc.com]
Sent: Monday, July 07, 2014 2:53 PM
To: Diane Galvan
Subject: Lab Order 1401868 SR-84 to I-280

Hi Diane,

Please run WET chromium on samples B9/1 and B7/1 and WET nickel on sample B7/1

1401868-20	B9 / 1'	Chromium
1401868-15	B7 / 1'	Chromium
1401868-15	B7 / 1'	Nickel

Regular TAT.
Thanks,
Luann



Luann Beadle | *Senior Staff Scientist*
Geocon Consultants, Inc.
6671 Brisa Street, Livermore, California 94550
Tel 925.371.5900 Cell 925.395.1669
www.geoconinc.com

**EMSL Analytical, Inc**

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Phone/Fax: (510) 895-3675 / (510) 895-3680

<http://www.EMSL.com>sanleandrolab@emsl.com

EMSL Order:	091409921
CustomerID:	GECN21
CustomerPO:	E8721-02-06
ProjectID:	

Attn: **Luann Beadle**
Geocon Consultants, Inc.
6671 Brisa Street

Livermore, CA 94550

Phone: (925) 371-5900
 Fax: (925) 371-5915
 Received: 06/24/14 8:45 AM
 Analysis Date: 7/9/2014
 Collected: 6/20/2014

Project: **E8721-02-06 SR84 AND I-280 CALTRANS CONTRACT 04A4336 PRICING**

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
B1-0 091409921-0001		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B1-10 091409921-0002		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B1-20 091409921-0003		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B1-30 091409921-0004		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B1-40 091409921-0005		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B3-0 091409921-0006		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B3-10 091409921-0007		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected

Analyst(s)

Jorge Leon (36)

Israel Gutierrez
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc San Leandro, CA

Initial report from 07/09/2014 12:18:57



EMSL Analytical, Inc

2235 Polvorosa Ave , Suite 230, San Leandro, CA 94577

Phone/Fax: (510) 895-3675 / (510) 895-3680

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sanleandrolab@emsl.com

EMSL Order:	091409921
CustomerID:	GECN21
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ProjectID:	

Attn: **Luann Beadle**
Geocon Consultants, Inc.
6671 Brisa Street

Phone: (925) 371-5900
 Fax: (925) 371-5915
 Received: 06/24/14 8:45 AM
 Analysis Date: 7/9/2014
 Collected: 6/20/2014

Livermore, CA 94550

Project: **E8721-02-06 SR84 AND I-280 CALTRANS CONTRACT 04A4336 PRICING**

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
B3-20 <i>091409921-0008</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B3-30 <i>091409921-0009</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B3-40 <i>091409921-0010</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B5-0 <i>091409921-0011</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B5-10 <i>091409921-0012</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B5-20 <i>091409921-0013</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B5-30 <i>091409921-0014</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected

Analyst(s)

Jorge Leon (36)

Israel Gutierrez
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc San Leandro, CA

Initial report from 07/09/2014 12:18:57

**EMSL Analytical, Inc**

2235 Polvorosa Ave , Suite 230, San Leandro, CA 94577

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EMSL Order:	091409921
CustomerID:	GECN21
CustomerPO:	E8721-02-06
ProjectID:	

Attn: **Luann Beadle**
Geocon Consultants, Inc.
6671 Brisa Street

Livermore, CA 94550

Phone: (925) 371-5900
 Fax: (925) 371-5915
 Received: 06/24/14 8:45 AM
 Analysis Date: 7/9/2014
 Collected: 6/20/2014

Project: **E8721-02-06 SR84 AND I-280 CALTRANS CONTRACT 04A4336 PRICING**

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
B5-40 091409921-0015		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B7-0 091409921-0016		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B7-10 091409921-0017		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	<0.25% Chrysotile
B7-20 091409921-0018		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B7-30 091409921-0019		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B7-40 091409921-0020		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B9-0 091409921-0021		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected

Analyst(s)

Jorge Leon (36)

Israel Gutierrez
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc San Leandro, CA

Initial report from 07/09/2014 12:18:57



EMSL Analytical, Inc

2235 Polvorosa Ave , Suite 230, San Leandro, CA 94577

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EMSL Order:	091409921
CustomerID:	GECN21
CustomerPO:	E8721-02-06
ProjectID:	

Attn: **Luann Beadle**
Geocon Consultants, Inc.
6671 Brisa Street

Phone: (925) 371-5900
 Fax: (925) 371-5915
 Received: 06/24/14 8:45 AM
 Analysis Date: 7/9/2014
 Collected: 6/20/2014

Livermore, CA 94550

Project: **E8721-02-06 SR84 AND I-280 CALTRANS CONTRACT 04A4336 PRICING**

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
B9-10 <i>091409921-0022</i>		Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	<0.25% Chrysotile
B9-20 <i>091409921-0023</i>		Gray Non-Fibrous Homogeneous		98.25% Non-fibrous (other)	1.75% Chrysotile
B9-30 <i>091409921-0024</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	<0.25% Chrysotile
B2-0 <i>091409921-0025</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B2-5 <i>091409921-0026</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B2-10 <i>091409921-0027</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B4-0 <i>091409921-0028</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	<0.25% Chrysotile

Analyst(s) _____
 Jorge Leon (36)



 Israel Gutierrez
 or other approved signatory

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 Samples analyzed by EMSL Analytical, Inc San Leandro, CA

Initial report from 07/09/2014 12:18:57



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Attn: **Luann Beadle**
Geocon Consultants, Inc.
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Phone: (925) 371-5900
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Livermore, CA 94550

Project: **E8721-02-06 SR84 AND I-280 CALTRANS CONTRACT 04A4336 PRICING**

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
B4-5 <i>091409921-0029</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B4-7 <i>091409921-0030</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	<0.25% Chrysotile
B6-0 <i>091409921-0031</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	None Detected
B6-5 <i>091409921-0032</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	<0.25% Chrysotile
B8-0 <i>091409921-0033</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	<0.25% Chrysotile
B8-5 <i>091409921-0034</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	<0.25% Chrysotile
B10-0 <i>091409921-0035</i>		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	<0.25% Chrysotile

Analyst(s)
 Jorge Leon (36)


 Israel Gutierrez
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 Samples analyzed by EMSL Analytical, Inc San Leandro, CA

Initial report from 07/09/2014 12:18:57



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sanleandrolab@emsl.com

EMSL Order: 091409921
CustomerID: GECN21
CustomerPO: E8721-02-06
ProjectID:

Attn: **Luann Beadle**
Geocon Consultants, Inc.
6671 Brisa Street

Livermore, CA 94550

Phone: (925) 371-5900
Fax: (925) 371-5915
Received: 06/24/14 8:45 AM
Analysis Date: 7/9/2014
Collected: 6/20/2014

Project: **E8721-02-06 SR84 AND I-280 CALTRANS CONTRACT 04A4336 PRICING**

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
B10-5 091409921-0036		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	<0.25% Chrysotile

Analyst(s)
Jorge Leon (36)


Israel Gutierrez
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Samples analyzed by EMSL Analytical, Inc San Leandro, CA

Initial report from 07/09/2014 12:18:57



EMSL ANALYTICAL, INC.
LABORATORY PRODUCTS TRAINING

Asbestos Chain of Custody
EMSL Order Number (Lab Use Only):

№ 091409921

EMSL ANALYTICAL, INC.
2235 POLYVOROSA DR., STE. 230
SAN LEANDRO, CA 94577
PHONE: (510) 895-3675
FAX: (510) 895-3680

Company: <u>Geocon</u>		EMSL-Bill to: <input checked="" type="checkbox"/> Same <input type="checkbox"/> Different If Bill to is Different note instructions in Comments**	
Street: <u>6671 Brisa St.</u>		Third Party Billing requires written authorization from third party	
City: <u>Livermore</u>	State/Province: <u>CA</u>	Zip/Postal Code: <u>94550</u>	Country: <u>USA</u>
Report To (Name): <u>Luan Beadle</u>		Fax #: <u>925-371-5915</u>	
Telephone #: <u>beadle@geoconinc.com</u>		Email Address: <u>925-371-5900</u>	
Project Name/Number: <u>SRB4 and I-280 Caltrans Contract 044336 pricing</u>			
Please Provide Results: <input type="checkbox"/> Fax <input checked="" type="checkbox"/> Email Purchase Order: <u>E6721-02-06</u> U.S. State Samples Taken: <u>CA</u>			

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 hours/6 hours, 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 <input type="checkbox"/> NIOSH 7400 <input type="checkbox"/> w/ OSHA 8hr. TWA PLM - Bulk (reporting limit) <input type="checkbox"/> PLM EPA 600/R-93/116 (<1%) <input type="checkbox"/> PLM EPA NOB (<1%) Point Count <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) Point Count w/Gravimetric <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) <input type="checkbox"/> NYS 198.1 (friable in NY) <input type="checkbox"/> NYS 198.6 NOB (non-friable-NY) <input type="checkbox"/> NIOSH 9002 (<1%)	TEM - Air <input type="checkbox"/> 4-4.5hr TAT (AHERA only) <input type="checkbox"/> AHERA 40 CFR, Part 763 <input type="checkbox"/> NIOSH 7402 <input type="checkbox"/> EPA Level II <input type="checkbox"/> ISO 10312 TEM - Bulk <input type="checkbox"/> TEM EPA NOB <input type="checkbox"/> NYS NOB 198.4 (non-friable-NY) <input type="checkbox"/> Chatfield SOP <input type="checkbox"/> TEM Mass Analysis-EPA 600 sec 2.5 TEM - Water: EPA 100.2 Fibers >10µm <input type="checkbox"/> Waste <input type="checkbox"/> Drinking All Fiber Sizes <input type="checkbox"/> Waste <input type="checkbox"/> Drinking	TEM - Dust <input type="checkbox"/> Microvac - ASTM D 5755 <input type="checkbox"/> Wipe - ASTM D6480 <input type="checkbox"/> Carpet Sonication (EPA 600/J-93/167) Soil/Rock/Vermiculite <input checked="" type="checkbox"/> PLM CARB 435 - A (0.25% sensitivity) <input type="checkbox"/> PLM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - C (0.01% sensitivity) <input type="checkbox"/> EPA Protocol (Semi-Quantitative) <input type="checkbox"/> EPA Protocol (Quantitative) Other: <input type="checkbox"/>
--	---	--

Check For Positive Stop - Clearly Identify Homogenous Group

Samplers Name:

Samplers Signature:

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
B1-0	soil	2 p/bx bag	6/19/14 10:08
B1-10			10:20
B1-20			10:35
B1-30			10:45
B1-40			10:55
B3-0			12:16
B3-10			12:35
B3-20			12:39

Client Sample # (s): <u>25</u>	Total # of Samples:
Relinquished (Client): <u>[Signature]</u>	Date: <u>6/23/14</u> Time: <u>16:45</u>
Received (Lab): <u>[Signature]</u>	Date: <u>6/24/14</u> Time: <u>8:45</u>
Comments/Special Instructions: <u>[Signature]</u>	



Asbestos Chain of Custody

EMSL Order Number (Lab Use Only)

091409921

EMSL ANALYTICAL, INC.
2235 POLVOROSA DR, STE 230
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
B3-30	soil	2: plac bag	6/19/14 12:45
B3-40			↓ 12:54
B5-0			6/20/14 8:35
B5-10			8:50
B5-20			8:55
B5-30			9:05
B5-40			9:10
B7-0			10:05
B7-10			10:20
B7-20			10:26
B7-30			10:30
B7-40			10:35
B9-0			12:12
B9-10			12:26
B9-20			12:35
B9-30			12:45
B9-40			
*Comments/Special Instructions:			



EMSL ANALYTICAL, INC.
LABORATORY PRODUCTS TRAINING

Asbestos Chain of Custody

EMSL Order Number (Lab Use Only):

091409921

EMSL ANALYTICAL, INC.
2235 POLVOROSA DR, STE. 230
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**

Street: 6671 Brian St. Third Party Billing requires written authorization from third party

City: Livermore State/Province: _____ Zip/Postal Code: 94550 Country: USA

Report To (Name): LuAnn Beadle Fax #: 925-371-5915

Telephone #: 925-371-5900 Email Address: beadle@geoconinc.com

Project Name/Number: SR84 - I-280 Caltrans Contract 04A4336 Pricing

Please Provide Results: Fax Email Purchase Order: _____ U.S. State Samples Taken: _____

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 hours/6 hours, 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 <input type="checkbox"/> NIOSH 7400 <input type="checkbox"/> w/ OSHA 8hr. TWA	TEM - Air <input type="checkbox"/> 4-4.5hr TAT (AHERA only) <input type="checkbox"/> AHERA 40 CFR, Part 763 <input type="checkbox"/> NIOSH 7402 <input type="checkbox"/> EPA Level II <input type="checkbox"/> ISO 10312	TEM - Dust <input type="checkbox"/> Microvac - ASTM D 5755 <input type="checkbox"/> Wipe - ASTM D6480 <input type="checkbox"/> Carpet Sonication (EPA 600/J-93/167)
PLM - Bulk (reporting limit) <input type="checkbox"/> PLM EPA 600/R-93/116 (<1%) <input type="checkbox"/> PLM EPA NOB (<1%) Point Count <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) Point Count w/Gravimetric <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) <input type="checkbox"/> NYS 198.1 (friable in NY) <input type="checkbox"/> NYS 198.6 NOB (non-friable-NY) <input type="checkbox"/> NIOSH 9002 (<1%)	TEM - Bulk <input type="checkbox"/> TEM EPA NOB <input type="checkbox"/> NYS NOB 198.4 (non-friable-NY) <input type="checkbox"/> Chatfield SOP <input type="checkbox"/> TEM Mass Analysis-EPA 600 sec. 2.5	Soil/Rock/Vermiculite <input checked="" type="checkbox"/> PLM CARB 435 - A (0.25% sensitivity) <input type="checkbox"/> PLM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - C (0.01% sensitivity) <input type="checkbox"/> EPA Protocol (Semi-Quantitative) <input type="checkbox"/> EPA Protocol (Quantitative)
TEM - Water: EPA 100.2 Fibers >10µm <input type="checkbox"/> Waste <input type="checkbox"/> Drinking All Fiber Sizes <input type="checkbox"/> Waste <input type="checkbox"/> Drinking		Other: <input type="checkbox"/>

Check For Positive Stop - Clearly Identify Homogenous Group

Samplers Name: _____ Samplers Signature: _____

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
B2-0	soil ↓	2 ploc bags ↓	6/20/14 7:15
B2-5			7:20
B2-10			7:50
B4-0			8:00
B4-5			8:30
B4-7			8:40
B6-0			8:55
B6-5			9:20

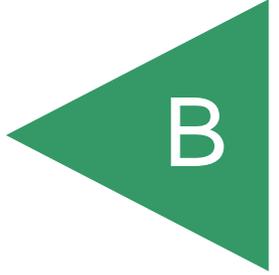
Client Sample # (s): 12 Total # of Samples: _____

Relinquished (Client): [Signature] Date: 6/23/14 Time: 16:45

Received (Lab): [Signature] Date: 6-24-14 Time: 8:45a

Comments/Special Instructions: COIL

APPENDIX



DEPTH IN FEET	BLOW COUNT	SAMPLE NO.	LITHOLOGY	BORING NO. B1		SOIL (USCS)	HEADSPACE (PPM)
				DATE DRILLED <u>6/19/2014</u>	WATER LEVEL (ATD) _____		
				EQUIPMENT <u>Hollow-stem Auger</u>		DRILLER <u>Gregg Drilling</u>	
SOIL DESCRIPTION							
1		B1-0	4 INCHES ASPHALT	Sandy Gravelly Fill		GP	
2		B1-1	Sandy Gravelly Fill				
3		B1-3	Hard, dry, brown to yellowish brown, fine to coarse Sandy SILT/Silty fine to coarse SAND, semi-lithified		ML/SM		
4		B1-5					
5		B1-5					
6							
7							
8							
9							
10		B1-10					
11							
12							
13							
14							
15							
16							
17							
18							
19							
20		B1-20					
21							
22							
23							
24							

BORING ELEVATION:	ENGINEER/GEOLOGIST: John Love
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PROJECT NO. **E8271-06-06**

DEPTH IN FEET	BLOW COUNT	SAMPLE NO.	LITHOLOGY	BORING NO. B1		SOIL (USCS)	HEADSPACE (PPM)
				DATE DRILLED <u>6/19/2014</u>	WATER LEVEL (ATD) _____		
				EQUIPMENT <u>Hollow-stem Auger</u>		DRILLER <u>Gregg Drilling</u>	
SOIL DESCRIPTION							
26							
27							
28							
29							
30		B1-30					
31							
32							
33							
34							
35							
36				Very dense, moist, light brown, Clayey fine SAND, low plasticity	SC		
37							
38							
39							
40		B1-40		BORING TERMINATED AT 40 FEET			

Log of Boring B1, page 2 of 2

ENV_NO_WELL E8271-02-06 LOGS.GPJ 07/23/14

BORING ELEVATION:	ENGINEER/GEOLOGIST: John Love
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NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	BLOW COUNT	SAMPLE NO.	LITHOLOGY	BORING NO. B3		SOIL (USCS)	HEADSPACE (PPM)
				DATE DRILLED <u>6/19/2014</u>	WATER LEVEL (ATD) _____		
				EQUIPMENT <u>Hollow-stem Auger</u>		DRILLER <u>Gregg Drilling</u>	
SOIL DESCRIPTION							
1		B3-0		4 INCHES ASPHALT		GP	
2		B3-1		Sandy Gravelly Fill		SM	
3				Very dense, slightly moist, light to dark brown, Silty SAND, predominantly fine sand			
4		B3-3					
5							
6		B3-5					
7							
8							
9				Stiff, moist, dark brown, fine Sandy CLAY, medium plasticity		CL	
10		B3-10					
11							
12							
13							
14							
15							
16				Very stiff, slightly moist, yellowish brown, fine Sandy SILT		ML	
17							
18							
19							
20		B3-20					
21				- light greenish brown			
22							
23							
24							

BORING ELEVATION:	ENGINEER/GEOLOGIST: John Love
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PROJECT NO. **E8271-06-06**

DEPTH IN FEET	BLOW COUNT	SAMPLE NO.	LITHOLOGY	BORING NO. B3		SOIL (USCS)	HEADSPACE (PPM)	
				DATE DRILLED <u>6/19/2014</u>	WATER LEVEL (ATD) _____			
				EQUIPMENT <u>Hollow-stem Auger</u> DRILLER <u>Gregg Drilling</u>				
SOIL DESCRIPTION								
26								
27								
28								
29								
30		B3-30	█	- gray				
31								
32								
33								
34								
35								
36								
37								
38								
39								
40		B3-40	█	BORING TERMINATED AT 40 FEET				

Log of Boring B3, page 2 of 2

ENV_NO_WELL E8721-02-06 LOGS.GPJ 07/23/14

BORING ELEVATION:	ENGINEER/GEOLOGIST: John Love
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DEPTH IN FEET	BLOW COUNT	SAMPLE NO.	LITHOLOGY	BORING NO. B5		SOIL (USCS)	HEADSPACE (PPM)
				DATE DRILLED <u>6/20/2014</u>	WATER LEVEL (ATD) _____		
				EQUIPMENT <u>Hollow-stem Auger</u>		DRILLER <u>Gregg Drilling</u>	
SOIL DESCRIPTION							
1		B5-0		4 INCHES ASPHALT		GP SM/SW	
2		B5-1		Hard, dry, brown to variegated, Silty fine to coarse SAND			
3		B5-3					
4		B5-5					
5		B5-5		Hard, dry, yellowish brown, Silty fine to coarse SAND		SM	
6							
7							
8							
9							
10		B5-10					
11							
12							
13							
14							
15							
16							
17							
18							
19							
20		B5-20		Very dense, slightly moist, brown, Silty fine SAND		SM	
21							
22							
23							
24							

BORING ELEVATION:	ENGINEER/GEOLOGIST: John Love
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PROJECT NO. **E8271-06-06**

DEPTH IN FEET	BLOW COUNT	SAMPLE NO.	LITHOLOGY	BORING NO. B5		SOIL (USCS)	HEADSPACE (PPM)
				DATE DRILLED <u>6/20/2014</u>	WATER LEVEL (ATD) _____		
				EQUIPMENT <u>Hollow-stem Auger</u> DRILLER <u>Gregg Drilling</u>			
SOIL DESCRIPTION							
26							
27							
28							
29							
30		B5-20			Hard, dry, light brown with some orange and black, Sandy SILT, semi-lithified	ML	
31							
32							
33							
34							
35							
36							
37							
38							
39							
40		B5-40			BORING TERMINATED AT 40 FEET		

Log of Boring B5, page 2 of 2

ENV_NO_WELL E8271-02-06 LOGS.GPJ 07/23/14

BORING ELEVATION:	ENGINEER/GEOLOGIST: John Love
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NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	BLOW COUNT	SAMPLE NO.	LITHOLOGY	BORING NO. B7		SOIL (USCS)	HEADSPACE (PPM)
				DATE DRILLED <u>6/20/2014</u>	WATER LEVEL (ATD) _____		
				EQUIPMENT <u>Hollow-stem Auger</u>		DRILLER <u>Gregg Drilling</u>	
SOIL DESCRIPTION							
1		B7-0		4 INCHES ASPHALT		GP	
2		B7-1		Sandy Gravelly Fill			
3				Hard, dry, light brown and black, fine to coarse Sandy SILT, some gravel		ML	
4				Stiff, moist, dark brown, fine to coarse Sandy CLAY, low to plasticity		CL	
5		B7-5		Stiff, moist, dark brown, fine to coarse Sandy CLAY, low to plasticity		CL	
6							
7							
8							
9							
10		B7-10		Moist, brown with bluish brown, fine to coarse Sandy CLAY, some angular gravel, low plasticity		CL	
11							
12							
13							
14							
15							
16							
17							
18							
19							
20		B7-20		Very dense, slightly moist, yellowish brown, Silty fine SAND		SM/SP	
21							
22							
23							
24							

BORING ELEVATION:	ENGINEER/GEOLOGIST: John Love
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PROJECT NO. **E8271-06-06**

DEPTH IN FEET	BLOW COUNT	SAMPLE NO.	LITHOLOGY	BORING NO. B7		SOIL (USCS)	HEADSPACE (PPM)
				DATE DRILLED <u>6/20/2014</u>	WATER LEVEL (ATD) _____		
				EQUIPMENT <u>Hollow-stem Auger</u> DRILLER <u>Gregg Drilling</u>			
SOIL DESCRIPTION							
26							
27							
28							
29							
30		B7-30			Firm, moist, yellowish brown, Silty fine SAND	SM	
31							
32							
33							
34							
35							
36							
37							
38							
39					- very moist at 40'		
40		B7-40			BORING TERMINATED AT 40 FEET		

Log of Boring B7, page 2 of 2

ENV_NO_WELL E8721-02-06 LOGS.GPJ 07/23/14

BORING ELEVATION:	ENGINEER/GEOLOGIST: John Love
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NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	BLOW COUNT	SAMPLE NO.	LITHOLOGY	BORING NO. B9		SOIL (USCS)	HEADSPACE (PPM)
				DATE DRILLED <u>6/20/2014</u>	WATER LEVEL (ATD) _____		
				EQUIPMENT <u>Hollow-stem Auger</u>		DRILLER <u>Gregg Drilling</u>	
SOIL DESCRIPTION							
1		B9-0		4 INCHES ASPHALT		GP	
2		B9-1		Sandy Gravelly Fill			
3		B9-3		Dense, dry, greenish gray, Gravelly well graded SAND		GW	
4							
5		B9-5					
6							
7							
8							
9							
10		B9-10					
11							
12				- very hard drilling			
13							
14							
15							
16							
17							
18							
19							
20		B9-20		- bluish gray, slightly moist			
21							
22							
23							
24							

BORING ELEVATION:	ENGINEER/GEOLOGIST: John Love
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PROJECT NO. **E8271-06-06**

DEPTH IN FEET	BLOW COUNT	SAMPLE NO.	LITHOLOGY	BORING NO. B9		SOIL (USCS)	HEADSPACE (PPM)
				DATE DRILLED <u>6/20/2014</u>	WATER LEVEL (ATD) _____		
				EQUIPMENT <u>Hollow-stem Auger</u> DRILLER <u>Gregg Drilling</u>			
SOIL DESCRIPTION							
26			○				
27			○				
28			○				
29			○				
30		B9-30	○				
31			○				
32			○				
33			○				
34			○				
35			○				
36			○				
37			○				
38			○				
39			○				
40		NOREC	○	- tree root			
				BORING TERMINATED AT 40 FEET			

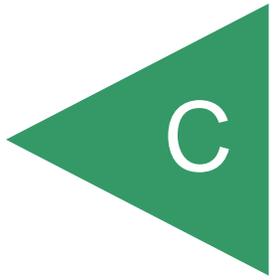
Log of Boring B9, page 2 of 2

ENV_NO_WELL E8721-02-06 LOGS.GPJ 07/23/14

BORING ELEVATION:	ENGINEER/GEOLOGIST: John Love
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NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

APPENDIX



As

Number of Valid Observations	6
Number of Distinct Observations	6
Minimum	0.5
Maximum	6.5
Mean	2.65
Median	2.35
SD	2.157
Variance	4.651
Coefficient of Variation	0.814
Skewness	1.262
Mean of log data	0.666
SD of log data	0.912
95% Standard Bootstrap UCL	3.99

Co

Number of Valid Observations	6
Number of Distinct Observations	6
Minimum	7.1
Maximum	24
Mean	13.4
Median	9.4
SD	7.878
Variance	62.07
Coefficient of Variation	0.587
Skewness	0.909
Mean of log data	2.463
SD of log data	0.55
95% Standard Bootstrap UCL	18.3

TPHd

Number of Valid Observations	16
Number of Distinct Observations	14
Minimum	1.8
Maximum	2,900
Mean	283
Median	10.45
SD	729.7
Variance	532468
Coefficient of Variation	2.579
Skewness	3.482
Mean of log data	3.033
SD of log data	2.307
95% Standard Bootstrap UCL	573

TPHmo

Number of Valid Observations	16
Number of Distinct Observations	14
Minimum	3.4
Maximum	12,000
Mean	1219
Median	28.5
SD	3041
Variance	9246876
Coefficient of Variation	2.495
Skewness	3.369
Mean of log data	4.132
SD of log data	2.629
95% Standard Bootstrap UCL	2,450



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

15024A081CT

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

of 111 GRAND AVENUE; OAKLAND, CA 94612

at STATE ROUTE 84 STORM DAMAGE REPAIR PROJECT

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. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and 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.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

SERPENTINITE CONTAINING ASBESTOS MAY BE PRESENT

The sixty-nine 42-inch-diameter 28-to-45-foot-deep vertical drilled shafts along the Interstate 280 northbound on-ramp located at the Route 84 and Interstate 280 intersection in Woodside, San Mateo County

This classification shall be conspicuously posted at the place of employment.



Douglas Patterson, Senior Engineer

September 29, 2014

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
2424 Arden Way, Suite 125
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



TO: Persons Interested In Recycled Water
FROM: Palo Alto Regional Water Quality Control Plant
SUBJECT: Recycled Water Application, Permit, and Rules

REUSE OF TERTIARY RECYCLED WATER

The Palo Alto Regional Water Quality Control Plant will provide tertiary recycled water at no charge to permitted contractors, commercial landscapers, industrial and commercial facilities, institutions, and government agencies. The plant produces “TERTIARY” quality water pursuant to state regulations. Acceptable uses are shown on the following page.

RECYCLED WATER PERMIT COST

The Recycled Water Permit Fee is \$50.00 check or money order (no cash) payable to “**City of Palo Alto.**” Payment should be included with the application. Payment of the permit fee allows self-service pickup and use of recycled water for three years on a first come-first served basis up to the capacity of the Recycled Water Plant (4.5 mgd).

STANDPIPE LOCATION & HOURS

The overhead standpipe is located at 2501 Embarcadero Way, Palo Alto, CA 94303. The standpipe provides two connections:

1. An overhead water tank truck fill rate as high as 500-gallons per minute.
2. A 2-inch fire hose for filling smaller tanks

Standpipe fill hours are Monday to Friday 7:00 a.m. to 4:30 p.m. except on Palo Alto public holidays¹ and monthly Household Hazardous Waste collection days (the first Friday of the month from 2:00 p.m. to 5:00 p.m.). The system may be shut down on some occasions for maintenance. Hours may be expanded during exceptional drought conditions. Permittees applying recycled water from the standpipe to use areas outside the plant service area will not have priority to use the water during periods of drought (or other circumstances) where recycled water needs to be rationed to those areas within the plant service area.

WATER QUALITY

The recycled water meets state regulations for safe use of tertiary recycled water. A recent laboratory analysis info sheet is available for analyzing agronomic and other water quality data.

PERMIT AND APPLICATION

Users/distributors are required to fill out and sign the attached recycled water permit² and application and shall be responsible for the proper distribution and use of the recycled water. Recycled water permit applications are available from the Regional Water Quality Control Plant [website](#) or at 2501 Embarcadero Way, Palo Alto, CA 94303 during business hours. Changes in use or use sites will require an updated application to be approved.

¹ See <http://www.cityofpaloalto.org/cals/>

² Palo Alto Municipal Code Chapter 16.12 and San Francisco Bay RWQCB Board Order 93-160

Suitable Uses* of Recycled Water

<i>Use of Recycled Water</i>	Treatment Level		
	Tertiary Recycled Water	Secondary-2.2 Recycled Water	Secondary-23 Recycled Water
<i>Irrigation of:</i>			
Food crops—contact with edible portion of crop	Allowed	Not Allowed	Not Allowed
Parks and playgrounds	Allowed	Not Allowed	Not Allowed
School yards	Allowed	Not Allowed	Not Allowed
Residential landscaping	Allowed	Not Allowed	Not Allowed
Unrestricted access golf courses	Allowed	Not Allowed	Not Allowed
Any other irrigation uses not prohib. by other prov. of CCR	Allowed	Not Allowed	Not Allowed
Food crops—edible portion above gd/not in contact w/ recl. Water	Allowed	Allowed	Not Allowed
Cemetaries	Allowed	Allowed	Allowed
Freeway landscaping	Allowed	Allowed	Allowed
Restricted access golf courses	Allowed	Allowed	Allowed
Ornamental nursery stock and sod farms	Allowed	Allowed	Allowed
Pasture for milk animals	Allowed	Allowed	Allowed
Any nonedible vegetation with access control to prevent use as if it were a park, playground or school yard.	Allowed	Allowed	Allowed
Orchards w/ no contact between edible portion and recl. water.	Allowed	Allowed	Allowed
Vineyards w/ no contact between edible portion and recl. water	Allowed	Allowed	Allowed
Non food-bearing trees not irrigated <14 days of harvest	Allowed	Allowed	Allowed
Fodder crops (e.g. alfalfa) and fiber crops (e.g. cotton)	Allowed	Allowed	Allowed
Seed crops not eaten by humans	Allowed	Allowed	Allowed
Food crops that undergo commercial pathogen-destroying processing before human consumption (e.g. sugar beets)	Allowed	Allowed	Allowed
<i>Supply for impoundments:</i>			
Nonrestricted rec. impound., w/ suppl. monit. for path. org.	Allowed**	Not Allowed	Not Allowed
Restricted rec. impound. and fish hatcheries	Allowed	Allowed	Not Allowed
Landscape impound. w/o decorative fountains	Allowed	Allowed	Allowed
<i>Supply for cooling or air cond.:</i>			
Ind. or comm. cooling or air cond. with cooling tower, evaporative condenser, or spraying that creates a mist	Allowed***	Not Allowed	Not Allowed
Ind. or comm. cooling or air cond. w/o cooling tower, evaporative condenser, or spraying that creates a mist	Allowed	Allowed	Allowed
<i>Other uses:</i>			
Flushing toilets and urinals	Allowed	Not Allowed	Not Allowed
Priming drain traps	Allowed	Not Allowed	Not Allowed
Industrial process water that may contact workers	Allowed	Not Allowed	Not Allowed
Structural fire fighting	Allowed	Not Allowed	Not Allowed
Decorative fountains	Allowed	Not Allowed	Not Allowed
Commercial laundries	Allowed	Not Allowed	Not Allowed
Consol. of backfill material around potable water pipelines	Allowed	Not Allowed	Not Allowed
Artificial snow making for commercial outdoor uses	Allowed	Not Allowed	Not Allowed
Industrial boiler feed	Allowed	Allowed	Allowed
Nonstructural fire fighting	Allowed	Allowed	Allowed
Backfill consol. around nonpotable piping	Allowed	Allowed	Allowed
Soil compaction	Allowed	Allowed	Allowed
Mixing concrete	Allowed	Allowed	Allowed
Dust control on roads and streets	Allowed	Allowed	Allowed
Cleaning roads, sidewalks and outdoor work areas	Allowed	Allowed	Allowed
Flushing sanitary sewers	Allowed	Allowed	Allowed

* Refer to the full text of the latest version of Title-22

** With "conventional tertiary treatment" additional monitoring may be necessary

*** Drift eliminators and/or biocides are required if public or employees can be exposed to mist

RULES AND REGULATIONS FOR THE USE OF RECYCLED WATER

A. RECYCLED WATER USE AGREEMENTS

- 1. Final requirements added to those in this permit packet may be required pursuant to state regulations, the plant’s NPDES permit, and other requirements, as warranted and will constitute the Recycled Water Use Agreement³
- 2. For large scale and long-term projects, a more detailed application meeting State of California Department of Public Health and/or San Francisco Bay Regional Water Quality Control Board requirements may apply and involve additional requirements.

B. RECYCLED WATER USER: PERMIT RULES AND REGULATIONS

- 1. Recycled Water Production^{4, 5}
 - a. The City of Palo Alto is the recycled water producer, producing “TERTIARY” recycled water.
 - b. The permittee is a “USER” and may only use recycled water produced by the city that is filtered, oxidized, and disinfected, meeting the following water quality standards:

5-day biochemical oxygen demand (BOD)	10 mg/l, 30 day average
5-day BOD	20 mg/l, daily maximum
Dissolved Oxygen.....	1.0 mg/l, daily minimum
Dissolved Sulfide	0.1 mg/l, daily maximum
Turbidity	2 turbidity units, maximum daily average
Turbidity	5 turbidity units, maximum, 5% of any 24-h period
Turbidity	10 turbidity units, maximum
Total Coliform Organisms.	The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed an MPN of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30 day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters.

- c. The city reserves the right to discontinue the delivery of recycled water at any time it cannot meet its responsibilities as Producer to distribute recycled water meeting the above requirements.⁶

- 2. Use Rules
 - a. Reuse of recycled water shall not create a nuisance per Water Code⁷, defined as:

³ San Francisco Bay RWQCB Board Order 93-160, Provisions Section C.2
⁴ San Francisco Bay RWQCB Board Order 93-160, Section A.1, A.2, and A.4
⁵ Title 22, Division 4, Chapter 3, Section 60301 – 60355
⁶ San Francisco Bay RWQCB Board Order 93-160, Section A.3
⁷ San Francisco Bay RWQCB Board Order 93-160, Prohibitions Section B.1; California Water Code 13050(m)

- i...Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.
 - ii...Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.
 - iii...Occurs during, or as a result of, the treatment or disposal of wastes.
- b. No recycled water shall be discharged from the treatment facilities, irrigation holding tanks, storage ponds, man-made marsh, or other containment, other than for irrigation, industrial reuse, or for discharge to a municipal sewage collection system.⁸
- c. Recycled water shall not be used as a domestic or animal water supply.⁹
- d. Spray, mist, or runoff shall not enter dwellings, designated outdoor eating areas, or food handling facilities.¹⁰
- e. Drinking water fountains shall be protected against contact with recycled water spray, mist, or runoff.¹¹
- f. Recycled water shall not be applied in groundwater recharge and wellhead protection areas (so designated by local agencies).¹²

3. Cross Connection Prevention

- a. There shall be no cross-connections between the potable water supply and pipes containing recycled water. Supplementing recycled water with water used for domestic supply shall not be allowed except through an air-gap separation.¹³
- b. An air-gap or reduced pressure principle backflow device shall be provided at all domestic water service connections to recycled water use areas.¹⁴
- c. Except as allowed under section 7604 of title 17, California Code of Regulations, no physical connection shall be made or allowed to exist between any recycled water system and any separate system conveying potable water.¹⁵
- d. Cross connection prevention shall be provided, as required, pursuant to state and local regulations.¹⁶

4. Irrigation Rules

- a. No recycled water used for irrigation shall be applied during periods of rainfall or when soils are saturated such that runoff occurs.¹⁷
- b. No recycled water used for irrigation shall be allowed to escape to areas outside the designated use areas by surface flow or by airborne spray.¹⁸
- c. Recycled water shall not be applied to park, golf course, or landscape areas in such a manner or at such times that may expose golf, picnickers, or other

⁸ San Francisco Bay RWQCB Board Order 93-160, Prohibitions Section B.5

⁹ San Francisco Bay RWQCB Board Order 93-160, Prohibitions Section B.6

¹⁰ Title 22, Division 4, Chapter 3, Section 60310 (e) (2)

¹¹ Title 22, Division 4, Chapter 3, Section 60310 (e) (3)

¹² Board Order 96-011 (by reference only)

¹³ San Francisco Bay RWQCB Board Order 93-160, Prohibitions Section B.6

¹⁴ San Francisco Bay RWQCB Board Order 93-160, Prohibitions Section B.6

¹⁵ Title 22, Division 4, Chapter 3, Section 60310 (h)

¹⁶ Title 17, Division 1, Chapter 5, Group 4, Article 2

¹⁷ San Francisco Bay RWQCB Board Order 93-160, Prohibitions Section B.2

¹⁸ San Francisco Bay RWQCB Board Order 93-160, Prohibitions Section B.3

individuals, or that may cause picnic tables, and other food and drinking outlets to come into contact with airborne spray droplets.¹⁹

- d. Any irrigation runoff shall be confined to the recycled water use area, unless the runoff does not pose a public health threat and is authorized by the regulatory agency.²⁰
- e. To the extent possible, the operation of the irrigation system should be during periods of minimal public use of the approved area.²¹

5. Signs

- a. The User shall assure that all above ground equipment, including pumps, piping, storage reservoir, and valves, etc. which may at any time contain recycled water shall be adequately and clearly identified with warning signs. The User shall make all necessary provisions to inform the public that the liquid being distributed is recycled water and is unfit for human consumption.²²
- b. Warning signs and labels should read "CAUTION: NONPOTABLE WATER – DO NOT DRINK," or "CAUTION: RECYCLED WATER – DO NOT DRINK," or other approved sign.²³
- c. All use areas where recycled water is used that are accessible to the public shall be posted with signs that are visible to the public, in a size no less than 4 inches high by 8 inches wide, that include the following wording : "RECYCLED WATER - DO NOT DRINK". Each sign shall display an international symbol similar to that shown in Title 22 regulations, Section 60310-A. The Department of Public Health may accept alternative signage and wording, or an educational program, provided the applicant demonstrates to the Department of Public Health that the alternative approach will assure an equivalent degree of public notification.²⁴

6. On-site Requirements²⁵

- a. Dual plumbed systems for toilet and urinal flushing and floor trap priming shall comply with state regulations.²⁶
- b. Special rules apply to use of recycled water for industrial or commercial cooling or air conditioning that involve the use of a cooling tower, evaporative condenser, spraying or any mechanism that creates a mist.²⁷
- c. Water strainers may be required on-site
- d. Irrigation controllers shall be:
 - i. Automatic
 - ii. Provided with a moisture sensor controller²⁸ to prevent irrigation during periods of rainfall.

¹⁹ San Francisco Bay RWQCB Board Order 93-160, Prohibitions Section B.4

²⁰ Title 22, Division 4, Chapter 3, Section 60310 (e) (1)

²¹ San Francisco Bay RWQCB Board Order 93-160, Provisions Section C.9, Guidelines for Distribution of Nonpotable Water, California-Nevada Section American Water Works Association (1992), Section 5.10.2

²² San Francisco Bay RWQCB Board Order 93-160, Provisions Section C.8

²³ San Francisco Bay RWQCB Board Order 93-160, Provisions Section C.9, Guidelines for Distribution of Nonpotable Water, California-Nevada Section American Water Works Association (1992), Section 5.12

²⁴ Title 22, Division 4, Chapter 3, Section 60310 (g)

²⁵ San Francisco Bay RWQCB Board Order 93-160, Provisions Section C.9, Guidelines for Distribution of Nonpotable Water, California-Nevada Section American Water Works Association (1992), Section 5

²⁶ Title 22, Division 4, Chapter 3, Article 5

²⁷ Title 22, Division 4, Chapter 3, Section 60306

- iii. Color coded differently from potable water controllers.
 - iv. Labeled inside and outside that water is recycled water.
 - v. Provided with any special instructions for recycled water use needed for those managing the system.
 - e. Backflow prevention is required if potable water shares the use area with recycled water.
 - f. Pipelines, equipment, and irrigated areas should be clearly identified with purple pipe, warning tape, tape wrap, signs, etc. as follows:
 - i. New systems - Per state regulations
 - ii. Converted onsite systems – By review with RWQCP staff
 - g. Hoses
 - i. Recycled water hose bibbs are not allowed; quick couplers with signage are allowed for recycled water.
 - ii. Nonpotable hoses shall not be compatible with onsite potable hose bibb connections.
 - iii. Potable hose bibbs shall also have a sign when nonpotable water is used onsite.
 - iv. The portions of the recycled water piping system that are in areas subject to access by the general public shall not include any hose bibbs. Only quick couplers that differ from those used on the potable water system shall be used on the portions of the recycled water piping system in areas subject to public access.²⁹
 - h. Onsite potable water lines shall also have 3-inch wide warning tape provided on top of the pipe.
 - i. Horizontal / vertical separations are required.
 - j. Any drinking fountains must be outside of nonpotable use areas.
 - k. Applications must indicate that no drinking fountains, picnic tables, or food establishments will exist in the use area.

7. Water Trucks

- a. Trucks shall have a label indicating that they contain recycled water.³⁰

8. Impoundments

- a. Warning signs shall be installed to notify that the water in the impoundment is unsafe to drink.³¹
- b. No impoundment of disinfected tertiary recycled water shall occur within a certain distance of a domestic water supply well.³²

9. System Management

- a. Users will be responsible for the application of recycled water on their respective use areas and associated operations and maintenance.³³

²⁸ A satellite, wireless, or internet based ET controller is an acceptable alternative to a moisture sensor.

²⁹ Title 22, Division 4, Chapter 3, Section 60310 (i)

³⁰ San Francisco Bay RWQCB Board Order 93-160, Provisions Section C.9, Guidelines for Distribution of Nonpotable Water, California-Nevada Section American Water Works Association (1992), Section 5.8

³¹ San Francisco Bay RWQCB Board Order 93-160, Provisions Section C.9, Guidelines for Distribution of Nonpotable Water, California-Nevada Section American Water Works Association (1992), Section 5.12

³² Title 22, Division 4, Chapter 3, Section 60310

³³ San Francisco Bay RWQCB Board Order 93-160, Provisions Section C.5

- b. The User shall provide employee training to assure proper operation of recycled water facilities, worker protection, and compliance with state rules.³⁴
- c. The USER is responsible for all onsite system maintenance, supervision, user training, noticing RWQCP of system changes, operation in accordance with rules and regulations, and reporting.³⁵
- d. City, county, and state regulatory staff overseeing recycled water will have the right to inspect use areas during reasonable hours for verifying records and proper application of recycled water as well as ensure proper maintenance, supervision, training, and operation of recycled water systems.³⁶
- e. Violations of any of the rules herein should be self-reported to the RWQCP, with corrective actions planned and implemented by the USER. Failure to correct and/or cease violations within a timeframe determined by the Producer may result in termination of the User's permit. Penalties may also be assessed.³⁷
- f. Recycled water customers shall meter and record flow. Recycled water users shall make self-monitoring observations pursuant to any requirements in their permit.³⁸
- g. Recycled water facilities shall be operated in conformance with the California Department of Public Health 'Guidelines for Use of Reclaimed Wastewater for Irrigation and Impoundment' and "Guidelines for Worker Protection at Reclamation Use Areas" and the American Water Works Association California-Nevada Section's Guideline for the Distribution of Nonpotable Water.³⁹
- h. User shall conduct a complete inspection of all irrigation lines, sprinklers, and emitters at least once each year during the dormant season. A report of the findings of these inspections, including descriptions of any significant repairs or modifications made to the distribution systems, shall be submitted annually.⁴⁰
- i. User must carry a copy of the Recycled Water Use Agreement, release form, and Board Order 93-160 and provide them for inspection to state, county, and local officers when requested.⁴¹

C. MISCELLANEOUS RULES

- 1. Recycled water shall not be allowed to escape from the designated use area as surface flow to either pond or to enter waters of the state.
- 2. Adequate measures shall be taken to minimize public contact with recycled water and to prevent the breeding of flies, mosquitoes, and other vectors of public health significance during the process of reuse.
- 3. Signs
 - a. Adequate means of notification shall be provided to inform the public that recycled water is being used. Conspicuous warning signs with proper wording of sufficient size to be clearly read shall be posted at adequate intervals around the use area, unless public access is otherwise restricted.

³⁴ San Francisco Bay RWQCB Board Order 93-160, Provisions Section C.7

³⁵ San Francisco Bay RWQCB Board Order 93-160, Provisions Section C.6

³⁶ San Francisco Bay RWQCB Board Order 93-160, Provisions Section C.10; California Water Code 13267 (c)

³⁷ San Francisco Bay RWQCB Board Order 93-160, Provisions Section C.9, Guidelines for Distribution of Nonpotable Water, California-Nevada Section American Water Works Association (1992), Section 6.5 and 6.6

³⁸ San Francisco Bay RWQCB Board Order 93-160, Provisions Section C.4

³⁹ San Francisco Bay RWQCB Board Order 93-160, Provisions Section C.9

⁴⁰ San Francisco Bay RWQCB Board Order 93-160, Self Monitoring Program Section VI.2

⁴¹ San Francisco Bay RWQCB Board Order 93-160, Provisions Section C.3

- b. All recycled water valves, outlets and sprinkler heads should be appropriately tagged to warn the public that the water is not safe for drinking or direct contact. Tank trucks used for carrying or spraying recycled water should be identified as such.
4. Use: Recycled water shall not be applied on walkways, passing vehicles, buildings, or areas not under the control of the user.
5. Irrigation: The landscape irrigation must be done during periods when the grounds will have maximum opportunity to dry before use by the public. Irrigated areas shall be properly graded to minimize ponded water.

D. MISCELLANEOUS RULES FOR IMPOUNDMENTS

1. Distribution (filling) would occur from tank truck manually with the operator present at all times.
2. Appropriate signs would be posted to identify the water as being recycled water and no wading allowed.
3. Algae growth due to nutrients in recycled water to be controlled by manual removal or other appropriate means.
4. It is not recommended to use chemicals containing metals.

GUIDELINES FOR WORKER PROTECTION⁴² **(State Department of Public Health Guidelines)**

The following guidelines pertain to all categories of recycled water:

A. Workers should be informed that although recycled water has been treated to lower health risks, bacterial and viral contamination may be present and potentially may cause illness or infection. Contact with recycled water by ingestion, inhalation of mist, or on cuts or abrasions should be avoided, and the precautionary measures listed below should be carefully reviewed and followed.

B. Precautionary measures should be taken to minimize worker contact with constituents of recycled water.

1. Workers should not be subjected to recycled water sprays, mists or aerosols.
2. Workers should be protected with protective clothing when there will be more than casual contact with the recycled water.
3. Where oxidized, coagulated, clarified, filtered, or disinfected recycled water is used, less stringent precautions may be allowed. [Note: City provides recycled water meeting this criteria.]

C. Safe drinking water should be supplied for workers. Where bottled water is provided, the water should be in contamination-proof containers and protected from recycled water and dust.

D. Hand-washing facilities should be provided consisting of potable water supply, hand-washing soap, and single use sanitary paper towels. The importance of hand washing should be stressed when working with recycled water, especially before eating or smoking.

E. Workers should not apply recycled water by hand held nozzles or other hand held devices that can produce sprays, mists or aerosols.

F. Precautions should be taken to avoid contamination of food taken into recycled water use areas. Food should not be taken into areas still wet with recycled water.

G. Workers should be notified that recycled water is in use. Notification should include the posting of conspicuous warning signs with proper wording of sufficient size to be clearly read.

In those locations where English is not the primary language of the workers, the signs should be in the appropriate language as well as English.

H. An adequate First Aid kit should be available on location. Cuts and abrasions should be promptly washed, disinfected, and bandaged.

⁴² San Francisco Bay RWQCB Board Order 93-160, Provisions Section C.9, Guidelines for Worker Protection, California Department of Public Health

APPLICATION FOR RECYCLED WATER USE PERMIT

USER Name: _____
USER Address: _____
USER City, State, Zip: _____
USER phone: _____
USER email: _____

SITE SUPERVISOR Name: _____
SITE SUPERVISOR Address: _____
SITE SUPERVISOR City, State, Zip: _____
SITE SUPERVISOR phone: _____
SITE SUPERVISOR email: _____

Distribution method:

- Water truck spray
- Water truck hose
- Irrigation system
- Hard piped connection

Maximum anticipated usage (gallons / day) _____

Address of Use Area(s) _____

Type of Recycled Water Use (check all that apply)

- Irrigation of:
 - parks and playgrounds
 - school yards
 - residential landscaping
 - golf course
 - cemetery
 - freeway landscaping
 - nursery stock and sod farm
 - orchard, vineyard, food crops
 - other _____
- Impoundment:
 - nonrestricted recreational with body contact
 - restricted recreational impoundment
 - fish hatchery
 - landscape
- Onsite Use:
 - cooling or air conditioner
 - with cooling tower, evaporative condenser, or spraying that creates a mist
 - without cooling tower, evaporative condenser, or spraying that creates a mist
 - flushing toilets and/or urinals
 - priming drain traps
 - industrial process water
 - industrial boiler feed
 - commercial laundries
- Other:
 - decorative fountains

- dust control on roads and streets
- cleaning roads, sidewalks, and outdoor work areas
- flushing sanitary sewers
- consolidation of backfill material
 - around potable water pipelines
 - around nonpotable water pipelines
- soil compaction
- fire fighting
 - structural
 - nonstructural
- mixing concrete
- other _____

Questions for User for Review by Producer

General Questions for All Applicants

1. Are animals regularly present in the use area? _____
2. Are there dwellings present in the use area? _____
3. Are there designated outdoor eating areas in the use area? _____
4. Are there food and drinking outlets in the use area? _____
5. Are there food handling and/or food service establishments in the use area? _____
6. Are there drinking water fountains in the use area? _____
7. Are there picnic tables in the use area? _____
8. Is the use area in a groundwater recharge zone designated by the local agency? _____
9. Is the use area in a domestic water wellhead protection area designated by the local agency? _____
10. Will potable water be sharing the use area with recycled water? _____
11. Will the recycled water be mixed with potable water for further distribution/use? _____
12. Is there a domestic water system in the recycled water use area? _____
13. Are there above ground pumps, piping, or valves that will contain recycled water in the use area? _____
14. Will the public have access to the use area? _____
15. Will the use site have dual plumbing in a building? _____
16. Will the use site have toilet and urinal flushing with recycled water? _____
17. Will the use site have floor trap priming with the recycled water? _____
18. Will the use site use recycled water for industrial and commercial cooling or air conditioning? _____
19. Are there any hose bibbs in the recycled water use area? _____
20. Are there any hose bibbs on the entire property? _____
21. Will the use site have an impoundment? _____
22. Do workers distributing recycled water have safe drinking water accessible? _____
23. Do workers distributing recycled water have hand washing facilities with a potable water supply, hand-washing soap, and single use sanitary paper towels available? _____
24. Do workers distributing recycled water have a First Aid kit available at the use area? _____

Include Suitable Drawings, If Warranted, Including:

1. Show recycled water use area
2. Show recycled water piping, irrigation system, storage tanks, etc.
3. Show potable system in the same recycled water use area
4. Show hose bibbs (recycled water and potable water) on entire property
5. Show backflow preventers on property
6. Show all domestic wells on property and within 100 feet from periphery of use area
7. Show designated eating areas, food service facilities, drinking fountains, picnic tables, dwellings
8. Show impoundments

If using standpipe:

1. What size tank will be filled? _____
2. What are the cities where water will be distributed? _____
3. Does the truck have a label indicating that it contains recycled water? _____

THIS PERMIT IS FOR THE PROPOSED USE OF RECYCLED WATER, CONDITIONAL UPON THE FOLLOWING:

1. The enclosed permit packet's "Rules and Regulations for the Use of Recycled Water" shall be complied with.
2. The proposed use shall be ceased immediately when rules and regulations have been violated (by either the producer, user, or the distributor), and shall not be resumed until such time that all conditions causing the violations have been corrected.
3. The enclosed "Guidelines for Worker Protection" shall be complied with.
4. This permit may be terminated by the Producer (i.e., the City of Palo Alto Regional Water Quality Control Plant) at any time when deemed necessary.

Recycled water is water, which has been recycled from Sanitary Sewage. I have read the entire permit packet, initialed all pages, understand all rules, and agree to abide by the rules for its use as stated above. Recycled water is being provided by the City of Palo Alto to the undersigned at the request of, and for the benefit of, the undersigned. In consideration of its receipt, the undersigned hereby agrees to indemnify, defend, save harmless the City of Palo Alto, its officers, agents, and employees from any and all claims, demands, or liability associated with or arising out of the possession, use or examination of said material by or for the undersigned.

Signature of Applicant/User and Application Date

Signature of Application Approver and Date
James S. Allen, Manager Regional Water Quality Control Plant

RECYCLED WATER USE PERMIT

NAME OF PRODUCER: Regional Water Quality Control Plant
ADDRESS: City of Palo Alto
Regional Water Quality Control Plant
2501 Embarcadero Way
Palo Alto, CA 94303

This Use Permit must be available for inspection at all times. The Permittee is subject to all Prohibitions, Specifications and Provisions of San Francisco Bay RWQCB Board Order No. 93-160 and the attached "Rules and Regulations for the Use of Recycled Water."

EFFECTIVE DATE OF PERMIT _____ EXPIRATION DATE _____

PRODUCER INFORMATION

PRODUCER'S LEVEL OF TREATMENT (ALL DISINFECTED):

secondary-23 secondary-2.2 tertiary (Title 22 60301.230) tertiary with conventional treatment

VOLUME OF RECYCLED WATER AUTHORIZED PER DAY _____ GALLONS

METHOD OF WATER DISTRIBUTION _____ TANKER TRUCK _____ OTHER _____

USER INFORMATION

NAME OF USER _____

ADDRESS _____

PHONE _____ CONTACT NAME _____

EMAIL _____

SITE SUPERVISOR INFORMATION (If different from above)

SITE SUPERVISOR _____ PHONE _____

ADDRESS _____

EMAIL ADDRESS _____

Users and Site Supervisors must follow the attached Guidelines for Worker Protection, Rules and Regulations for the Use of Recycled Water, and San Francisco Bay RWQCB Board Order No. 93-160.

TYPE OF WATER REUSE

APPLICATION METHOD _____ TANK TRUCK _____ TANK TRUCK SPRAY _____ IRRIGATION SYSTEM

USE OF THE WATER _____

WHERE APPLIED: COUNTY _____ CITY _____

CERTIFICATION

I HEREBY CERTIFY UNDER PENALTY OF PERJURY THAT THE INFORMATION PROVIDED IN THIS APPLICATION AND IN ANY ATTACHMENTS IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE. I ALSO CERTIFY THAT I HAVE READ AND AGREE TO ABIDE BY SAN FRANCISCO BAY RWQCB BOARD ORDER NO. 93-160.

PRODUCER SIGNATURE _____ TITLE PLANT MANAGER DATE _____

USER SIGNATURE _____ TITLE _____ DATE _____

SITE SUPERVISOR SIGNATURE _____ TITLE _____ DATE _____

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 93-160

WATER RECLAMATION REQUIREMENTS FOR:

CITY OF PALO ALTO
PALO ALTO REGIONAL WATER QUALITY CONTROL PLANT
PALO ALTO
SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter called the Board), finds that:

1. The City of Palo Alto (hereinafter called Producer) operates a tertiary wastewater treatment plant and water reclamation facility at 2501 Embarcadero Way, Palo Alto. The Producer submitted a Reclamation Master Plan dated April 1992 for the use of reclaimed water throughout the service area of the Regional Water Quality Control Plant (RWQCP).
2. The Producer proposes to divert approximately nine million gallons per day (9 mgd) of tertiary-treated effluent from its Regional Water Quality Control Plant and to further treat the effluent to acceptable levels at its reclamation facility for various reclaimed water uses. Current and potential reclaimed water users and use areas have been identified as listed below and shown in Figure 1 (attached). Users are not required to limit the quantity of use to the estimated usage listed below. Other potential users may be identified in the future and added to the following list.

<u>Users</u>	<u>Estimated Usage (mgd)</u>
City Parks and Schools	2.5
Stanford University	1.6
Shoreline Golf Course	1.2
Sharon Heights Golf Course	1.0
Palo Alto Golf Course	0.8
Stanford Research Park	0.5
NASA Ames Research Center	0.5
Truck fill stations	0.5
Caltrans	0.2
Palo Alto Muni Service Center	0.2

3. The Producer will permit specific reuse projects located within the areas listed in Finding 2 of this Order by obtaining Reclaimed Water Use Agreements with individual Users. The Producer will design and incrementally install reclaimed water transmission facilities to serve these projects. Users will submit engineering reports for each individual project to the Producer for approval. The Producer will maintain these reports at its facility.

4. The Producer will continue to investigate other potential reuse strategies such as groundwater recharge, streamflow augmentation, and dual water supply for new construction. This will enable the Producer to move towards achieving a goal of reusing the maximum possible amount of reclaimed water.
5. The production and uses of reclaimed water are currently permitted under Order No. 86-33, adopted by the Board on May 21, 1986, which prescribes water reclamation requirements for irrigation of the golf courses and parks in the cities of Palo Alto and Mountain View. Up to two million gallons per day of tertiary-treated effluent was diverted, and further treated to unrestricted use quality for use on the parks and golf courses.
6. Board Order No. 91-042 provided "blanket" authorization for tanker-truck distribution of reclaimed water and the expansion of existing fixed irrigation system projects already subject to water reuse requirements. Reclaimed water distribution at the truck fill stations operated by the Producer are currently permitted under Order No. 91-042.
7. This Order incorporates the requirements of Order No. 86-33 and Order No. 91-042, and therefore supersedes both Orders.
8. California Water Code Section 13512 states that it is the intention of the legislature that the State undertake all possible steps to encourage development of water reclamation facilities so that reclaimed water may be made available to help meet the growing water demands of the State.

Section 13523 provides that a regional board, after consulting with and receiving the recommendations of the State Department of Health Services, and if it determines such action to be necessary to protect the public health, safety, or welfare, shall prescribe water reclamation requirements for water which is used or proposed to be used as reclaimed water. The use of reclaimed water for the purposes specified in Finding 2, could affect the public health, safety, or welfare, and requirements for those uses are, therefore, necessary in accordance with the California Water Code.

In Section 13550, the Legislature defines the use of potable domestic water for the irrigation of greenbelt areas, including but not limited to cemeteries, golf courses, parks, and highway landscaped areas, as a waste or an unreasonable use of such water within the meaning of Section 2 of Article X of the California Constitution when suitable reclaimed water is available.

Section 13576(e) states that the use of reclaimed water has proven to be safe from a public health standpoint and that the State Department of Health Services is updating regulations for the use of reclaimed water.

9. This Order's requirements conform with and implement the water reclamation criteria of the State Department of Health Services (Title 22, Division 4, Chapter 3, Sections 60301-60355 of the California Code of Regulations [CCR]) to protect the public health, safety, and welfare.

10. The Board amended its Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on September 16, 1992, and the State Water Resources Control Board (State Board) approved it on April 27, 1993. The Basin Plan supports water reclamation and further states that the disposal of wastewater to inland, estuarine, or coastal waters is not considered a permanent wastewater disposal solution where the potential exists for conservation and reclamation. The Basin Plan prescribes water quality objectives for reclaimed water, as well as for ground and surface waters of Santa Clara County. The Basin Plan identifies beneficial uses of the underlying groundwaters as:
- Industrial service and process water supply
 - Municipal and domestic supply
 - Agricultural supply

The Basin Plan identifies beneficial uses of the surface waters of South San Francisco Bay and its tributaries as :

- Water contact recreation
 - Non-water contact recreation
 - Wildlife habitat
 - Preservation of rare and endangered species
 - Estuarine habitat
 - Fish migration
 - Fish spawning
 - Industrial service and process supply
 - Shellfish harvesting
 - Navigation
 - Commercial and sport fishing
11. Effluent limitations of this Order are based on applicable CCR Title 22 regulations, the Basin Plan, State Plans and policies, current plant performance, and best professional judgement. The limitations are considered to be those attainable by best available technology, in the judgment of the Board.
12. The proposed uses of reclaimed water will maintain and enhance natural resources, and thus this Order is categorically exempt from the provisions of the California Environmental Quality Act in accordance with Title 14, California Administrative Code, Chapter 3, Section 15307.
13. The Board has notified the Users, Producer, and interested agencies and persons of its intent to prescribe water reclamation requirements for the proposed discharges, and has provided them with an opportunity for a public hearing and to submit their written views and recommendations.
14. The Board, at a public meeting, heard and considered all comments pertaining to these proposed uses of reclaimed water.

IT IS HEREBY ORDERED, that the City of Palo Alto (Producer and User) and the Users who have signed Reclaimed Water Use Agreements pursuant to this Order, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

A. Reclaimed Water Quality Specifications

1. Unrestricted Quality Reclaimed Water (2.2 MPN)

The Producer shall assure that reclaimed water used for industrial reuse, irrigation in areas with a high probability of direct public contact as may occur in portions of parks, playgrounds, schoolyards, golf courses that include residential development with exposure to irrigation spray, and other areas where the public has similar exposure, shall be an adequately oxidized, coagulated, clarified, filtered, and disinfected water (as defined in CCR Title 22, Division 4, Chapter 3, Sections 60301-60335) that meets the following quality limits at all times:

- | | | |
|----|-------------------------|---|
| a. | CBOD (5-day, 20°C) | 20 mg/L daily maximum
10 mg/L monthly average |
| b. | Dissolved Oxygen | 1.0 mg/L minimum |
| c. | Dissolved Sulfide | 0.1 mg/L maximum |
| d. | Turbidity | 2 NTU maximum daily average operating turbidity and not exceeding 5 NTU more than five (5) percent of the time during any 24-hour period. |
| e. | Total coliform bacteria | At any point downstream of the disinfection facilities after adequate contact with disinfectant, the median number of total coliform organisms shall not exceed 2.2 MPN/100 mL as determined from the bacteriological results of the last seven (7) days for which analyses have been completed, and the number of total coliform organisms shall not exceed 23 MPN/100 mL in any sample. |

2. Restricted Quality Reclaimed Water (23 MPN)

The Producer shall assure that reclaimed water to be used for irrigation of golf courses, cemeteries, freeway landscapes, and landscapes in other areas where the public has restricted access or exposure, shall at a minimum be an adequately oxidized and disinfected water that meets the following quality limits prior to delivery for any such use at all times:

- | | | |
|----|--------------------|--|
| a. | CBOD (5-day, 20°C) | 20 mg/L daily maximum
10 mg/L monthly average |
|----|--------------------|--|

- b. Dissolved Oxygen 1.0 mg/L minimum
- c. Dissolved Sulfide 0.1 mg/L maximum
- d. Total coliform bacteria At any point downstream of the disinfection facilities after adequate contact with disinfectant, the median number of total coliform organisms shall not exceed 23 MPN/100 mL as determined from the bacteriological results of the last seven (7) days for which analyses have been completed, and the number of total coliform organisms shall not exceed 240 MPN/100 mL in any two consecutive samples.

- 3. The Producer shall discontinue delivery of reclaimed water to Users during any period in which it has reason to believe that the limits for that use as specified in A.1 or A.2 of this Order are not being met. The delivery of reclaimed water shall not be resumed until all conditions which caused the limits to be violated have been corrected.
- 4. The State Department of Health Services is currently revising the Title 22 regulations for water reuse. When revised regulations are finalized, the Executive Officer may authorize changes to the restricted and unrestricted reclaimed water uses consistent with those regulations.

B. Prohibitions

- 1. The treatment, storage, distribution, or reuse of reclaimed water shall not create a nuisance as defined in section 13050(m) of the California Water Code.
- 2. No reclaimed water used for irrigation shall be applied during periods of rainfall or when soils are saturated such that runoff occurs.
- 3. No reclaimed water used for irrigation shall be allowed to escape to areas outside the designated use areas by surface flow or by airborne spray.
- 4. Reclaimed water shall not be applied to park, golf course, or landscape areas in such a manner or at such times that may expose golfers, picnickers, or other individuals, or that may cause picnic tables, and other food and drinking outlets to come into contact with airborne spray droplets.
- 5. No reclaimed water shall be discharged from the treatment facilities, irrigation holding tanks, storage ponds, man-made marsh, or other containment, other than for irrigation or industrial reuse in accordance with this Order or for discharge to a municipal sewage collection system.
- 6. Reclaimed water shall not be used as a domestic or animal water supply. There

shall be no cross-connections between the potable water supply and pipes containing reclaimed water. Supplementing reclaimed water with water used for domestic supply shall not be allowed except through an air-gap separation. An air-gap or reduced pressure principle backflow device shall be provided at all domestic water service connections to reclaimed water use areas.

C. Provisions

1. Order No. 86-33 is hereby rescinded. This Order supersedes Order 91-042 for all uses specified by that Order.
2. Reclaimed Water Use Agreements, obtained by the Producer with each User, form the basis of permitted reclaimed water use by specific Users. Reclaimed Water Use Agreements shall specify self-monitoring requirements for each User, based on the attached self-monitoring program. If someone other than the User is responsible for applying the reclaimed water (Distributor), e.g. a truck hauler, then the User shall inform them of these requirements in a written agreement or other suitable manner. A Distributor shall fill out a Reclaimed Water Release Form when receiving reclaimed water from the Producer.
3. A copy of the Reclaimed Water Use Agreement and this Order must be provided to the Users by the Producer. The Users and Distributors must have these available at all times for inspection by Regional Board staff, the Producer, or State/County Health Officers. The Distributors must also carry the Reclaimed Water Release Form at all times.
4. The Producer shall comply with the self-monitoring program as adopted by the Board and as may be amended by the Executive Officer. The Producer is responsible for collecting reports from users. Users are responsible for submitting on-site observation reports and use data to the Producer, who will compile and file self-monitoring reports with the Regional Board.
5. The Producer will be responsible for ensuring that reclaimed water meets the quality standards of this Order and for operation and maintenance of major transport facilities and associated appurtenances. Users will be responsible for the application of reclaimed water on their respective use areas and associated operations and maintenance.
6. The Producer and Users shall maintain in good working order and operate as efficiently as possible any facility or control system installed by the Producer or Users to achieve compliance with the water reclamation requirements.
7. The Producer and Users shall provide employee training to assure proper operation of reclamation facilities, worker protection, and compliance with this Order.
8. The Producer and Users shall assure that all above ground equipment, including pumps, piping, storage reservoir, and valves, etc. which may at any

time contain reclaimed water shall be adequately and clearly identified with warning signs. The Producer and Users shall make all necessary provisions to inform the public that the liquid being distributed is reclaimed water and is unfit for human consumption.

9. Reclamation facilities shall be operated in conformance with the California Department of Health Service "Guidelines for Use of Reclaimed Wastewater for Irrigation and Impoundment" and "Guidelines for Worker Protection at Reclamation Use Areas" and the American Water Works Association, California-Nevada Section's *Guidelines for the Distribution of Non-potable Water*.
10. The Producer and Users shall permit the Board or its authorized representative in accordance with California Water Code Section 13267(c):
 - a. Entry upon premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of the Order.
 - b. Access to and copy of any records that must be kept under the conditions of this Order.
 - c. Inspection of any facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order.
 - d. To photograph, sample, and monitor for the purpose of assuring compliance with this Order.
11. The Board will revise this Order periodically and may revise these requirements when necessary.

I, Steven R. Ritchie, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on 12/15/93.



STEVEN R. RITCHIE
EXECUTIVE OFFICER

Attachments:

- A. Figure 1 -- PARWQCP Water Reclamation Reuse Areas
- B. DOHS Guidelines for Use of Reclaimed Wastewater for Irrigation and Impoundment
- C. DOHS Guidelines for Worker Protection at Water Reclamation Use Areas
- D. Self-Monitoring Program

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION**

SELF-MONITORING PROGRAM

FOR

**CITY OF PALO ALTO
PALO ALTO REGIONAL WATER QUALITY CONTROL PLANT
PALO ALTO
SANTA CLARA COUNTY**

ORDER NO. 93-160

SELF-MONITORING PROGRAM

CITY OF PALO ALTO
PALO ALTO REGIONAL WATER QUALITY CONTROL PLANT
RECYCLED WATER USERS
ORDER NO. 93-160

I. GENERAL

Reporting responsibilities of waste dischargers are specified in Sections 13225(a), 13267(b), 13268, 13383, and 13387(b) of the California Water Code and the San Francisco Bay Regional Board's Resolution No. 73-16.

The principle purposes of a monitoring program by a Producer of reclaimed water, also referred to as a self-monitoring program, are:

1. To document compliance with water reclamation requirements and prohibitions established by this Regional Board; and
2. To facilitate self-policing by the Producer in the prevention and abatement of pollution arising from water reclamation.

II. RECLAIMED WATER SAMPLING AND ANALYSIS

The Producer shall document effluent quality under their regular facility Waste Discharge Requirements self-monitoring program (Order No. 93-085). See below for any violations related to the water reuse program.

III. REPORTS TO BE FILED WITH THE REGIONAL BOARD

1. Violation of Requirements

In the event the Producer is unable to comply with conditions of the water reclamation requirements and prohibitions, the Producer shall notify the Regional Board in writing within two weeks of the non-compliance. The written report shall include pertinent information explaining reasons for non-compliance and shall indicate what steps are being taken to prevent the problems from recurring.

2. Annual Self-Monitoring Report

An annual report for each calendar year shall be submitted to the Board by January 30 of the following year. The report shall include:

- a. Letter of Transmittal: A letter transmitting self-monitoring reports should accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Producer has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory.

The transmittal letter shall contain a statement by the Producer, or the Producer's authorized agent, under penalty of perjury, that to the best of the signer's knowledge the report is true, accurate, and complete.

- b. Tabulations of the results from each required analysis by Producer specified in Table 1 (Attachment A) by date, time, type of sample, and station.
- c. A list of existing and new authorized reclaimed water Users, including the name, location, and projected annual flow to be delivered.
- d. Tabulation of inspections and observations of reuse sites, including User's standard observations and random inspections by the Producer.
- e. A summary of effluent violations related to water reclamation, violations found during inspection of reuse sites, corrective actions taken, and any changes to or revoking of User authorizations.
- f. A summary of ground water monitoring conducted in accordance with provisions of the Environmental Impact Report completed for the reclamation project.
- g. An update regarding development of the Reclamation Master Plan, including planning, design, and construction of facilities, and preparation of required reports and technical documents.

IV. STANDARD OBSERVATIONS

1. Evidence of runoff of reclaimed water from the site (show affected area on a sketch, and estimate volume).
2. Odor of wastewater origin from irrigation site: If present, indicate apparent source, characterization, direction of travel, and any public use areas or offsite facilities affected by the odors.

3. Evidence of ponding of reclaimed water, and/or evidence of mosquitoes breeding within the irrigation area due to ponded water.
4. Warning signs properly posted to inform public that irrigation water is reclaimed water, which is not safe for drinking.
5. Evidence of leaks or breaks in the irrigation system pipelines or tubing.
6. Evidence of plugged, broken, or otherwise faulty drip irrigation system emitters or spray irrigation sprinklers.

V. DESCRIPTION OF SAMPLING AND OBSERVATION STATIONS

1. RECLAIMED WATER

<u>Station</u>	<u>Description</u>
E-001	Location at the Palo Alto Regional Water Quality Control Plant where a representative sample of treatment plant effluent being diverted for reclamation can be obtained and total diverted flow can be measured.

2. LAND OBSERVATION STATIONS

<u>Station</u>	<u>Description</u>
L-1 to L-n	Locations at a sufficient number of points at reuse areas in order to ensure compliance with water reclamation requirements.

3. IMPOUNDMENT FACILITIES

<u>Station</u>	<u>Description</u>
P-1 to P-n	Locations at points along the periphery of each storage, ornamental, golf course, or other pond or impoundment.

VI. SCHEDULE OF SAMPLING, MEASUREMENTS, AND ANALYSIS

1. The self-monitoring program is applicable during the periods when reclaimed water is in use. The Producer and Users are required to perform observations, sampling, measurements, and analyses according to the schedule given in Table 1 (Attachment A).

2. The Producer shall require the Users to conduct a complete inspection of all irrigation lines, sprinklers, and emitters at least once each year during the dormant season. A report of the findings of these inspections, including descriptions of any significant repairs or modifications made to the distribution systems, shall be submitted in the annual report (due January 30 of each year).

I, Steven R. Ritchie, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Regional Board's Resolution No. 73-16 in order to obtain data and document compliance with Water Reclamation Requirements established in Regional Board Order No. 93-160.
2. Has been revised and ordered by the Executive Officer on June 20, 1995. This Self-Monitoring Program supersedes the previous program and amends the water reclamation requirements adopted by the Board on December 15, 1993.
3. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the Producer, and revisions will be ordered by the Executive Officer.



STEVEN R. RITCHIE
EXECUTIVE OFFICER

Attachment: Table 1 - Schedule for Sampling, Measurements, and Analysis

File No. 2189.8103 (SMM)

ATTACHMENT A

TABLE 1
SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS
Palo Alto RWQCP - Water Reclamation Req'ts

SAMPLING STATIONS	E-1			All L	All P
	Grab	C-24	Cont.	Obs.	Obs.
Flow Rate (gallons/day)			D	Q ¹	Q ¹
Total Coliform (MPN/100ml)	3/W ²				
Turbidity (NTU)		3/W ²			
Dissolved Oxygen (mg/l)	3/W ²				
Dissolved Sulfides (mg/l) (if DO < 1 mg/l)	3/W ²				
pH (units)	3/W ²				
Chlorine Residual (mg/l)			D ²		
Applicable Standard Observations				A ³	A ³

LEGEND FOR TABLE 1

Type of Sample

Grab = Instantaneous grab sample
 C-24 = 24-hour composite sample
 Cont. = Continuous monitoring (recorder)
 Obs. = Observation

Sampling Frequency

D = Daily
 3/W = Three times per week
 W = Weekly
 2/M = Twice per month
 Q = Quarterly
 A = Annual

¹ Flow totals for each User will be compiled by the Producer on a quarterly basis. Daily average flow will be calculated from these quarterly totals and reported for each User in the Producer's annual report.

² When producing reclaimed water.

³ Observations that the Producer requires each User to complete when reclaimed water is being used. The Producer will establish User self-monitoring requirements that depend on the size and complexity of each site, as a condition of each User's permit.