

INFORMATIONAL HANDOUT

MATERIALS INFORMATION

Foundation Report dated October 6, 2011

Price Quote for
ABSORB 350 Crash Cushion
Quickchange Moveable Barrier

M e m o r a n d u m *Flex your power!*

Be energy efficient!

To: FRITZ HOFFMAN
Branch Chief
Division of Engineering Services, Structure Design
Office of Bridge Design – Central, Branch 6

Date: October 6, 2011

File: 05-SCr-17-10.8/11.3
0512000010 (EA 05-1A7101)
Br. No. 36E-TBD
Summit Slide Retaining Wall

Attn: Seiji Morimoto

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES

Subject: Foundation Report

Scope of Work

A Foundation Report (FR) is provided for the Summit Slide Retaining Wall, a timber lagged soldier pile wall with subhorizontal ground anchors. Work performed for this report includes a literature search, field mapping, conducting a seismic refraction line, a subsurface investigation, and installing and monitoring instrumentation.

Project Description and Background

State Route 17 in the project area is a rural four-lane divided conventional highway that crosses the Santa Cruz Mountains. It connects the cities of Santa Cruz and San Jose. The route serves regional and interregional traffic, including motorists who commute daily to job centers in the Silicon Valley. The highway in the vicinity of the project includes sharp curves and steep grades.

The northbound number two lane of Route 17 at milepost 11.04, ¼ – mile north of Glenwood Drive, developed a sag during a series of rainstorms that occurred in January and February 2011. A field investigation revealed a landslide below the roadway to be the cause of the sag. The landslide is characterized as a large retrogressive rotational slide. The initial slide is likely several years old. It exhibits a near-vertical headscarp within approximately 50 feet of the northbound edge of pavement. The landslide lengthens to the northwest as movement occurs within the main body of the slide. The sagging in the number 2 lane is the most recent extension of the slide. The main body of the landslide measures approximately 380 feet wide, parallel to the highway, and it extends more than 600 feet down slope. Refer to Exhibit A for mapping of landslide limits.

Approximately 70 feet of the northbound number 2 lane has been impacted by the landslide to date. At the time of the initial site investigation, cracking extended to the lane line between the number 1 and number 2 lanes. The number 2 lane had subsided approximately 5 inches.

It is proposed to construct a timber lagged soldier pile retaining wall with subhorizontal ground anchors at the location to mitigate existing damage to the roadway and to prevent further retrogressive movement of the landslide onto the highway.

The following datum was used to reference horizontal and vertical positions of the proposed structure:

- Horizontal: North American Datum of 1983 (NAD83(92) (1991.35))
- Vertical: North American Vertical Datum of 1988 (NAVD88)

Pertinent Reports and Investigations

The following publications were used to assist in the assessment of site conditions:

1. *Caltrans ARS Online*.
2. *Geotechnical Services Design Manual, Version 1.0*, Division of Engineering Services, August 2009.
3. *Preliminary Geologic Map of Santa Cruz County, California*, Earl E. Brabb, 1986.
4. *Slide Repair Recommendations – Soldier Pile Tieback Wall*, Caltrans Office of Geotechnical Design – West, June 6, 2011.

Field Investigation and Testing Program

Three geotechnical borings were performed to determine soil conditions, depth to landslide movement, and ground water elevations. Continuous soil samples were obtained from the borings using a punch core apparatus retrieved via wire line. Soils were visually classified in accordance with the Caltrans Soil and Rock Logging, Classification, and Presentation Manual (June 2010). Standard Penetration Tests (SPT), ASTM test method 1586, were performed to estimate in situ density of the soils. Soil strength parameters of cohesionless soils were estimated from correlations with SPT blow counts.

Boring RC-11-001, located 35.9 feet right of centerline Station 214+67.3+18, was advanced 61.5 feet to elevation 1524.3 feet. The boring was instrumented as an open-standpipe observation well by installing 1-1/2" slotted PVC pipe in the hole and backfilling the annulus with washed #8 sand. Boring RC-11-002, located 35.2 feet right of centerline Station 216+02.6, was advanced 71.5 feet, to elevation 1522.4 feet. Slope inclinometer casing was installed and in boring RC-11-

002. Boring RC-11-003, located 47.9 feet left of centerline Station 216+03.0, was advanced 41.5 feet, to elevation 1552.3 feet. The purpose of the boring was to determine soil characteristics in the subhorizontal ground anchor zone of the retaining wall.

A seismic refraction line was performed approximately 4 feet left of the proposed retaining wall layout line for the purpose of better understanding the subsurface conditions and to correlate the two geotechnical borings on the easterly shoulder of the highway.

Laboratory Testing Program

Soil samples obtained during the subsurface investigation were submitted to the Headquarters Geotechnical Laboratory for corrosion potential testing.

Site and Subsurface Conditions

Topography and Drainage

The project is located in the Santa Cruz Mountains, in the Coast Ranges geomorphic province. Terrain consists of densely vegetated, steep sided mountains with steeply incised drainages.

The site is in the West Branch Soquel Creek water shed. Soquel Creek drains into Monterey Bay near Capitola.

Climate

The climate in the Santa Cruz Mountains is Mediterranean with annual rainfall varying locally between 25 inches and 60 inches or more. Most of the rain occurs during the winter months, but summer days are often foggy and wet. Due to these climatic conditions, vegetation is abundant with thick stands of redwood and fir in the valleys and on lower hills; and oak, pine, and chaparral on the higher ground.

Geology

The “Geologic Map of Santa Cruz County, California,” compiled by Earl E. Brabb (1989) indicates that Oligocene and Eocene aged Rices Mudstone, geologic unit T_{sr}, and Eocene aged Twobar Shale, geologic unit T_{st}, underlie the project area. Brabb describes Rices Mudstone as olive-gray mudstone and massive, medium light gray, very fine to fine-grained arkosic sandstone. The Twobar Shale is described as very thin bedded and laminated olive-gray shale.

Soil Conditions

Borings RC-11001 and RC-11-002 encountered approximately 10 to 15 feet of fill material consisting of very stiff sandy clay and dense clayey sand with gravel overlying about 20 to 40

feet of stiff to hard sandy clay and gravelly clay. Beneath the clays lies bedrock consisting of slightly to intensely weathered, very intensely to intensely fractured, soft to moderately soft siltstone. Boring RC-11-003 encountered about 15 feet of very stiff to hard sandy clay and gravelly lean clay overlying slightly weathered, very intensely to intensely fractured, soft to moderately soft siltstone/mudstone. The clay layers above bedrock have some structure, and appear to be residual soil.

Analysis of the seismic refraction study show a deepening of the rock contact in the area of the land sliding that is consistent with surface observations.

Ground Water

Table 1 summarizes ground water measurements to date. Ground water monitoring will continue until permanent mitigation for the landslide is in place.

Table 1: Ground Water Observations

<i>Boring ID</i>	<i>Date</i>	<i>Surface Elevation (feet)</i>	<i>Depth to Groundwater (feet)</i>	<i>Groundwater Elevation (feet)</i>
RC-11-001	4/29/2011	1585.8	27.6	1558.2
	5/3/2011		40.7	1545.1
	5/11/2011		42.0	1543.8
	5/18/2011		42.7	1543.1
	6/3/2011		43.8	1542.0
	7/27/2011		44.8	1541.0
	8/6/2011		44.6	1541.2

The seismic refraction study indicated that ground water elevations ranged from 1540 feet above sea level along the southern portion of the proposed retaining wall to 1554 feet above sea level at the northern end of the proposed wall.

Scour Evaluation

Scour is not an issue of concern at the project location.

Corrosion Evaluation

Representative soil samples taken during the subsurface investigation were tested for corrosion potential. The Department considers a site corrosive to foundation elements if one or more of the following conditions exist for the representative soil and/or water samples taken at the site:

- Chloride concentration is greater than or equal to 500 ppm
- Sulfate concentration is greater than or equal to 2000 ppm
- The pH is 5.5 or less

Since resistivity serves as an indicator parameter for the possible presence of soluble salts, tests for sulfate and chloride are usually not performed unless the resistivity of the soil is 1,000 ohm-cm or less.

Table 2: Corrosion Test Summary

Boring	Depth	SIC Number	Minimum Resistivity (Ohm-Cm)	pH	Chloride Content (ppm)	Sulfate Content (ppm)
RC-11-002	30'-60'	C634129	975	7.2	Pending	Pending
Corrosive if:			≤ 1000	≤ 5.5	≥ 500	≥ 2000

Because the resistivity of the submitted soil sample tested less than 1,000 ohm-cm, the sample had to be sent to Headquarters Transportation Laboratory for testing to determine chloride and sulfate content. The results of those tests have not yet been received. Test results will be forwarded to Structure Design in a separate memorandum when they become available.

Seismic Recommendations

The project is located within a seismically active region of California. There are several earthquake faults in close proximity to the project area. Table 3 lists the active and potentially active faults in the project vicinity as described in Caltran's 2007 *Fault Database*. Corresponding Moment Magnitudes and distances to the bridge site are also given. A fault map is included in the attachments to this report.

Table 3: Active and Potentially Active Faults

<i>Fault</i>	<i>Moment Magnitude of Maximum Credible Earthquake¹</i>	<i>Type of Fault²</i>	<i>Distance to Fault from Project Area (kilometers)</i>
Sargent Fault (Northwest Section)	6.8	RLSS	2.2
San Andreas Fault Zone (Santa Cruz Mountains Section)	7.9	RLSS	2.4
Zayante-Vergales Fault Zone	7.0	RLSS	13.7
Monte Vista-Shannon Fault Zone	6.7	R	14.5
Cascade Fault	6.9	R	15.6
Silver Creek Fault	7.1	R	25.0

A design response spectrum for the project area was estimated using the *2009 Caltrans Seismic Design Procedure*. The procedure was developed to calculate the minimum seismic design requirements for bridges on State highways. The method calculates design response spectra over a range of periods. The design response spectrum is based on the envelope of a deterministic and a probabilistic spectrum. The deterministic spectrum is calculated as the arithmetic average of median response spectra computed using the Chiou & Youngs and Campbell & Bozorgnia ground motion prediction equations (CY-CB GMPE). These equations are applied to all faults in or near California considered to be active in the last 700,000 years (late Quaternary age) and capable of producing a moment magnitude earthquake of 6.0 or greater.

The probabilistic spectrum is obtained from the 2008 USGS Seismic Hazard Map for the 5% in 50 years probability of exceedance (or 975 year return period). The spectral values are adjusted with a soil amplification factor based on an average of the Boore-Atkinson (2008), Campbell Bozorgnia (2008), and Chiou-Youngs (2008) ground motion prediction models. For sites underlain by soils having an average shear wave velocity for the upper 30 meters of soil (V_{S30}) of less than 300 meters per second, the 2009 USGS Probabilistic Seismic Hazard Analysis Interactive Deaggregation Tool is used to develop the probabilistic spectrum.

The controlling faults at the project site are the Sargent Fault (Northwestern section) and the San Andreas Fault Zone (Santa Cruz Mountains section). The design response spectrum was governed by the probabilistic spectrum with a soil amplification factor for a V_{S30} of 270 meters

¹ According to Caltrans 2007 *Fault Database*

² LLSS=left-lateral strike-slip fault; RLSS=right-lateral strike-slip fault; R=reverse fault; N=normal fault

per second. The 270 meters per second V_{S30} value is an average shear wave velocity for Type D soils. The peak ground acceleration at the project site is 0.8 g (gravity).

No known active or potentially active faults project towards or cross the highway alignment within the project limits. Therefore, there is low potential for surface fault rupture to occur and no mitigation efforts are necessary.

Liquefaction potential at the project site is low. For liquefaction to occur, three elements in combination are necessary: loose granular soils, saturated soil conditions, and strong ground shaking. The soils in the project area are primarily cohesive, and are not prone to liquefaction.

Geotechnical Analysis

The slope inclinometer installed in boring RC-11-002 has not shown any movement to date. Based on landslide mapping and observations of the soil cores taken from boring RC-11-002, however, it is estimated that the depth of the slide plane is approximately 21 feet at the location of the boring.

Slope stability analyses were performed using SLOPE/W 2007 and cross section A – A depicted on Attachment 4 and located as shown on Attachment 3. Attachment 6 shows the output for a model of the existing failure condition using the Spencer method and a fully specified failure surface. This is a simplified one layer model in which soil strength parameters were back calculated with an interpreted piezometric ground water surface to achieve a factor of safety of 1.0. The assumed depth of movement is 21 feet. The effective geotechnical parameters for the slide materials are $\Phi = 18$ degrees, Cohesion = 0 psf, and Unit Weight = 125 pcf.

The ground anchor forces required to resist the landslide forces were then evaluated per FHWA Geotechnical Engineering Circular No. 4 and Section 5.5.5.7.1 of Caltrans' Bridge Design Specifications. The assumed retaining wall design heights were 15 feet between "W1" Stations 214+10 and 215+10, and 29 feet between "W1" Stations 215+45 and 216+35. The wall was assumed to be free draining. Reinforcement loads were applied at 15 degrees from horizontal, and were increased in the stability analysis until the target factor of safety was achieved. The results of the stability analysis indicate that a total reinforcement load of 15 kips per foot of wall is required for a 15-foot design height and 40.5 kips per foot of wall is required for a 29-foot design height. The stability models included a traffic surcharge of 240 pounds per square foot and a horizontal seismic load of 0.2 g (gravity). The recommended anchor loads resulted in a static factor of safety greater than 1.3, with a factor of safety just over 1.0 for the pseudostatic case.

Allowable anchor loads were estimated to be 125 kips per anchor using the suggested values for ultimate bond stress of soft shale presented in FHWA Geotechnical Engineering Circular No. 4 and a factor of safety of 2.0. Assuming one row of anchors and a required ground anchor force

of 15 kips per foot of wall for a 15-foot design height, the maximum pile spacing was calculated to be 8'-4". Assuming three rows of anchors loaded to 125 kips and a required ground anchor force of 40.5 kips per foot of wall, the maximum pile spacing for the 29-foot design height wall was calculated to be 9'-3".

Soldier pile embedment requirements were determined using the vertical component of the anchor loads to calculate axial demand, and Section 4.6.5.1.1 of Caltrans' Bridge Design Specifications to calculate ultimate side resistance of Cast in Drilled Hole (CIDH) concrete piles in cohesive soils. A factor of safety of 2.0 was used to determine allowable side resistance. Allowable unit side resistance was calculated to be 270 psf. Caltrans' Bridge Design Specifications recommend neglecting the top 5 feet and bottom one-pile diameter of drilled shaft in the determination of total side resistance. Tip resistance was neglected because of anticipated difficulties in removing loose material from the bottom of the drilled holes.

Geotechnical Design Recommendations

"W1" Station 214+10 to Station 215+10: 15-foot Design Height Wall

The following soil strength parameters were used to calculate the ground anchor forces required to resist landslide forces:

- Phi = 18 degrees, Cohesion = 0 psf, Unit Weight = 125 pcf

The following are geotechnical recommendations for the design of a 15-foot high soldier pile wall with timber lagging and one row of subhorizontal ground anchors:

- Allowable Anchor Load = 125 kips
- Subhorizontal Ground Anchor Declination = 15 degrees
- Subhorizontal Ground Anchor Unbonded Length = 70 feet
- P_{TOTAL} = 15 kips/foot of wall
- Maximum Pile Spacing = 8'-4"
- Pile Length = 45 feet

"W1" Station 215+45 to Station 216+35: 29-foot Design Height Wall

The following soil strength parameters were used to calculate the ground anchor forces required to resist landslide forces:

- Phi = 18 degrees, Cohesion = 0 psf, Unit Weight = 125 pcf

The following are geotechnical recommendations for the design of a 29-foot high soldier pile wall with timber lagging and three rows of subhorizontal ground anchors:

- Allowable Anchor Load = 125 kips
- Subhorizontal Ground Anchor Declination = 15 degrees
- Row 1 Subhorizontal Ground Anchor Unbonded Length = 85 feet
- Row 2 Subhorizontal Ground Anchor Unbonded Length = 75 feet
- Row 3 Subhorizontal Ground Anchor Unbonded Length = 65 feet
- $P_{TOTAL} = 40.5$ kips/foot of wall
- Maximum Pile Spacing = 9'-3"
- Pile Length = 70 feet

The 70-foot pile length should be maintained through the transition from 15-foot to 29-foot design height and at the northerly end of the retaining wall in case of continued expansion of the landslide limits.

Structure Design should perform a check of the required anchor forces using the lateral earth pressure distribution suggested in Memo to Designers 5-12 and the following parameters and assumptions:

- $\Phi = 18$ degrees, Cohesion = 0 psf, Unit Weight = 125 pcf
- $K_a = 0.53$
- $K_p = 1.73$
- Passive Earth Pressure Above Dredge Line = 0
- Traffic Surcharge = 240 psf
- Horizontal Seismic Coefficient = 0.2 g
- Wall is free draining to the bottom of lagging

An underdrain system is recommended in front of the retaining wall as shown on Attachments 4 and 5 to prevent build up of hydrostatic pressure behind the wall.

Construction Considerations

Caving conditions may be encountered during drilling for the piles and subhorizontal ground anchors due to the intensely fractured nature of the rock. Use of temporary casing may be necessary to control caving.

Even though hard rock was not encountered in the geotechnical borings, it may be encountered during drilling of the piles and subhorizontal ground anchor holes. The contractor who constructed the soil nail walls on the southbound side of the highway on both sides of the project area encountered hard rock while drilling soil nail holes, and had to employ a down-hole hammer to complete the drilling.

Depending on the time of year of construction and the yearly precipitation total, ground water may be encountered in the pile and subhorizontal ground anchor holes. Soldier pile and subhorizontal ground anchor installations may require dewatering before placing concrete.

Grout loss may occur during the installation of subhorizontal ground anchors due to the intensely fractured nature of the rock. Controlling measures such as the use of a “grout sock” could greatly reduce the potential for grout loss.

Project Information

Standard Special Provision S5-280, “Project Information”, discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The Department makes the following supplemental project information available:

Supplemental Project Information

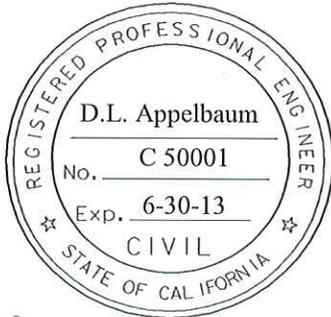
Means	Description
Included in the Information Handout	Foundation Report for the Summit Slide Retaining Wall dated October 6, 2011.
Available for inspection at the District Office	None.
Available for inspection at the Transportation Laboratory	None
Available for inspection at _____; telephone (____) - _____	None
Available as specified in the Standard Specifications	
Available at: http://www.dot.ca.gov/hq/esc/oe/weekly_ads/index.php	

Items listed to be included in the Information Handout will be provided in Acrobat (.pdf) format to the Addressee of this report via electronic mail.

Closure

The recommendations contained in this report are based on specific project information that has been provided by Central Region Project Development. If any conceptual changes are made during final project design, the Office of Geotechnical Design – North, Branch D should review those changes to determine if the recommendations contained in this report are still applicable. Any questions regarding the recommendations contained herein should be directed to the attention of Dan Appelbaum, (805) 549-3745, or Mike Finegan, (805) 549-3194, at the Office of Geotechnical Design – North, Branch D.

Supervised by,



Daniel L. Appelbaum
DANIEL L. APPELBAUM, PE
Transportation Engineer
Geotechnical Design – North
Branch D

MICHAEL S. FINEGAN, PE, Chief
Geotechnical Design - North
Branch D

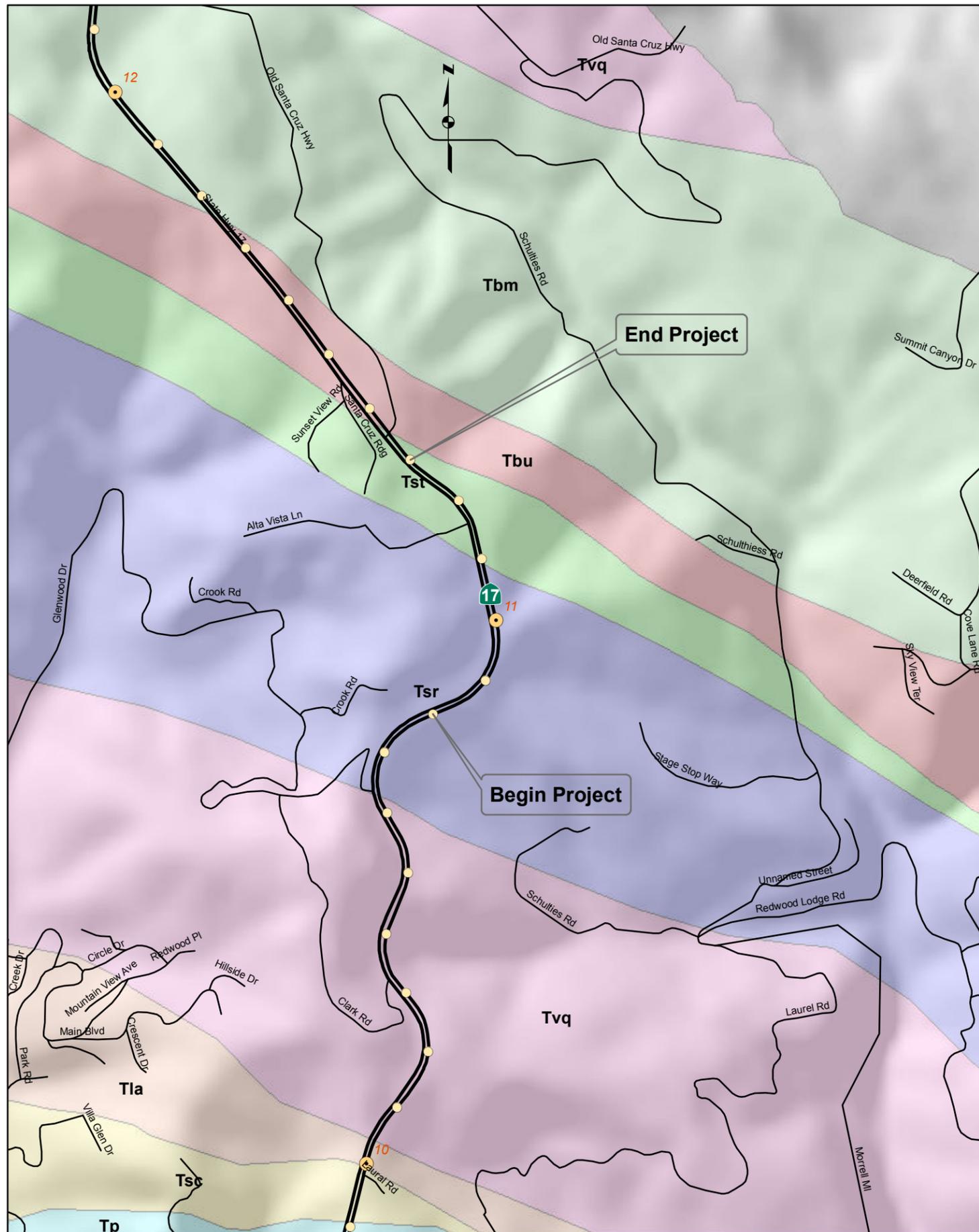
- c: Roy Bibbens / GDN Records (E-copy)
- GeoDOG - Digital Archive of Geotechnical Data (E-copy)
- Steve DiGrazia – Project Manager (E-copy)
- Mark Willian – GS Corporate (E-copy)
- Structure Construction R.E. Pending File (email RE_pending_file@dot.ca.gov)
- Doug Lambert – District Materials Engineer (E-copy)
- Craig Whitten – DES Office Engineer, Office of PS&E (E-copy)
- Job File / Branch D Records

LIST OF ATTACHMENTS

ATTACHMENT 1	GEOLOGIC MAP
ATTACHMENT 2	EARTHQUAKE FAULTS
ATTACHMENT 3	LAYOUT
ATTACHMENT 4	SECTION A - A
ATTACHMENT 5	SECTION B - B
ATTACHMENT 6	SLOPE/W RESULTS: EXISTING CONDITION
ATTACHMENT 7	SLOPE/W RESULTS: 15' DESIGN HEIGHT WALL
ATTACHMENT 8	SLOPE/W RESULTS: 29' DESIGN HEIGHT WALL
ATTACHMENT 9	RETAINING WALL ELEVATION VIEW
ATTACHMENT 10	SLOPE INCLINOMETER PLOT

Geologic Map

Summit Slide Retaining Wall
05-SCr-17-10.8/11.3



Geologic Units

Unit Description

- Tp: Purisima Formation (Pliocene and upper Miocene)
- Tsc: Santa Cruz Mudstone (Upper Miocene)
- Tla: Lambert Shale (lower Miocene)
- Tvq: Vaqueros Sandstone (lower Miocene and Oligocene)
- Tsr: Rices Mudstone Member (Oligocene and Eocene)
- Tst: Twobar Shale Member (Eocene)
- Tbu: Upper sandstone member - Butano Sandstone (Eocene)
- Tbm: Middle siltstone member - Butano Sandstone (Eocene)
- Whole Postmiles
- Tenth Postmiles





Earthquake Faults

Summit Slide Retaining Wall
05-SCr-17-10.8/11.3

State Highways

- Outside D5
- District 5
- State Bridges (SCr)
- Caltrans Faults (2007 Database)

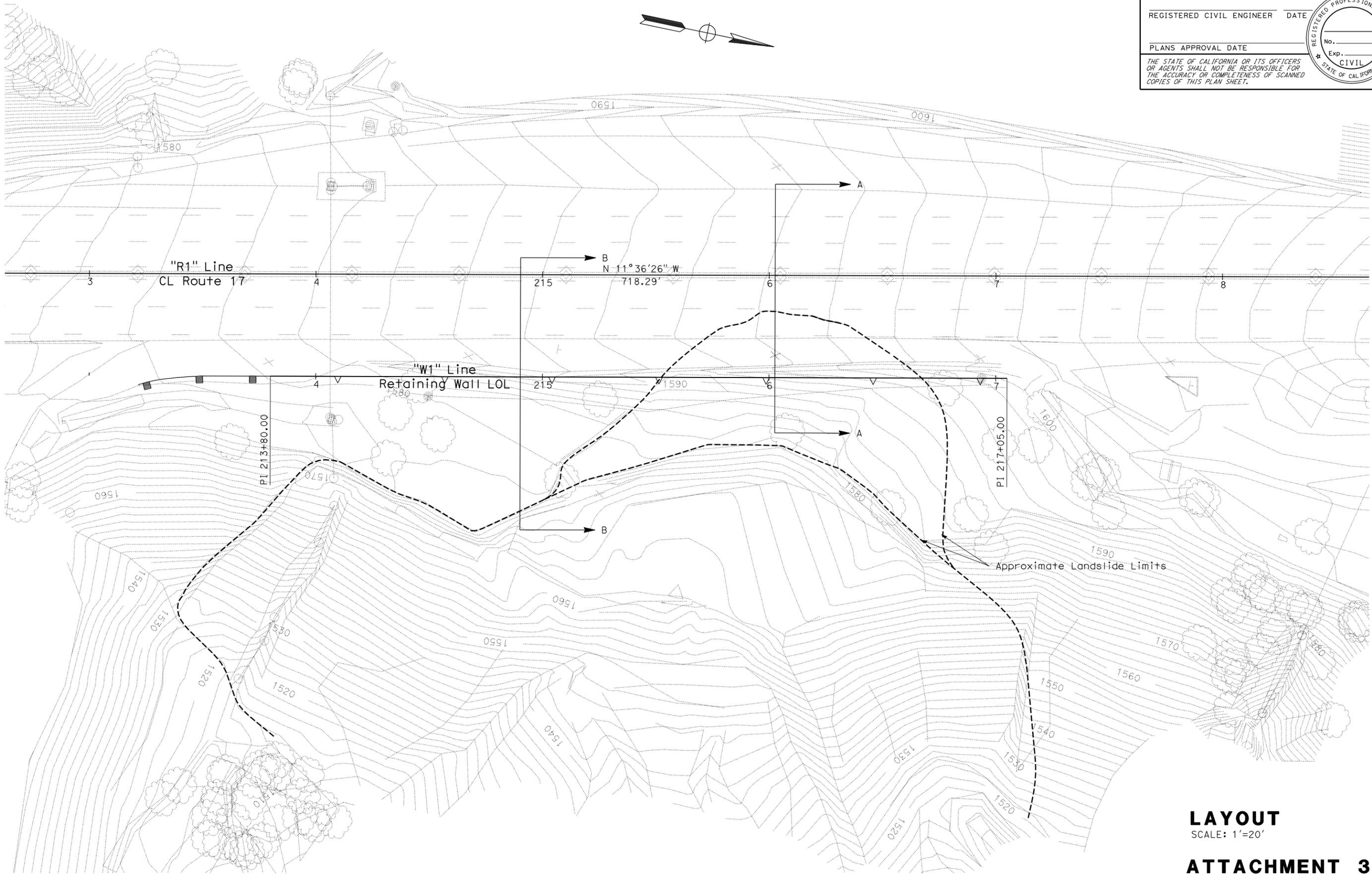


Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	Scr	17	10.8/11.3		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



LAYOUT
SCALE: 1"=20'

ATTACHMENT 3

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans GEOTECHNICAL DESIGN
 FUNCTIONAL SUPERVISOR
 CALCULATED/DESIGNED BY
 CHECKED BY
 REVISED BY
 DATE REVISED

x
x
x
x
x
x
x
x
x
x

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	Scr	17	10.8/11.3		

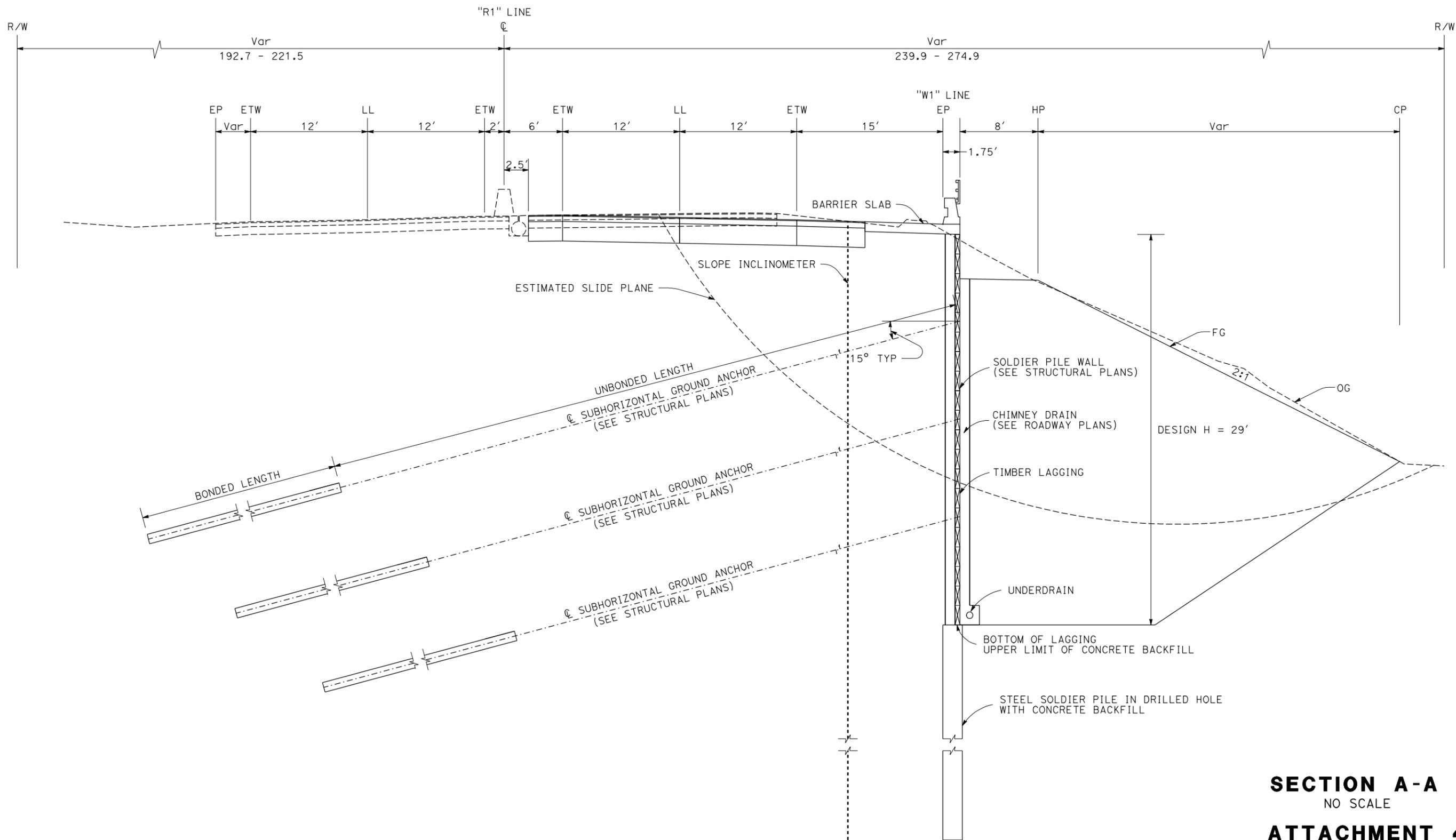
REGISTERED CIVIL ENGINEER	DATE
PLANS APPROVAL DATE	



REGISTERED PROFESSIONAL ENGINEER
No. _____
Exp. _____
CIVIL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans GEOTECHNICAL DESIGN
 FUNCTIONAL SUPERVISOR
 CALCULATED/DESIGNED BY
 CHECKED BY
 REVISED BY
 DATE REVISED



SECTION A-A
NO SCALE
ATTACHMENT 4

LAST REVISION | DATE PLOTTED: 05/02/2011

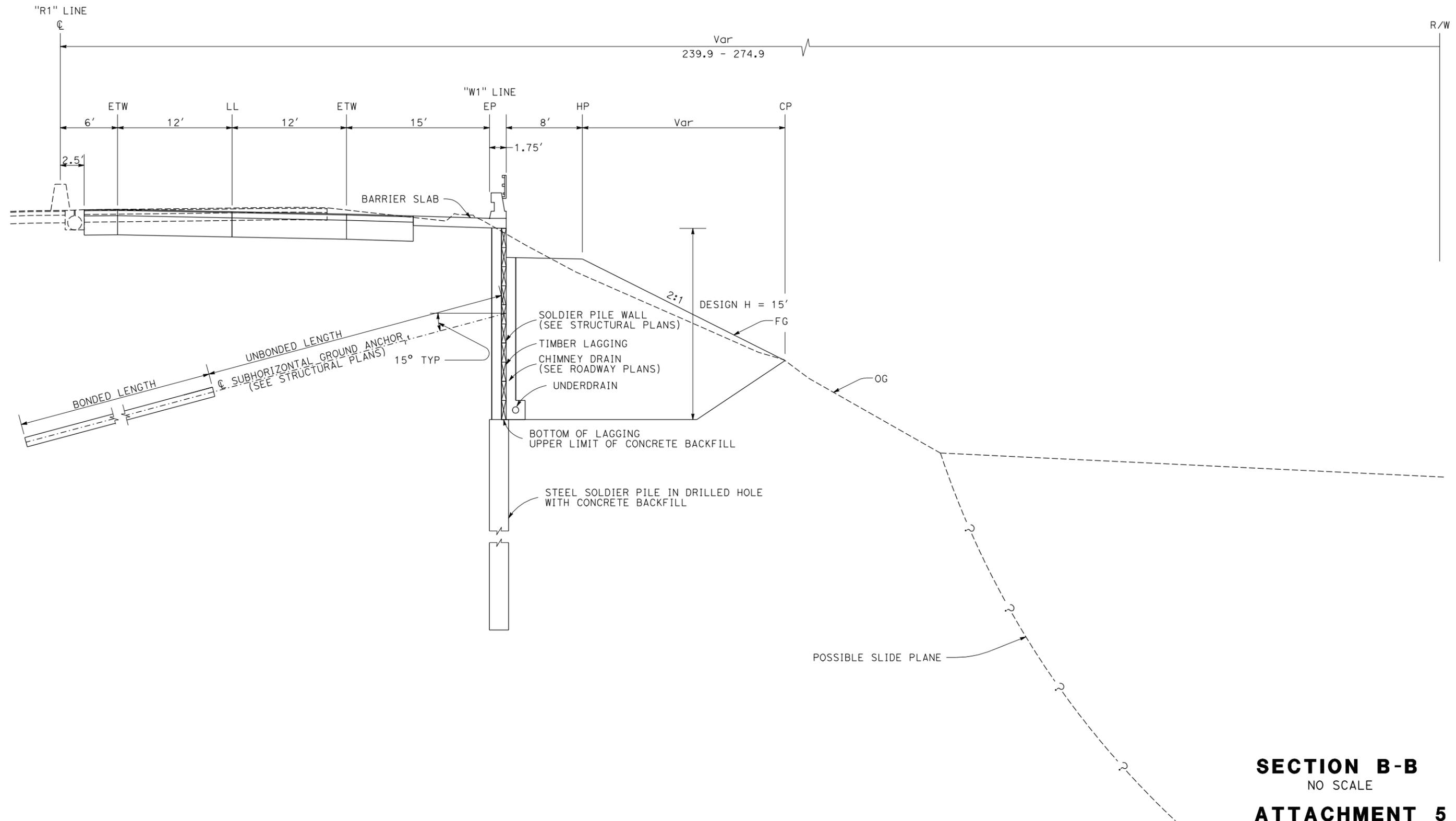
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	Scr	17	10.8/11.3		

REGISTERED CIVIL ENGINEER	DATE
PLANS APPROVAL DATE	



REGISTERED PROFESSIONAL ENGINEER
No. _____
Exp. _____
CIVIL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



SECTION B-B
 NO SCALE
ATTACHMENT 5

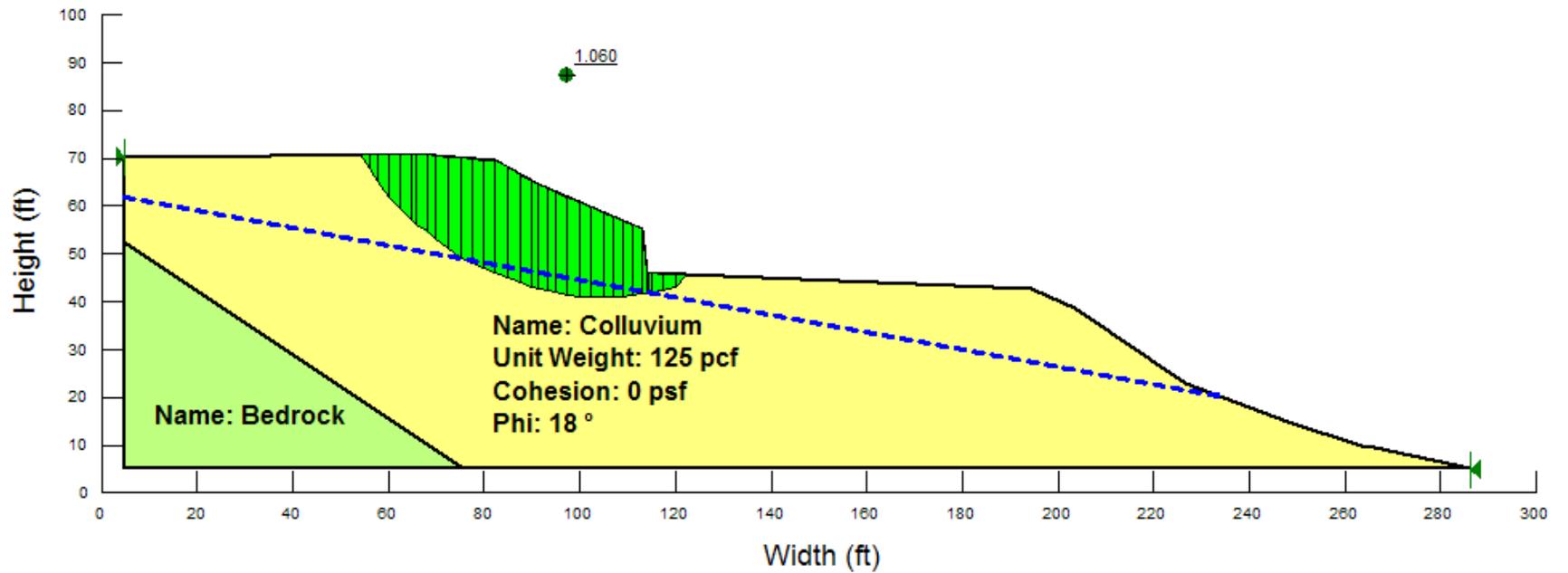
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans GEOTECHNICAL DESIGN

REVISOR BY
 DATE

CALCULATED-DESIGNED BY
 CHECKED BY

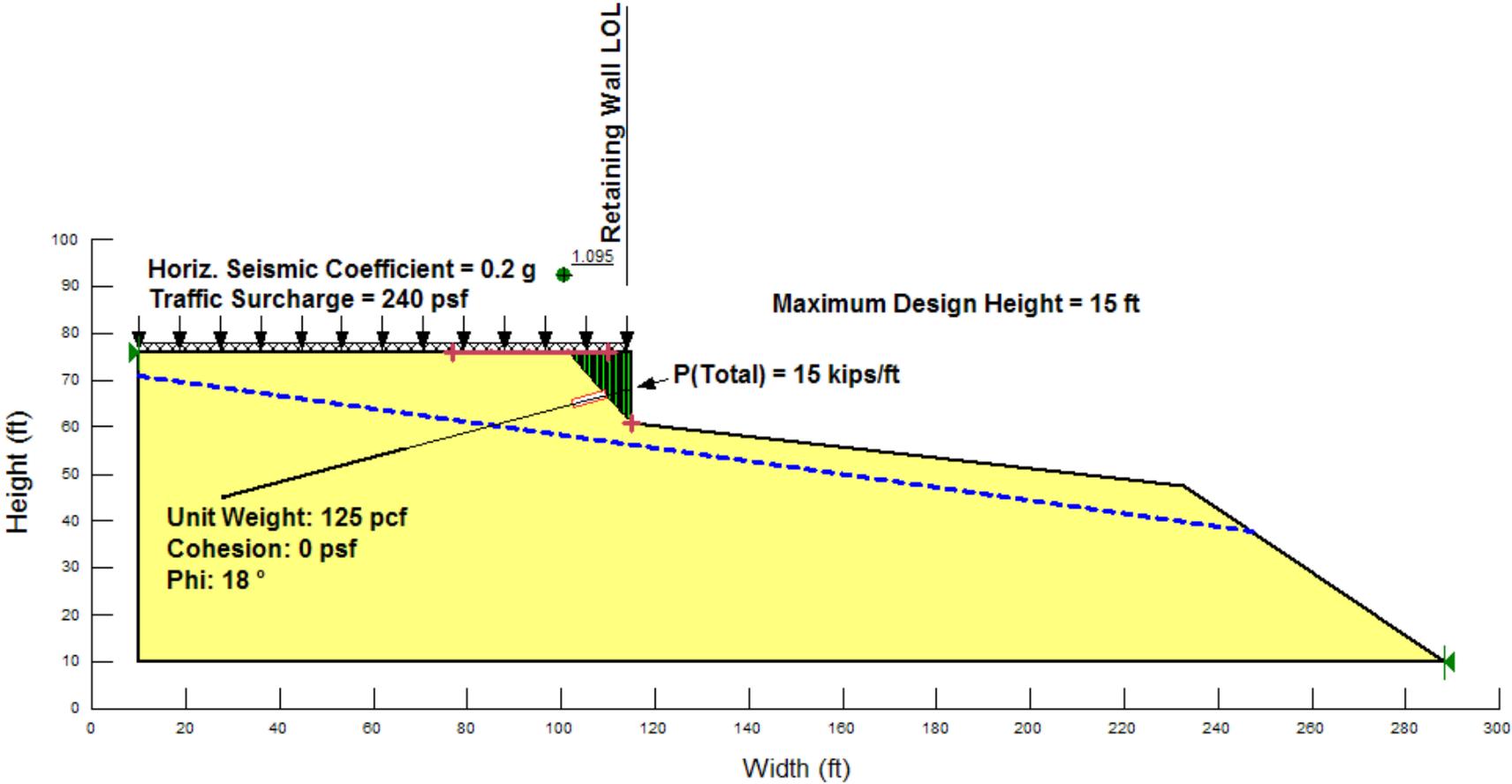
FUNCTIONAL SUPERVISOR

Summit Slide Retaining Wall: Back Analysis

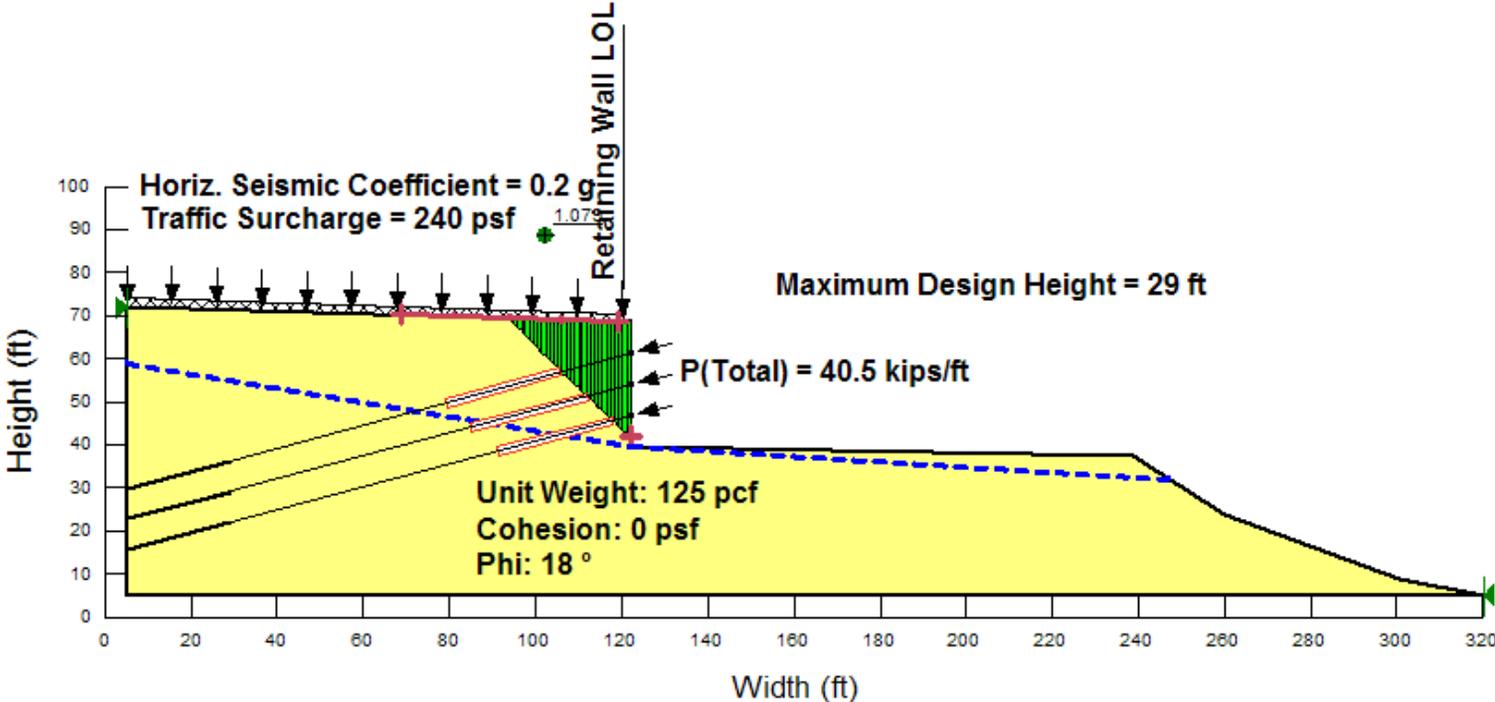


ATTACHMENT 6

Summit Slide Retaining Wall



Summit Slide Retaining Wall



FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	REVISOR BY
	CHECKED BY	DATE REVISED

DATE	BY

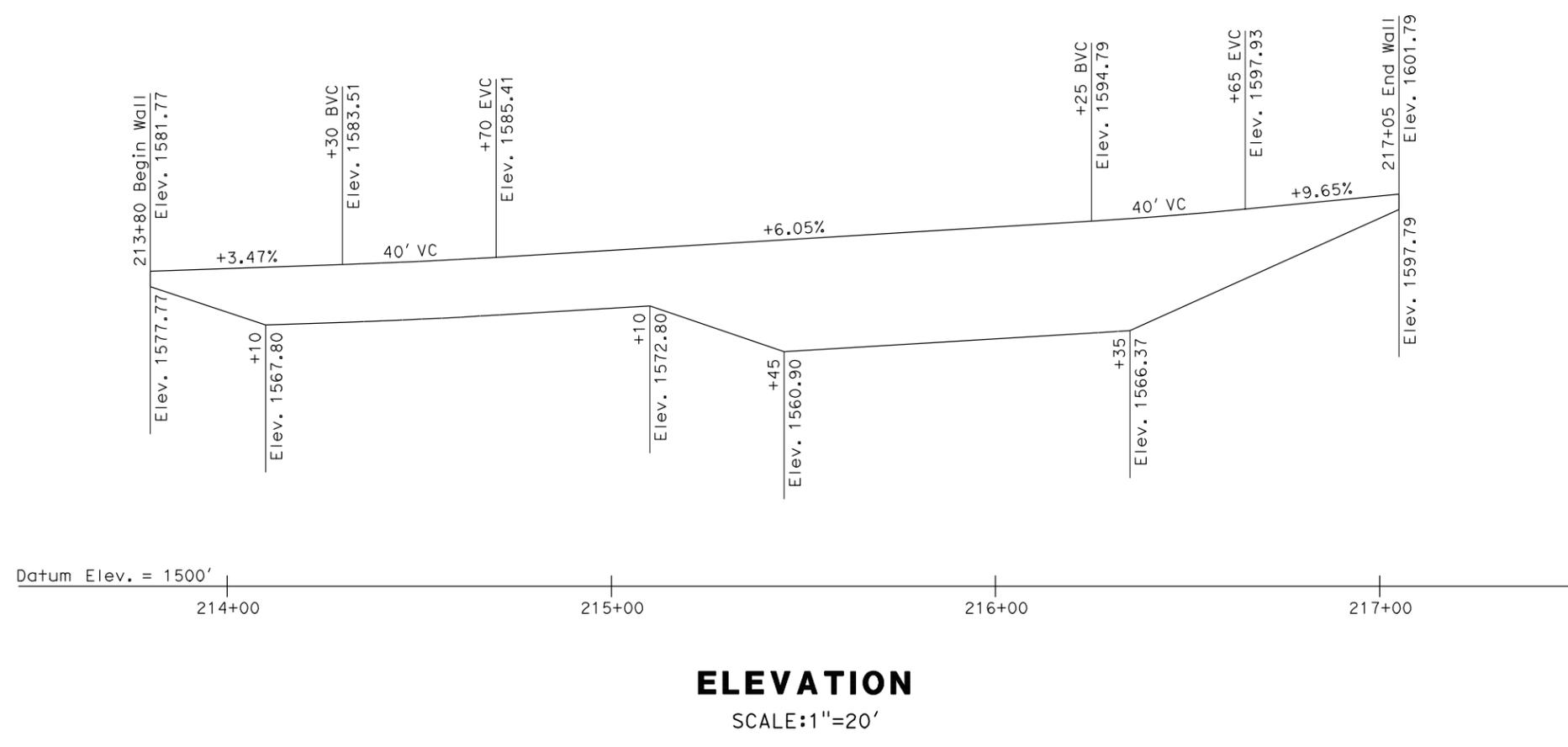
REVISION	DATE	BY

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SCR	17	10.8/11.3		

REGISTERED CIVIL ENGINEER DATE _____

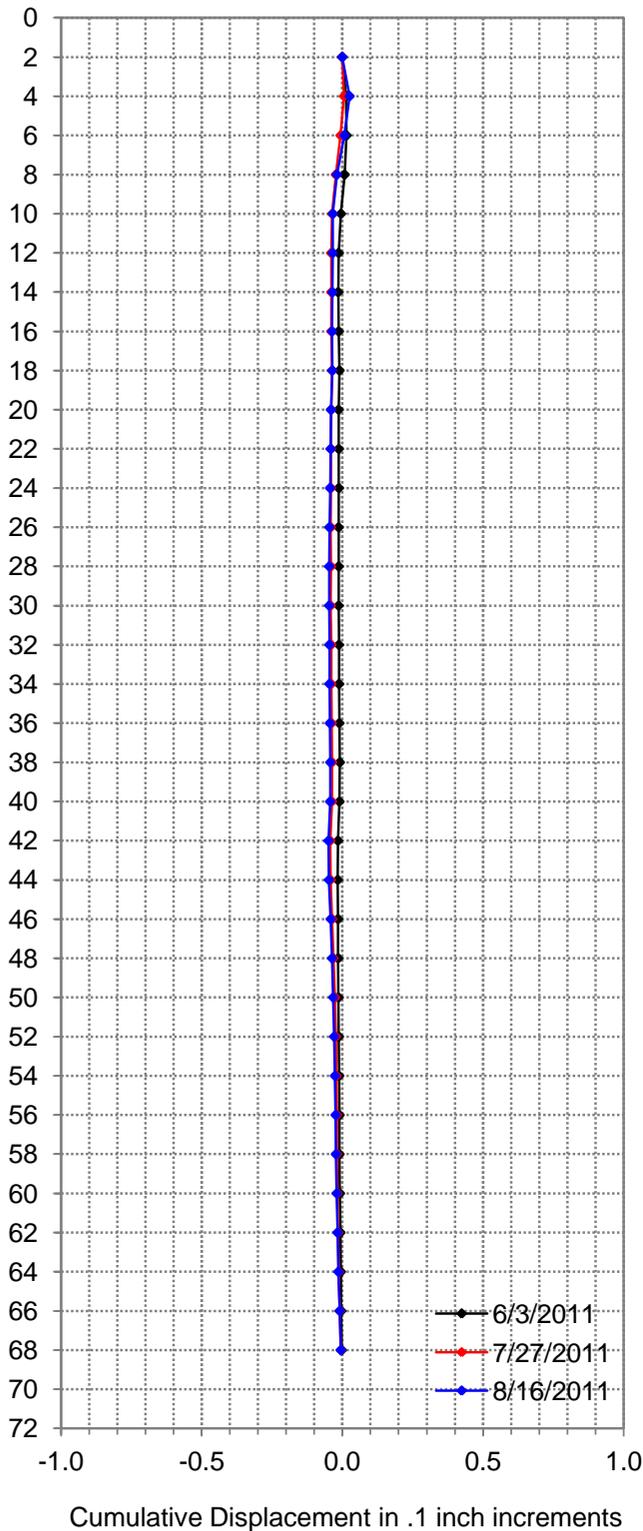
PLANS APPROVAL DATE _____

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

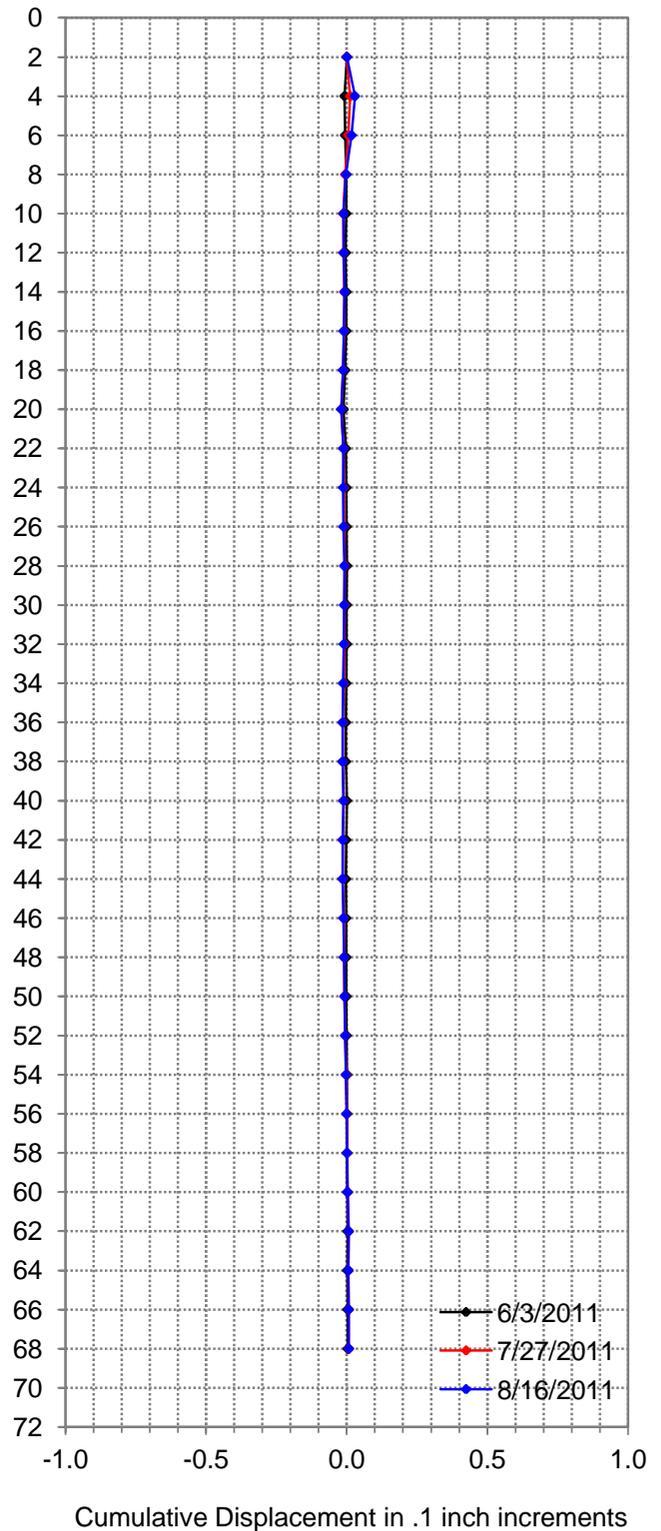



Cumulative Displacement (inches) since 4/29/2011

A AXIS (bias shift applied)



B AXIS (bias shift applied)



SEA 11-01
Summit Slide
05-SCR-17-PM 10.8/11.3
October 5, 2011

CA-Department of Transportation
DES-OGDW Orinda Field Station
15 Camino Pablo (510) 292-5177
ATTACHMENT 10



BARRIER SYSTEMS



A LINDSAY TRANSPORTATION SOLUTIONS COMPANY

DOMESTIC LEASE QUOTATION #1112-0031Qrev1

Date: December 13th, 2012

To: Aaron Henkel, PE
Caltrans District 5
50 Higuera Street
San Luis Obispo, CA 93401

Job: CA SR-17 PM 11

Dear Mr. Henkel:

Attached please find our quotation for the lease/rental of 24" Quickchange® Moveable Barrier and Barrier Transfer Machine (BTM) to assist in the construction of this project as noted above.

Series 200 Construction Barrier - Lease/Rental

110 M (361 L.ft) "black" hardware and reinforcements (not painted, galvanized, or epoxy coated). The barriers do not include reflectors or striping. Barriers may be new or used.

<u>Term of Lease</u>	<u>Price per foot</u>	<u>Additional Months*</u>
9 months	\$48.00	\$3.60 per foot per month
12 months	\$55.00	\$3.60 per foot per month

3333 Vaca Valley Parkway, Suite 800, Vacaville, CA 95688
Tel: 707-374-6800 Fax: 707-374-6801
An ISO 9001:2000 Company

Variable Length Barrier – VLB

All VLB's for the job as designed will be included in the price above. VLB units will be substituted one for one for concrete pieces and will be charged at the same unit price as concrete units.

Barrier Transfer Machine - BTM-3

One Standard Machine with No Options
per Specification TB 960515 Rev-3

Machine may be new or reconditioned.

<u>Term of Lease</u>	<u>Price Per Each</u>	<u>Additional Months*</u>
9 months	\$138,000.00	\$12,000.00 per month
12 months	\$171,000.00	\$12,000.00 per month

NOTE: Machine is shipped partially disassembled. The mainframe has lifting lugs and a 20-ton crane or similar equipment must be available for unloading. In conjunction with training, we will furnish a technician to supervise the assembly of the machines using your labor and equipment. The approximate time required is two men for a day. The equipment required in addition to the crane for unloading is a forklift and a set of general mechanic's tools.

A permitted 14' wide load using an appropriate low boy trailer maybe an available option which would allow the machines to be shipped fully assembled. Certain restrictions and conditions are applicable to this alternative. Please contact our Field Services Department at 707 374-6800, with any questions regarding the assembled shipment alternative.

Cost of machine includes 2 consecutive days set-up and training (2 weeks notice required). Additional days are available as follows:

- Additional consecutive days: \$1,300.00 per day
- Additional non-consecutive days: \$1,300.00 per day
(portal to portal) plus air fare.

Barriers are one meter long and will be billed as 3.28 feet per barrier times the per foot price for the number of barriers needed to fulfill the linear foot requirement of the order. By necessity, the lineal feet billed may be up to 3.28 feet more than the quantity ordered.

Maintenance: Regular maintenance of the machine is required and periodic adjustment of the wall may be necessary.

Lessor will provide all parts to maintain the machine to factory specifications (not including consumables such as fuel, lubrication and hydraulic fluids). Lessor will also provide quarterly inspections to help Lessee maintain the machine to factory specifications. Lessee is responsible for providing access to the machine for Lessor's employees and for providing the labor for routine maintenance. Any parts damaged due to an accident or negligence will be the responsibility of Lessee.

If additional information is required, please contact our Field Services Department at 707-374-6800.

Taxes: This quotation is exclusive of federal, state and local taxes, which the parties agree are the responsibility of the lessee. Lessor will add the amount of any applicable federal, state or local sales or equivalent taxes to the quotation unless the Lessee provides seller with an acceptable resale or exemption certificate.

Insurance: Lessee will provide both liability and casualty insurance with a minimum limit of \$1 million for bodily injury and Property Damage and a \$10 million umbrella limit.

Storage: Finished parts will be stored at no charge for 30 days following completion of the order. Additional storage time, if required, may be available. Arrangements for additional storage time must be made by the Lessee with the landlord of the property where the barrier is stored.

Pickup Destination:

Barriers: All barriers will be available at our Rio Vista, Ca. yard. (Night loading will be available) Contractor is responsible for loading, trucking and unloading.

Machines: Rio Vista, CA, freight prepaid & add.

VLB's Rio Vista, CA, freight prepaid & add.

Specifications:

Barriers will be manufactured by the wet or dry cast method using forms. Minimum concrete 28 day compressive strength shall be 4,000 PSI. "Bugholes" caused by trapped air bubbles will be permitted. Rock pockets or other voids caused by inadequate consolidation of the concrete shall be filled. Used barriers may have non-structural damage such as chipped edges or corners, etc.

All materials shall be on the approved list of the State in which the barriers are manufactured. Air entrainment shall be as specified by the ordering agency plus or minus 1-1/2 percentage points. All steel hardware and reinforcements shall be "black" (not galvanized, painted, or epoxy coated) unless otherwise quoted. All materials shall be of U.S. origin except that up to 5% by value foreign origin material may be used if required.

All inspections shall be performed by Barrier Systems Sales & Service (B.S.S. &S.) who will certify that the product is in compliance with their specifications and shop drawings. If additional State specifications and/or inspections are required, an additional charge may be made which will be quoted upon receipt of additional specifications.

**Terms of
Payment:**

Lease/rental payments shall be due and payable as follows:

Barrier: Lease Period starts upon delivery. The full lease amount is payable net 30 days from date of invoice, upon approval of credit. No retentions will be withheld from Lessor. No rebates will be allowed.

Machine: Lease Period starts upon delivery. The full lease amount is payable net 30 days from date of invoice, upon approval of credit. No retentions will be withheld from Lessor. No rebates will be allowed.

* If additional month-by-month lease/rental is continued, payment is due monthly, in advance.

**Finance
Charge:**

A Financing Charge of 1-1/3% per month (16% per annum) will be computed on past due amounts. Lessee agrees that all collection costs, court costs, investigation costs, legal fees and all other

incidental costs incurred in the collection of his past due account will be paid by the lessee.

PLEASE NOTE THAT THE TERMS OF THIS QUOTATION ARE INDEPENDENT OF THE TERMS OF PAYMENT BY THE STATE TO THE LESSEE.

**Return on
Completion
of Project:**

All barriers shall be returned to Rio Vista, Ca. yard. Lessee is responsible for loading, trucking, unloading and stacking (see TB-000626 Rev.0) items for and from shipment.

Machines and VLB's will be returned to Rio Vista, Ca. Freight Prepaid with Insurance.

Lessee will be responsible for unloading barriers at Lessor's yard and for loading machines for return to Rio Vista, Ca.

All items shall be returned in "as received" condition less ordinary wear and tear.

All barrier sections, which are not reusable, will be invoiced at \$492 per 24" barrier and \$6,000 per VLB.

Unusual damage or wear to the machines will be repaired at Lessee's expense.

Delivery:

Barrier: Available 45 days after receipt and acceptance of a signed Lease Agreement.

Machines: Available 45 days after receipt and acceptance of a signed Lease Agreement.

Note:

This quotation is valid for all bidders and is good for orders received within 60 days from the award date, provided, delivery of product is made within 90 days of award date and that the transactions take place in Calendar year 2012.

PLEASE NOTE: Any modifications, including additions or reductions in quantity, or additions to the terms hereof will constitute a counteroffer by lessee. Any such modifications or additions may result in adjustments to the lease/rental price.

Warranty and Terms: This quotation is subject to the following attachments which are herewith made a part of this quotation:

Warranty - W030587 Rev. 7
24" QMB Barrier Specification - TB 950222 Rev. 3
BTM-3 Specification - TB 960515 Rev 3
Barrier Deployment – TB 941025 Rev 3
QMB 24" Barrier Stacking Specification – TB000626 Rev. 0
Quick-Lock VLB Specification - TB990831 Rev. 3

Thank you for giving us this opportunity to quote on this project. We strongly encourage the successful bidder to coordinate with our applications department regarding the details of the proposed layout for the system prior to delivery. This collaboration will allow us to ensure that the maximum efficiency of the system is realized by our customers.

Please advise when barrier and machines will be required, giving at least 30 days of advance notice.

If a different lease period is required please let us know and we will provide additional pricing.

Cordially,

BARRIER SYSTEMS SALES AND SERVICE LLC



Erik Weber
Sr. Applications Engineer

Aaron Henkel
District 5

12.9.2011

Dear Aaron,

The ABSORB 350 System is a non-redirective crash cushion that has been designed and tested to meet the rigorous requirements of NCHRP Report 350, Test Levels 2 (43 mph, 70 km/h) and 3 (62 mph, 100 km/h). This impact attenuator system offers maintenance workers and contractors a reliable and easy method to protect the ends of concrete barriers. The ABSORB 350 Crash Cushion can be attached to the end of permanent or portable concrete barrier (pcb), Quick Moveable Barrier and steel barrier without the need to anchor the system to the roadway surface. At 24" [610 mm] wide, it is ideally suited for narrow areas where road and workspace is limited. ABSORB 350 is easy to install and is easier to restore after an impact than other non-redirective crash cushions because the system uses uniform modular components.

As the California Distributor for The ABSORB 350 System, Statewide Traffic Safety & Signs hereby agrees to sell the ABSORB 350 System to any contractor or subcontractor on any State Highway Contract. All sales are to be in accordance with Statewide Traffic Safety & Signs conditions and credit policies in effect at the time of the order submittal.

These products meet the requirements of California Department of Transportation's specifications and are manufactured by:

Barrier Systems

3333 Vaca Valley Pkwy
Vacaville, CA 95688
Phone: (707) 374-6800
Fax. (707) 374-6801

The ABSORB 350 is distributed by:

Northern California

Statewide Traffic Safety & Signs
130 Grobric Court
Fairfield, Ca 94533
Phone 800.770.2644
Fax 707.864.9956

Central California

Statewide Traffic Safety & Signs
522 Lindon Ln
Nipomo, Ca 93444
Phone 800.559.7080
Fax 805.929.5786

Southern California

Statewide Traffic Safety & Signs
13755 Blaisdell Pl.
Poway, Ca 92064
Phone 800.547.9683
Fax 858.679.7117

The prices shown below are guaranteed for all for all bidders. Price is for the Highway 17 Job. Price guarantee is good for orders received within 60 days from the award date, provided, delivery of product is made within 90 days of award date and that the transactions take place in Calendar year 2012.

The following are exclusive to be used with 24" wide Quick Moveable Barrier

System Number	Description	Price Each
AB070M24	TL-2 ABSORB for up to 24" QMB	\$7221.00
AB100Q24	TL-3 ABSORB for up to 24" QMB	\$10,653.00

These prices do not include installation or sales tax. All prices are FOB Nipomo, Ca

If you have questions or I can be of further assistance with Barrier Products, please contact me.

Regards,



Statewide Traffic Safety & Signs
Bill Peterson
Account Manager
522 Lindon Lane
Nipomo, Ca 93444
Office 805.929.5070
Fax: 805.929.5786
Cell: 805.431.1402
E-Mail billp@statewidesafety.com