Information Handout
11-063804
11-SD-8 KP 28.0/R30.1

1. Revised Foundation Report for East Main Street UC Widen, Bridge No. 57-0381R.
2. Foundation Report for Broadway UC Widen, Bridge No. 57-0475R.
3. Foundation Review for East Main Street UC Widen, Bridge No. 57-0381R.
4. Foundation Review for Broadway UC Widen, Bridge No. 57-0475R.
5. Water source information
6. Foundation Report for Proposed Retaining and Sound Walls, June 30, 2005
7. Revised Retaining Wall Foundation Recommendations, January 31, 2007
8. Foundation Report for Proposed Sound Walls Addendum, May 18, 2007
9. Sound Wall Soil Friction Angle Correction, December 9, 2008
10. Structural Section Recommendations, July 23, 2007
11. Hazardous Waste Review, September 7, 2007
12. Limited Aerially Deposited Lead Assessment, Interstate 8, 2nd Street to Greenfield Drive, El Cajon, California, PM R17.7/R18.7, Task Order No. 11-063800-VO, Contract No. 43A0012 - Portion
13. California Regional Water Quality Control Board - Section 401 dated February 04, 2009

State of California

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: MR. ELIAS KURANI
Structures Design
Office of Bridge Design-South
Bridge Design Branch 18
MS #9-Des 18

Attention: Mr. Prem Rimal

Date: April 8, 2008

File: 11-SD-8-KP 28.70
11-063801
E. Main St. UC (Widen)
Br. #57-0381 R

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES
OFFICE OF GEOTECHNICAL DESIGN – SOUTH 2
DESIGN BRANCH B, MS #5

Subject: Revised Foundation Report

This report presents a Revised Foundation Report which supercedes the Foundation Report, dated February 29, 2008, for the proposed left side widening of the East Main Street Undercrossing (UC) Right Bridge (Br. #57-0381 R), which was recently sent to your office. This Revised Foundation Report presents design changes at the Bent 2 location, which include a reduced footing size, decrease in total vertical load, decrease in the factored nominal bearing resistances, as well as other changes.

The following foundation recommendations are based on subsurface information gathered during the August 2005 foundation investigation performed by Caltrans, "As-built" Log of Test Boring data from 1957, as well as "As-built" contract plans. The foundation investigation performed in August 2005 consisted of drilling two mud-rotary exploratory borings. The boring locations and data are shown on the Log of Test Boring sheets. With regards to the current foundation recommendations, all elevations referenced within this report and shown on the recent Log of Test Boring sheets are based on the NAVD 1988 vertical datum (as-built elevations have been converted from NGVD 1929 datum to NAVD 1988 datum using a conversion factor of +0.60 m (+1.95 ft.)).

Project Description/History

The bridge site is located in San Diego County, on Interstate 8 within the city of El Cajon. The project proposes to widen the left side of the right bridge approximately 5.6 m (19.2 ft). The existing E. Main Street UC bridges consist of two (left and right) two span structures built in 1961. "As-built" records indicate the existing left and right bridges are supported on spread footings at the Abutments 1 and 3, as well as Bent 2 locations, and were designed using an Allowable Bearing Capacity of 766 kPa (8 tsf). At the Abutments 1 and 3 locations, a single continuous abutment footing was originally constructed that connects the left and right bridges. The Abutment 1 bottom of footing is at elevation 153.3 m (502.95 ft), the Bent 2 bottom of footings are at elevation 153.6

m (503.95 ft), and the Abutment 3 bottom of footing is at elevation 153.6 m (503.95 ft). The original Foundation Recommendation Report, dated April 11, 1957, recommended that the bridge structures be supported on spread footings placed at or below elevation 153.9 m (504.95 ft), with a design loading up to 766 kPa (8 tsf).

Wingwalls on the left side of the left bridge and right side of the right bridge, Abutments 1 and 3 locations, are also supported on spread footings. The wingwalls at the left bridge Abutments 1 and 3, locations, and the wingwall at the right bridge, Abutment 3 location are supported on footings founded in native material. The wingwall at the right bridge, Abutment 1 location, the segment located closest to Abutment 1 is supported on a footing founded in native material, whereas the other three wingwall segments, furthest from Abutment 1, are supported on footings founded on fill material.

Site Geology

The bridge site is located in an urban environment within the city limits of El Cajon, which is located in a small valley east of San Diego. Based on the Geologic Map of California, San Diego-El Centro Sheet (Jenkins, 1962), the valley where the city of El Cajon lies is generally underlain by Quaternary Alluvium, and is surrounded by hills predominantly composed of Mesozoic granitic rocks, with some areas of Eocene nonmarine and Pre-Cretaceous metamorphic rocks.

The foundation investigation performed in August 2005 consisted of two mud-rotary borings drilled with a CS 2000 drill rig. Boring B-1-05, drilled inside (left side) of the Right Bridge Bent 2 location, revealed that underlying the asphalt of the city street is a stiff, silty, sandy clay to approximately 1.52 m (5.0 ft) deep (elev. 153.6 m (503.9 ft)), which is underlain by a medium dense to very dense silty sand extending down to approximately 4.1 m (13.5 ft) deep (elev. 151.0 m (495.4 ft)) where igneous bedrock was encountered. The igneous bedrock ranged from decomposed to moderately weathered, very soft to moderately hard, and extended to the maximum depth of boring B-1-05 (elev. 141.3 m (463.5 ft)).

Boring B-2-05, drilled inside (right side) of the Left Bridge Bent 2 location, revealed that underlying the asphalt of the city street is a hard, silty, sandy clay with gravel to approximately 1.52 m (5.0 ft) deep (elev. 153.7 m (504.3 ft)), which is underlain by a medium dense to very dense silty sand extending down to approximate 4.1 m (13.5 ft) deep (elev. 151.1 m (495.8 ft)) where igneous bedrock was encountered. The igneous bedrock ranged from decomposed to intensely weathered, very soft to soft, and extended to the maximum depth of boring B-2-05 (elev. 141.4 m (464.0 ft)).

For more specific soils and rock data from the 2005 foundation investigation, refer to the Log of Test Borings.

Ground Water

No ground water was encountered in borings B-1-05 and B-2-05 during the August 2005 subsurface investigation, nor was ground water encountered in the original subsurface

investigation in 1957. It is anticipated that no ground water will be encountered during construction, although ground water elevations are subject to seasonal fluctuations and will be encountered at higher or lower elevations depending on conditions at time of construction.

Scour Potential

Scour is not considered to be an issue at this bridge site.

Corrosion

Corrosion test results for some soil samples collected from borings B-2-05 are shown below in Table 1. Based on current Caltrans standards, the site is not considered corrosive.

Table 1 – Corrosion Test Summary

Location	SIC Number	Minimum Resistivity (Ohm-Cm)	pH	Chloride Content (ppm)	Sulfate Content (ppm)
Boring B-2-05 Elev. 153.7-153.1 m (Elev. 504.3-502.3 ft)	C638051 A	5000	7.93	N/A	N/A
Boring B-2-05 Elev. 148.8-148.5 m (Elev. 488.3-487.3 ft)	C638051 B	4900	8.02	N/A	N/A
Boring B-2-05 Elev. 143.7-143.3 m (Elev. 471.3-470.3 ft)	C638051 C	4800	7.67	N/A	N/A

Note: Caltrans currently defines a corrosive environment as an area where the soil has a minimum resistivity of less than 1000 ohm-cm, and either contains greater than or equal to 500 ppm of chlorides, greater than or equal to 2000 ppm of sulfates, or has a pH of 5.5 or less.

Fault and Seismic Data

The structure site is potentially subject to strong ground motions from nearby earthquake sources during the design life of the new structure. The Office of Geotechnical Design-South 2 has provided Final Seismic Design Recommendations for the site in a memorandum dated October 21, 2005. The controlling fault for the site is the Newport-Inglewood-Rose Canyon/E Fault (NIE) located approximately 22.5 km (14.0 mi.) southwest of the site, with a maximum credible earthquake Mw=7.0. The corresponding Peak Bedrock Acceleration is estimated to be 0.3g.

Liquefaction Potential

Final Seismic Design Recommendations, dated October 21, 2005, state that the bridge site is not prone to liquefaction.

Foundation Recommendations

The following recommendations are for the proposed widening to the left side of the East Main Street UC Right Bridge (Br. #57-0381 R), as shown on the General Plan dated March 28, 2007.

Spread footings are recommended to be used at the Abutments 1 and 3, as well as Bent 2 support locations.

Abutments 1 and 3 Locations

At the Abutments 1 and 3 locations, a continuous spread footing extending between the left and right bridges already exists, therefore, at those locations, the widened portion can be supported on those existing footings. The recommendations for Allowable Bearing Capacity for Abutments 1 and 3 support locations are shown in Table 2 below.

Table 2: Abutments 1 and 3 Spread Footing Data (Br. #57-0381 R)

Support Location	Minimum Footing Width (Existing)	Bottom of Footing Elevation	Recommended Bearing Limits	
			WSD [1]	LRFD [2]
			Allowable Bearing Capacity (q_{all})	Nominal Bearing Resistance (q_n)
Abutment 1	4.57 m (15.0 ft)	153.3 m (502.95 ft)	766 kPa (16.0 ksf)	N/A
Abutment 3	4.57 m (15.0 ft)	153.6 m (503.95 ft)	766 kPa (16.0 ksf)	N/A

Notes: 1) Working Stress Design (WSD). The Maximum Equivalent Uniform Contact Pressure, (q_{max}), is not to exceed the recommended Allowable Bearing Capacity, (q_{all}).
2) Load and Resistance Factor Design, (LRFD). The Maximum Equivalent Uniform Contact Pressure, (q_{max}), divided by the Strength Reduction Factor, ($\phi = 0.45$), is not to exceed the recommended Nominal Bearing Resistance, (q_n).

Bent 2 Location

At the Bent 2 location, spread footings are also recommended for support of the proposed widening. The bottom of footing elevation and footing dimensions are shown below in Table 3; the vertical loadings, moments, shears, and effective footing dimensions are presented below in Table 4; and the factored nominal bearing resistances for the strength and extreme limit states are shown below in Table 5.

Table 3: Bent 2 Spread Footing Dimensions (Br. #57-0381 R)

Location	Bottom of Footing Elevation	Footing Dimensions			Depth of Footing[3] (D_f)
		Length (L_L)[1]	Length (L_T)[2]	Thickness (t)	
Bent 2	152.95 m (501.8 ft)	5.0 m (16.5 ft)	6.2 m (20.5 ft)	1.2 m (4.0 ft)	1.52 m (5.0 ft)

Notes: 1) (L_L) Longitudinal direction.
2) (L_T) Transverse direction.
3) (D_f) Minimum footing embedment depth taken from ground surface to bottom of footing.

Table 4: Bent 2 Controlling Loading Conditions (Br. #57-0381 R)

Limit State[1]	Moment[2]		Shear[3]		Vertical Loading[4]	Effective Footing Dimensions		Estimated Settlement
	M_T	M_L	S_T	S_L		$(L_L)^5$	$(L_T)^6$	
Service	1174 kN-m (866 k-ft)	1681 kN-m (1240 k-ft)	0 kN (0 kips)	0 kN (0 kips)	5440 kN (1223 kips)	4.42 m (14.5 ft)	5.82 m (19.1 ft)	< 13 mm (0.5 in)
Strength	2391 kN-m (1763 k-ft)	2717 kN-m (2004 k-ft)	0 kN (0 kips)	0 kN (0 kips)	6628 kN (1490 kips)	3.87 m (12.7 ft)	5.52 m (18.1 ft)	N/A
Extreme (T)	10687 kN-m (7881 k-ft)	0 kN-m (0 k-ft)	0 kN (0 kips)	0 kN (0 kips)	4057 kN (912 kips)	0.98 m (3.2 ft)	5.03 m (16.5 ft)	< 13 mm (0.5 in)

Notes: 1) Only the controlling design Loading conditions for each Limit State are listed
2) (M_T) Moment in transverse direction at top of footing. (M_L) Moment in longitudinal direction at top of footing.
3) (S_T) Shear in transverse direction at top of footing. (S_L) Shear in longitudinal direction at top of footing.
Per accepted design practice and Seismic Design Criteria 7.7.1.1, designer did not use shear in moment calculation.
4) Vertical loading is the total vertical load at top of footing, and does not include the weight of the spread footing and soil cover on the footing.
5) (L_L) Longitudinal direction.
6) (L_T) Transverse direction.

Table 5: Bent 2 Spread Footing Data (Br. #57-0381 R)

Support Location	LRFD		
	Service	Strength $\varphi_b = 0.45$	Extreme Event $\varphi_b = 1.00$
	Permissible Net Contact Stress	Factored Nominal Bearing Resistance	Factored Nominal Bearing Resistance
Bent 2	N/A*	1312 kPa (27.4 ksf)	1618 kPa (33.8 ksf)

Note: *N/A due to bottom of footing located just above granitic bedrock.

The recommended nominal bearing resistances provided in Table 5, above, are based on the following design criteria:

1) The Bent 2 footing shall be constructed at or below the recommended elevation shown in Table 3 above.

2) The Bent 2 footing has the footing dimensions as shown in Table 3.

3) The controlling Bent 2 footing vertical loads, moments, and shear forces used for footing design are as shown in Table 4.

If any of the above footing dimensions are reduced, bottom of footing elevations increased, or vertical load, moment or shear forces increased, the Office of Geotechnical Design-South 2, Branch B, is to be contacted for reevaluation.

General Notes:

1. All support locations are to be plotted in plan view on the Log of Test Borings as stated in "Memo to Designers" 4-2. The plotting of support locations should be made prior to requesting a final foundation review.

Construction Considerations:

1. At the Bent 2 support location, concrete for the support footing shall be placed neat against the trimmed walls and undisturbed material at the bottom of the footing excavation. Should the bottom of the footing excavation be disturbed, then the bottom of the footing excavation shall be extended down at 0.15 m (0.5 ft) intervals until undisturbed material is observed and approved by the Engineer. The subexcavated material is to be replaced with lean concrete. The disturbed native material is not to be recompacted.

2. The Bent 2 footing excavation is to be inspected and approved by a representative of the Office of Geotechnical Design-South 2, Branch B, prior to placing any steel or concrete for the support footing in the excavation. Once the excavation has been completed to the specified elevation, the contractor is to allow five (5) working days for the inspection. The structure representative is to provide the Office of Geotechnical Design-South 2, Branch B, a one-week notification prior to beginning the five-day contractor waiting period.

The recommendations contained in this report are based on specific project information regarding structure type, location, and design loads that have been provided by the Office of Bridge Design-South. If any conceptual changes are made during final project design, the Office of Geotechnical Design-South 2, Design Branch B should review those changes to determine if these foundation recommendations are still applicable. Any questions regarding the above recommendations should be directed to the attention of Erich Neupert, (916) 227-4565, at the Office of Geotechnical Design-South II, Branch B.

Prepared by: Date: 4/8/08

Erich Neupert

Erich Neupert, P.G., 8137
Engineering Geologist
Office of Geotechnical Design-South 2
Design Branch B

PROFESSIONAL GEOLOGIST
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STATE OF CALIFORNIA

cc: R.E. Pending File
John Stayton - Specs & Estimates (4)
Dave Pajouhesh – PCE
Lou Melendez – District 11 (Project Manager)
Abbas Abghari – OGDS-2
Mark DeSalvatore-OGDS-2
David Liao-OGDS-2
Project File

State of California

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: MR. ELIAS KURANI
Structures Design
Office of Bridge Design-South
Bridge Design Branch 18
MS #9-Des 18

Attention: Mr. Richard Schendel

Date: April 8, 2008

File: 11-SD-8-KP 29.60
11-063801
Broadway UC (Widen)
Br. #57-0475 R

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES
OFFICE OF GEOTECHNICAL DESIGN – SOUTH 2
DESIGN BRANCH B, MS #5

Subject: Foundation Report

This report presents the foundation recommendations for the proposed left side widening of the Broadway Undercrossing (UC) Right Bridge (Br. #57-0475 R). The following foundation recommendations are based on subsurface information gathered during the August 2005 foundation investigation performed by Caltrans, "As-built" Log of Test Boring data from 1960, the original foundation recommendation report dated July 12, 1960, and "As-built" contract plans. The foundation investigation performed in August 2005 consisted of drilling three mud-rotary exploratory borings. The boring locations and data are shown on the Log of Test Boring (LOTB) sheets. With regards to the current foundation recommendations, all elevations referenced within this report and shown on the recent Log of Test Boring sheets are based on the NAVD 1988 vertical datum ("As-built" elevations have been converted from NGVD 1929 datum to NAVD 1988 datum using a conversion factor of +0.61 m (+2.0 ft)).

Project Description/History

The bridge site is located in San Diego County, on Interstate 8 within the city of El Cajon. The project proposes to widen the left side of the right bridge approximately 5.9 m (20 ft). The existing Broadway UC bridges consist of two (left and right) three span structures built in 1965. "As-built" records indicate the existing left and right bridges are supported on spread footings at all support locations. The original Foundation Recommendation Report, dated July 12, 1960, and the Foundation Review dated August 24, 1962 recommended that the Abutments 1 and 4, for the right and left bridges be supported on spread footings founded on engineered fill compacted to 95% relative compaction and designed using an Allowable Bearing Capacity of 143.6 kPa (1.5 tsf). Bents 2 and 3 support locations are also supported on spread footings, and were designed using an Allowable Bearing Capacity up to 478.8 kPa (5.0 tsf), with the bottom of footings placed at least 1.2 m (4 ft) below the (then) existing ground surface.

The "As-built" construction records show that at the right bridge, the Abutment 1 bottom of footing ranges from elev. 172.7-172.5 m (566.5-566.0 ft) from left to right across the length of the footing, and at Abutment 4, the bottom of footing ranges from elev. 173.9-173.8 m (570.6-570.1 ft) from left to right, across the length of the footing. At the left bridge location, the Abutment 1 bottom of footing ranges from elev. 171.9-172.3 m (564.1-565.4 ft) from left to right across the length of the footing, and at Abutment 4, the bottom of footing ranges from elev. 173.2-173.6 m (568.3-569.7 ft) from left to right, across the length of the footing.

At the right bridge location, the Bent 2 bottom of footings are at elev. 167.3 m (549.0 ft) for the left column and at elev. 167.9 m (551.0 ft) for the right column, and the Bent 3 bottom of footings are at elev. 168.2 m (552.0 ft) for the left column and at elev. 168.9 m (554.0 ft) for the right column. At the left bridge location, the Bent 2 bottom of footings are at elev. 166.1 m (545.0 ft) for both the left and right columns, and the Bent 3 bottom of footings are at elev. 166.4 m (546.0 ft) for both the left and right columns.

Site Geology

The bridge site is located in an urban environment within the city limits of El Cajon, which is located in a small valley east of San Diego. Based on the Geologic Map of California, San Diego-El Centro Sheet (Jenkins, 1962), the valley where the city of El Cajon lies, is generally underlain by Quaternary Alluvium, and is surrounded by hills predominantly composed of Mesozoic granitic rocks, with some areas of Eocene non-marine and Pre-Cretaceous metamorphic rocks.

The foundation investigation performed in August 2005 consisted of three mud-rotary borings drilled with a CS 2000 drill rig. Boring B-1-05, was drilled on the inside (left side) of the right bridge, between Bent 2 and Bent 3, on the existing city street. Boring B-1-05 revealed that underlying the asphalt of the city street is a stiff, silty, sandy clay to approximately 0.46 m (1.5 ft) deep (elev. 168.2 m (551.8 ft)), which is underlain by a dense silty sand extending down to approximately 2.0 m (6.5 ft) deep (elev. 166.7 m (546.8 ft)) where igneous bedrock was encountered. The igneous bedrock ranged from decomposed to fresh, very soft to very hard, and extended to the maximum depth of boring B-1-05 (elev. 153.4 m (503.3 ft.)).

Boring B-2-05, drilled on top of the Abutment 4 embankment fill, inside (left side) of the right bridge, revealed medium dense to dense, silty sand with gravel (fill material) extending down to approximately 6.4 m (21.0 ft) deep (elev. 170.0 m (557.8 ft.)). Below the fill material, native material was encountered which consisted of interbedded layers of very stiff, silty sandy clay, and medium dense, silty sand to approximately 7.8 m (25.7 ft) deep (elev. 168.6 m (553.1 ft)) where igneous bedrock was encountered. The igneous bedrock ranged from decomposed to moderately weathered, very soft to moderately hard, and extended to the maximum depth of boring B-2-05 (elev. 159.7 m (523.8 ft)).

Boring B-3-05, drilled on top of the Abutment 1 embankment fill, inside (left side) of the right bridge, revealed a medium dense, silty sand with gravel (fill material) extending down to approximately 5.5 m (18.0 ft) deep (elev. 169.5 m (556.1 ft)). Below the fill material, native

material was encountered which consisted of interbedded layers of medium dense silty sand; silty sand with gravel; clayey silty sand; and very stiff silty sandy clay extending to approximately 8.7 m (28.5 ft) deep (elev. 166.3 m (545.6 ft)) where igneous bedrock was encountered. The igneous bedrock ranged from decomposed to slightly weathered, very soft to hard, and extended to the maximum depth of boring B-3-05 (elev. 158.2 m (519.1 ft)).

For more specific soils and rock data, from the 2005 foundation investigation, refer to the Log of Test Borings.

Ground Water

No ground water was encountered in borings B-1-05, B-2-05 or B-3-05 during the August 2005 subsurface investigation, nor was ground water encountered in the original subsurface investigation in 1960. It is anticipated that no ground water will be encountered during construction, although ground water elevations are subject to seasonal fluctuations and may be encountered at higher or lower elevations depending on conditions at time of construction.

Scour Potential

Scour is not considered to be an issue at this bridge site.

Corrosion

Corrosion test results for some soil samples collected from borings B-3-05 are shown below in Table 1. Based on current Caltrans standards, the site is not considered corrosive.

Table 1 – Corrosion Test Summary

Location	SIC Number	Minimum Resistivity (Ohm-Cm)	pH	Chloride Content (ppm)	Sulfate Content (ppm)
Boring B-3-05 Elev. 175.0-174.4 m (Elev. 574.1-572.1 ft)	C638052 A	8100	7.96	N/A	N/A
Boring B-3-05 Elev. 166.9-166.6 m (Elev. 547.6-546.6 ft)	C638052 B	2100	8.24	N/A	N/A
Boring B-3-05 Elev. 165.2-164.3 m (Elev. 542.1-539.1 ft)	C638052 C	3700	8.28	N/A	N/A
Boring B-3-05 Elev. 162.2-161.9 m (Elev. 532.1-531.1 ft)	C638052 D	2400	8.27	N/A	N/A

Note: Caltrans currently defines a corrosive environment as an area where the soil has a minimum resistivity of less than 1000 ohm-cm, and either contains greater than or equal to 500 ppm of chlorides, greater than or equal to 2000 ppm of sulfates, or has a pH of 5.5 or less.

Fault and Seismic Data

The structure site may potentially be subject to strong ground motions from nearby earthquake sources during the design life of the new structure. The Office of Geotechnical Design-South 2 has provided Final Seismic Design Recommendations for the site in the memorandum dated October 25, 2005. The controlling fault for the site is the Newport-Inglewood-Rose Canyon/E Fault (NIE) located approximately 24 km (15.0 miles) southwest of the site, with a maximum credible earthquake Mw=7.0. The corresponding Peak Bedrock Acceleration is estimated to be 0.2g.

Liquefaction Potential

Final Seismic Design Recommendations, dated October 25, 2005, state that the bridge site is not prone to liquefaction.

Foundation Recommendations

The following recommendations are for the proposed widening to the left side of the Broadway UC Right Bridge (Br. #57-0475 R), as shown on the General Plan dated March 20, 2008. Spread footings are recommended to be used at the Abutments 1 and 4, as well as Bents 2 and 3 support locations.

Abutments 1 and 4 Locations

At Abutments 1 and 4 locations, the widened portion can be supported on spread footings. The recommended Allowable Bearing Capacity to be used for design, bottom of footing elevations, and minimum footing width dimensions for Abutments 1 and 4 support locations are shown in Table 2 below.

Table 2: Abutments 1 and 4 Spread Footing Data (Br. #57-0475 R)

Support Location	Minimum Footing Width	Bottom of Footing Elevation	Recommended Bearing Limits	
			WSD [1]	LRFD [2]
			Allowable Bearing Capacity (q_{all})	Nominal Bearing Resistance (q_n)
Abutment 1	2.44 m (8.0 ft)	171.8 m (563.6 ft)	143.6 kPa (3.0 ksf)	N/A
Abutment 4	2.44 m (8.0 ft)	173.1 m (567.9 ft)	143.6 kPa (3.0 ksf)	N/A

Notes: 1) Working Stress Design (WSD). The Maximum Equivalent Uniform Contact Pressure, (q_{max}), is not to exceed the recommended Allowable Bearing Capacity, (q_{all}).
2) Load and Resistance Factor Design, (LRFD). The Maximum Equivalent Uniform Contact Pressure, (q_{max}), divided by the Strength Reduction Factor, ($\phi = 0.45$), is not to exceed the recommended Nominal Bearing Resistance, (q_n).

The recommended Allowable Bearing Capacities to be used for design, listed in Table 2, above, are based on the following design criteria:

1) The abutment footings have a minimum width as shown in Table 2.

2) Abutments 1 and 4 footings shall be constructed at or below the recommended elevations shown in Table 2 above.

3) At Abutments 1 and 4 locations, the abutment footings are to be positioned such that there will be a minimum horizontal distance of 1.2 m (4.0 ft) from the near face/top of the footing to the face of the finished slope (Bridge Design Specifications 4.4.5.1).

If any of the above minimum footing widths or horizontal embedment depths are reduced, or bottom of footing elevations raised, the Office of Geotechnical Design-South 2, Branch B, is to be contacted for reevaluation.

Bents 2 and 3 Locations

At Bents 2 and 3 locations, spread footings are also recommended for support of the proposed widening. The bottom of footing elevations and footing dimensions are shown below in Table 3; the vertical loadings, moments, shears and effective footing dimensions are presented below in Table 4; and the factored nominal bearing resistances for the strength and extreme limit states are shown below in Table 5.

Table 3: Bents 2 and 3 Spread Footing Dimensions (Br. #57-0475 R)

Location	Bottom of Footing Elevation	Footing Dimensions			Depth of Footing[3] (D_f)
		Length (L_L)[1]	Length (L_T)[2]	Thickness (t)	
Bent 2	167.00 m (547.9 ft)	3.66 m (12.0 ft)	5.49 m (18.0 ft)	0.914 m (3.0 ft)	1.52 m (5.0 ft)
Bent 3	167.55 m (549.7 ft)	3.66 m (12.0 ft)	5.49 m (18.0 ft)	0.914 m (3.0 ft)	1.52 m (5.0 ft)

Notes: 1) (L_L) Longitudinal direction.
2) (L_T) Transverse direction.
3) (D_f) Minimum footing embedment depth taken from ground surface to bottom of footing.

Table 4: Bents 2 and 3 Controlling Loading Conditions (Br. #57-0475 R)

Limit State[1]	Moment[2]		Shear[3]		Vertical Loading[4]	Effective Footing Dimensions		Estimated Settlement
	M_T	M_L	S_T	S_L		$(L_L)^5$	$(L_T)^6$	
Service	919.4 kN-m (678 k-ft)	633.3 kN-m (467 k-ft)	0 kN (0 kips)	0 kN (0 kips)	2918 kN (656 kips)	3.23 m (10.6 ft)	4.85 m (15.9 ft)	< 13 mm (0.5 in)
Strength	1840.1 kN-m (1357 k-ft)	679.4 kN-m (501 k-ft)	0 kN (0 kips)	0 kN (0 kips)	3870 kN (870 kips)	3.17 m (10.4 ft)	4.54 m (14.9 ft)	N/A
Extreme (L)	0 kN-m (0 k-ft)	3125.6 kN-m (2305 k-ft)	0 kN (0 kips)	0 kN (0 kips)	2037 kN (458 kips)	0.58 m (1.9 ft)	5.49 m (18.0 ft)	< 13 mm (0.5 in)

Notes: 1) Only the controlling design Loading conditions for each Limit State are listed
2) (M_T) Moment in transverse direction at top of footing. (M_L) Moment in longitudinal direction at top of footing.
3) (S_T) Shear in transverse direction at top of footing. (S_L) Shear in longitudinal direction at top of footing.
Per accepted design practice and Seismic Design Criteria 7.7.1.1, designer did not use shear in moment calculation.
4) Vertical loading is the total vertical load at top of footing, and does not include the weight of the spread footing and soil cover on the footing.
5) (L_L) Longitudinal direction.
6) (L_T) Transverse direction.

Table 5: Bents 2 and 3 Spread Footing Data (Br. #57-0475 R)

Support Location	LRFD		
	Service	Strength $\varphi_b = 0.45$	Extreme Event $\varphi_b = 1.00$
	Permissible Net Contact Stress	Factored Nominal Bearing Resistance	Factored Nominal Bearing Resistance
Bent 2	N/A*	1197 kPa (25.0 ksf)	1389 kPa (29.0 ksf)
Bent 3	N/A*	1197 kPa (25.0 ksf)	1389 kPa (29.0 ksf)

Note: *N/A due to bottom of footing located just above granitic bedrock.

The recommended nominal bearing resistances provided in Table 5, above, are based on the following design criteria:

1) The Bents 2 and 3 footings shall be constructed at or below the recommended elevations shown in Table 3 above.

2) The Bents 2 and 3 footings have the footing dimensions as shown in Table 3.

3) The controlling Bents 2 and 3 footing vertical loads, moments, and shear forces used for footing design are as shown in Table 4.

If any of the above footing dimensions are reduced, bottom of footing elevations increased, or vertical load, moment or shear forces increased, the Office of Geotechnical Design-South 2, Branch B, is to be contacted for reevaluation.

General Notes:

1. All support locations are to be plotted in plan view on the Log of Test Borings as stated in 'Memo to Designers' 4-2. The plotting of support locations should be made prior to requesting a final foundation review.

Construction Considerations:

1. At Abutments 1 and 4 support locations, concrete for the proposed support footings shall be placed neat against the undisturbed engineered fill on the bottom of the footing excavation. Should the bottom of the footing excavation be disturbed, then the disturbed soils shall be recompacted to 95% relative compaction prior to placement of concrete for the structure support footings.

2. At Bents 2 and 3 support locations, concrete for the support footings shall be placed neat against the trimmed walls and undisturbed material at the bottom of the footing excavations. Should the bottom of the footing excavation be disturbed, then the bottom of the footing excavation shall be extended down at 0.15 m (0.5 ft) intervals until undisturbed material is observed and approved by the Engineer. The subexcavated material is to be replaced with lean concrete. The disturbed native material is not to be recompacted.

3. The Bents 2 and 3 footing excavations are to be inspected and approved by a representative of the Office of Geotechnical Design-South 2, Branch B, prior to placing any steel or concrete for the support footings in the excavations. Once the excavations have been completed to the specified elevations, the contractor is to allow five (5) working days for the inspection. The structure representative is to provide the Office of Geotechnical Design-South 2, Branch B, a one-week notification prior to beginning the five-day contractor waiting period.

The recommendations contained in this report are based on specific project information regarding structure type, location, and design loads that have been provided by the Office of Bridge Design-South. If any conceptual changes are made during final project design, the Office of Geotechnical Design-South 2, Design Branch B should review those changes to determine if these foundation recommendations are still applicable. Any questions regarding the above recommendations should be directed to the attention of Erich Neupert, (916) 227-4565, at the Office of Geotechnical Design-South II, Branch B.

Prepared by: Date: 4/8/08

Erich Neupert

Erich Neupert, P.G., 8137
Engineering Geologist
Office of Geotechnical Design-South 2
Design Branch B

PROFESSIONAL GEOLOGIST
ERICH NEUPERT
No. 8137
Exp. 2/28/10
STATE OF CALIFORNIA

cc: R.E. Pending File
John Stayton - Specs & Estimates (4)
Dave Pajouhesh – PCE
Lou Melendez – District 11 (Project Manager)
Abbas Abghari – OGDS-2
Mark DeSalvatore-OGDS-2
David Liao- OGDS-2
Project File

FOUNDATION REVIEW

DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES

To: **Structure Design**
1. Preliminary Report
2. R.E. Pending File
3. Specifications & Estimates
4. File

Geotechnical Services
1. GS (Sacramento)
2. GS

District Project Development
District Project Engineer

Date: 8/13/08

E. MAIN ST. UC
Structure Name

11 SD 8
District County Route Post Km

11-063801 57-0381 R
E.A. Number Structure Number

Foundation Report By: ERICH NEUPERT Dated: 4/8/08

Reviewed By: RICHARD SCHENDEL / PREM RIMAL (OSD) ERICH NEUPERT (GS)

General Plan Dated: 8/06/08 Foundation Plan Dated: 8/05/08

☑ No changes. ☐ The following changes are necessary.

FOUNDATION CHECKLIST

N/A Pile Types and Design Loads
~~Pile Lengths~~
~~Predrilling~~
~~Pile Load Test~~
~~Substitution of H Piles For Concrete Piles~~ ☐ Yes ☐ No

✓ Footing Elevations, Design Loads, and Locations
✓ Seismic Data
✓ Location of Adjacent Structures and Utilities
✓ Stability of Cuts or Fills
✓ Fill Time Delay
✓ Effect of Fills on Abutments and Bents

✓ LOTB's
✓ Fill Surcharge
✓ Approach Paving Slabs
✓ Scour
✓ Ground Water
✓ Tremie Seals/Type D Excavation

Office of Structure Design Branch No.

Erich Neupert
Geotechnical Services

Rev. 10/02

FOUNDATION REVIEW

DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES

To: **Structure Design**
1. Preliminary Report
2. R.E. Pending File
3. Specifications & Estimates
4. File

Geotechnical Services
1. GS (Sacramento)
2. GS

District Project Development
District Project Engineer

Date: 8/13/08

BROADWAY UC
Structure Name

District	County	Route	Post Km
11	SD	8	

E.A. Number	Structure Number
11-063801	57-0475R

Foundation Report By: ERICH NEUPERT Dated: 4/08/08

Reviewed By: RICHARD SCHENDEL (OSD) ERICH NEUPERT (GS)

General Plan Dated: 7/25/08 Foundation Plan Dated: 7/25/08

☑ No changes. ☐ The following changes are necessary.

FOUNDATION CHECKLIST

- N/A Pile Types and Design Loads
- N/A Pile Lengths
- N/A Predrilling
- ~~Pile Load Test~~
- ~~Substitution of H Piles For Concrete Piles~~ ☐ Yes ☐ No
- ✓ Footing Elevations, Design Loads, and Locations
- ✓ Seismic Data
- Location of Adjacent Structures and Utilities
- Stability of Cuts or Fills
- ~~Fill Time Delay~~
- Effect of Fills on Abutments and Bents
- ✓ LOTB's
- ~~Fill Surcharge~~
- ~~Approach Paving Slabs~~
- ~~Scour~~
- Ground Water
- ~~Tremie Seals/Type D Excavation~~

Office of Structure Design Branch No. Erich Neupert Geotechnical Services

Rev. 10/02

Helix Water District

Setting standards of excellence in public service

7811 University Avenue
La Mesa, CA 91941-4927

(619) 466-0585
FAX (619) 466-1823
www.hwd.com

November 14, 2008

Attn: Chadwick K. Lau, P.E.
Department of Transportation
4050 Taylor St.
San Diego, CA 92110

Subject: Availability of construction water for Contract No. 11-063801

Mr. Lau:

Regarding your request for approximately 2,700,000 gallons of potable water, within 13 months, for use in construction of two auxiliary lanes along interstate 8, we have the following comments:

Helix Water District has water mains in the vicinity of your project at Second St., Grape St., E. Main St., N. Third St., Broadway and Greenfield Drive capable of providing the required quantity of water. There are fire hydrants along these intersections within a reasonable distance to provide access for construction water through construction meters.

Helix Water District is currently in a Drought Response Level 1 – Drought Watch Condition. A copy of our Drought Response Policy and Procedure is attached for your reference. A summary of the District's drought response levels are as follows:

Drought Response Levels	Use Restrictions	Conservation Target	DMP Stage
1 - Drought Watch	Voluntary	Up to 10%	Stage 1 or 2
2 - Drought Alert	Mandatory	Up to 20%	Stage 2 or 3
3 - Drought Critical	Mandatory	Up to 40%	Stage 3
4 - Drought Emergency	Mandatory	Above 40%	Stage 3

Per our Policy Section 4.9-8(B) subsection 1 & (g) Public works projects are exempt from a Level 4 Mandatory restriction on water useage. The language in the current policy may change these exceptions to include public works projects. You may be asked to consider securing a source of non-potable water from Padre Dam for your use for this project if a Response Level 4 is issued.

In conclusion, we anticipate the water you ask for will be available for your project. This letter is not a commitment of water for your project but is to notify you we expect there will be a sufficient amount of water for your construction needs given the current drought level and policy do not change.

Please call me if at (619) 667-6277, you have any questions,

Sincerely,

Chris Magill

Chris Magill
Senior Engineering Technician

c. Tim Smith, Aneld Anub, Carlos Perdomo, Carlos Lugo, Mark Umphres, Mark Weston, Helix Water District

Elected Board of Directors:
Charles W. Muse
President
Richard K. Smith
Vice President
John B. Linden
DeAna R. Verbeke
Kathleen Coates Hedberg

Staff:
Mark S. Weston
General Manager
Donna Bartlett-May
Board Secretary

Legal Counsel:
Scott C. Smith

Recycled Paper

President
DeAna R. Verbeke
Kathleen Coates Hedberg
Recycled Paper

SECTION 4.9 DROUGHT RESPONSE POLICY AND PROCEDURE

4.9-1 POLICY

Article 10, Section 2 of the California Constitution declares that waters of the state are to be put to beneficial use, that waste, unreasonable use, or unreasonable method of use of water be prevented, and that water be conserved for the public welfare.

Conservation of current water supplies and minimization of the effects of water supply shortages that are the result of drought are essential to the public health, safety and welfare.

Regulation of the time of certain water use, manner of certain water use, design of rates, method of application of water for certain uses, installation and use of water-saving devices, provide an effective and immediately available means of conserving water.

California Water Code Sections 375 et seq. authorize water suppliers to adopt and enforce a comprehensive water conservation program.

Adoption and enforcement of a comprehensive water conservation program will allow the Helix Water District to delay or avoid implementing measures such as water rationing or more restrictive water use regulations pursuant to a declared water shortage emergency as authorized by California Water Code Sections 350 et seq.

San Diego County is a semi-arid region and local water resources are scarce. The region is dependent upon imported water supplies provided by the San Diego County Water Authority, which obtains a substantial portion of its supplies from the Metropolitan Water District of Southern California. Because the region is dependent upon imported water supplies, weather and other conditions in other portions of this state and of the southwestern United States affect the availability of water for use in San Diego County.

The San Diego County Water Authority has adopted an Urban Water Management Plan that includes water conservation as a necessary and effective component of the Water Authority's programs to provide a reliable supply of water to meet the needs of the Water Authority's 24 member public agencies, including the Helix Water District. The Water Authority's Urban Water Management Plan also includes a contingency analysis of actions to be taken in response to water supply shortages. This policy is consistent with the Water Authority's Urban Water Management Plan.

As anticipated by its Urban Water Management Plan, the San Diego County Water Authority, in cooperation and consultation with its member public agencies, has adopted a Drought Management Plan, which establishes a progressive program for responding to water supply limitations resulting from drought conditions. This policy is intended to be consistent with and to implement the Water Authority's Drought Management Plan.

The Water Authority's Drought Management Plan contains three stages containing regional actions to be taken to lessen or avoid supply shortages. This policy contains drought response levels that correspond with the Drought Management Plan stages.

The Helix Water District, due to the geographic and climatic conditions within its territory and its dependence upon water imported and provided by the San Diego County Water Authority, may experience shortages due to drought conditions, regulatory restrictions

enacted upon imported supplies and other factors. The Helix Water District has adopted an Urban Water Management Plan that includes water conservation as a necessary and effective component of its programs to provide a reliable supply of water to meet the needs of the public within its service territory. The Helix Water District's Urban Water Management Plan also includes a contingency analysis of actions to be taken in response to water supply shortages. This policy is consistent with the Urban Water Management Plan adopted by the Helix Water District.

The water conservation measures and progressive restrictions on water use and method of use identified by this policy provide certainty to water users and enable Helix Water District to control water use, provide water supplies, and plan and implement water management measures in a fair and orderly manner for the benefit of the public.

4.9-2 DECLARATION OF NECESSITY AND INTENT

The District in this Declaration of Necessity and Intent finds the following:

4.9-2(A) This policy and procedure establishes water management requirements necessary to conserve water, enable effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, prevent unreasonable use of water, prevent unreasonable method of use of water within the Helix Water District in order to assure adequate supplies of water to meet the needs of the public, and further the public health, safety, and welfare, recognizing that water is a scarce natural resource that requires careful management not only in times of drought, but at all times.

4.9-2(B) This policy and procedure establishes regulations to be implemented during times of declared water shortages, or declared water shortage emergencies. It establishes four levels of drought response actions to be implemented in times of shortage, with increasing restrictions on water use in response to worsening drought conditions and decreasing available supplies.

4.9-2(C) Level 1 condition drought response measures are voluntary and will be reinforced through local and regional public education and awareness measures that may be funded in part by Helix Water District. During drought response condition Levels 2 through 4, all conservation measures and water-use restrictions are mandatory and become increasingly restrictive in order to attain escalating conservation goals.

4.9-2(D) During a Drought Response Level 2 condition or higher, the water conservation measures and water use restrictions established by this policy are mandatory and violations are subject to criminal, civil, and administrative penalties and remedies specified in this policy.

4.9-3 DEFINITIONS

The following words and phrases whenever used in this Section shall have the meaning defined below:

4.9-3(A) "Grower" refers to those engaged in the growing or raising, in conformity with recognized practices of husbandry, for the purpose of commerce, trade, or

industry, or for use by public educational or correctional institutions, of agricultural, horticultural or floricultural products, and produced: (1) for human consumption or for the market, or (2) for the feeding of fowl or livestock produced for human consumption or for the market, or (3) for the feeding of fowl or livestock for the purpose of obtaining their products for human consumption or for the market. "Grower" does not refer to customers who purchase water subject to the Metropolitan Interim Agricultural Water Program or the Water Authority Special Agricultural Rate programs.

4.9-3(B) "Water Authority" means the San Diego County Water Authority.

4.9-3(C) "DMP" means the Water Authority's Drought Management Plan in existence on the effective date of this policy and as readopted or amended from time to time, or an equivalent plan of the Water Authority to manage or allocate supplies during shortages.

4.9-3(D) "Metropolitan" means the Metropolitan Water District of Southern California.

4.9-3(E) "Person" means any natural person, corporation, public or private entity, public or private association, public or private agency, government agency or institution, school district, college, university, or any other user of water provided by the Helix Water District.

4.9-3(F) "Conservation offset" means the implementation of proven conservation techniques which, when installed, will result in a reduction equal to demand of the proposed use. Calculation of demand and saving shall be performed or verified by the member agency or the General Manager based upon non-drought conditions.

4.9-3(G) "Potable water" means water delivered by a member agency or the San Diego County Water Authority which meets drinking water standards.

4.9-4 APPLICATIONS

4.9-4(A) The provisions of this policy apply to any person in the use of any water provided by the Helix Water District.

4.9-4(B) This policy is intended solely to further the conservation of water. It is not intended to implement any provision of federal, state, or local statutes, ordinances, or regulations relating to protection of water quality or control of drainage or runoff. Refer to the local jurisdiction or Regional Water Quality Control Board for information on any stormwater ordinances and stormwater management plans.

4.9-4(C) Nothing in this policy is intended to affect or limit the ability of Helix Water District to declare and respond to an emergency, including an emergency that affects the ability of the District to supply water.

4.9-4(D) The provisions of this policy do not apply to use of water from private wells or to recycled water.

4.9-4(E) Nothing in this policy shall apply to use of water that is subject to a special supply program, such as the Metropolitan Interim Agricultural Water Program or the Water Authority Special Agricultural Rate programs. Violations of the conditions of special supply programs are subject to the penalties established under the applicable program. A person using water subject to a special supply program and other water provided by the Helix Water District is subject to this policy in the use of the other water.

4.9-5 DROUGHT RESPONSE LEVEL 1 – DROUGHT WATCH CONDITION

4.9-5(A) A Drought Response Level 1 condition is also referred to as a "Drought Watch" condition. A Level 1 condition applies when the Water Authority notifies its member agencies that due to drought or other supply reductions, there is a reasonable probability there will be supply shortages and that a consumer demand reduction of up to 10 percent is required in order to ensure that sufficient supplies will be available to meet anticipated demands. The General Manager shall declare the existence of a Drought Response Level 1 and take action to implement the Level 1 conservation practices identified in this policy.

4.9-5(B) During a Level 1 Drought Watch condition, Helix Water District will increase its public education and outreach efforts to emphasize increased public awareness of the need to implement the following water conservation practices. [The same water conservation practices become mandatory if the District declares a Level 2 Drought Alert condition]:

(1) Stop washing down paved surfaces, including but not limited to sidewalks, driveways, parking lots, tennis courts, or patios, except when it is necessary to alleviate safety or sanitation hazards.

(2) Stop water waste resulting from inefficient landscape irrigation, such as runoff, low head drainage, or overspray, etc. Similarly, stop water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways, or structures.

(3) Irrigate residential and commercial landscape before 10 a.m. and after 6 p.m. only. Consider limiting lawn watering and landscape irrigation using sprinklers to no more than ten (10) minutes per day. Irrigation run time should be adjusted to avoid runoff.

(4) Use a hand-held hose equipped with a positive shut-off nozzle or bucket to water landscaped areas, including trees and shrubs located on residential and commercial properties that are not irrigated by a landscape irrigation system.

(5) Irrigate nursery and commercial grower's products before 10 a.m. and after 6 p.m. only. Watering is permitted at any time with a hand-held hose equipped with a positive shut-off nozzle, a bucket, or when a drip/micro-irrigation system/equipment is used. Irrigation of nursery propagation beds is permitted at any time. Watering of livestock is permitted at any time.

(6) Use re-circulated water to operate ornamental fountains.

(7) Wash vehicles using a bucket and a hand-held hose with positive shut-off nozzle, mobile high pressure/low volume wash system, or at a commercial site that re-circulates (reclaims) water on-site. Avoid washing during hot conditions when additional water is required due to evaporation.

(8) Serve and refill water in restaurants and other food service establishments only upon request.

(9) Offer guests in hotels, motels, and other commercial lodging establishments the option of not laundering towels and linens daily.

(10) Repair all water leaks within five (5) days of notification by the Helix Water District unless other arrangements are made with the General Manager.

4.9-5(C) During a Drought Response Level 2 condition or higher, all persons shall be required to implement the conservation practices established in a Drought Response Level 1 condition.

4.9-6 DROUGHT RESPONSE LEVEL 2 – DROUGHT ALERT CONDITION

4.9-6(A) A Drought Response Level 2 condition is also referred to as a "Drought Alert" condition. A Level 2 condition applies when the Water Authority notifies its member agencies that due to cutbacks caused by drought or other reduction in supplies, a consumer demand reduction of up to 20 percent is required in order to have sufficient supplies available to meet anticipated demands. The Helix Water District Board of Directors shall declare the existence of a Drought Response Level 2 condition and implement the mandatory Level 2 conservation measures identified in this policy.

4.9-6(B) All persons using Helix Water District water shall comply with Level 1 Drought Watch water conservation practices during a Level 2 Drought Alert, and shall also comply with the following additional conservation measures:

(1) Limit residential and commercial landscape irrigation to no more than three (3) assigned days per week on a schedule established by the General Manager and posted by the Helix Water District. During the months of November through May, landscape irrigation is limited to no more than once per week on a schedule established by the General Manager and posted by the Helix Water District. This section shall not apply to commercial growers or nurseries.

(2) Limit lawn watering and landscape irrigation using sprinklers to no more than ten (10) minutes per watering station per assigned day. Irrigation run time shall be adjusted to avoid runoff. This provision does not apply to landscape irrigation systems using water efficient devices, including but not limited to: weather based controllers, drip/micro-irrigation systems and stream rotor sprinklers.

(3) Water landscaped areas, including trees and shrubs located on residential and commercial properties, and not irrigated by a landscape irrigation system governed by Section 4.9-6(B)(1), on the same schedule set forth in Section 4.9-6(B)(1) by using a bucket, hand-held hose with positive shut-off nozzle, or low-volume non-spray irrigation.

(4) Repair all leaks within seventy-two (72) hours of notification by the Helix Water District unless other arrangements are made with the General Manager.

4.9-7 DROUGHT RESPONSE LEVEL 3 – DROUGHT CRITICAL CONDITION

4.9-7(A) A Drought Response Level 3 condition is also referred to as a "Drought Critical" condition. A Level 3 condition applies when the Water Authority notifies its member agencies that due to increasing cutbacks caused by drought or other reduction of supplies, a consumer demand reduction of up to 40 percent is required in order to have sufficient supplies available to meet anticipated demands. The Helix Water District Board of Directors shall declare the existence of a Drought Response Level 3 condition, and shall declare a water shortage emergency pursuant to California Water Code Section 350, and shall implement the Level 3 conservation measures identified in this policy.

4.9-7(B) All persons using Helix Water District water shall comply with Level 1 Drought Watch and Level 2 Drought Alert water conservation practices during a Level 3 Drought Critical condition and shall also comply with the following additional mandatory conservation measures:

(1) Limit residential and commercial landscape irrigation to no more than two (2) assigned days per week on a schedule established by the General Manager and posted by the Helix Water District. During the months of November through May, landscape irrigation is limited to no more than once per week on a schedule established by the General Manager and posted by the Helix Water District. This section shall not apply to commercial growers or nurseries.

(2) Water landscaped areas, including trees and shrubs located on residential and commercial properties, and not irrigated by a landscape irrigation system governed by Section 4.9-7(B)(1), on the same schedule set forth in Section 4.9-7(B)(1) by using a bucket, hand-held hose with a positive shut-off nozzle, or low-volume non-spray irrigation.

(3) Stop filling or re-filling ornamental lakes or ponds, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a drought response level under this policy.

(4) Stop washing vehicles except at commercial carwashes that re-circulate water, or by high pressure/low volume wash systems.

(5) Repair all leaks within forty-eight (48) hours of notification by the Helix Water District unless other arrangements are made with the General Manager.

4.9-7(C) Upon the declaration of a Drought Response Level 3 condition, no new potable water service shall be provided, no new temporary meters or permanent meters shall be provided, and no statements of immediate ability to serve or provide potable water service (such as, will serve letters, certificates, or letters of availability) shall be issued, except under the following circumstances:

(1) A valid, unexpired building permit has been issued for the project; or

(2) The project is necessary to protect the public's health, safety, and welfare; or

(3) The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of Helix Water District.

This provision shall not be construed to preclude the resetting or turn-on of meters to provide continuation of water service or to restore service that has been interrupted for a period of one year or less.

4.9-7(D) Upon the declaration of a Drought Response Level 3 condition, Helix Water District will suspend consideration of annexations to its service area.

4.9-7(E) The Helix Water District may establish a water allocation for property served by the District using a method that does not penalize persons for the implementation of conservation methods or the installation of water saving devices. If the Helix Water District establishes a water allocation it shall provide notice of the allocation by including it in the regular billing statement for the fee or charge or by any other mailing to the address to which the District customarily mails the billing statement for fees or charges for on-going water service. Following the effective date of the water allocation as established by the Helix Water District, any person that uses water in excess of the allocation shall be subject to a penalty for each billing unit of water in excess of the allocation. The penalty for excess water usage shall be cumulative to any other remedy or penalty that may be imposed for violation of this policy. The Helix Water District Board of Directors, by resolution, shall establish the amount of the penalty in accordance with applicable law.

4.9-8 DROUGHT RESPONSE LEVEL 4 – DROUGHT EMERGENCY CONDITION

4.9-8(A) A Drought Response Level 4 condition is also referred to as a "Drought Emergency" condition. A Level 4 condition applies when the Water Authority Board of Directors declares a water shortage emergency pursuant to California Water Code Section 350 and notifies its member agencies that Level 4 requires a demand reduction of more than 40 percent in order for the Helix Water District to have maximum supplies available to meet anticipated

demands. The Helix Water District shall declare a Drought Emergency in the manner and on the grounds provided in California Water Code Section 350.

4.9-8(B) All persons using Helix Water District water shall comply with conservation measures required during Level 1 Drought Watch, Level 2 Drought Alert, and Level 3 Drought Critical conditions and shall also comply with the following additional mandatory conservation measures:

(1) Stop all landscape irrigation, except crops and landscape products of commercial growers and nurseries. This restriction shall not apply to the following categories of use:

(a) Maintenance of trees and shrubs that are watered on the same schedule set forth in Section 4.9-7(B)(1) by using a bucket, hand-held hose with a positive shut-off nozzle, or low-volume non-spray irrigation;

(b) Maintenance of existing landscaping necessary for fire protection as specified by the Fire Marshal of the local fire protection agency having jurisdiction over the property to be irrigated;

(c) Maintenance of existing landscaping for erosion control;

(d) Maintenance of plant materials identified to be rare or essential to the well being of rare animals;

(e) Maintenance of landscaping within active public parks and playing fields, day care centers, school grounds, cemeteries, and golf course greens, provided that such irrigation does not exceed two (2) days per week according to the schedule established under Section 4.9-7(B)(1);

(f) Watering of livestock; and,

(g) Public works projects and actively irrigated environmental mitigation projects.

(2) Repair all water leaks within twenty-four (24) hours of notification by the Helix Water District unless other arrangements are made with the General Manager.

4.9-8(C) The Helix Water District may establish a water allocation for property served by the District. If the Helix Water District establishes a water allocation it shall provide notice of the allocation by including it in the regular billing statement for the fee or charge or by any other mailing to the address to which the District customarily mails the billing statement for fees or charges for on-going water service. Following the effective date of the water allocation as established by the Helix Water District, any person that uses water in excess of the allocation shall be subject to a penalty for each billing unit of water in excess of the allocation. The penalty for excess water usage shall be cumulative to any other remedy or penalty that may be imposed for violation of this policy. The Helix Water District Board of Directors, by resolution, shall establish the amount of the penalty in accordance with applicable law.

4.9-9 CORRELATION BETWEEN DROUGHT MANAGEMENT PLAN AND DROUGHT RESPONSE LEVELS

4.9-9(A) The correlation between the Water Authority's DMP stages and the Helix Water District's drought response levels identified in this policy is described herein. Under DMP Stage 1, the Helix Water District would implement Drought Response Level 1 actions. Under DMP Stage 2, the Helix Water District would implement Drought Response Level 1 or Level 2 actions. Under DMP Stage 3, the Helix Water District would implement Drought Response Level 2, Level 3, or Level 4 actions.

4.9-9(B) The drought response levels identified in this policy correspond with the Water Authority DMP as identified in the following table:

Drought Response Levels	Use Restrictions	Conservation Target	DMP Stage
1 - Drought Watch	Voluntary	Up to 10%	Stage 1 or 2
2 - Drought Alert	Mandatory	Up to 20%	Stage 2 or 3
3 - Drought Critical	Mandatory	Up to 40%	Stage 3
4 - Drought Emergency	Mandatory	Above 40%	Stage 3

4.9-10 PROCEDURES FOR DETERMINATION AND NOTICATION OF DROUGHT RESPONSE LEVEL

4.9-10(A) The existence of a Drought Response Level 1 condition may be declared by the General Manager upon a written determination of the existence of the facts and circumstances supporting the determination. A copy of the written determination shall be filed with the Clerk or Secretary of the Helix Water District and provided to the Helix Water District Board of Directors. The General Manager may post in the lobby of the Administration Office and publish a notice of the determination of existence of Drought Response Level 1 condition in one or more newspapers, including a newspaper of general circulation within the Helix Water District. The District may also post notice of the condition on their website.

4.9-10(B) The existence of Drought Response Level 2 or Level 3 conditions may be declared by resolution of the Helix Water District Board of Directors adopted at a regular or special public meeting held in accordance with state law. The mandatory conservation measures applicable to Drought Response Level 2 or Level 3 conditions shall take effect on the tenth (10) day after the date the response level is declared. Within five (5) days following the declaration of the response level, the Helix Water District shall publish a copy of the resolution in a newspaper used for publication of official notices.

4.9-10(C) The existence of a Drought Response Level 4 condition may be declared in accordance with the procedures specified in California Water Code Sections 351 and 352. The mandatory conservation measures applicable to Drought Response Level 4 conditions shall take effect on the tenth (10) day after the date the response level is declared. Within five (5) days following the declaration of the response level, the Helix Water District shall publish a copy

of the resolution in a newspaper used for publication of official notices. If the District establishes a water allocation, it shall provide notice of the allocation by including it in the regular billing statement for the fee or charge or by any other mailing to the address to which the Helix Water District customarily mails the billing statement for fees or charges for on-going water service. Water allocation shall be effective on the fifth (5) day following the date of mailing or at such later date as specified in the notice.

4.9-10(D) The Helix Water District Board of Directors may declare an end to a Drought Response Level by the adoption of a resolution at any regular or special meeting held in accordance with state law.

4.9-11 HARDSHIP VARIANCE

4.9-11(A) If, due to unique circumstances, a specific requirement of this policy would result in undue hardship to a person using agency water or to property upon which agency water is used, that is disproportionate to the impacts to Helix Water District water users generally or to similar property or classes of water uses, then the person may apply for a variance to the requirements as provided in this Section.

4.9-11(B) The variance may be granted or conditionally granted, only upon a written finding of the existence of facts demonstrating an undue hardship to a person using agency water or to property upon with agency water is used, that is disproportionate to the impacts to Helix Water District water users generally or to similar property or classes of water use due to specific and unique circumstances of the user or the user's property.

(1) Application. Application for a variance shall be a form prescribed by Helix Water District and shall be accompanied by a non-refundable processing fee in the amount of $250. (See also Section 2.12-14 of the Helix Water District Policies & Procedures Manual.)

(2) Supporting Documentation. The application shall be accompanied by photographs, maps, drawings, and other information, including a written statement of the applicant.

(3) Required Findings for Variance. An application for a variance shall be denied unless the approving authority finds, based on the information provided in the application, supporting documents, or such additional information as may be requested, and on water use information for the property as shown by the records of the Helix Water District, all of the following:

(a) That the variance does not constitute a grant of special privilege inconsistent with the limitations upon other Helix Water District customers.

(b) That because of special circumstances applicable to the property or its use, the strict application of this policy would have a

disproportionate impact on the property or use that exceeds the impacts to customers generally.

(c) That the authorizing of such variance will not be of substantial detriment to adjacent properties, and will not materially affect the ability of the Helix Water District to effectuate the purpose of this Section and will not be detrimental to the public interest.

(d) That the condition or situation of the subject property or the intended use of the property for which the variance is sought is not common, recurrent or general in nature.

(4) Approval Authority. The General Manager shall exercise approval authority and act upon any completed application no later than 10 days after submittal and may approve, conditionally approve, or deny the variance. The applicant requesting the variance shall be promptly notified in writing of any action taken. Unless specified otherwise at the time a variance is approved, the variance applies to the subject property during the term of the mandatory drought response.

(5) Appeals to Helix Water District Board of Directors. An applicant may appeal a decision or condition of the General Manager on a variance application to the Helix Water District Board of Directors within 10 days of the decision upon written request for a hearing. The request shall state the grounds for the appeal. At a public meeting, the Helix Water District Board of Directors shall act as the approval authority and review the appeal de novo by following the regular variance procedure. The decision of the Helix Water District Board of Directors is final.

4.9-12 VIOLATIONS AND PENALTIES

4.9-12(A) Any person, who uses, causes to be used, or permits the use of water in violation of this policy is guilty of an offense punishable as provided herein.

4.9-12(B) Each day that a violation of this policy occurs is a separate offense.

4.9-12(C) Administrative fines may be levied for each violation of a provision of this policy as follows:
(1) One hundred dollars for a first violation.
(2) Two hundred dollars for a second violation of any provision of this policy within one year.
(3) Five hundred dollars for each additional violation of this policy within one year.

4.9-12(D) Violation of a provision of this policy is subject to enforcement through installation of a flow-restricting device in the meter.

4.9-12(E) Willful violations of the mandatory conservation measures and water use restrictions as set forth in Section 4.9-8 and applicable during a Level 4 Drought Emergency condition may be enforced by discontinuing service to

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State of California **Business, Transportation and Housing Agency**

M e m o r a n d u m

Flex Your Power!
Be energy efficient!

To: Mr. Michael J. Webster
Project Design (M.S. 33)

Date: June 30, 2005
File: 11-SD-8
KP 28.0/R30.1
PM 17.4/R18.7
EA 11 – 167891

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
Geotechnical Services
Office of Geotechnical Design – South 2, Branch D

Subject: Foundation Report for Proposed Retaining and Sound Walls.

In accordance with your request, the Office of Geotechnical Design South 2 (OGDS-South 2) has prepared the attached Foundation Report for the proposed retaining walls and sound walls on Interstate 8, from Second Street to Greenfield Drive, in the City of El Cajon, San Diego County, California. The report presents the results of our field investigation, laboratory tests, and engineering analysis. The geotechnical data were developed for use in the design and construction phases of this project.

OGDS (South 2) staff will be available for further assistance. Should you have any questions or comments regarding this report, please contact Moussa Jandal at (858) 637-5545.

Moussa Jandal
TE (civil)

Zia Yazdani
Associate Materials and Research Engineer

cc Brian Hinman
File

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1.0 INTRODUCTION

This report addresses the geotechnical design considerations for the proposed retaining walls and sound walls to be constructed as part of the proposed project associated with an auxiliary lane in the City of El Cajon, San Diego County, California. The auxiliary lane will be constructed on eastbound Interstate 8 (I-8) from Second Street (KP 28.0) to Greenfield Drive (KP 30.1). According to the information submitted, this project proposes the widening to the inside of the existing eastbound lanes by means of an additional 3.6 m Portland Cement Concrete (PCC) lane and a 3.0 m Asphaltic Concrete (AC) shoulder.

The geotechnical investigation consisted of a site reconnaissance, research of existing reports and archived resources, exploratory soil borings, laboratory testing, data evaluation and analysis. The Caltrans Drilling Department performed the drilling of the soil borings and a Caltrans Engineer monitored the drilling operations and soil sampling during the field investigation.

The purpose of this report is to document subsurface geotechnical conditions, provide analyses of anticipated site conditions as they pertain to the project described herein, and to recommend design and construction criteria for the retaining and sound walls portion of the project. This report also establishes a geotechnical baseline to be used in assessing the existence and scope of changed site conditions.

2.0 EXISTING FACILITIES AND PROPOSED IMPROVEMENTS

The project is located between Second Street and Greenfield Drive on I-8 within the City of El Cajon in San Diego County, California. The existing freeway is comprised of four Portland Cement Concrete (PCC) lanes, two eastbound and two westbound, which are separated by an unpaved center median. The freeway general trend is in the east-west direction. At the proposed project site, along the eastern portion of the project, between the Main Street Undercrossing and Greenfield Drive the freeway turns gently in the northeast-southwest direction. The existing freeway is constructed mostly on elevated embankments with the exception of a short interval at the Grape Street Pedestrian Overcrossing, where the freeway is constructed near the natural ground elevation. The elevated embankments constitute the approaches of the freeway undercrossings at Second Street, Main Street and Greenfield Drive.

This project proposes the construction of an additional lane to the existing two eastbound lanes by widening to the inside of the freeway from Second Street to Greenfield Drive and including the East Main Street and Broadway bridges. The widening will involve the adding of a 3.6 m PCC lane and a 3.0 m Asphaltic Concrete (AC) shoulder, the construction of sound barrier berms with retaining walls and barrier sound walls along the eastbound side and barrier sound walls along the westbound side of the freeway. Additionally, the project includes the removal of the Grape Street Pedestrian Overcrossing.

3.0 PERTINENT REPORTS AND INVESTIGATIONS

Geologic Hazard Review, Auxiliary Lane-Sound Wall; San Diego County California, KP 28.0/R30.1, September 5, 1997, Prepared by Joseph P. Egan

4.0 PHYSICAL SETTING

4.1 Topography and drainage

The general topography of the project site is relatively flat and gently slopes towards the northwest direction. The freeway is elevated above the natural ground with fill at the bridge approach locations. At the east end of the project site toward Greenfield drive, the freeway transitions from being on fill materials to existing natural ground, at which point the freeway was cut into the toe of a hillside.

Forester Creek runs in the east-west direction and parallels the south side of the freeway. It is the main facility for run off storm drainage. The creek consists of a v-shape concrete lined ditch and is approximately 2.5 meters wide. The creek changes direction and crosses northwest under the freeway near the north end of the project site. The freeway drainage system consists of several concrete culverts and drainage pipes, which cross under the freeway in the north-south direction to drain into Forester Creek at multiple locations along the project site.

4.2 Regional Geology and Seismicity

The regional geology and seismicity of the project site are discussed in detail in the previously listed Geology Hazard Review Report, which is included in the appendix of this report.

5.0 EXPLORATION

A subsurface exploration program was conducted in order to document and evaluate soil conditions along the barrier sound wall and retaining wall alignments. The exploration program was conducted in January, February and April of 2005.

A total of thirty-three exploratory borings was conducted during the subsurface investigation for the sound and retaining walls. The soil borings were advanced using a CME truck mounted drilling rig and all terrain vehicle mounted rig utilizing hollow stem augers. Standard Penetration Tests (SPT) were conducted at intervals of 1.5 meters except at depths where relatively undisturbed samples were obtained. The undisturbed samples were obtained in selected borings at selected depth intervals for laboratory testing. SPT test results and soil descriptions are indicated on the boring logs.

Soil borings along each of the wall alignment were drilled to varying depths. The maximum depth of boring was 4.6 meters in the eastern area of the project site, where shallow bedrock was encountered and 10.7 meters in the western area where relatively deeper bedrock was

encountered. All borings are referenced from below existing ground surface elevation. The logs of all borings are included in the appendix.

Soil classifications in the attached boring logs follow the guidelines of the Caltrans Office of Structural Foundations Soils and Rock Logging Classification Manual which is generally based on the Engineering Geology Field Manual published by the Bureau of Reclamation.

6.0 GEOTECHNICAL TESTING

A geotechnical test program was developed in coordination with the subsurface exploration program. The testing program was designed to determine the physical and engineering properties of the native soils as they pertain to the proposed construction.

6.1 In-Situ Testing

In-situ testing included Standard Penetration Test (SPT). These tests were used to determine the consistency of the subsurface soils, and provide data to determine the physical and engineering properties of the subsurface soils. The SPT data are shown on the Soils and Geologic Exploration Logs contained in the appendix.

6.2 Laboratory Testing

Laboratory testing were performed on selected soil samples obtained from the exploratory borings. All samples were tested at the Caltrans Engineering Services Center Laboratory in Sacramento. Laboratory tests were conducted in accordance with the California Test Method (CTM), the American Society for Testing and Materials (ASTM), or the American Association of State Highway Testing Official (AASHTO) standards.

The laboratory tests performed included unit weight, moisture content, Atterberg Limit tests, consolidation tests and corrosion resistivity tests. The laboratory test results are included in the appendix of this report.

7.0 FOUNDATION RECOMMENDATIONS

Due to the considerable distance separating the sites of the various barrier sound walls and retaining walls and in view of the specific subsurface characteristics associated with each site, foundation recommendations for each structure are separately presented below:

7.1 Barrier Sound Wall SB1

7.1.1 Site description

This sound wall will be constructed out of masonry and will have a plantable safety shape barrier. It extends from west of East Main Street to east of Second Street. It will be located about 3m from the I-8 westbound edge of shoulder. The

wall height ranges from 2.4m to 4.9m.

7.1.2 Subsurface Investigation and Soil Conditions

The subsurface soil conditions of the site for this wall were investigated by the drilling of 7 exploratory borings (B-S1-1 through B-S1-7). The borings varied in depth from 6.0 meters in Boring B-S1-4 to 9.1 meters in Borings B-S1-1 and B-S1-6A. All borings were drilled in the asphaltic concrete pavement along the freeway's shoulder (see Layout Sheets L-1 through L-3 for boring locations). The subsurface soil conditions in the borings consist of three layers of soil types that vary in thickness and depth along the length of the sound wall.

The upper soil layer consists of fill materials varying in depth from 1 meter at the west end of the site (B-S1-1) to 4 meters at the east end of the site (B-S1-5). The fill material is comprised mostly of brown, reddish brown, dark brown and gray medium dense to very dense silty sand and sandy silt with scattered gravel and boulders and sandy gravel. The fill material resembles the existing lower natural alluvial soil layer; it was difficult to distinctively define the interface between the fill and alluvial soils.

The middle soil layer consists of alluvial soils varying in depth from 0.5 meter in Boring B-S1-3 to 3 meters in Boring B-S1- 6A. The alluvial soil is comprised of mostly light brown to dark brown, reddish brown, light gray to gray and white, stiff to very stiff lean clay with ferrous nodules and medium dense to dense clayey sand.

The bottom layer of soils consists of light gray and dark gray, medium dense to very dense poorly graded sand and clayey sand (decomposed granitic bedrock). This layer was not encountered in all of the borings due to the termination of the borings above top of bedrock. The top of bedrock was encountered at approximately 7.5 meters below the existing ground surface (EGS).

Ground water level was encountered consistently slightly above the bedrock elevation, at approximately 4.5 to 6 meters below EGS. Groundwater was measured at the time of the field investigation (January of 2005). It is important to recognize that groundwater elevations can fluctuate depending on subsurface stratification, and rainfall.

7.1.3 Conclusions and Recommendations

In our opinion the proposed sound wall can be constructed using the latest Caltrans Standard Plans (July 2004). The wall may be supported on a trench footing. Since the wall will be mostly constructed on a ground surface that is sloping down on one side and flat on the other, the design should be based on Case 2 of the Standard Plans for trench footings (page 291). Special attention should be paid to the location of the wall from top of slope to meet the minimum

distance requirement shown on the Standard Plans. The trench footing dimensions should be obtained from the table on page 291 for the Case 2 conditions and a soil friction angle $\Phi = 35^o$. We do not anticipate any difficulties in the excavation for the footings.

As an alternative, the sound wall may be supported on a pile cap on cast in drilled hole (CIDH) piles. The design information presented on page 295 of the Standard Plans may be used for the pile cap foundation (Case 2, $\Phi = 35^o$). The tip of the piles should be supported on the top of bedrock, which varies in elevation from approximately 143 m in Boring B-S1-1 to approximately 151 m in Boring B-S1-6A.

During drilling loose sandy soils and ground water may be encountered at some locations, which could cause caving of the walls of the hole. Temporary casing might be required under these conditions. In addition, cobbles and boulders may be encountered, which could cause a slow down of the drilling operations.

7.2 Barrier Sound Wall SB2

7.2.1 Site description

This sound wall will be constructed out of masonry with a plantable safety shape barrier. It will extend from west of East Main Street to east of Second Street. It will be located about 3m from the I-8 eastbound edge of shoulder. The wall height ranges from 2.4m to 3.0m.

7.2.2 Subsurface Investigation and Soil Conditions

The subsurface soil conditions of the site for this wall were investigated by the drilling of 6 exploratory borings (B-S2-1 through B-S2-6). The borings varied in depth from 6.0 meters in Boring B-S2-4 to 10.7 meters in Boring B-S2-5. All borings were drilled in the asphaltic concrete pavement of the freeway's shoulder (see Layout Sheets L-1 and L-2 for boring locations). The subsurface soil conditions in the borings consist of three layers of soil types that vary in thickness and depth along the length of the sound wall.

The upper soil layer consists of fill materials averaging approximately 1 meter in depth. The fill materials were encountered at a lower elevation in Boring B-S2-1, which might be the result of trenching and backfilling for previous utility installations. The fill materials are comprised of mostly brown, medium dense silty sand and sandy silt with occasional gravel and boulders.

The middle soil layer consists of alluvial soils varying in depth from 0.5 meter in Boring B-S2-3 to 2 meters in Boring B-S2- 6. The alluvial soils are mostly comprised of light brown to dark brown, reddish brown, light gray to gray and white, stiff to very stiff lean clay and fat clay with ferrous nodules and medium

dense to dense clayey sand.

The bottom soil layer consists of light gray and dark gray, medium dense to very dense, poorly graded sand and clayey sand (decomposed granitic bedrock). This layer was not encountered in all of the borings due to the termination of the borings above top of bedrock. The top of bedrock was encountered at approximately 7.5 meters below EGS.

Ground water was encountered consistently slightly above the bedrock elevation, at approximately 4.5 to 6 meters below EGS. It was measured at the time of the field investigation (January of 2005).

7.2.3 Conclusions and Recommendations

In our opinion the proposed sound wall can be constructed using the latest Caltrans Standard Plans (July 2004). The wall may supported on a trench footing Since the wall will be mostly constructed on a ground surface that is sloping down on one side and flat on the other, the design should be based on Case 2 of the Standard Plans for trench footings (page 291). Special attention should be paid to the location of the wall from top of slope to meet the minimum distance requirement shown on the Standard Plans. The trench footing dimensions should be obtained from the table on page 291 for the Case 2 conditions and a soil friction angle $\Phi = 35^o$. We do not anticipate any difficulties in the excavation for the footings.

As an alternative, the sound wall may be supported on a pile cap on cast in drilled hole (CIDH) piles. The design information presented on page 295 of the Standard Plans may be used for the pile cap foundation (Case 2, $\Phi = 35^o$). The tip of the piles should be supported on the top of bedrock, which varies in elevation from approximately 143 m in Boring B-S2-3 to approximately148 m in Boring B-S2-5.

During drilling loose sandy soils and ground water may be encountered at some locations, which could cause caving of the walls of the hole. Temporary casing might be required under these conditions. In addition, cobbles and boulders may be encountered, which could cause a slow down in the drilling operations.

7.3 Barrier Berm/Retaining Wall SB3R

7.3.1 Site description

This noise mitigation barrier will consist of a 1.25m-landscaped noise mitigation berm along the north shoulder of East Main Street eastbound on-ramp with a 1.2m to 3.0m high retaining wall.

7.3.1 Subsurface Investigation and Soil Conditions

The subsurface soil conditions of the site for this wall were investigated by the drilling of 9 exploratory borings (B-S3-1 through B-S3-8). The borings varied in depth from 6.0 meters in Boring B-S3-1 to 10.7 meters in Borings B-S3-5 and B-S3-8. Seven of the borings were drilled in the grass covered area on the north side of Forester Creek and two in the asphaltic concrete pavement of the freeway's shoulder (see Layout Sheets L-3 and L-4 for boring locations). The subsurface soil conditions in the borings consist of four layers of soil types that vary in thickness and depth along the length of the sound wall.

The upper layer consists of clayey soils that extend to a maximum depth of 3.5 meters in Boring B-S3-1. This layer of soil was not encountered in Boring B-S3R-6. The clayey soils consist of light to dark brown and reddish brown, firm to hard lean clay and fat clay with low to high plasticity, with ferrous and calcareous nodules. In addition, loose to medium dense clayey sand with some mica flakes was also encountered in this layer.

The second layer underlies the clayey soils and in general consists of brown, dark brown, reddish brown, light gray and gray very loose to medium dense silty sand, and poorly graded sand with occasional gravel and cobbles. This layer extends to the top of the bottom layer (bedrock) in Borings B-S3-4, B-S3-5, B-S3-8 and B-S3-9.

The third layer is very similar to the upper clayey layer. It is interbeded with the second layer at varying depths and extends to the top of bedrock in Boring B-S3-1, B-S3-2, B-S3-3 and B-S3-6.

The bottom most layer consists of light gray to gray and dark gray, greenish gray and light orange, medium dense to very dense medium to coarse sand, with gravel sizes (decomposed granitic bedrock). This layer was encountered in all of the borings at depths varying from 4 meters in Boring B-S3-1 to 9 meters in Boring B-S3-8.

The ground water level was on an average encountered about 4.5 meters below EGS. It was measured at the time of the field investigation (January and April of 2005).

7.3.3 Conclusions and Recommendations

In our opinion the proposed retaining wall for the barrier sound wall can be constructed using the latest Caltrans Standard Plans. We recommend the retaining wall be supported on Class 400 precast concrete piles in accordance with the Standard Plans (Page 249). The piles should supported in bedrock. The top of bedrock elevation is at approximately 151 m as encountered in Boring B-S3R-1 and Boring B-S3R-3. At these elevations we anticipate that the pile will develop a nominal axial resistance in excess of 400 KN. Additionally, we do not anticipate any difficulties in driving the pile to the required depths of penetration.

Drainage should be provided to prevent any water build up behind the retaining wall in accordance with the standard plan details.

7.4 Barrier Berm/Retaining Wall SB3

7.4.1 Site description

This wall will consist of a 1.25m-landscaped noise mitigation berm along the south shoulder of East Main Street eastbound on-ramp with a 1.2m to 5.5m high retaining wall along Forester Creek.

7.4.2 Subsurface Investigation and Soil Conditions

The subsurface soil conditions of the site for this wall were investigated by the drilling of 3 exploratory borings (B-S3R-1 through B-S3R-3). The borings varied in depth from 7.6 meters in Boring B-S3R-1 to 10.7 meters in Borings B-S3R-2 and B-S3R-3. Two of the borings were drilled in the grass covered area on the north side of the East Main Street eastbound onramp and one in the asphaltic concrete pavement of the freeway's shoulder (see Layout Sheet L-3 for boring locations). The subsurface soil conditions in the borings consist of four layers of soil types that vary in thickness and depth along the length of the sound wall.

The upper layer consists of fill materials, which were used in the construction of the embankment of the freeway. This layer was encountered only in Boring B-S3R-2. The fill materials consist of brown and light gray, medium dense silty sand, poorly graded sand and clayey sand with occasional gravel and cobbles.

The second layer underlying the fill materials consists of alluvial soils, which are comprised of light brown to dark brown, brownish gray and gray very stiff lean clay and fat clay with low to high plasticity and scattered gravel.

Underlying the alluvial soils, there exists a layer of sandy soils that in general consists of dark brown to brown, reddish brown, greenish gray, gray and tan, very loose to medium dense silty sand clayey sand, sandy gravel and sandy silt with scattered gravel. The loose interval of soils was encountered at a depth near the ground water elevation.

The bottom layer was encountered at varying depths from 4.6 meters in Boring B-S3R-1 to 9.1 meters in Boring B-S3R-3 below the EGS. This layer was comprised of light gray very dense sand with gravel sizes (decomposed granitic bedrock).

Ground water was encountered on the average of about 4.5 meters below EGS. It was measured at the time of the field investigation (January and April of 2005).

7.4.3 Conclusions and Recommendations

In our opinion the proposed retaining wall can be constructed using the latest Caltrans Standard Plans. We recommend the retaining wall be supported on Class 400 precast concrete piles in accordance with the Standard Plans (Page 249). The piles should be supported in bedrock. The top of bedrock varies in elevation from 149 m in Boring B-S3-2 to 154 m in Boring B-S3-9. At these elevations we anticipate that the pile will develop a nominal axial resistance in excess of 400 KN. Additionally, we do not anticipate any difficulties in driving the pile to the required depths of penetration.

Drainage should be provided to prevent any water build up behind the retaining wall in accordance with the standard plan details.

7.5 Barrier Berm/Retaining Wall SB4

7.5.1 Site description

This wall will consist of a 1.25m-landscaped noise mitigation berm east of Broadway and along the I-8 eastbound edge of shoulder. A 1.2m to 4.6m high retaining wall will be required on the southwest end along Forester Creek and on the southeast end along the right-of-way fence.

7.5.2 Subsurface Investigation and Soil Conditions

The subsurface soil conditions of the site for this wall were investigated by the drilling of 5 exploratory borings (B-S4-1 through B-S4-5). The borings varied in depth from 6.0 meters in Borings B-S4-3 and B-S4-4 to 9.1 meters in Borings B-S4-1 and B-S1-5. Two of the borings (B-S4-1 and B-S4-5) were drilled in the asphaltic concrete pavement of the freeway's shoulder. The other three borings (B-S4-2 through B-S4-4) were drilled in the natural ground surface to the north and along Forester Creek (see Layout Sheets L-1 through L-3 for boring locations). The subsurface soil conditions in the borings consist of three layers of soil types that vary in thickness and depth along the length of the retaining wall.

The upper layer consisting of fill materials was encountered only in Borings B-S4-1 and B-S4-5. The fill materials averaged in depth of about 6 meters and consisted mostly of brown to dark brown, reddish brown, and dark gray loose to medium dense silty sand and sandy silt with occasional gravel and boulders.

Underlying the fill materials there exists a layer of alluvial soils, which consist in general of brown to dark brown, reddish brown, very loose to very dense silty sand, sandy silt and poorly graded sand. This layer contains pockets of stiff to very stiff lean clay that were encountered in Boring B-S4-1 and pockets of medium dense clayey sand that were encountered in Borings B-S4-1, B-S4-2 and B-S4-4.

The bottom layer consisted of decomposed granitic bedrock. It was encountered at about 8.5 meters below EGS in Borings B-S4-2 through B-S4-3 and at a slightly higher elevation in Borings B-S4-1 and B-S4-5. The decomposed bedrock consists in general of black and white, light to dark gray, and reddish and bluish gray, very dense silty sand, well graded sand and clayey sand with gravel.

Ground water was encountered on the average of about 6 meters below EGS in Borings B-S4-2 and B-S4-3. In Boring B-S4-4 the groundwater level was noticeably higher due to restriction of the flow of the water as a result of nearby Forester Creek. The ground water levels were measured at the time of the field investigation (January and April of 2005).

7.5.3 Conclusions and Recommendations

In our opinion the proposed retaining wall can be constructed using the latest Caltrans Standard Plans. We recommend the retaining wall be supported on Class 400 precast concrete piles in accordance with the Standard Plans (Page 249). The piles should supported in bedrock. The top of bedrock varies in elevation from 154 m in Boring B-S4-2 to 160 m in Boring B-S4-5. At these elevations we anticipate that the pile will develop a nominal axial resistance in excess of 400 KN. Additionally, we do not anticipate any difficulties in driving the pile to the required depths of penetration.

Drainage should be provided to prevent any water build up behind the retaining wall in accordance with the standard plan details.

7.6 Barrier Sound Wall SB5

7.6.1 Site description

This sound wall will consist of a 2.4m high masonry wall with a plantable safety shape barrier. It will extend from east of Broadway to west of the Sunset Hill condominiums on private property near the east end of the project. The sound wall will be constructed about 3m south of the eastbound edge of shoulder.

7.6.2 Subsurface Investigation and Soil Conditions

The subsurface soil conditions of the site for this wall were investigated by the drilling of one exploratory boring (B-S5-1). The boring was located in the asphaltic concrete pavement on the south shoulder of eastbound I-8 (see Layout Sheet L-6 for boring location). The subsurface soil conditions in the boring consists of three types of soils.

The upper layer consists of fill material that was encountered below the pavement section of the freeway. It consists of mostly brown, reddish brown and gray medium dense well graded sand. These materials were derived from decomposed granitic bedrock. Occasional cobbles were also encountered in the fill.

Underlying the fill material there exists a layer of alluvial soils that consist of brown, gray and reddish brown medium dense silty sand and sandy silt.

The lower layer encountered was decomposed granitic bedrock, which was encountered at about 4.3 meters below EGS. The bedrock consists of greenish gray, orange and gray, dense poorly graded sand.

Groundwater was not encountered in this boring during the drilling operations.

7.6.3 Conclusions and Recommendations

In our opinion the proposed sound wall can be constructed using the latest Caltrans Standard Plans (July 2004). The wall may supported on a trench footing Since the wall will be mostly constructed on a ground surface that is sloping down on one side and flat on the other, the design should be based on Case 2 of the Standard Plans for trench footings (page 291). Special attention should be paid to the location of the wall from top of slope to meet the minimum distance requirement shown on the Standard Plans. The trench footing dimensions should be obtained from the table on page 291 for the Case 2 conditions and a soil friction angle $\Phi = 35^o$. We do not anticipate any difficulties in the excavation for the footings.

As an alternative, the sound wall may be supported on a pile cap on cast in drilled hole (CIDH) piles. The design information presented on page 295 of the Standard Plans may be used for the pile cap foundation (Case 2, $\Phi = 35^o$). The tip of the piles should be supported on the top of bedrock, which was encountered at an elevation of approximately 174 m in Boring B-S5-1

During drilling loose sandy soils and ground water may be encountered at some locations, which could cause caving of the walls of the hole. Temporary casing might be required under these conditions. In addition, cobbles and boulders may be encountered, which could cause a slow down of the drilling operations.

7.7 Barrier Sound Wall SB6

7.7.1 Site description

This sound wall will consist of two separate masonry walls, one on the east end along the Sunset Hill Condominiums property line. It will have transparent panels and a height of 2.4m. The second wall will be to the west with no transparent panels and a height of 3.7m.

7.7.2 Subsurface Investigation and Soil Conditions

The subsurface soil conditions of the site for this wall were investigated by the drilling of two exploratory borings (B-S6-1 and B-S6-2). The borings varied in depth from 3 meters in Boring B-S6-1 to 4.6 meters in Boring B-S6-2. The two borings were located in the asphaltic concrete pavement of the parking lot of the Sunset Hill Condominiums complex on Via Loma Vista in El Cajon. (see Layout Sheet L-7 boring locations). The subsurface soil conditions in the borings consist of three types of soils.

The upper layer consists of fill material that was encountered below the pavement section of the parking area. It consists of mostly light brown to brown and gray, medium dense silty sand and gravel. These materials were derived from decomposed granitic bedrock. Occasional cobbles were also encountered in the fill. This layer was only encountered in Boring B-S6-2.

Underlying the fill materials there exists a layer of alluvial/colluvial soils that consists of light brown, reddish brown, and dark gray, medium dense silty sand and clayey sand with gravel.

The lower explored layer consisted of bedrock that was encountered at a depth of between 3 to 4 meters below EGS. The bedrock consists of orange and gray dense poorly graded sand (decomposed granitic bedrock).

Groundwater was not encountered in the borings during the drilling operations.

7.7.3 Conclusions and Recommendations

In our opinion the proposed sound wall can be constructed using the latest Caltrans Standard Plans (July 2004). The wall may supported on a trench footing Since the wall will be mostly constructed on a ground surface that is sloping down on one side and flat on the other, the design should be based on Case 2 of the Standard Plans for trench footings (page 291). Special attention should be paid to the location of the wall from top of slope to meet the minimum distance requirement shown on the Standard Plans. The trench footing dimensions should be obtained from the table on page 291 for the Case 2 conditions and a soil friction angle $\Phi = 30^{o}$. We do not anticipate any difficulties in the excavation for

the footings.

As an alternative, the sound wall may be supported on a pile cap on cast in drilled hole (CIDH) piles. The design information presented on page 295 of the Standard Plans may be used for the pile cap foundation (Case 2, $\Phi = 35^o$). The tip of the piles should be supported on the top of bedrock, which varies in elevation from approximately 180 m in Boring B-S6-1 to approximately 179 m in Boring B-6-2

During drilling loose sandy soils and ground water may be encountered at some locations, which could cause caving of the walls of the hole. Temporary casing might be required under these conditions. In addition, cobbles and boulders may be encountered, which could cause a slow down of the drilling operations.

8.0 EMBANKMENT FILL SLOPE STABILITY

In some areas, noise mitigation barriers will require the construction of berms and retaining walls. Analyses were performed to determine the embankment slope stability at the location of the berm/retaining walls. The worst case configuration was selected in the analyses of slope stability. The analyses resulted in a factor of safety in excess of 1.5, which is the minimum acceptable value. The analysis is conservative and did not include the pile resistive force. The results of the stability analyses are presented in the Appendix to this report.

9.0 SETTLEMENT

The retaining walls will retain fill berms that will vary in height from approximately 3 to 5 m. A settlement analysis was performed for the maximum height of the berm of about 5m. The analysis indicates a maximum predicted settlement on the order of 25mm. This settlement is deemed to be tolerable and should not impact the integrity of the retaining walls. Additionally, the estimated settlements are anticipated to occur over a relatively short period of time and stabilize shortly after all of the fill loads are applied.

10.0 CORROSION POTENTIAL

Laboratory soil tests to evaluate corrosion potential were conducted for the walls by randomly selecting one sample in the upper 1 to 3 meters from different borings along the wall alignment. The results of the laboratory tests are summarized in the table below.

Wall Identification	*Sample depth (m)*	*Resistivety (Ohm/cm)*	*pH*	*Cl^- (mg/kg)*	*SO_4 (mg/kg)*
Barrier Sound Wall SB1 Boring B-S1-1	1.5-3.0	695	7.3	390	855
Barrier Sound Wall SB1 Boring B-S1-6	3.0-4.5	920	7.5	165	555
Barrier Sound Wall SB2 Boring B-S2-3	0.0-1.5	500	7.0	550	1,920
Barrier Sound Wall SBR3 B-SR3-1	1.5-5.0	820	7.4	180	980
Barrier Sound Wall SBR3 B-SR3-2	0.0-1.5	1,265	7.4	Non-Corrosive	Non-Corrosive
Barrier Sound Wall SB3 B-S3-3	1.0-4.5	710	7.5	280	1,140
Barrier Sound Wall SB3 B-S3-8	1.0-4.5	1,990	7.6	Non-Corrosive	Non-Corrosive
Barrier Sound Wall SB6 B-S6-3	1.0-4.5	2,900	7.6	Non-Corrosive	Non-Corrosive

As shown in the above table, the results of the laboratory tests indicate that the majority of soils encountered in the area are potentially corrosive. Therefore, it is conservative, to assume that the soils in the area are all potentially corrosive. The concrete mix design and the type of cement should be based on the potential for corrosion of the subsurface materials.

The following concrete mix design is deemed suitable for providing a 50-year design life for reinforced concrete structures in direct soil contact.

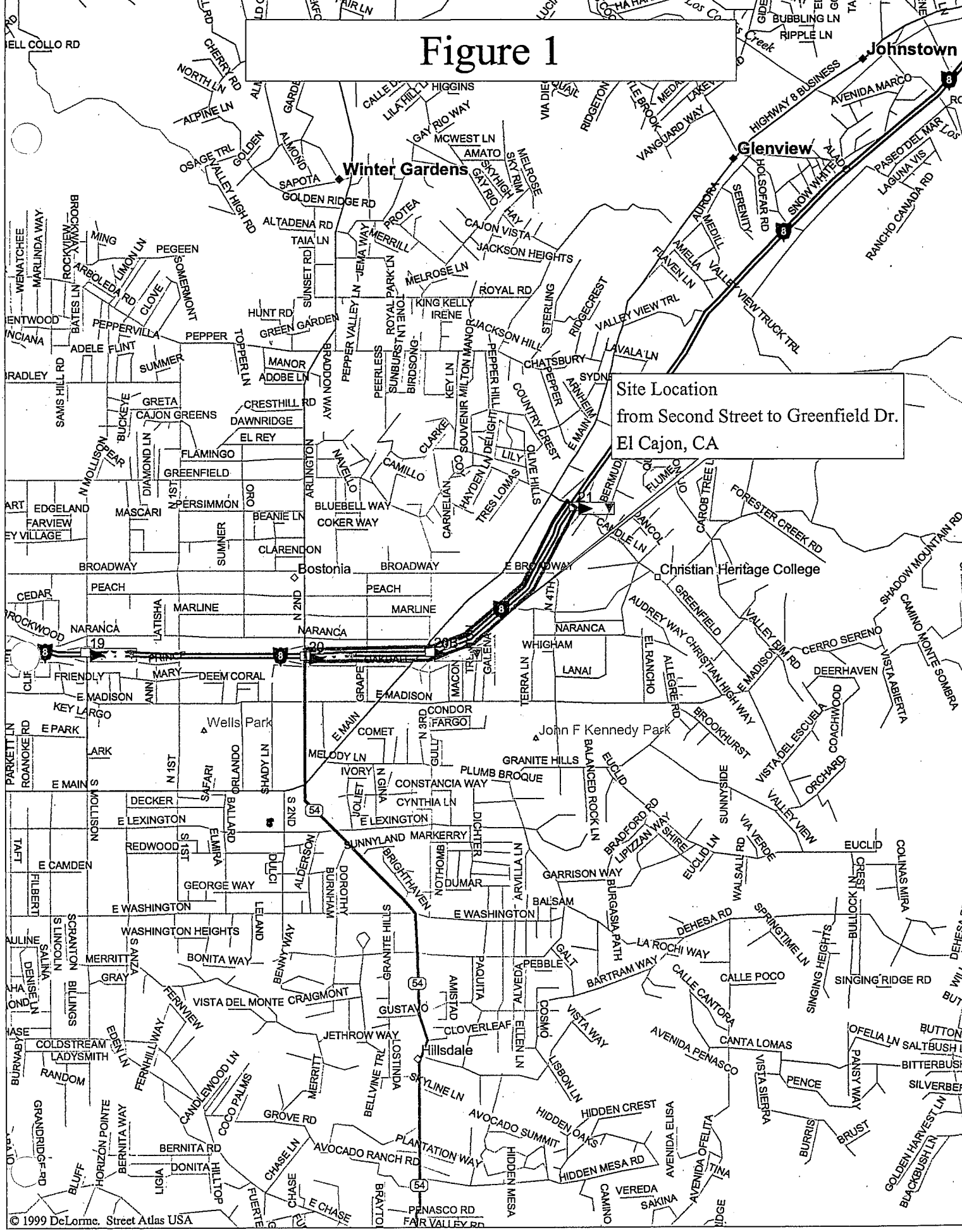
Cement Type:	Type II Modified or Type V
Minimum Cement Content:	313.5 kg/m^3
Mineral Admixture Replacement (normally fly-ash):	33%
Minimum cover over reinforcing steel:	64 mm

Conduit and pipe design recommendations are the responsibility of Caltrans District 11 Materials Laboratory, which will provide corrosion analysis and recommendations for the project based on the results of their study.

APPENDIX

SITE LOCATION

Figure 1


Site Location
from Second Street to Greenfield Dr.
El Cajon, CA
Johnstown
Glenview
Winter Gardens
Bostonia
Christian Heritage College
Wells Park
John F Kennedy Park
Hillsdale
© 1999 DeLorme. Street Atlas USA

LAYOUT PLAN SHEETS
(BORING LOCATIONS)

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	8	28.0/30.1	1	

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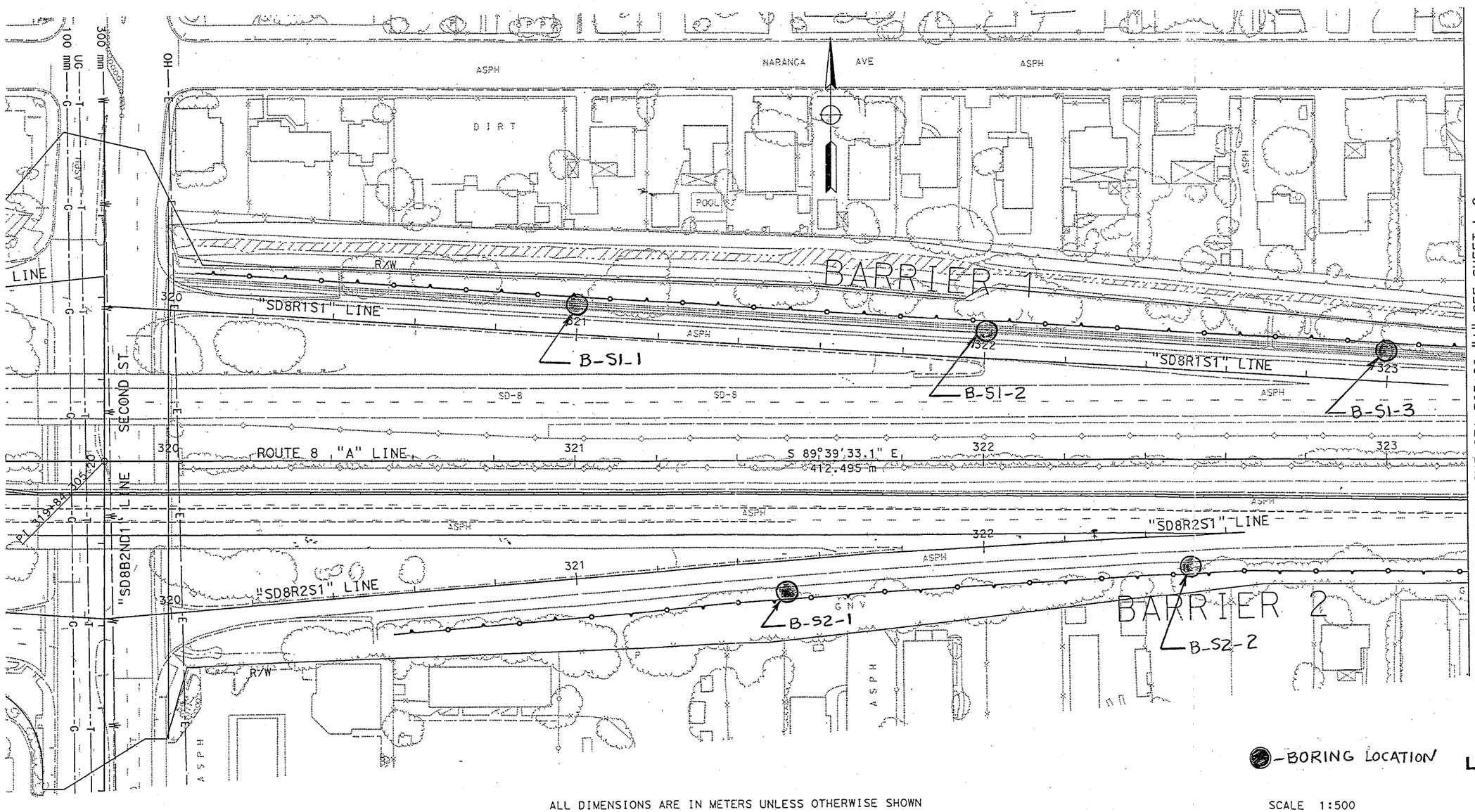
1. FOR COMPLETE RIGHT OF WAY DATA, SEE R/W RECORD MAPS AT DISTRICT OFFICE.
2. LOCATION OF UTILITY FACILITIES SHOWN ON THESE PLANS WERE OBTAINED FROM OWNERS RECORDS AND/OR FROM STATE SURVEYS.
3. ALL UTILITIES TO BE FIELD VERIFIED.

LEGEND:

SYMBOL	EXISTING UTILITY	OWNER
——E——	ELECTRIC	SAN DIEGO GAS & ELECTRIC
——G——	GAS LINE	SAN DIEGO GAS & ELECTRIC
——S——	SEWER LINE	CITY OF EL CAJON
——T——	TELEPHONE	SBC
——W——	WATER LINE	HELIX



ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE 1:500

LAYOUT

L-1

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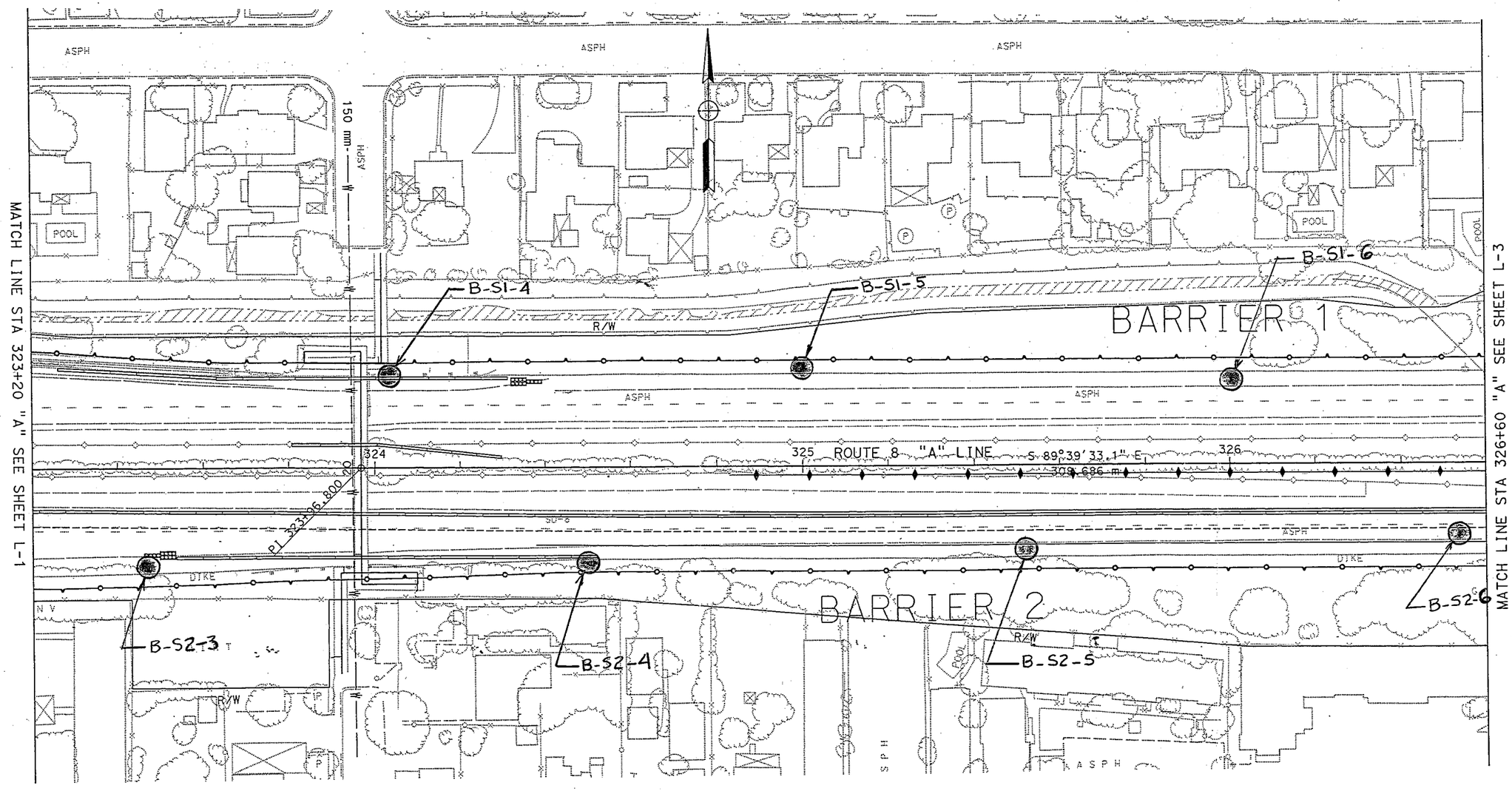

-BORING LOCATION

LAYOUT

L-2

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CURVE DATA

No.	LINE DESIGNATION	R	Δ	T	L
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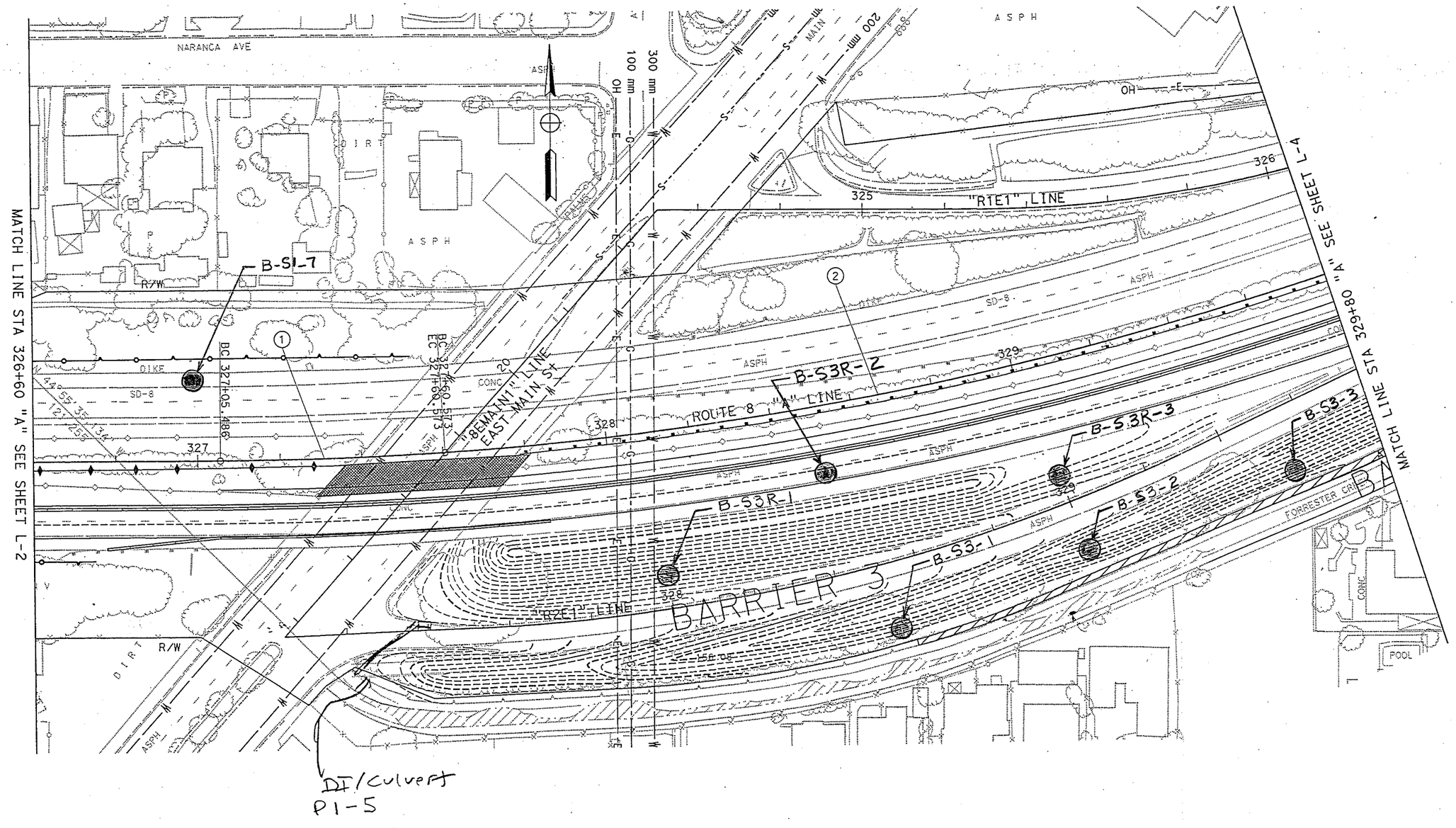
2	"A" LINE	853	-58°55'37"	482.138	877.741



● - BORING LOCATION

LAYOUT

SCALE 1:500

L-3

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B-7, 8, 10 11

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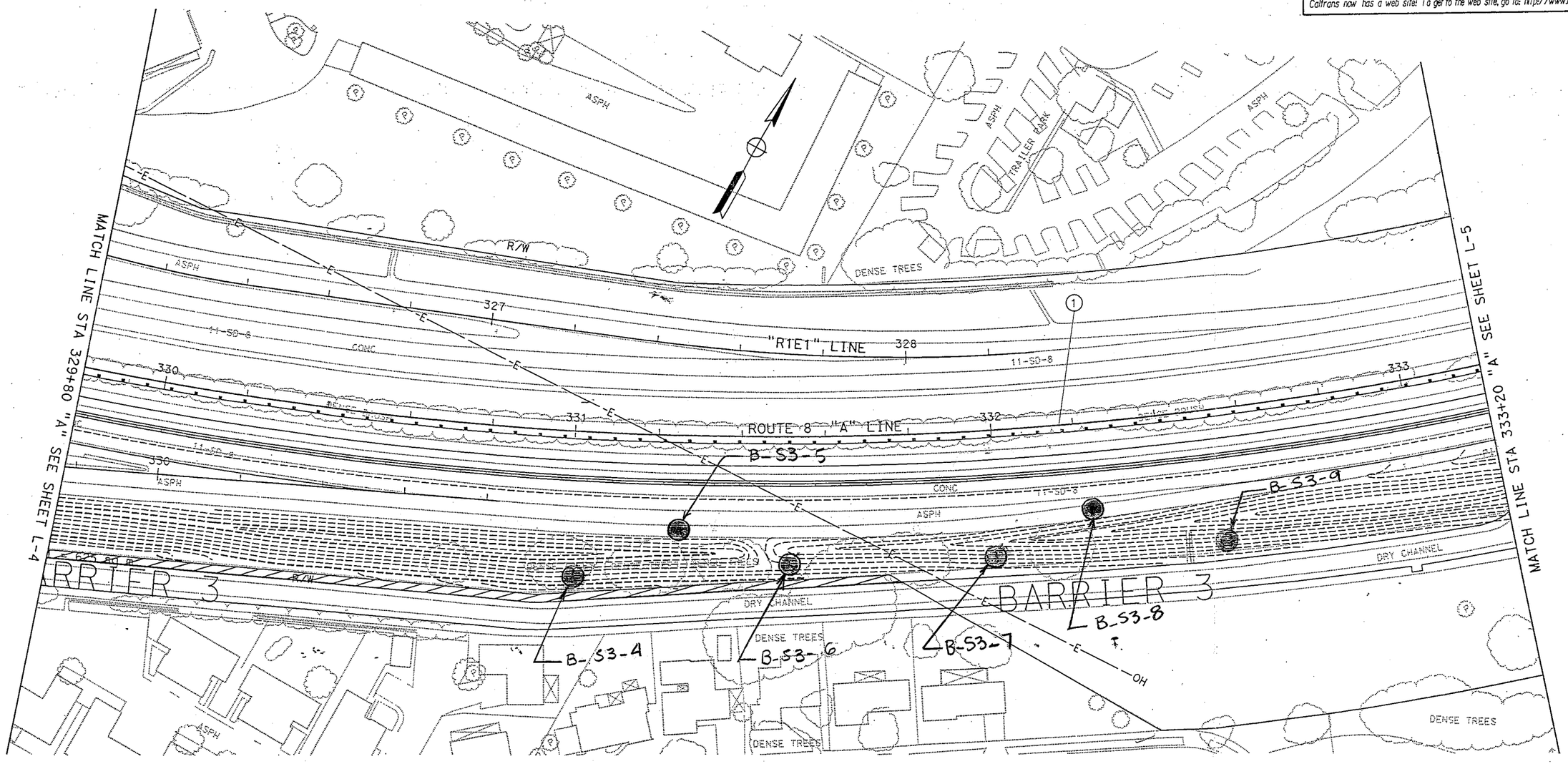

●-BORING LOCATION

LAYOUT

SCALE 1:500

L-4

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No.	LINE DESIGNATION	R	Δ	T	L
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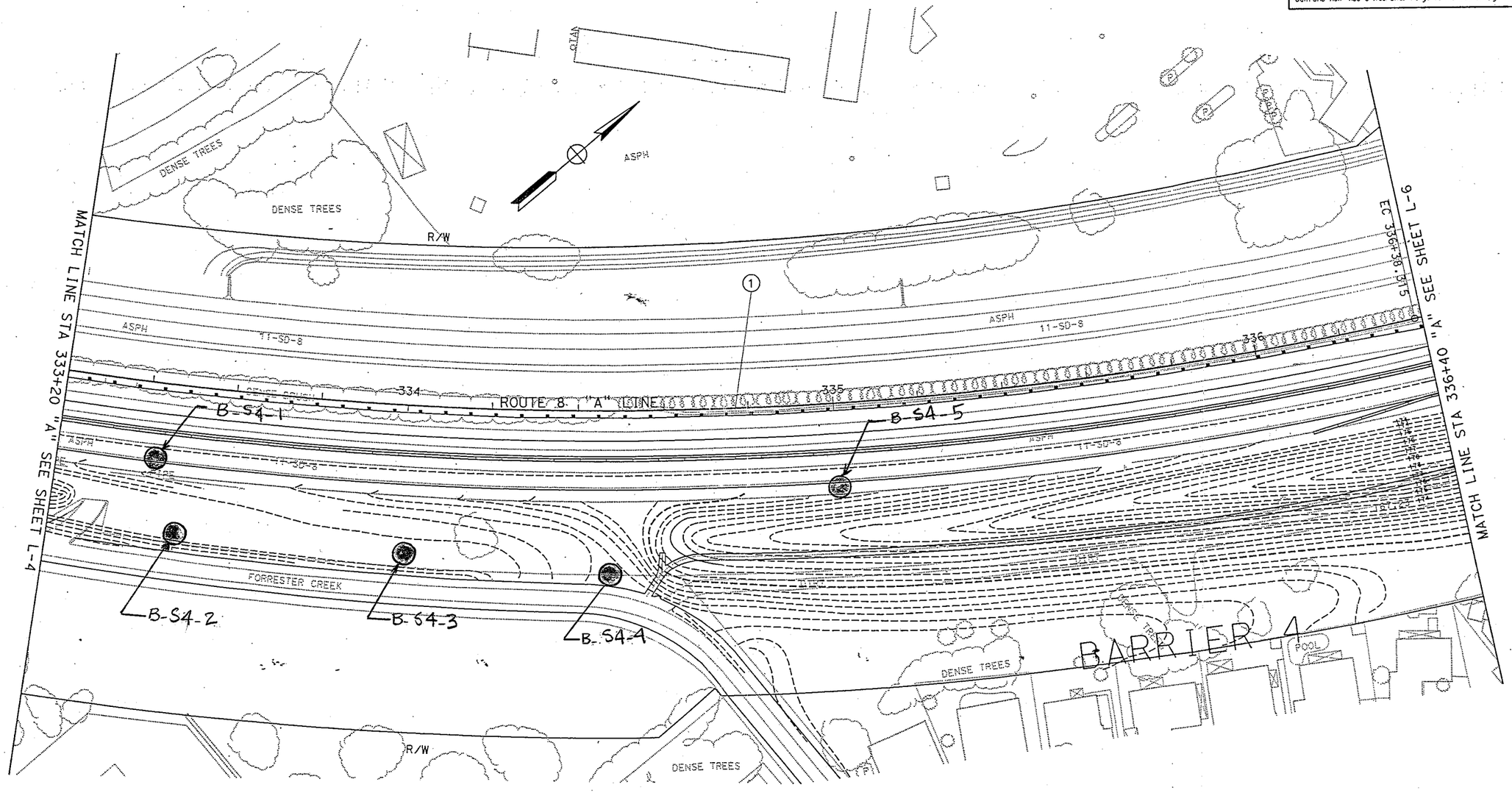

● - BORING LOCATION

LAYOUT

SCALE 1:500

L-5

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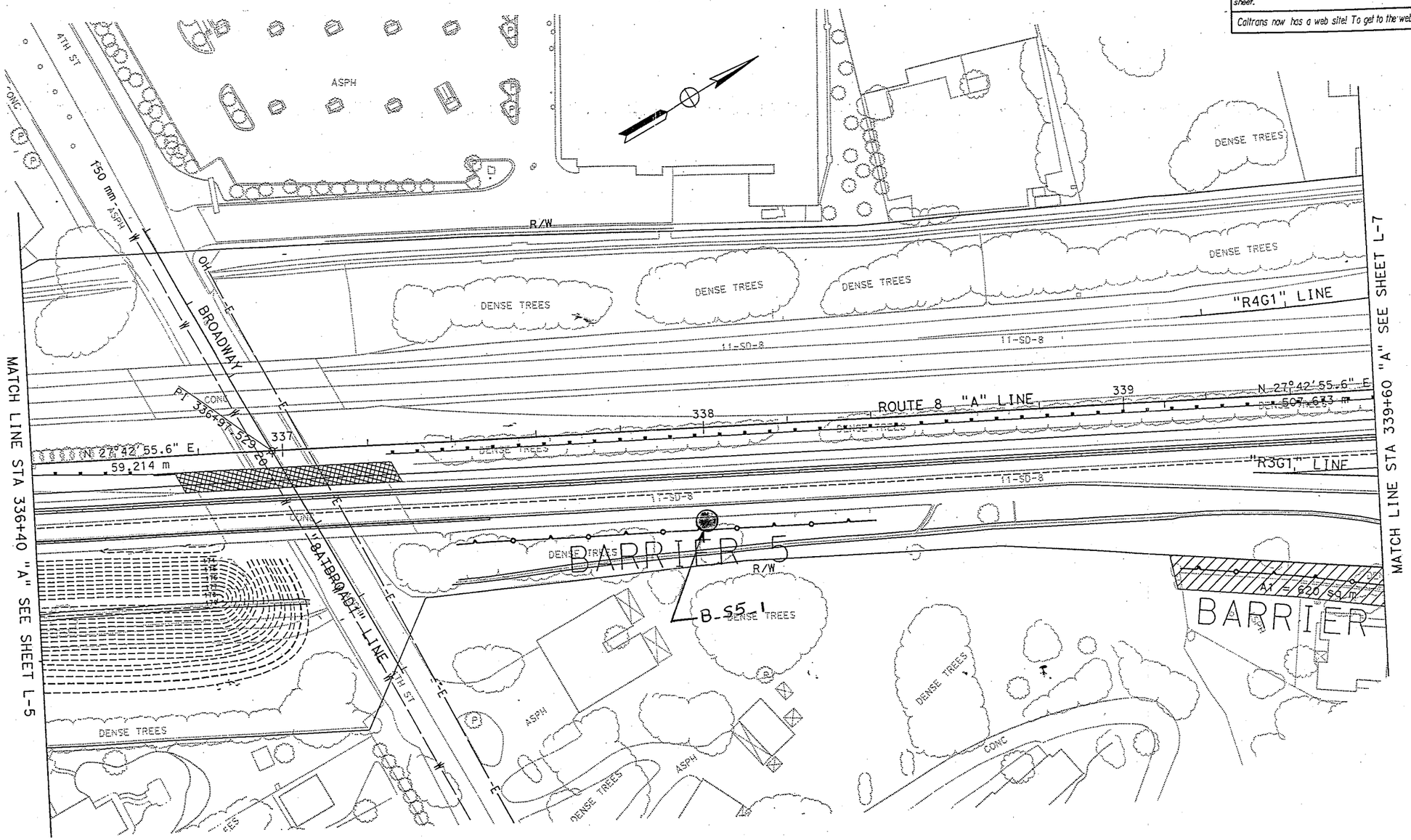

● - BORING LOCATION

LAYOUT

SCALE 1:500

L-6

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11	SD	8	28.0/30.1	7	

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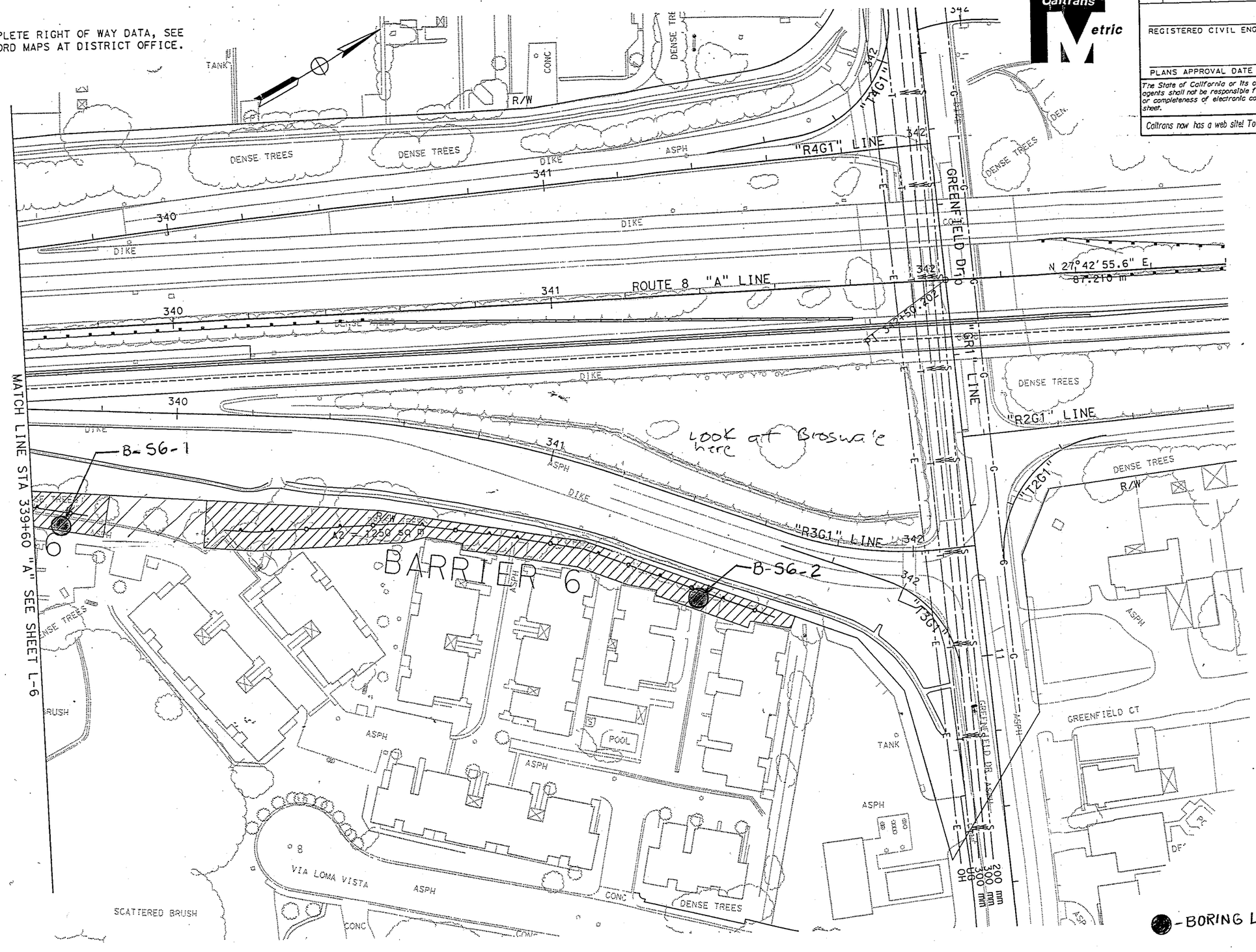

LAYOUT

SCALE 1:500

L-7

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EA 063800

TYPICAL CROSS-SECTIONS

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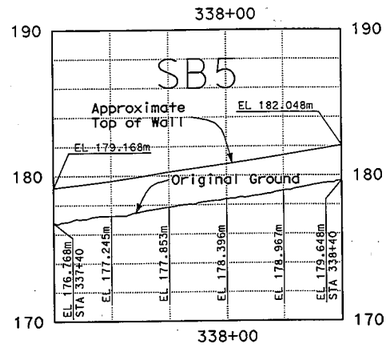

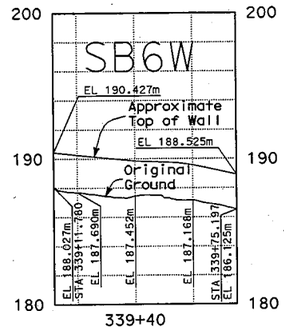

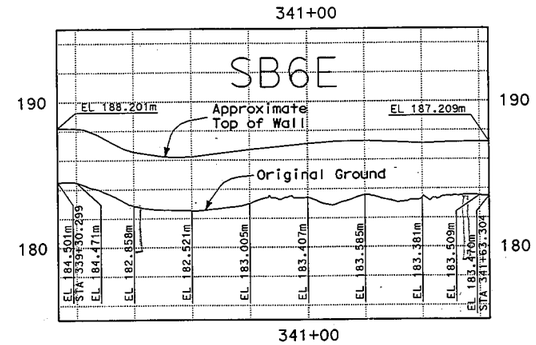

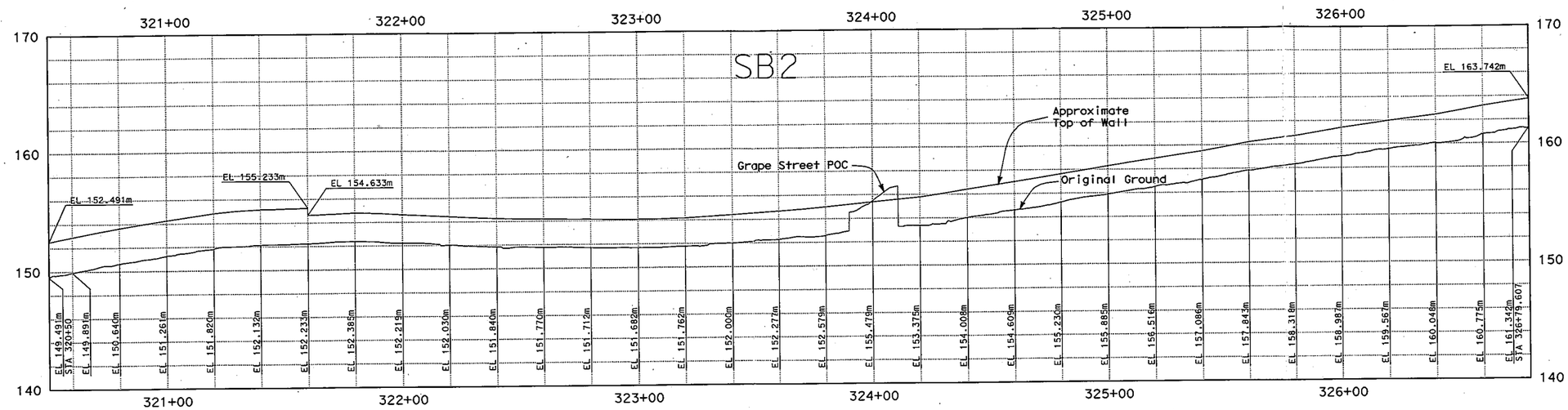

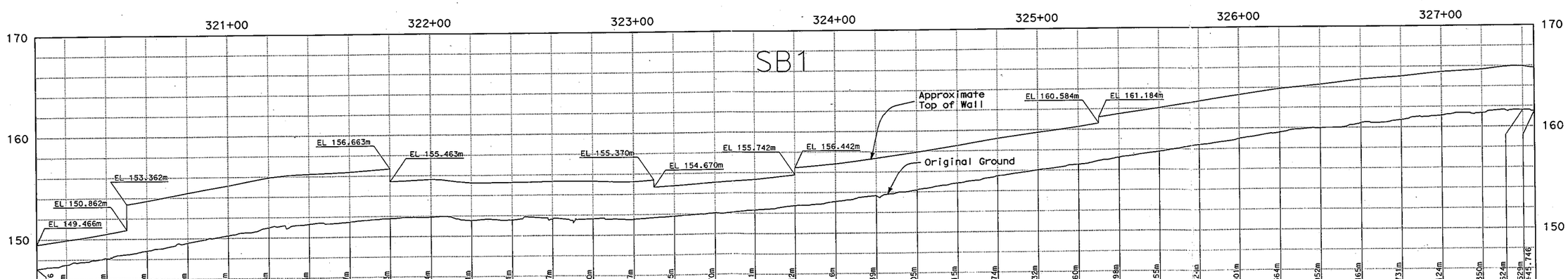

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P:\11-0638\02 User\Geotech\Wall Profile\SB-1,2,5,6.DGN

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SB-1,2,5,6.DGN

CU 00000

EA 000000

LAST REVISION 00-00-00 DATE PLOTTED => 11-MAR-2005

DESIGN STUDY ONLY
SB3 - SOUND BERM

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

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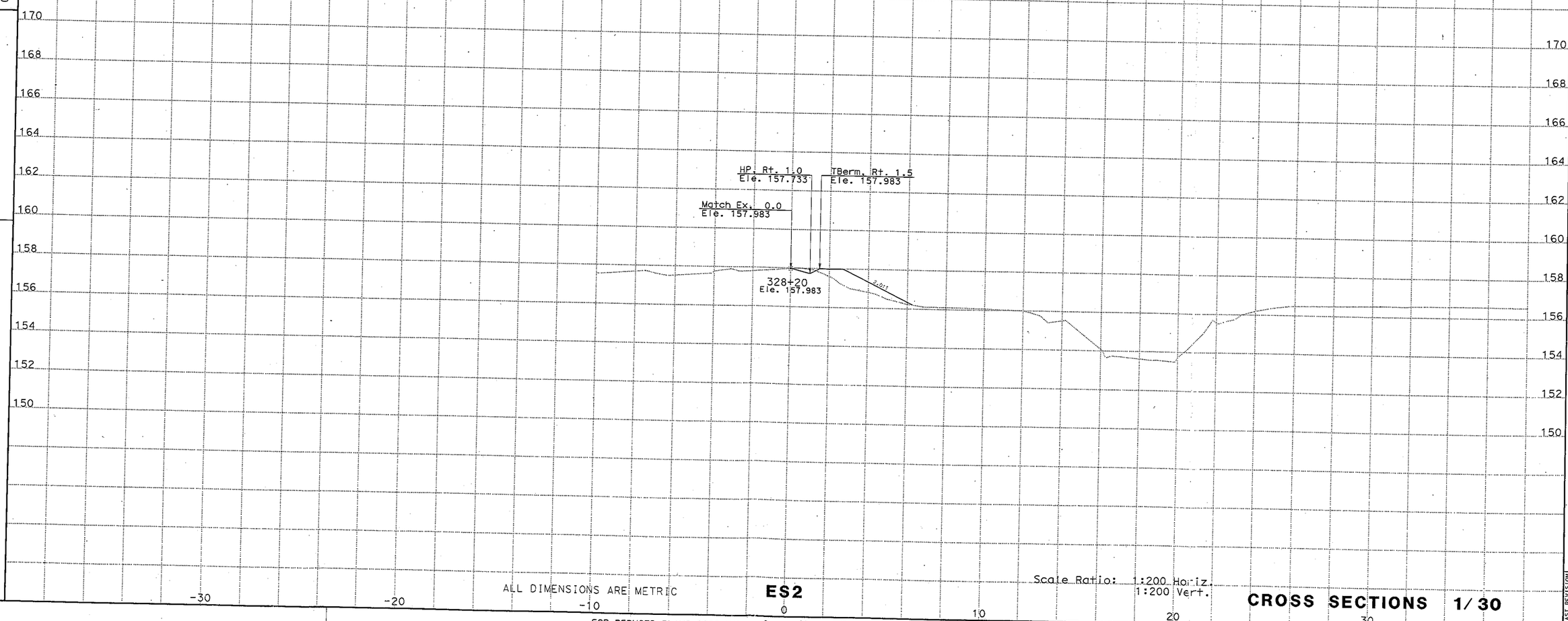

ALL DIMENSIONS ARE METRIC

ES2

Scale Ratio: 1:200 Horiz.
1:200 Vert.

CROSS SECTIONS 1/30

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

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CU 00000

EA 000000

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:29

DESIGN STUDY ONLY
SB3 - SOUND BERM

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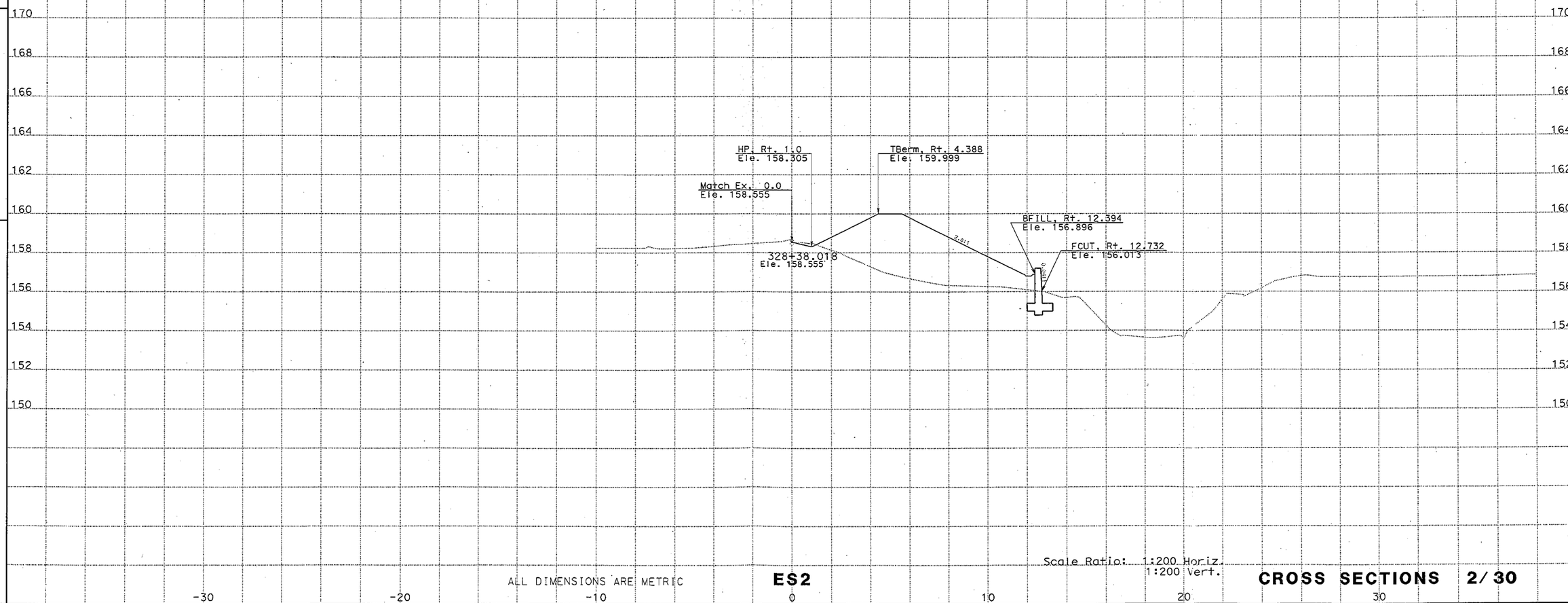

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 2/30

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

PROJECT ENGINEER

CALCULATED/DESIGNED BY

CHECKED BY

DATE REVISED BY

DATE REVISED

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:29

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SB3 - SOUND BERM

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

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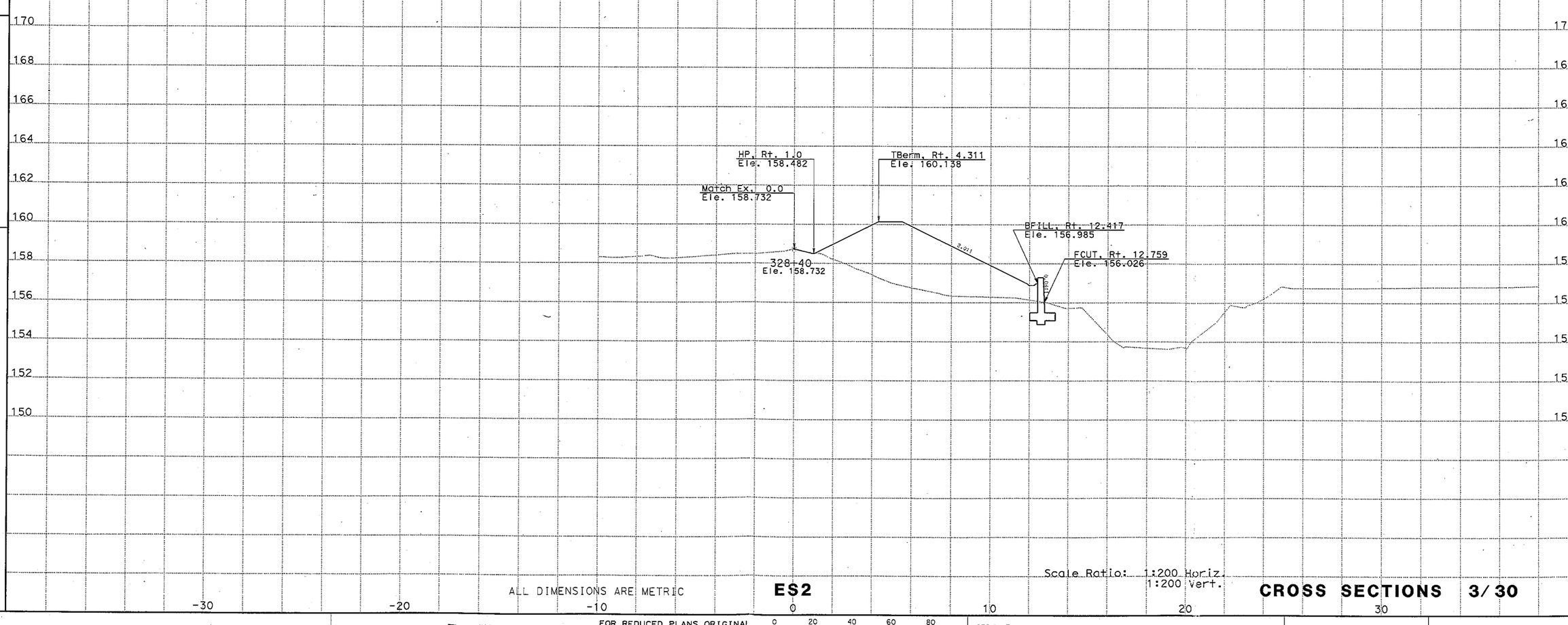

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 3/30

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PROJECT ENGINEER

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DATE REVISED

DATE

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:30

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwcyne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

DESIGN STUDY ONLY
SB3 - SOUND BERM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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PROJECT ENGINEER

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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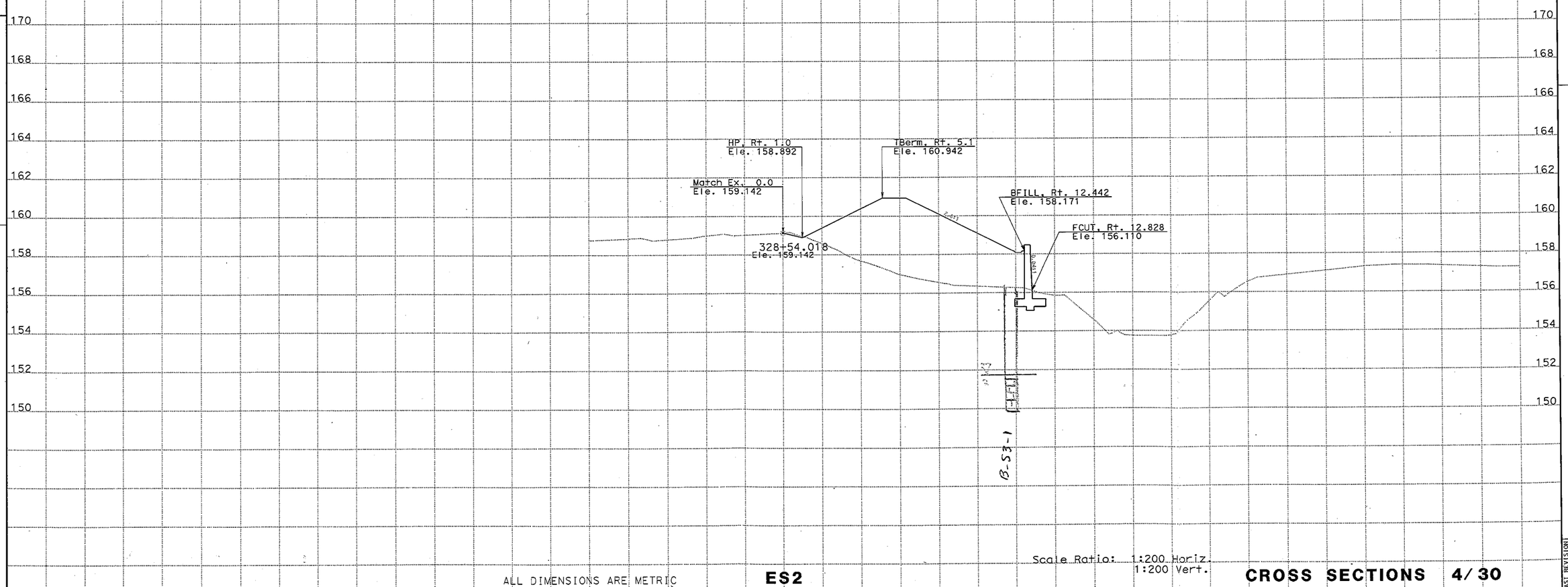

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1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 4/30

LAST REVISION 00-00-00 DATE PLOTTED => 03-MAR-2005 TIME PLOTTED => 11:30

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwoyne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

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Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET NO	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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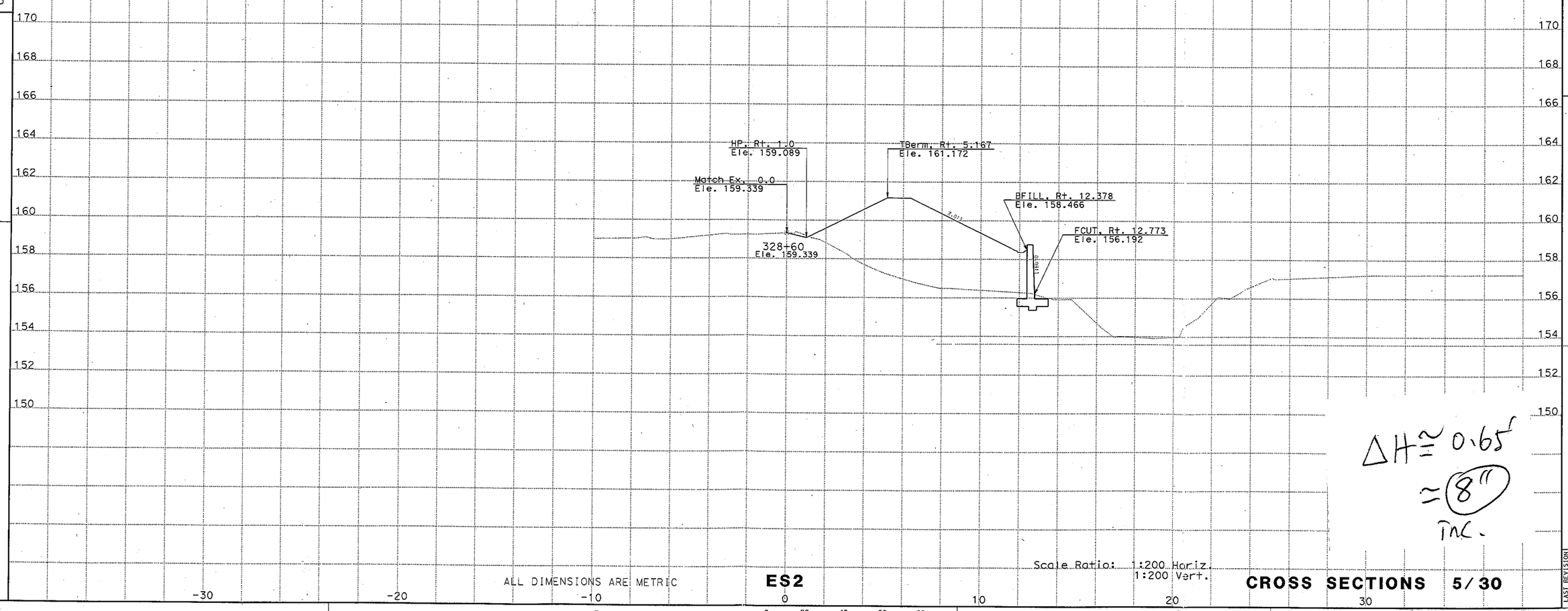

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Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 5/30

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW342 BWall Xsecs.dgn

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DATE REVISED

LAST REVISION 00-00-00
DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:30

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Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

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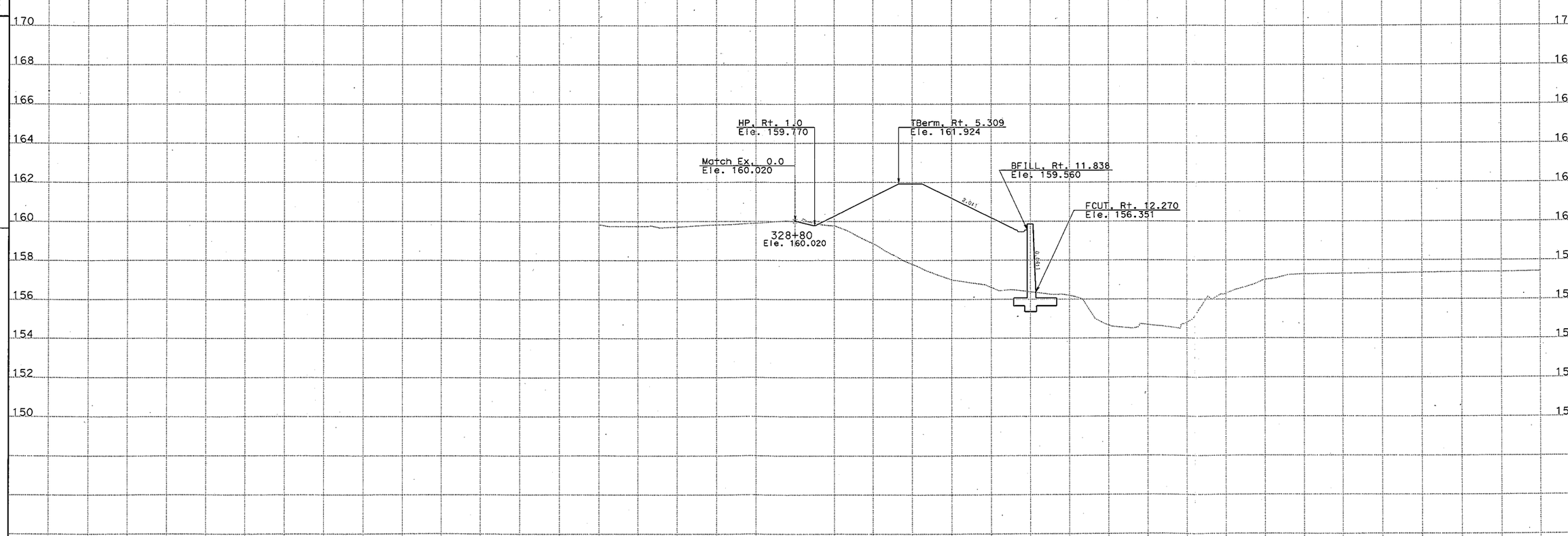

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 6/30

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DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:31

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

DESIGN STUDY ONLY
SB3 - SOUND BERM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

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	DATE REVISED

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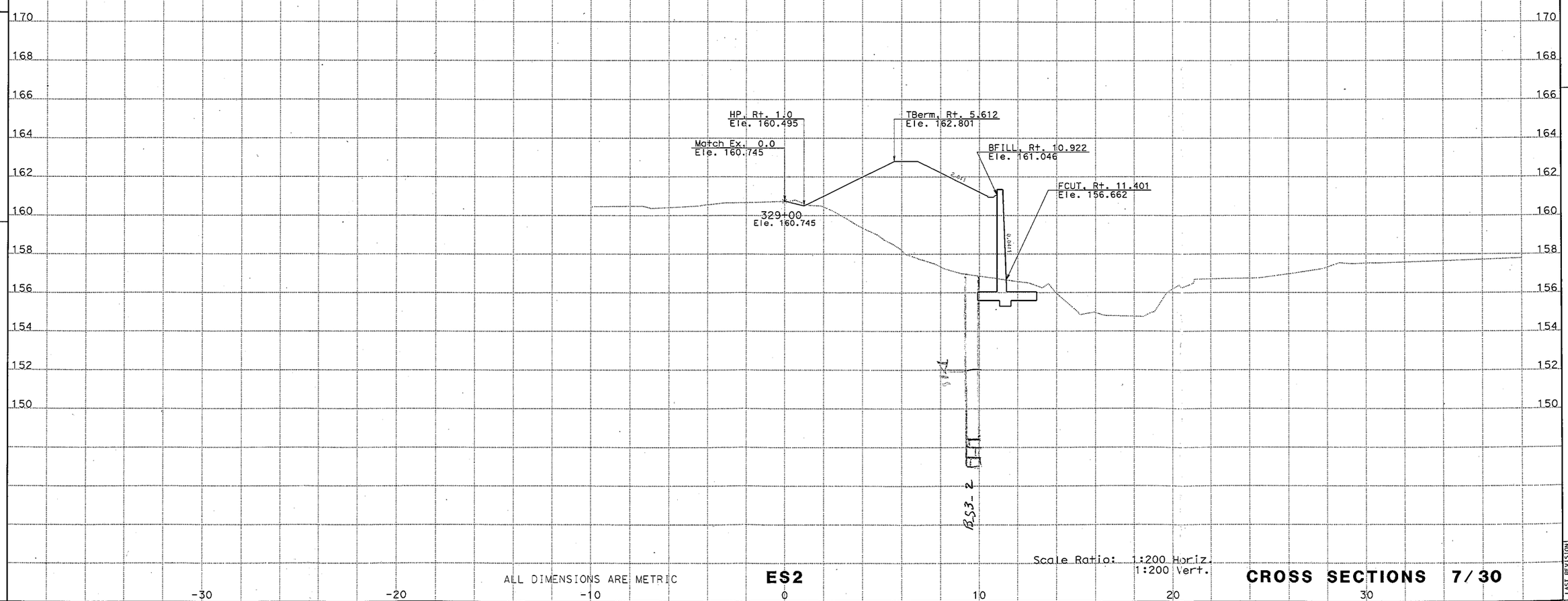

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 7/30

LAST REVISION 00-00-00 DATE PLOTTED => 03-MAR-2005

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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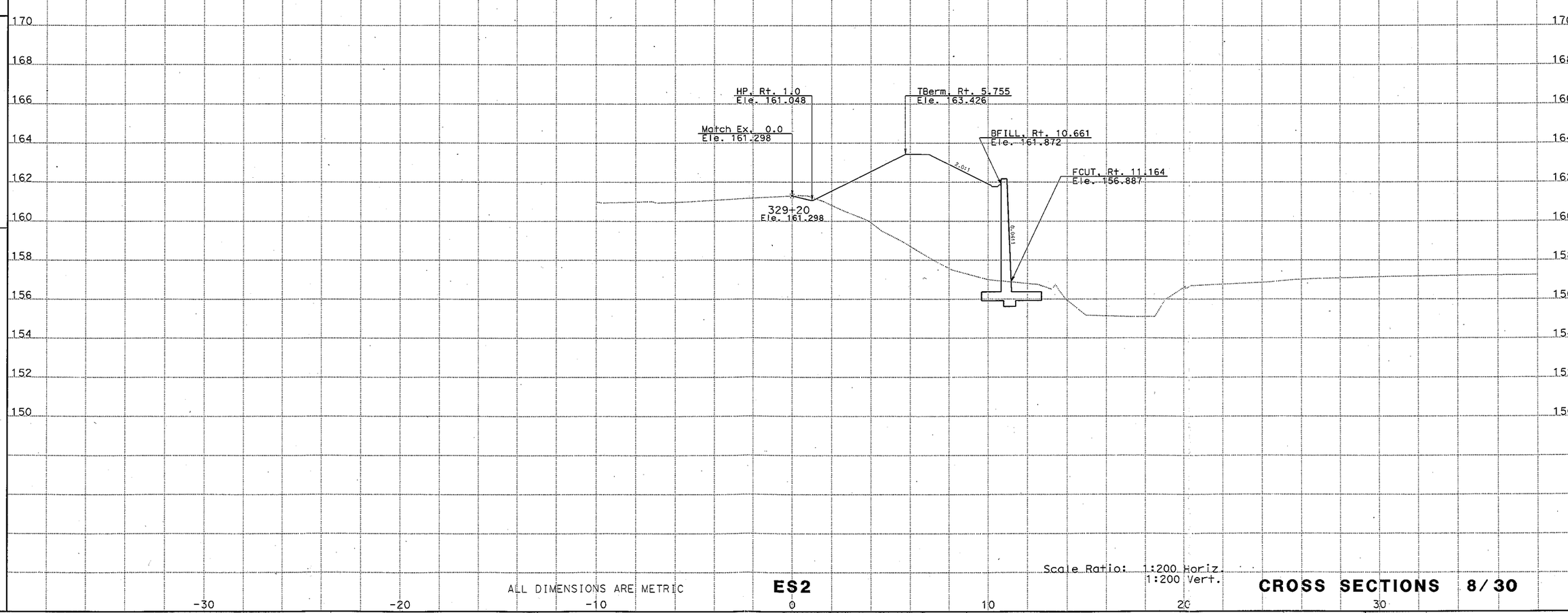

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 8/30

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DATE | REVISED

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USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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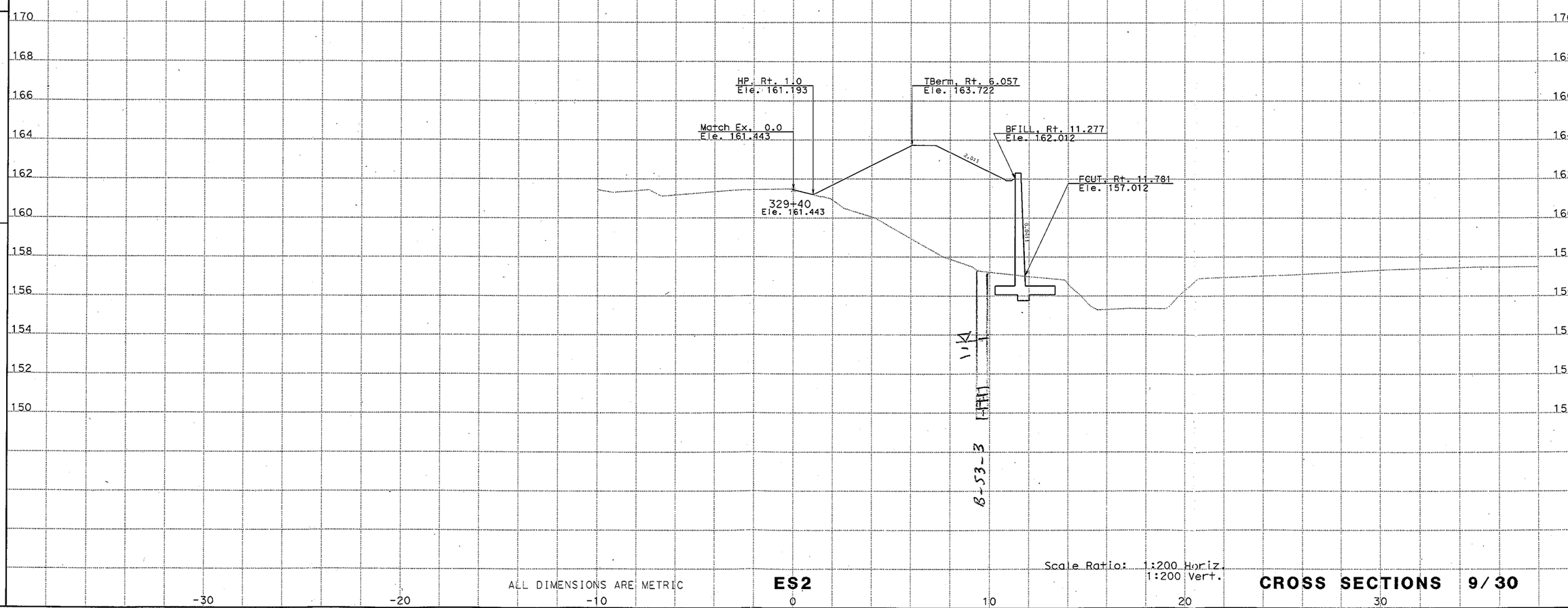

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 9/30

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:32

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

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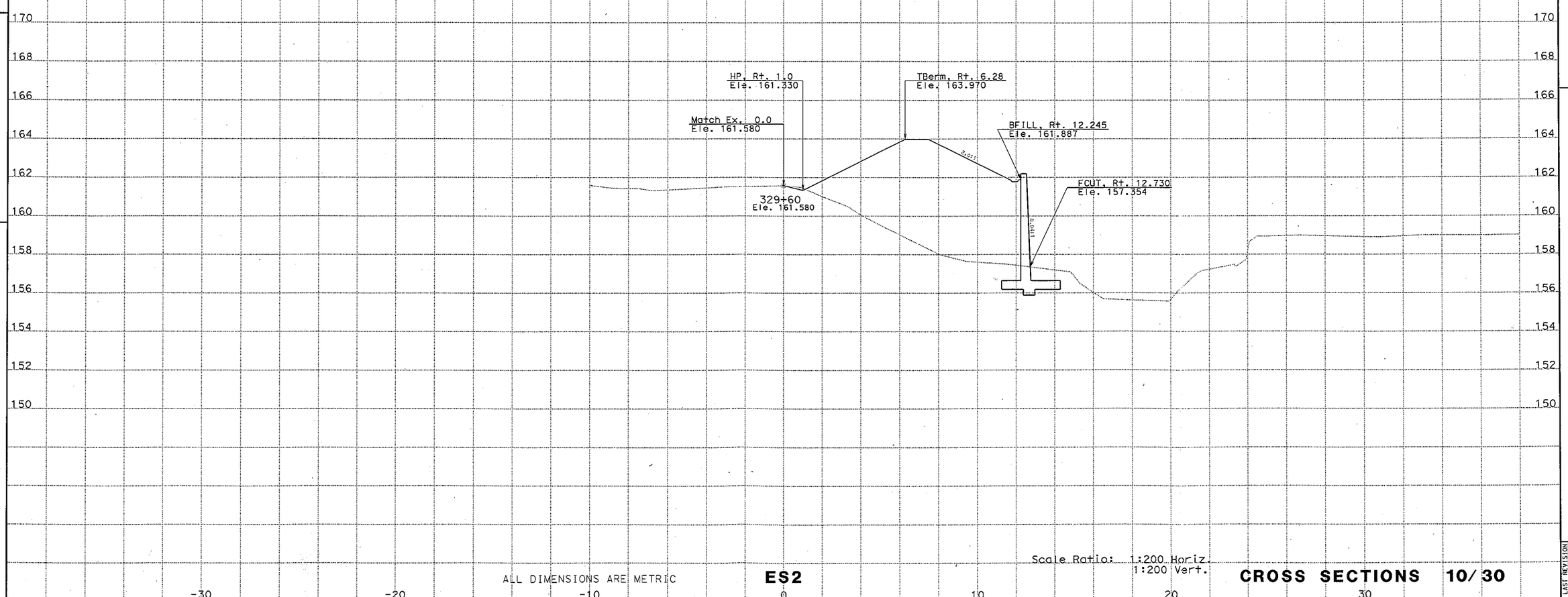

Scale Ratio: 1:200 Horiz.
1:200 Vert.

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ES2

CROSS SECTIONS 10/30

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FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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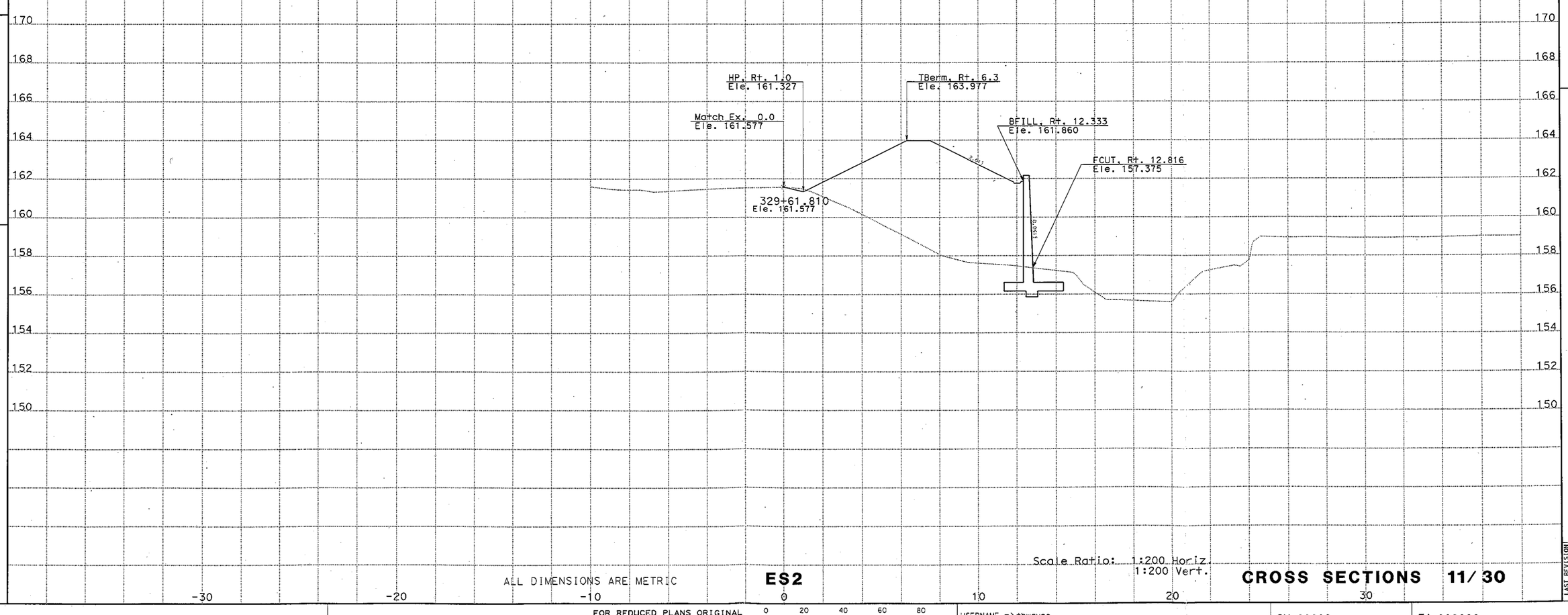

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 11/30

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

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DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:32

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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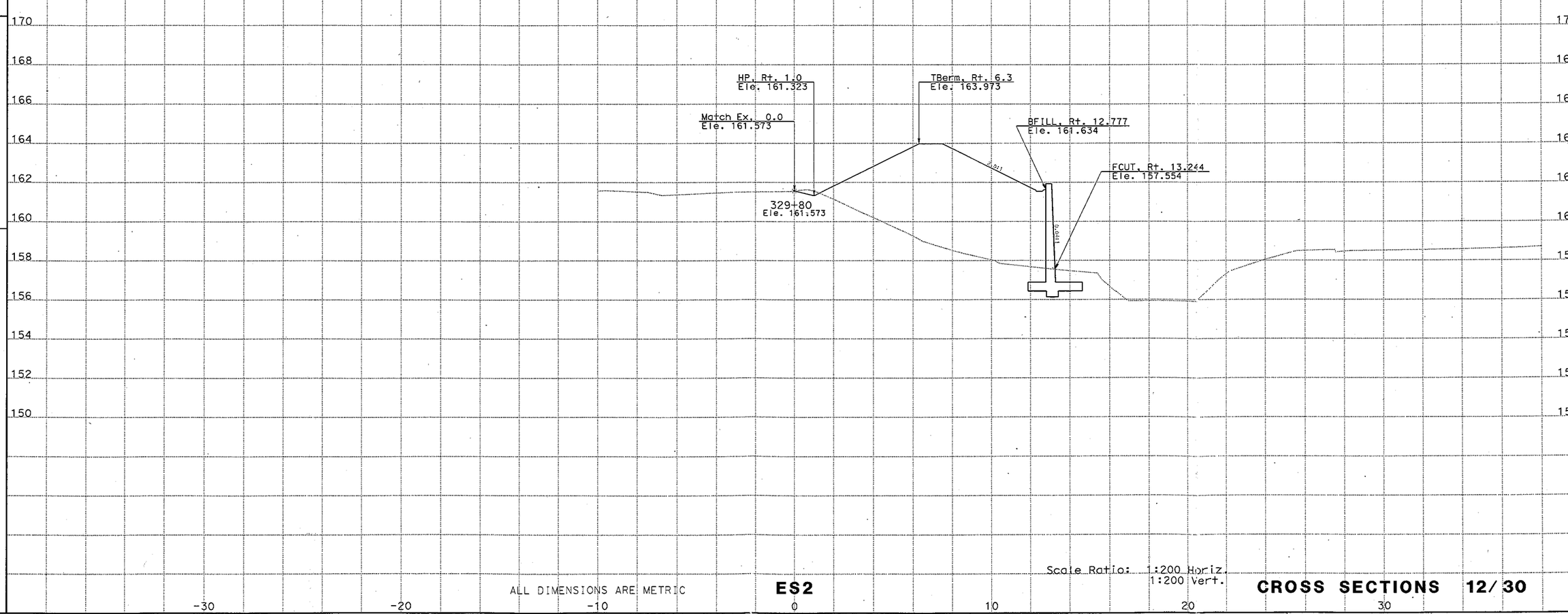

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 12/30

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

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DATE REVISED BY

DATE REVISED

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:33

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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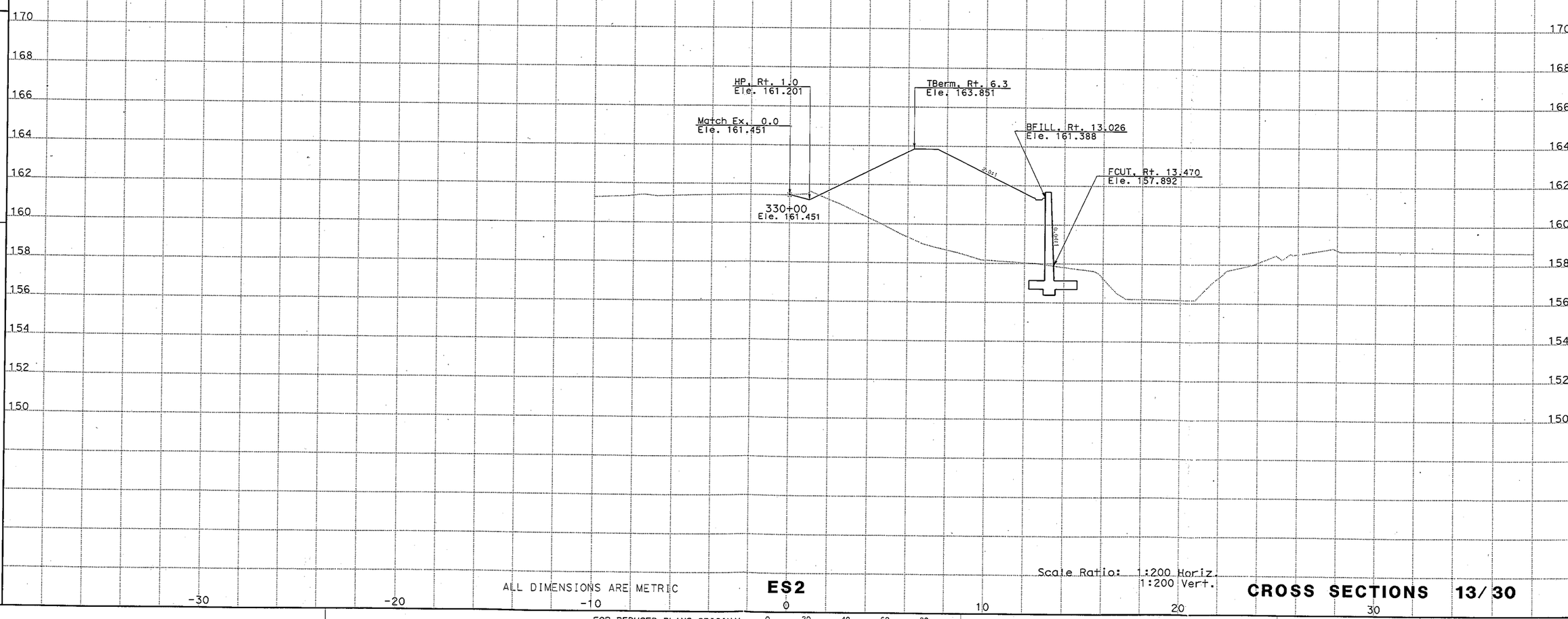

ALL DIMENSIONS ARE METRIC

ES2

Scale Ratio: 1:200 Horiz.
1:200 Vert.

CROSS SECTIONS 13/30

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:34

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

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SB3 - SOUND BERM

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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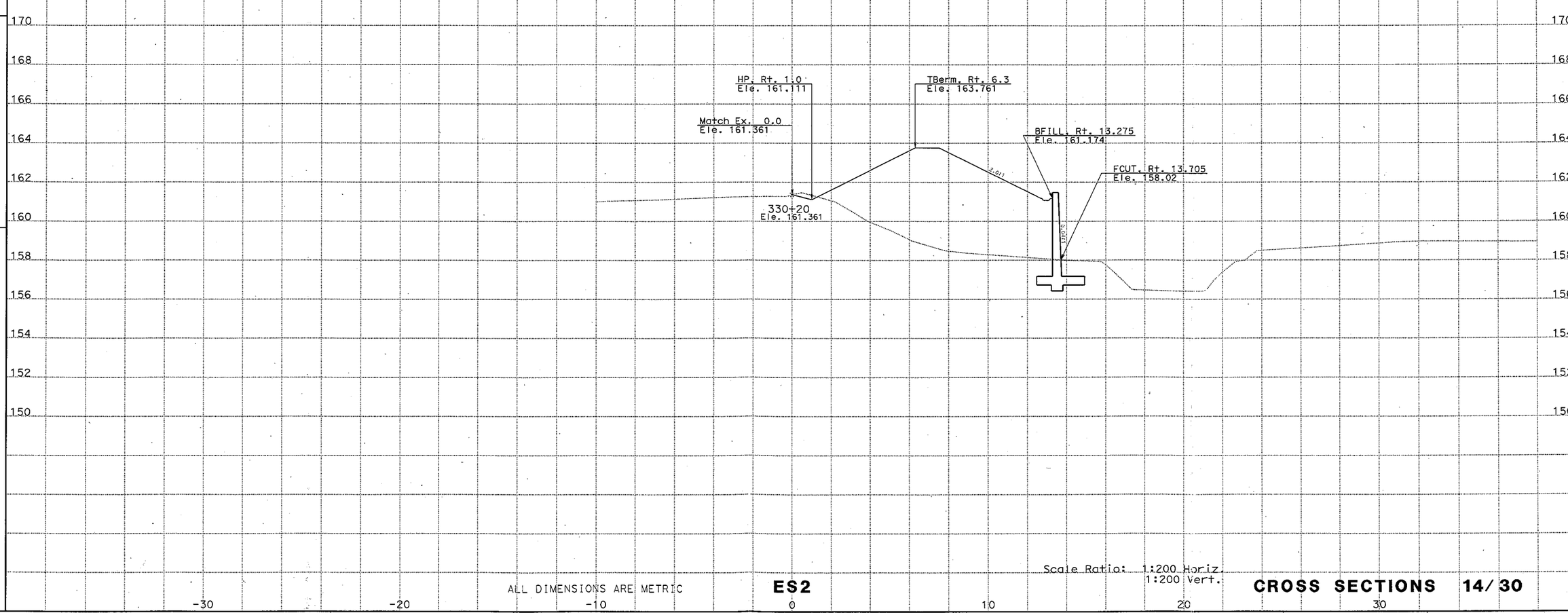

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 14/30

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

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LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:34

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SB3 - SOUND BERM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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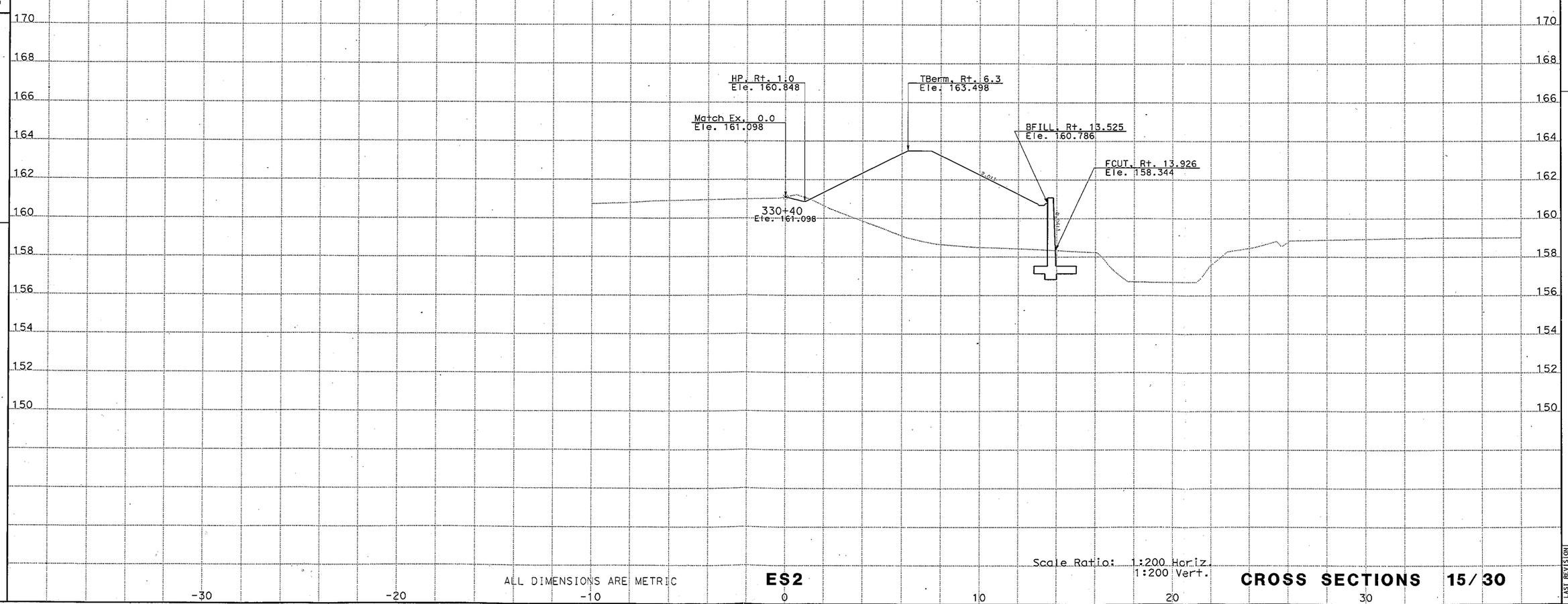

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 15/30

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LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:35

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwoyne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

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SB3 - SOUND BERM

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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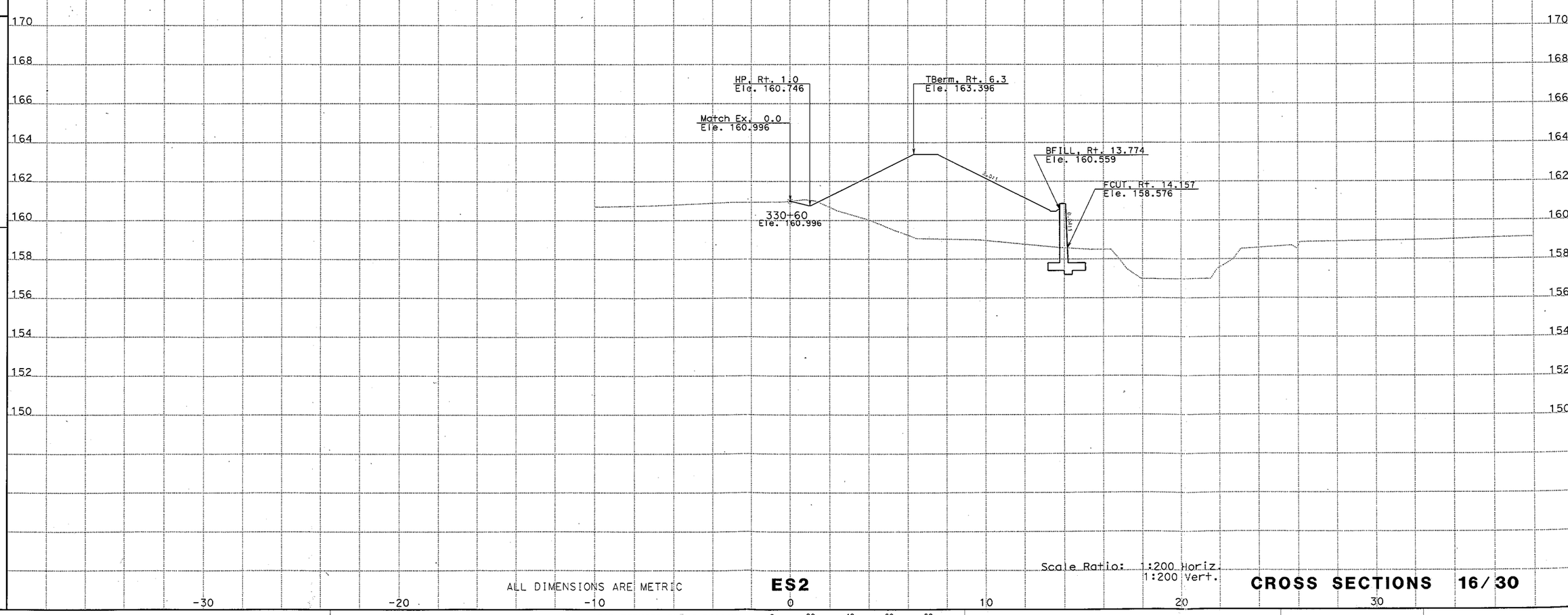

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 16/30

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DATE REVISED

DATE

LAST REVISION

DATE PLOTTED

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

DESIGN STUDY ONLY
SB3 - SOUND BERM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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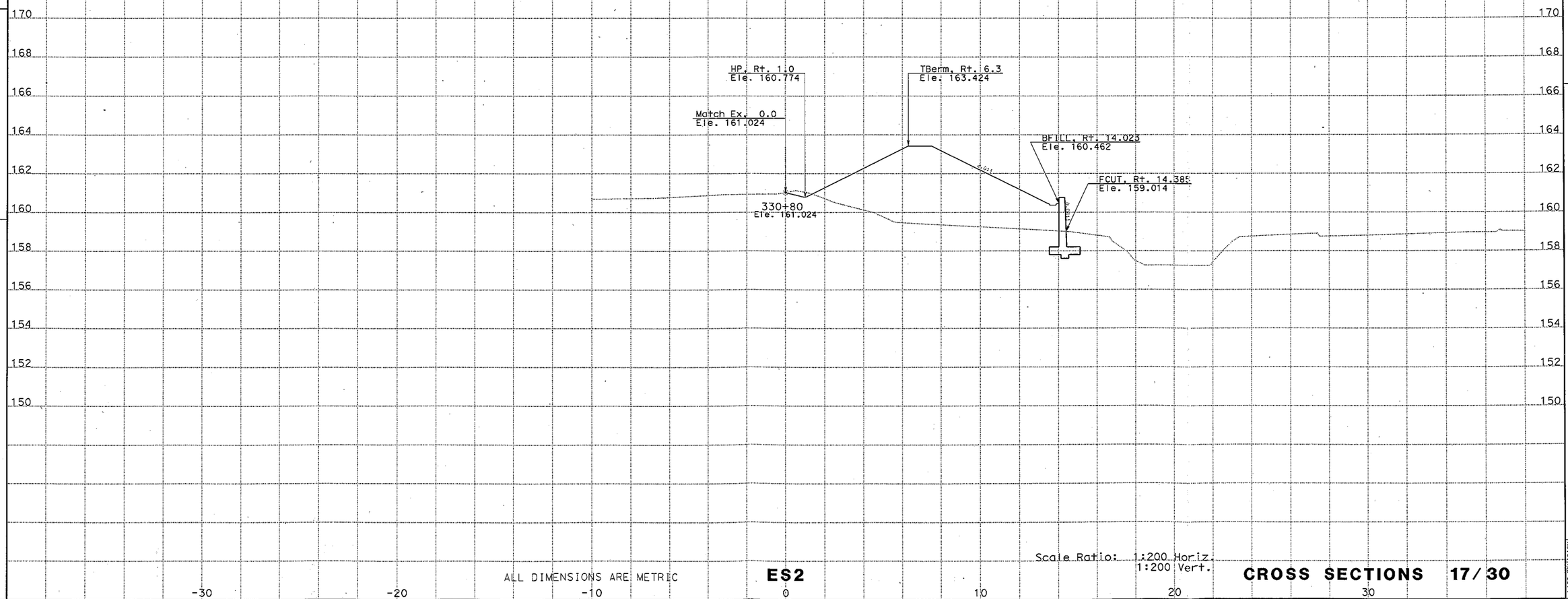

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 17/30

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

LAST REVISION 00-00-00 DATE PLOTTED => 03-MAR-2005 TIME PLOTTED => 13:35

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Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

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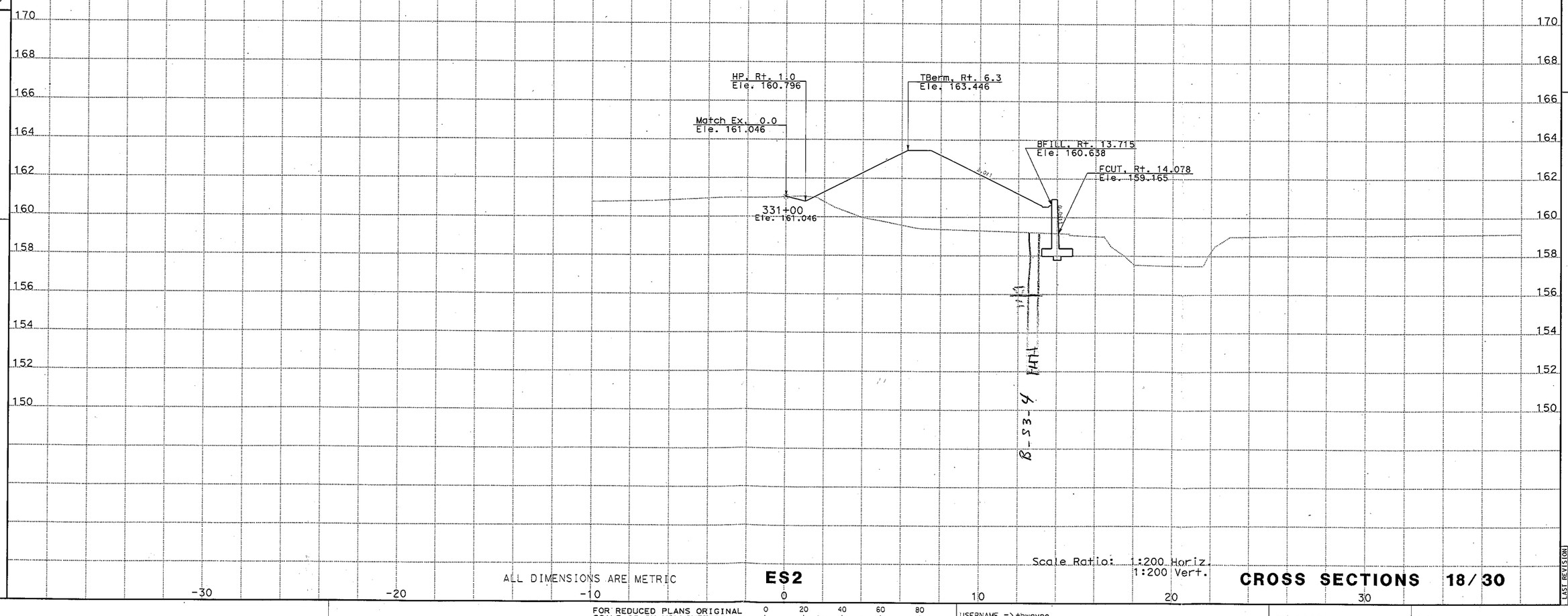

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 18/30

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:36

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

DESIGN STUDY ONLY
SB3 - SOUND BERM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

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Caltrans Metric

DATE	REVISED BY	DATE REVISED

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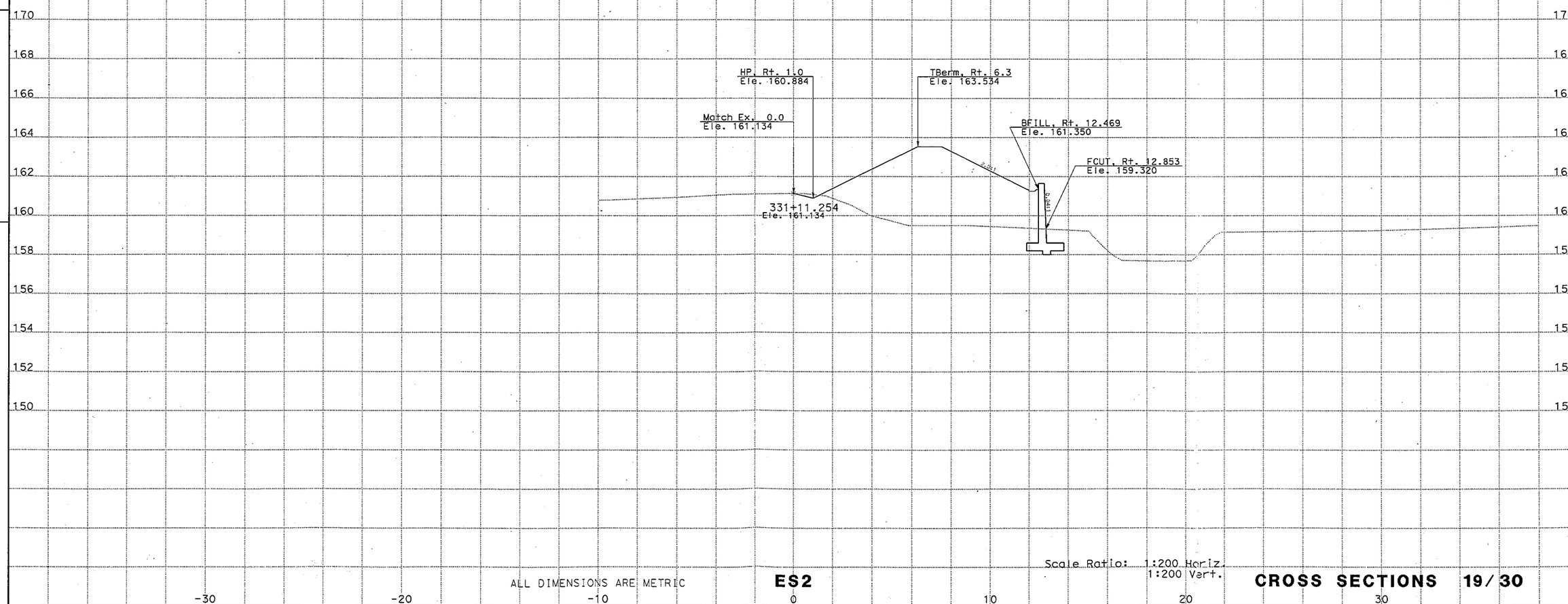
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans



ALL DIMENSIONS ARE METRIC

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ES2

CROSS SECTIONS 19/30

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:36

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

DESIGN STUDY ONLY
SB3 - SOUND BERM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

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REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. EXP. CIVIL STATE OF CALIFORNIA

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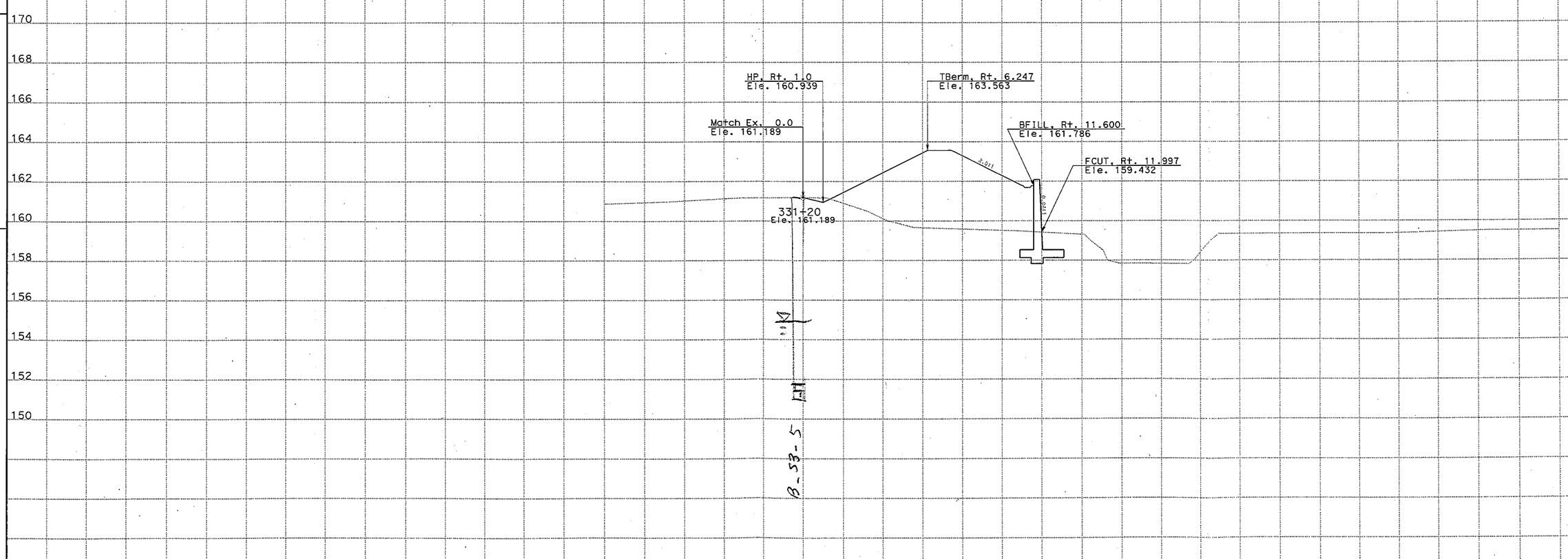

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 20/30

DATE	REVISED BY	DATE REVISED

CALCULATED/DESIGNED BY

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PROJECT ENGINEER

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:36

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

DESIGN STUDY ONLY
SB3 - SOUND BERM

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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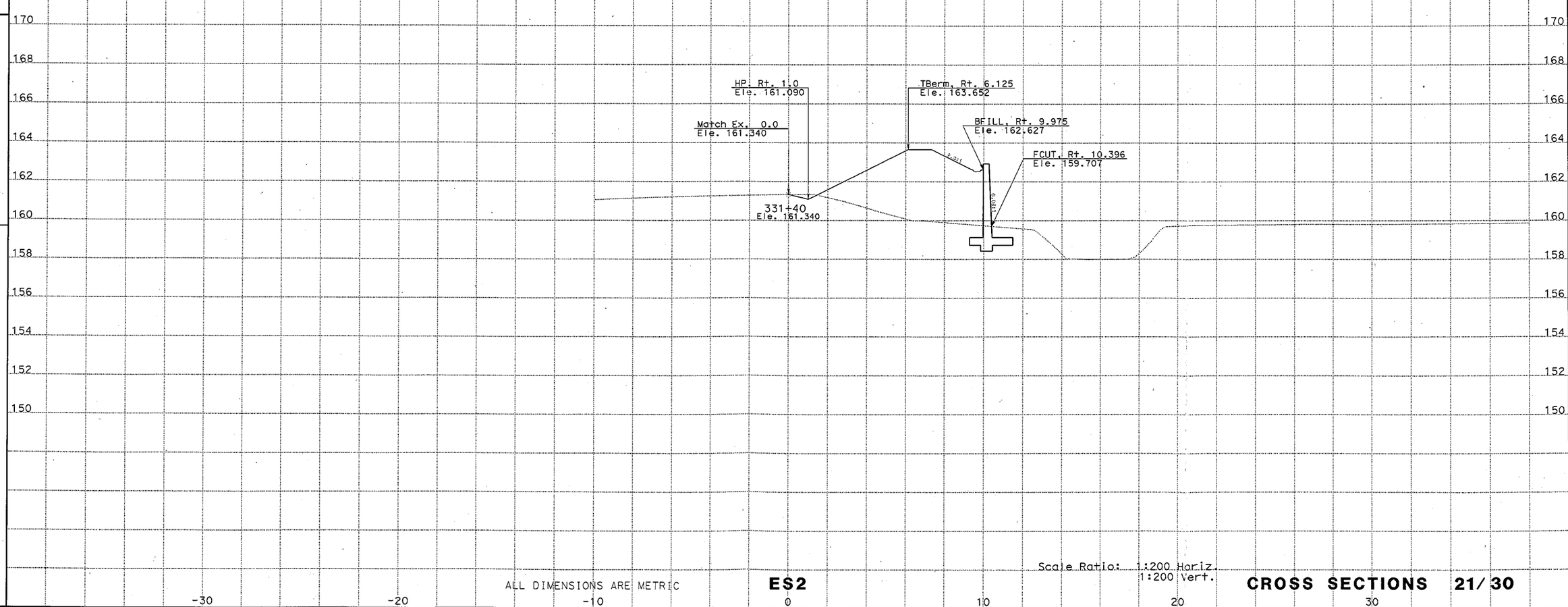

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 21/30

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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PROJECT ENGINEER

CALCULATED/DESIGNED BY

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DATE REVISED BY

DATE REVISED

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:37

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SB3 - SOUND BERM

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. EXP. CIVIL STATE OF CALIFORNIA

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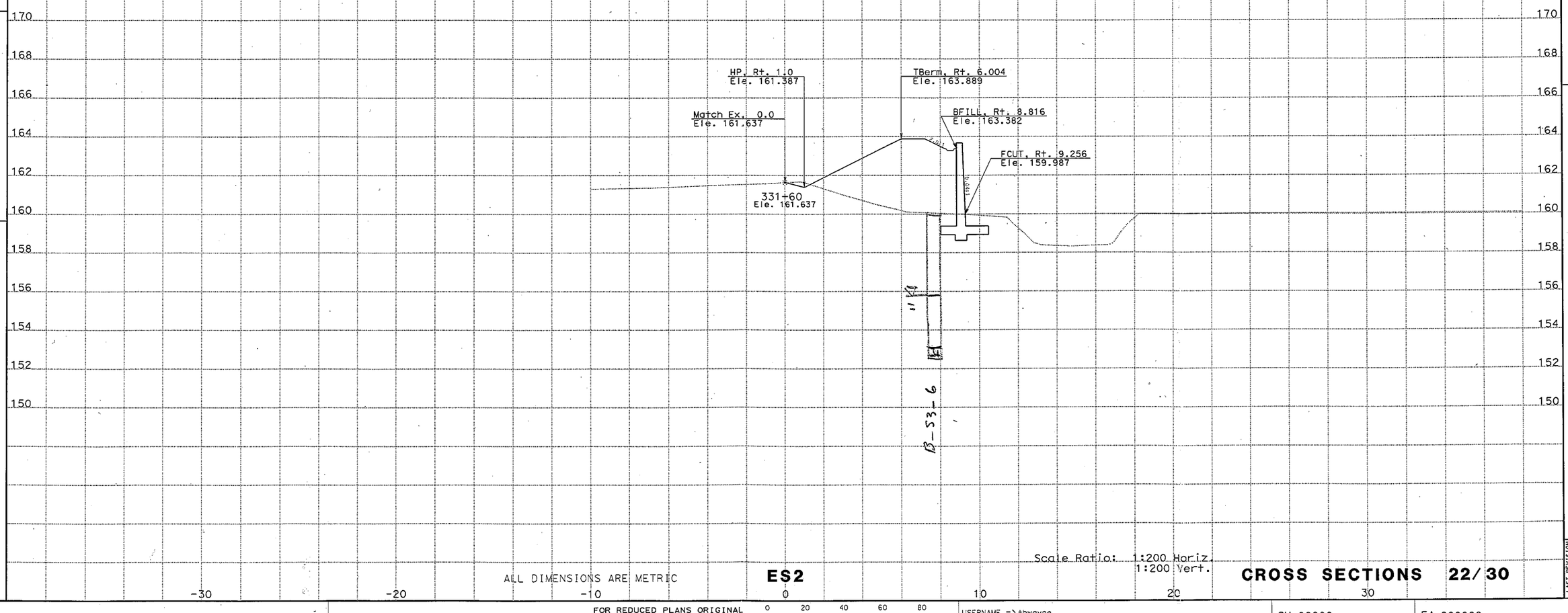

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 22/30

DATE	REVISED BY	DATE REVISED

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PROJECT ENGINEER

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Caltrans

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:37

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

DESIGN STUDY ONLY
SB3 - SOUND BERM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

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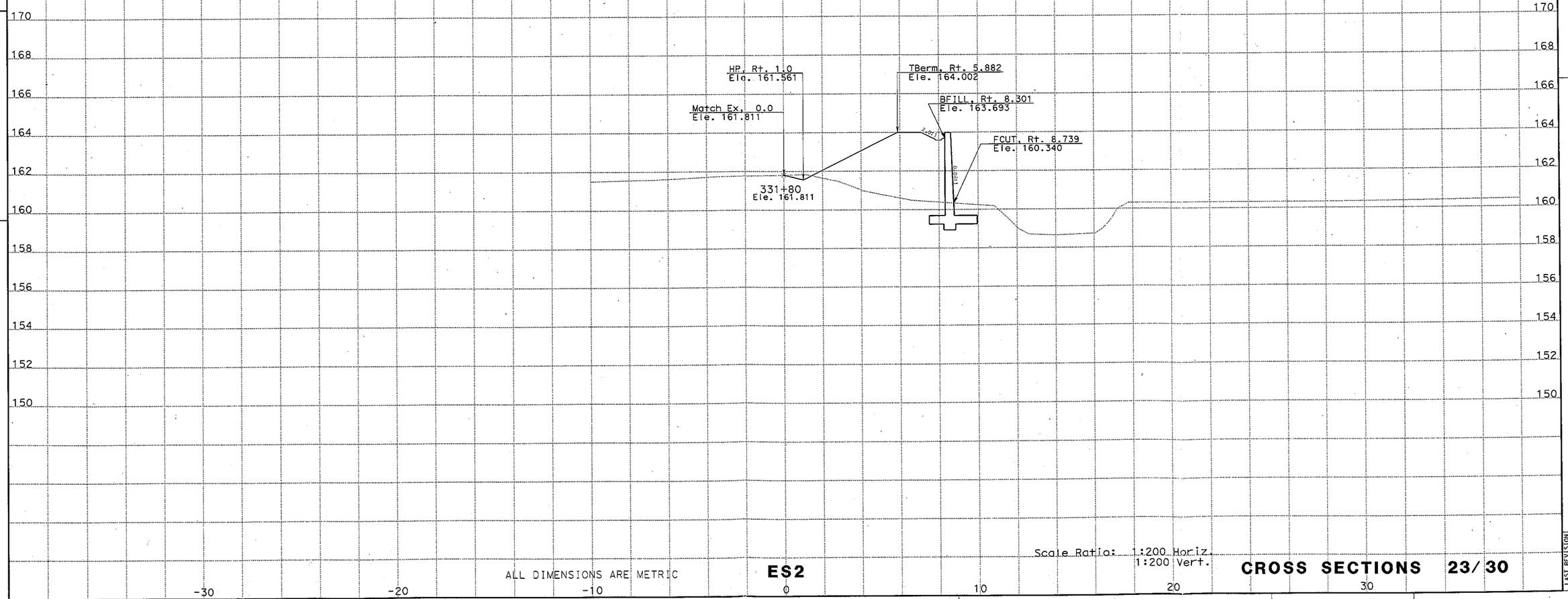

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 23/30

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

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CALCULATED/DESIGNED BY

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DATE REVISED BY

DATE REVISED

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:37

DESIGN STUDY ONLY
SB3 - SOUND BERM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

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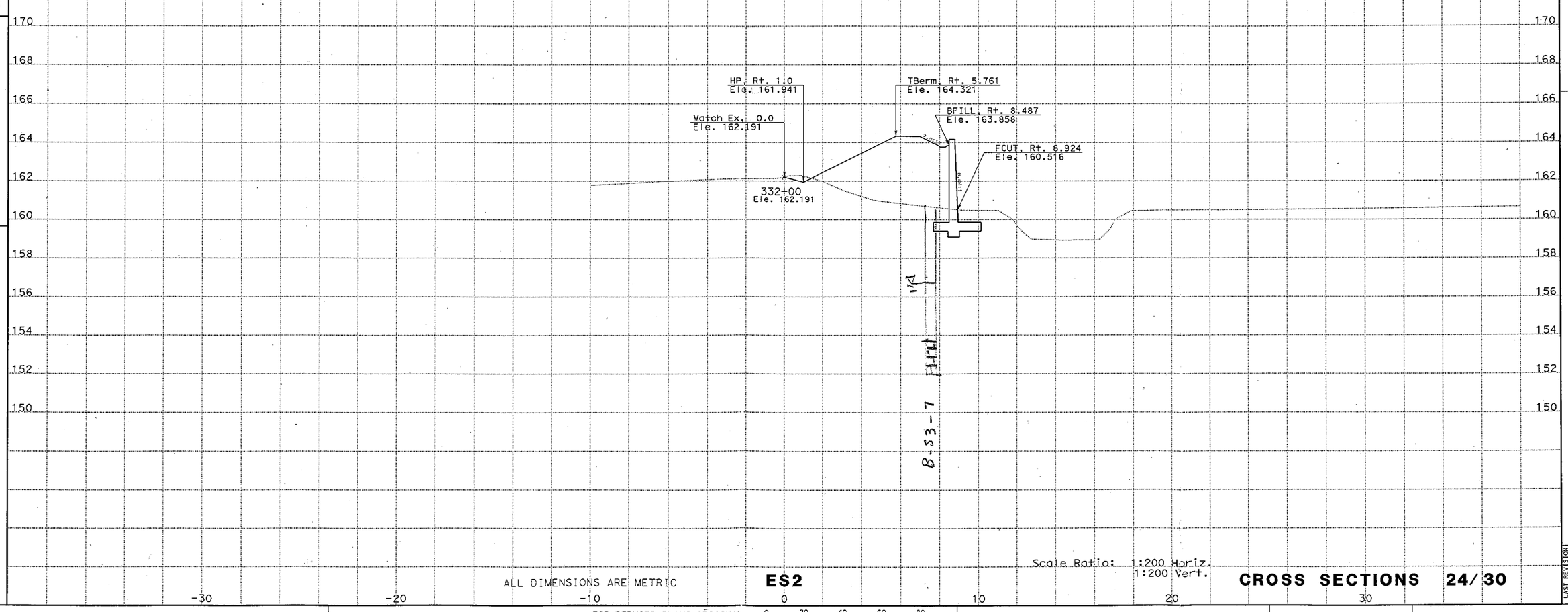

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 24/30

DATE | REVISED BY | DATE REVISED

CALCULATED/DESIGNED BY | CHECKED BY

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LAST REVISION 00-00-00 | DATE PLOTTED => 03-MAR-2005 | TIME PLOTTED => 13:38

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

DESIGN STUDY ONLY
SB3 - SOUND BERM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — EXP. — CIVIL — STATE OF CALIFORNIA

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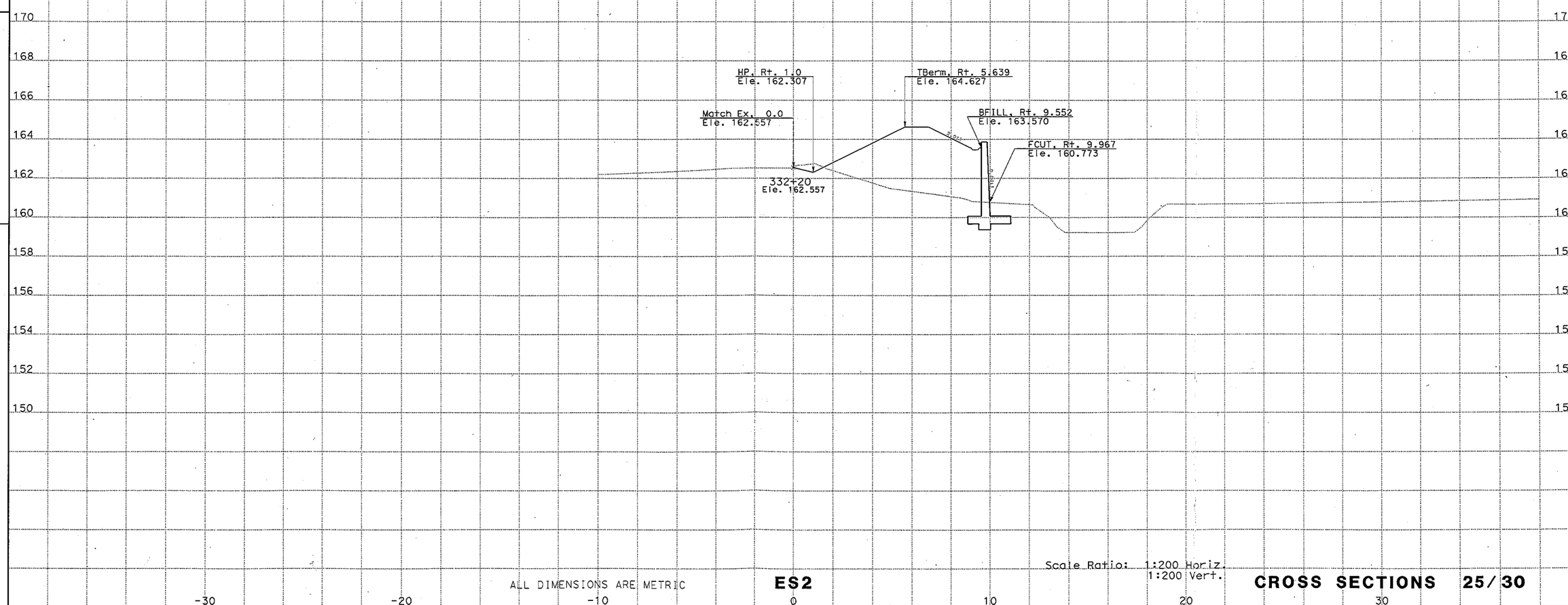

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 25/30

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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PROJECT ENGINEER

CALCULATED/DESIGNED BY

CHECKED BY

DATE REVISED BY

DATE REVISED

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:39

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwcyne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

DESIGN STUDY ONLY
SB3 - SOUND BERM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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

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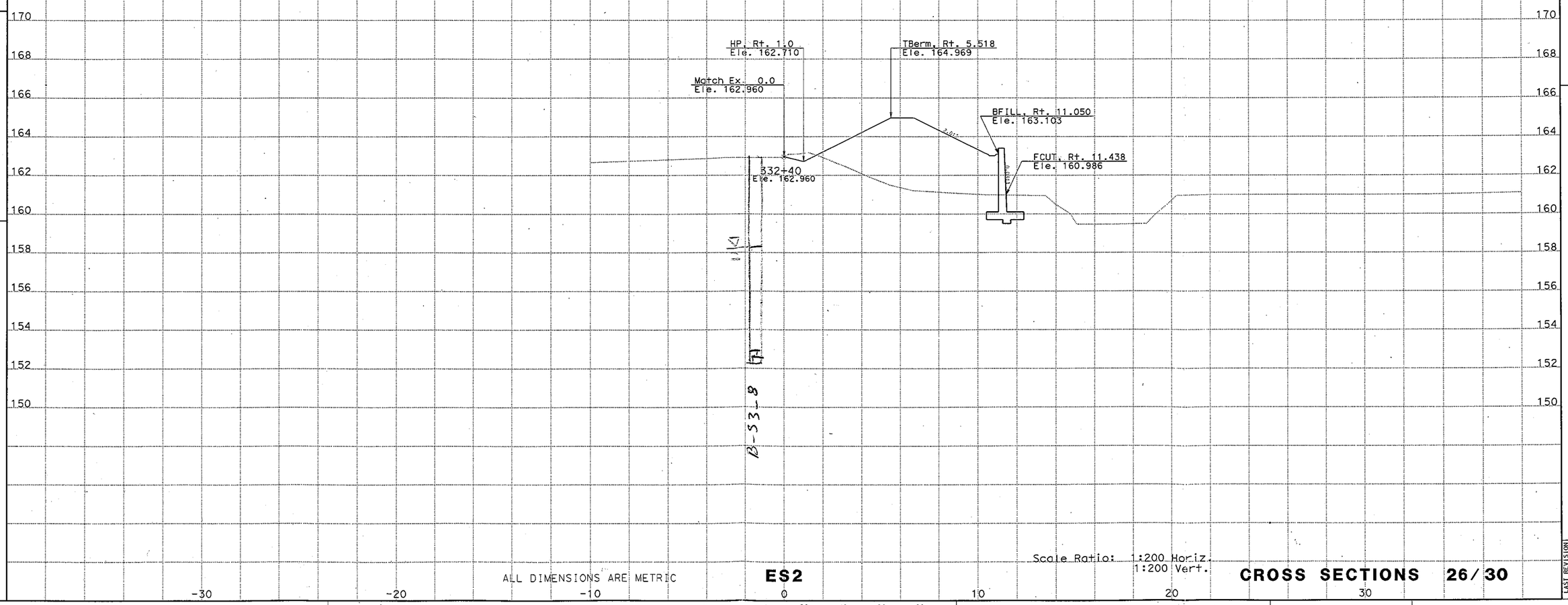

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 26/30

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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DATE REVISED BY

DATE REVISED

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:39

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

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SB3 - SOUND BERM

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

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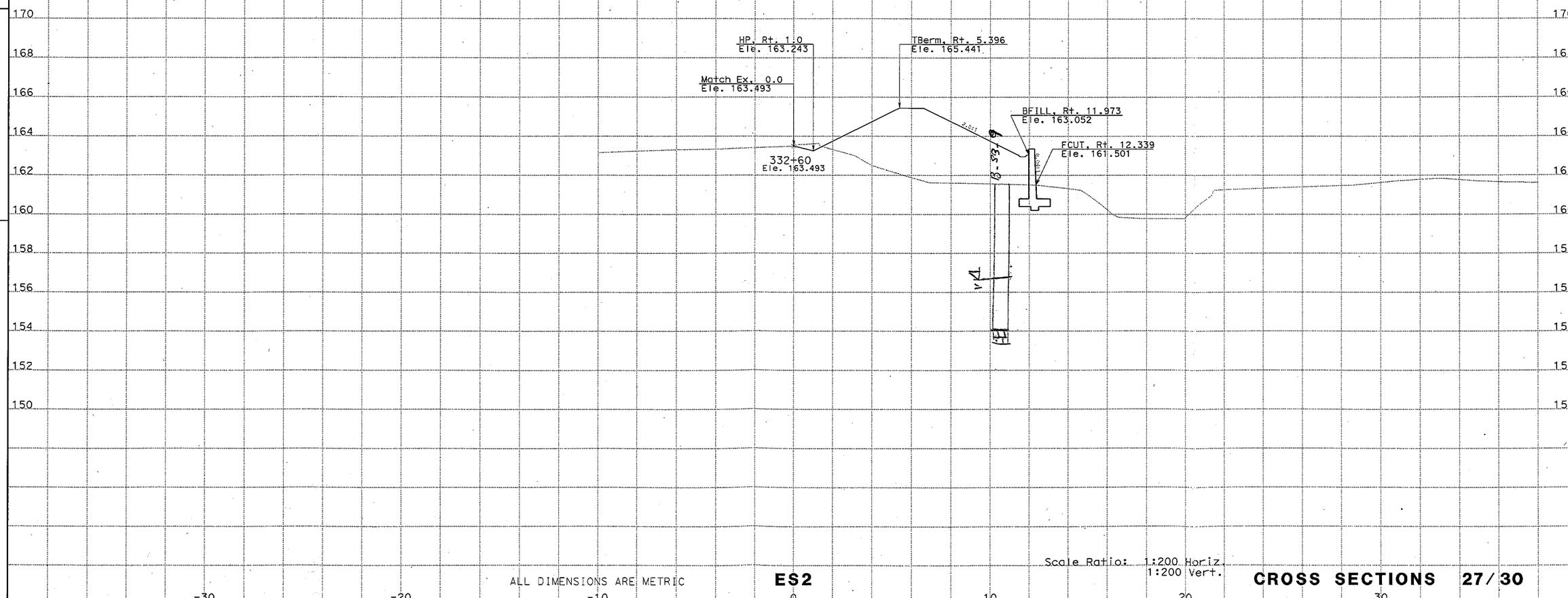

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 27/30

DATE | REVISED BY | DATE REVISED

CALCULATED/DESIGNED BY | CHECKED BY

PROJECT ENGINEER

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LAST REVISION 00-00-00 | DATE PLOTTED => 03-MAR-2005 | TIME PLOTTED => 13:39

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

DESIGN STUDY ONLY
SB3 - SOUND BERM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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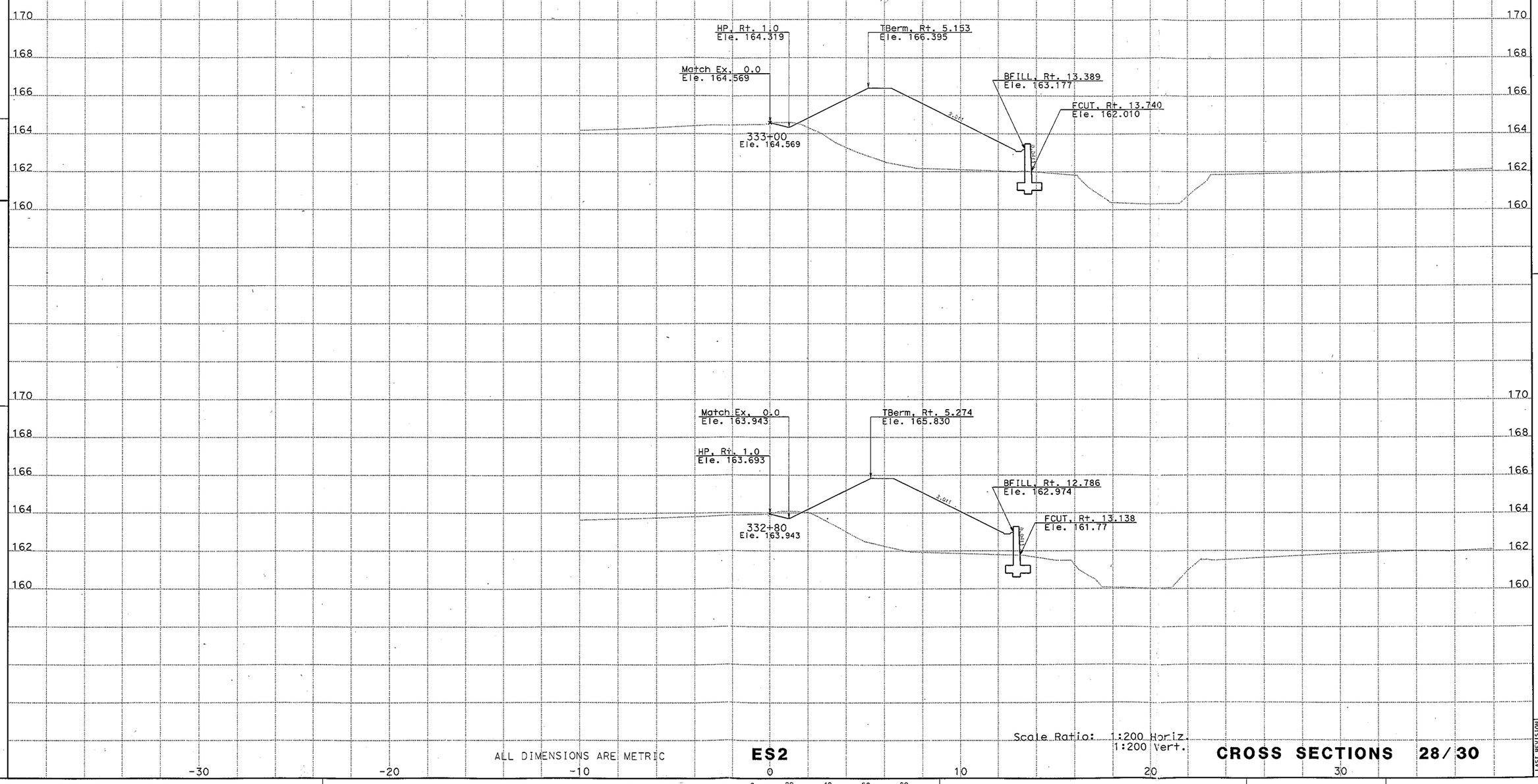

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 28/30

DATE	REVISED BY	DATE REVISED

CALCULATED/DESIGNED BY

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PROJECT ENGINEER

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LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:40

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

DESIGN STUDY ONLY
SB3 - SOUND BERM

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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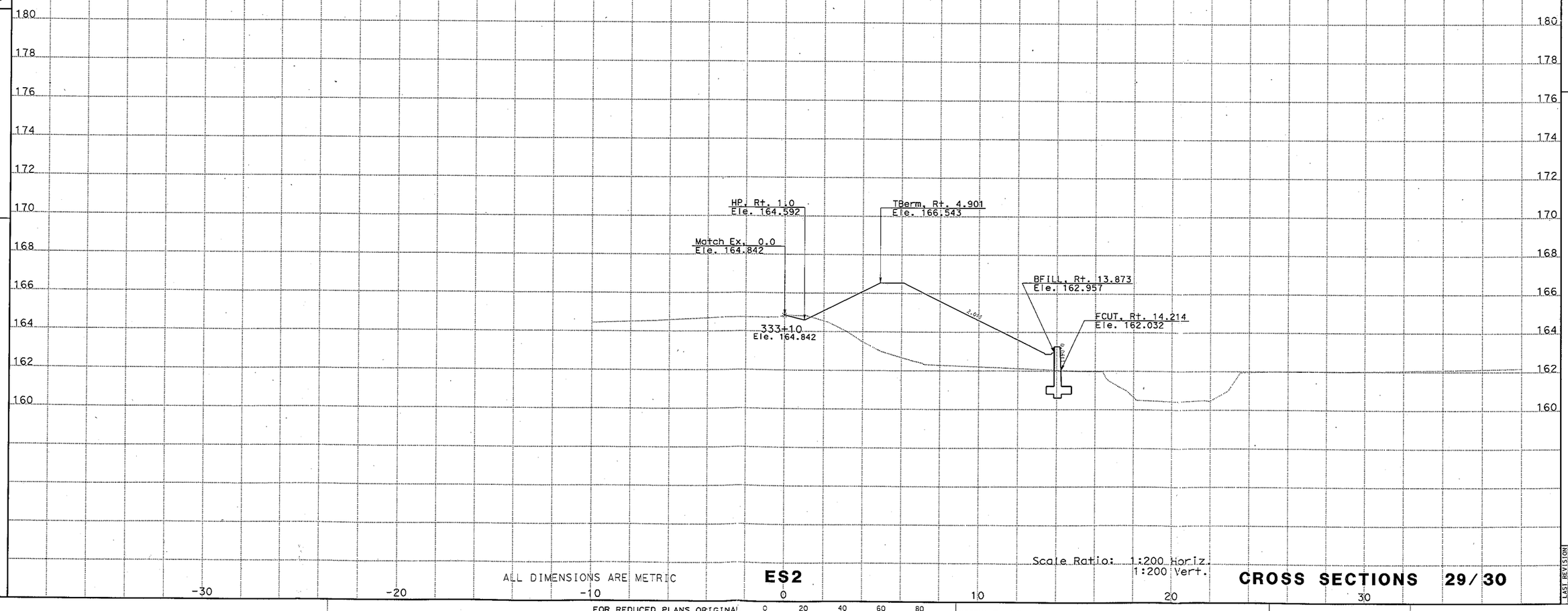
PROJECT ENGINEER

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans



ALL DIMENSIONS ARE METRIC

ES2

Scale Ratio: 1:200 Horiz.
1:200 Vert.

CROSS SECTIONS 29/30

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:40

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

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SB3 - SOUND BERM

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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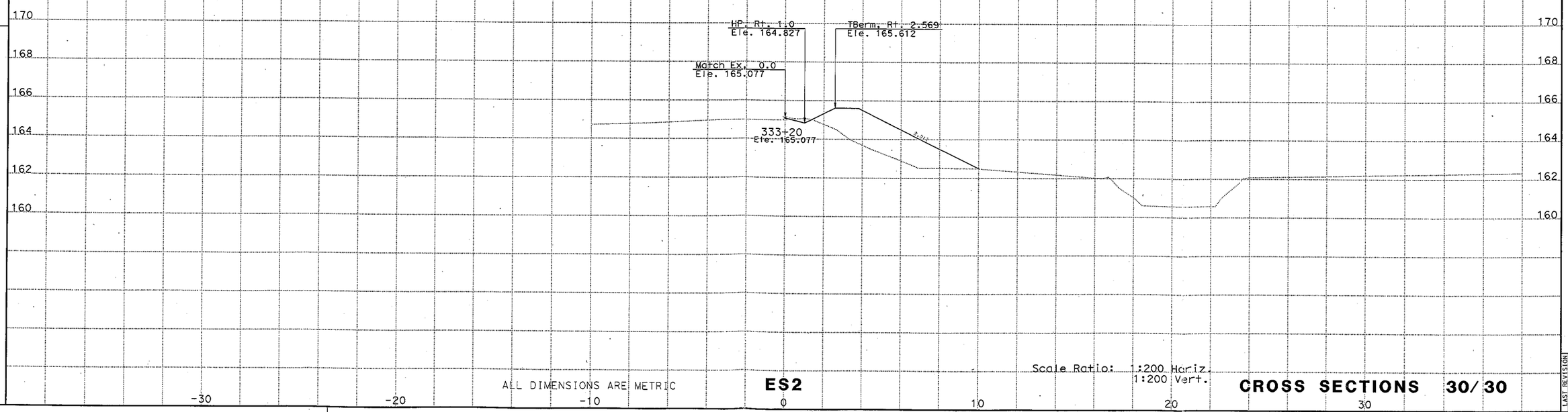

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES2

CROSS SECTIONS 30/30

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:41

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW3A2_RWall_Xsecs.dgn

CU 00000

EA 000000

DESIGN STUDY ONLY
SB4 - SOUND BERM

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

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	DATE REVISED

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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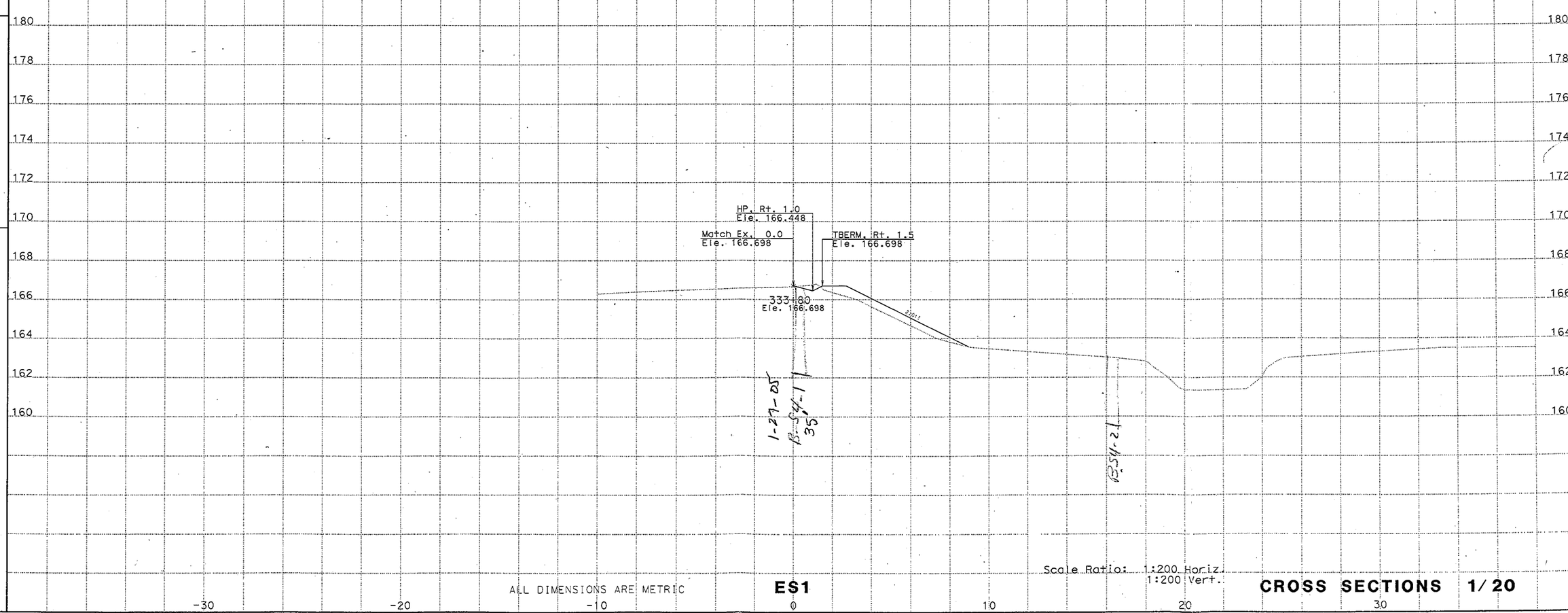

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES1

CROSS SECTIONS 1/20

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 12:54

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW4B1_RWall_Xsecs.dgn

CU 00000

EA 000000

DESIGN STUDY ONLY
SB4 - SOUND BERM

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

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DATE	REVISED BY	DATE REVISED

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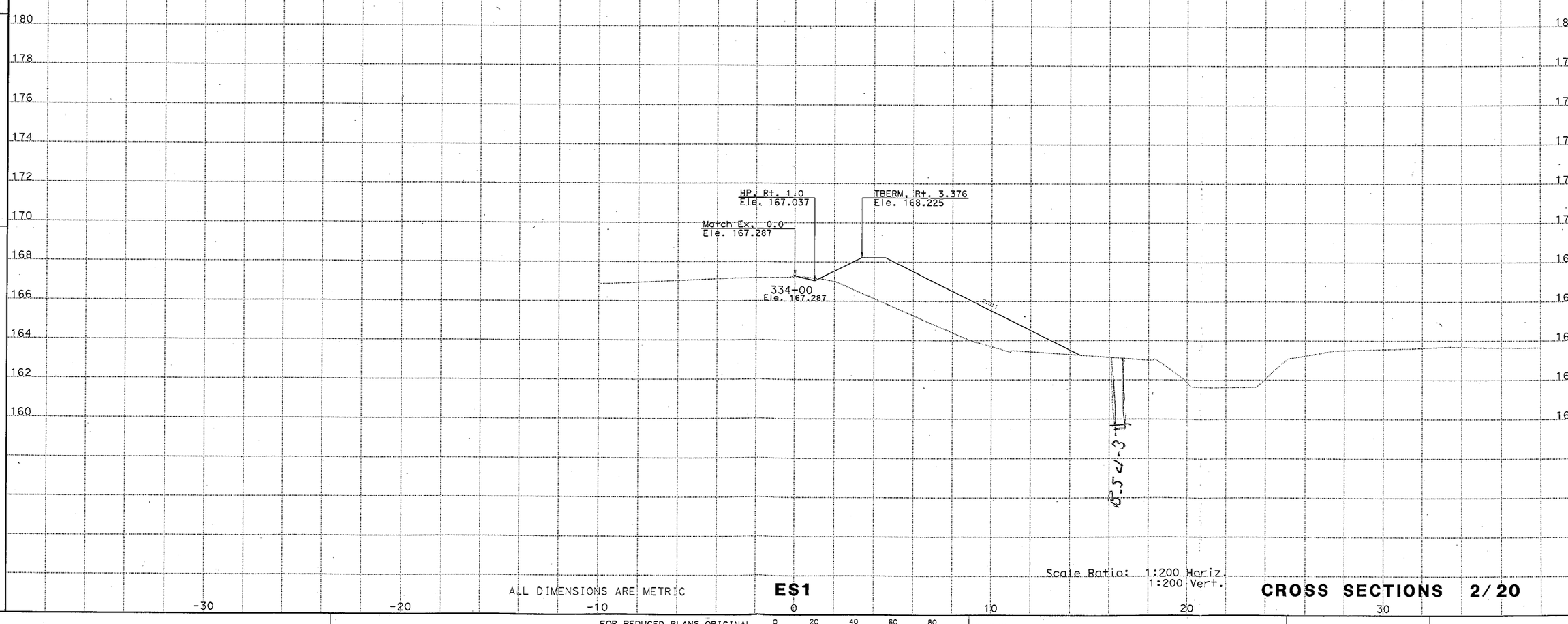
PROJECT ENGINEER

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans



Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES1

CROSS SECTIONS 2/20

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 12:54

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW481_RWall_Xsecs.dgn

CU 00000

EA 000000

DESIGN STUDY ONLY
SB4 - SOUND BERM

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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DATE	REVISED BY	DATE REVISED

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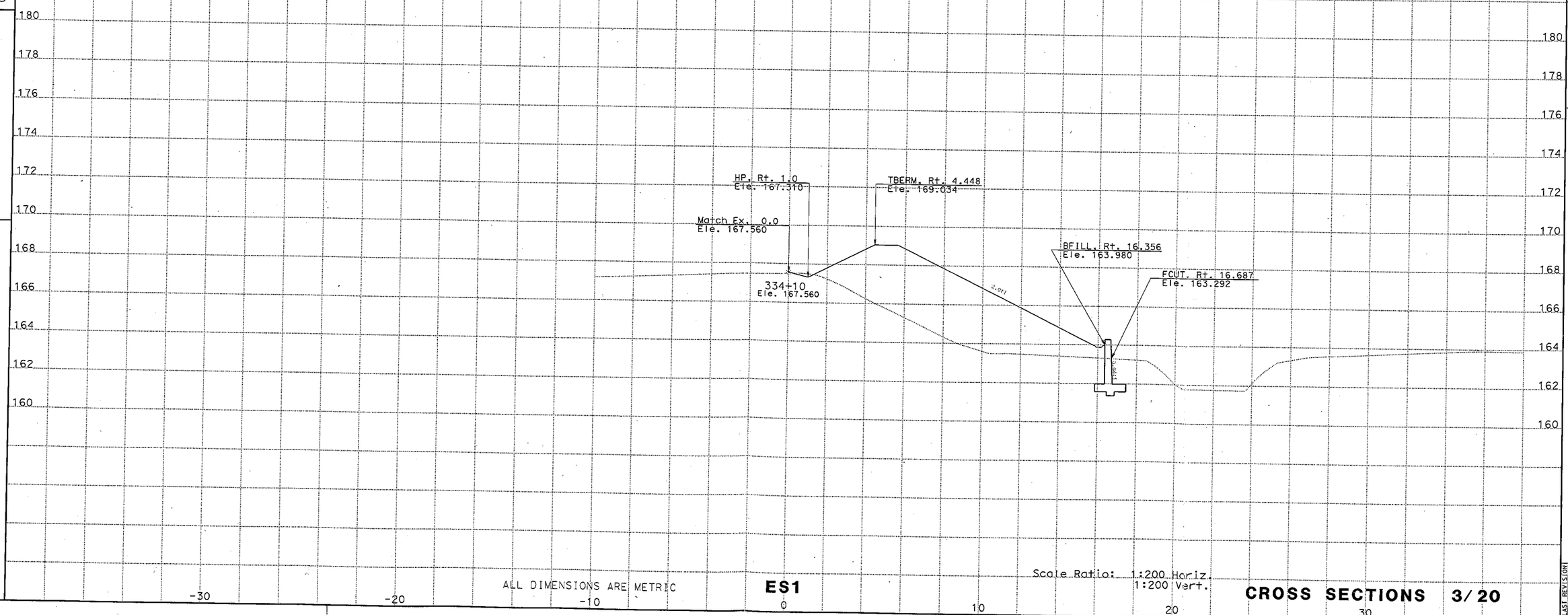
PROJECT ENGINEER

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans



ALL DIMENSIONS ARE METRIC

ES1

Scale Ratio: 1:200 Horiz.
1:200 Vert.

CROSS SECTIONS 3/20

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW4B1_RWall_Xsecs.dgn

CU 00000

EA 000000

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 12:54

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

Caltrans Metric

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PLANS APPROVAL DATE

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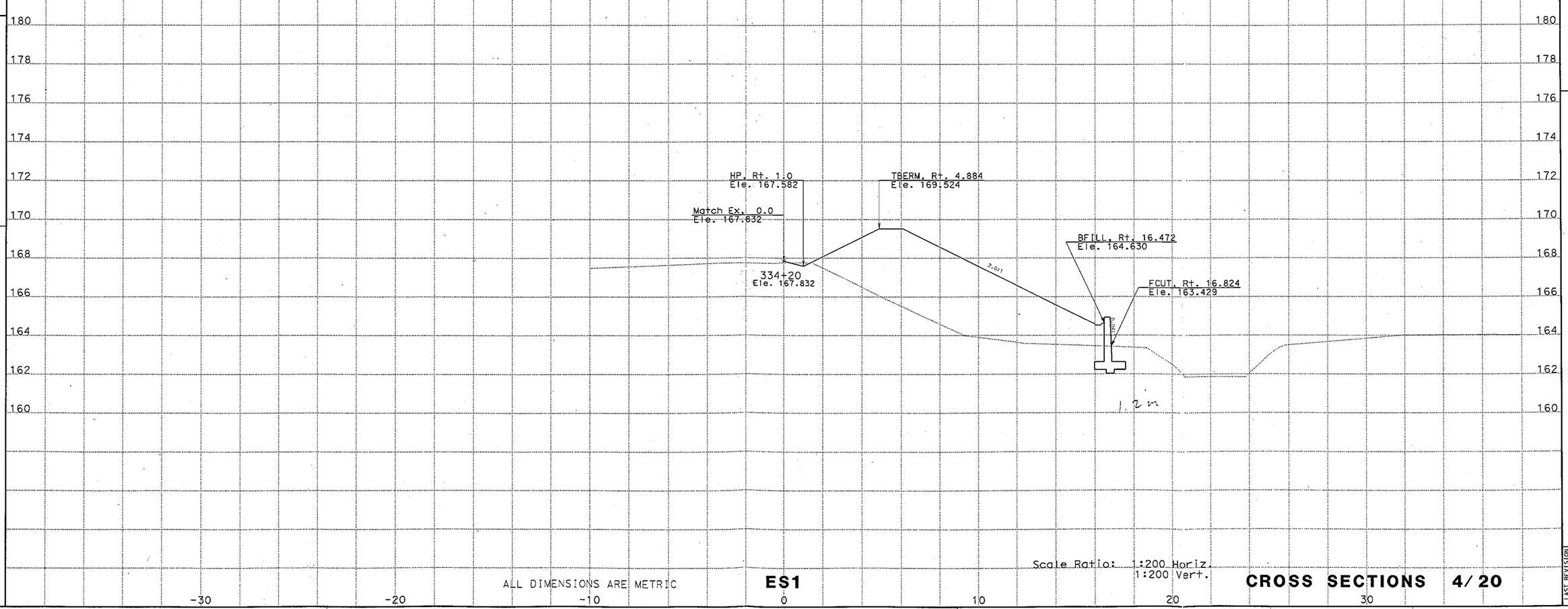

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES1

CROSS SECTIONS 4/20

DATE	REVISED BY	DATE REVISED

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PROJECT ENGINEER

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 12:54

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW4B1_RWall_Xsecs.dgn

CU 00000

EA 000000

DESIGN STUDY ONLY
SB4 - SOUND BERM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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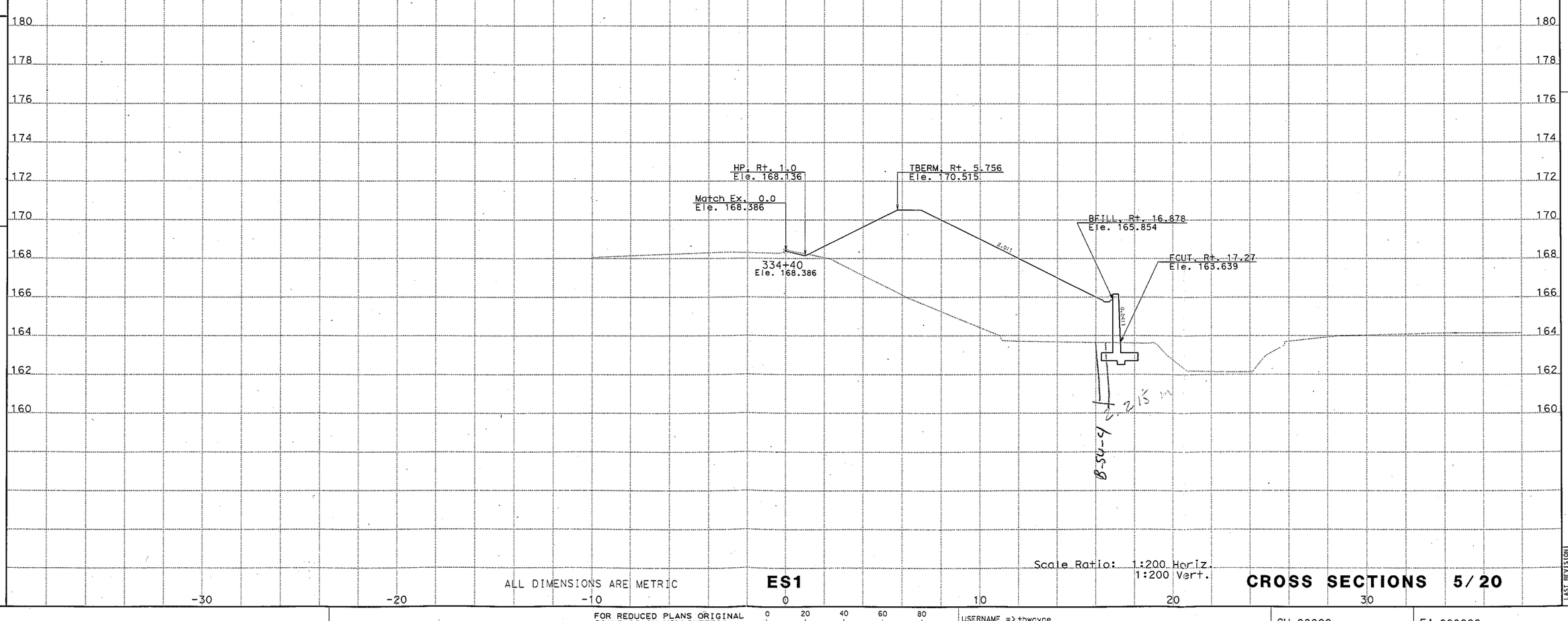

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES1

CROSS SECTIONS 5/20

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwoyne
DGN FILE => SW4B1_RWall_Xsecs.dgn

CU 00000

EA 000000

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

PROJECT ENGINEER

CALCULATED/DESIGNED BY

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DATE REVISED

DATE

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 12:55

DESIGN STUDY ONLY
SB4 - SOUND BERM

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

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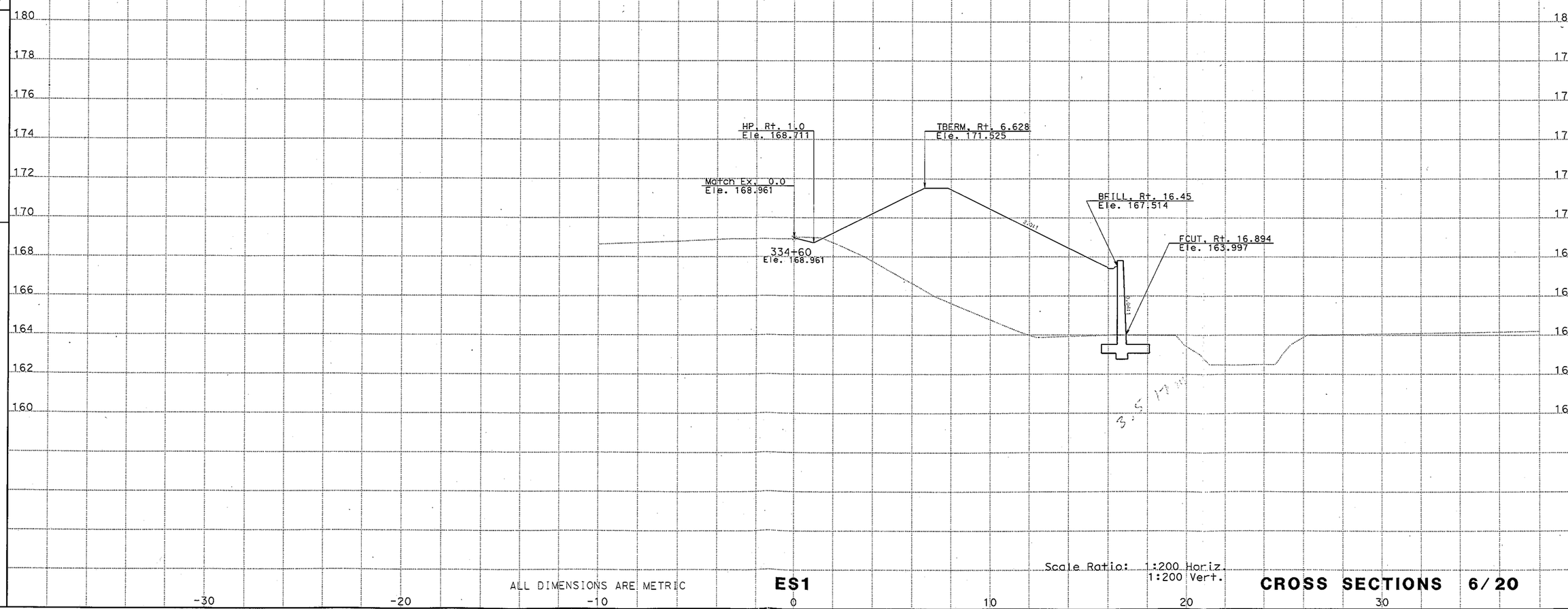

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES1

CROSS SECTIONS 6/20

DATE	REVISED BY	DATE REVISED

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DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 12:55

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW4B1_RWall_Xsecs.dgn

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SB4 - SOUND BERM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

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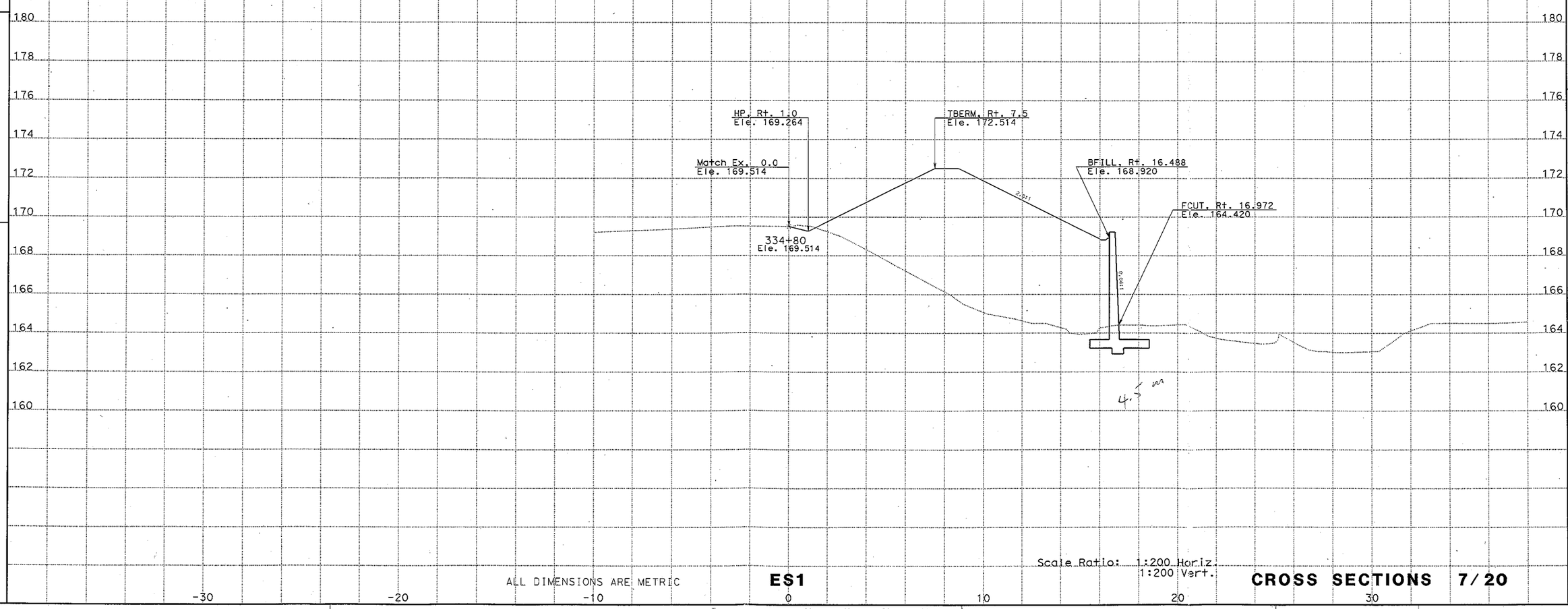

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES1

CROSS SECTIONS 7/20

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DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 12:56

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW4B1_RWall_Xsecs.dgn

CU 00000

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SB4 - SOUND BERM

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

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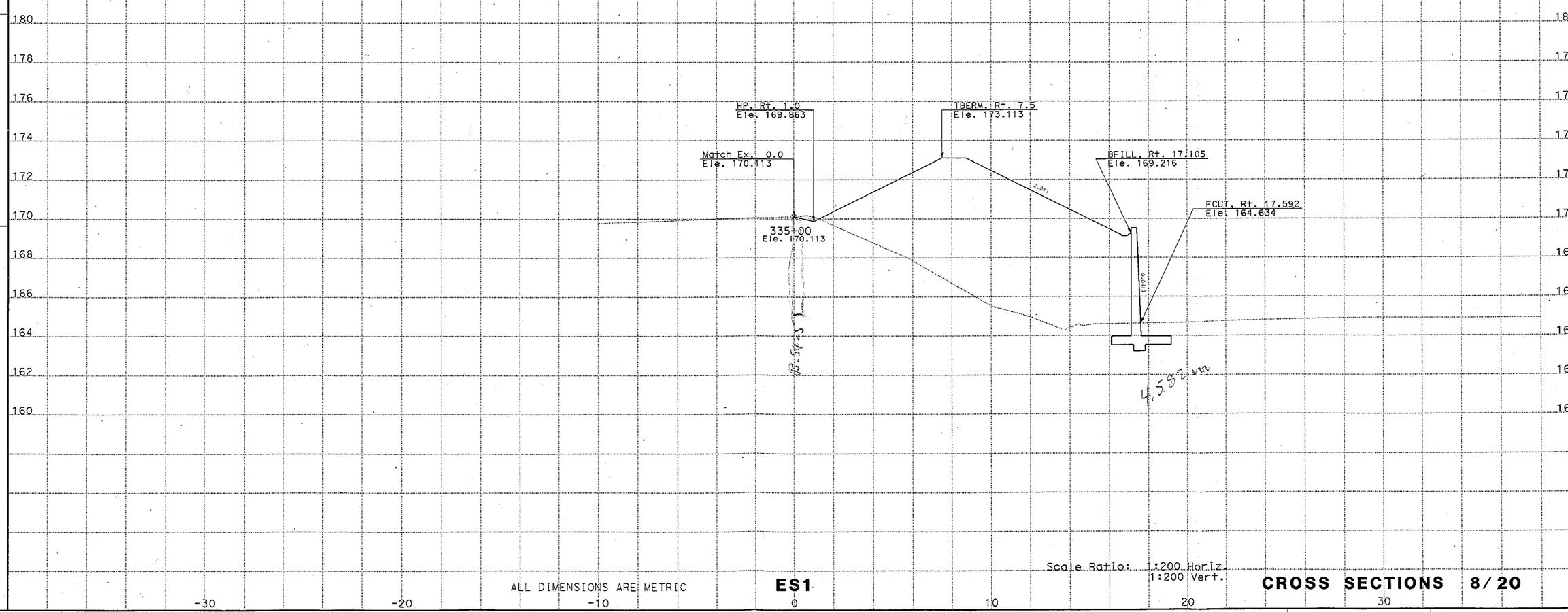

ALL DIMENSIONS ARE METRIC

ES1

Scale Ratio: 1:200 Horiz.
1:200 Vert.

CROSS SECTIONS 8/20

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 12:56

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DGN FILE => SW481_RWall_Xsecs.dgn

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SB4 - SOUND BERM

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

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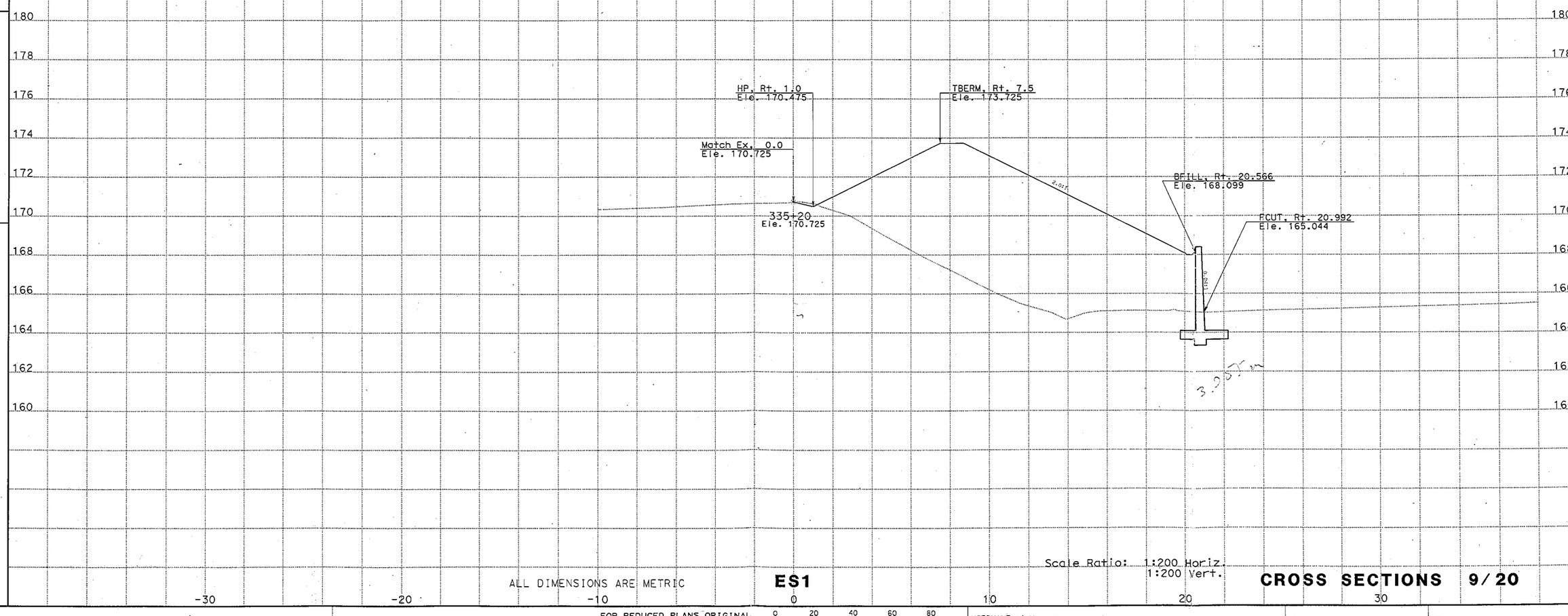

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES1

CROSS SECTIONS 9/20

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DATE REVISED

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 12:56

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW4B1_RWall_Xsecs.dgn

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SB4 - SOUND BERM

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

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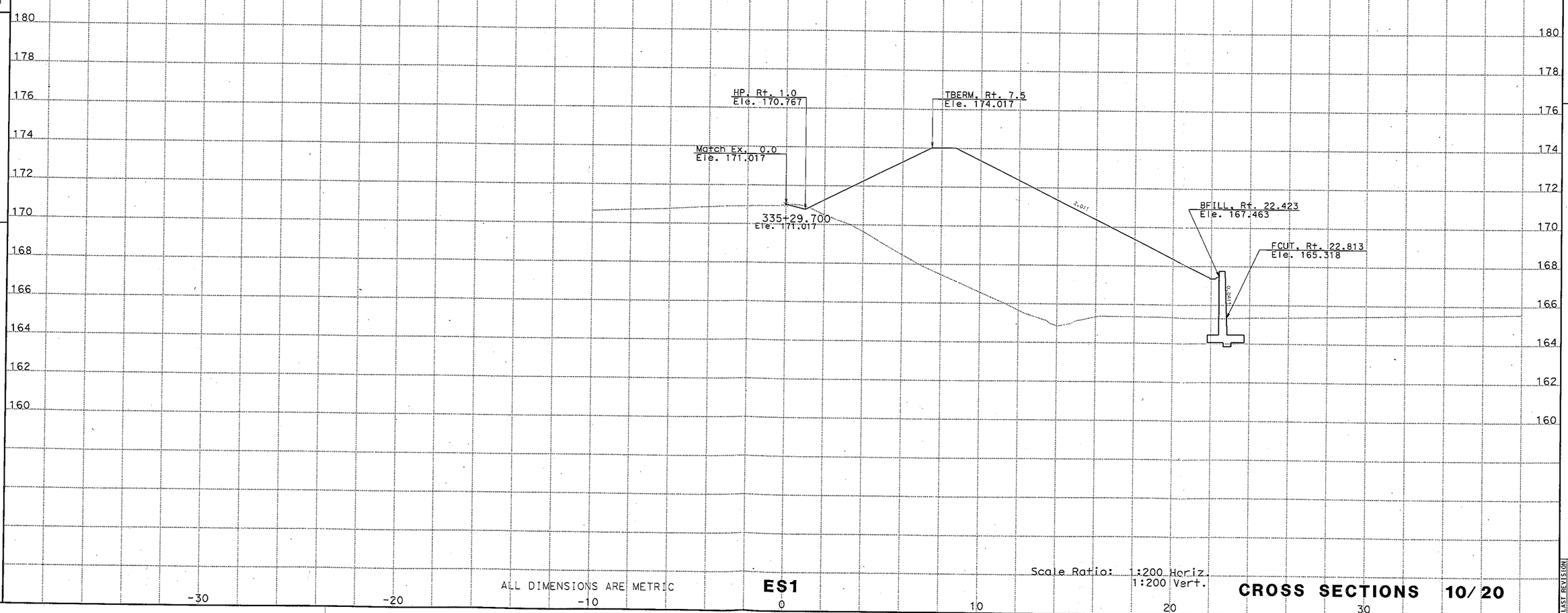

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES1

CROSS SECTIONS 10/20

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW4B1_RWall_Xsecs.dgn

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PROJECT ENGINEER

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DATE REVISED

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DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 12:57

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Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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PROJECT ENGINEER

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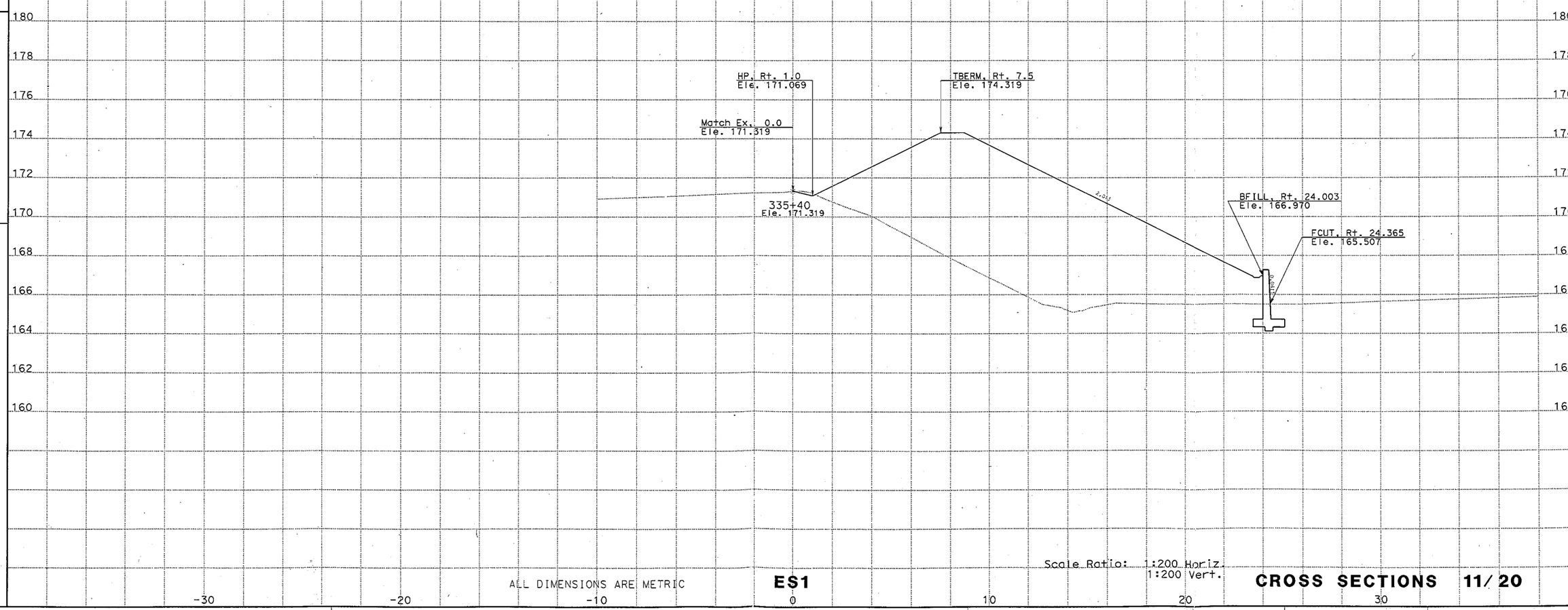

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES1

CROSS SECTIONS 11/20

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW4B1_RWall_Xsecs.dgn

CU 00000

EA 000000

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 12:57

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SB4 - SOUND BERM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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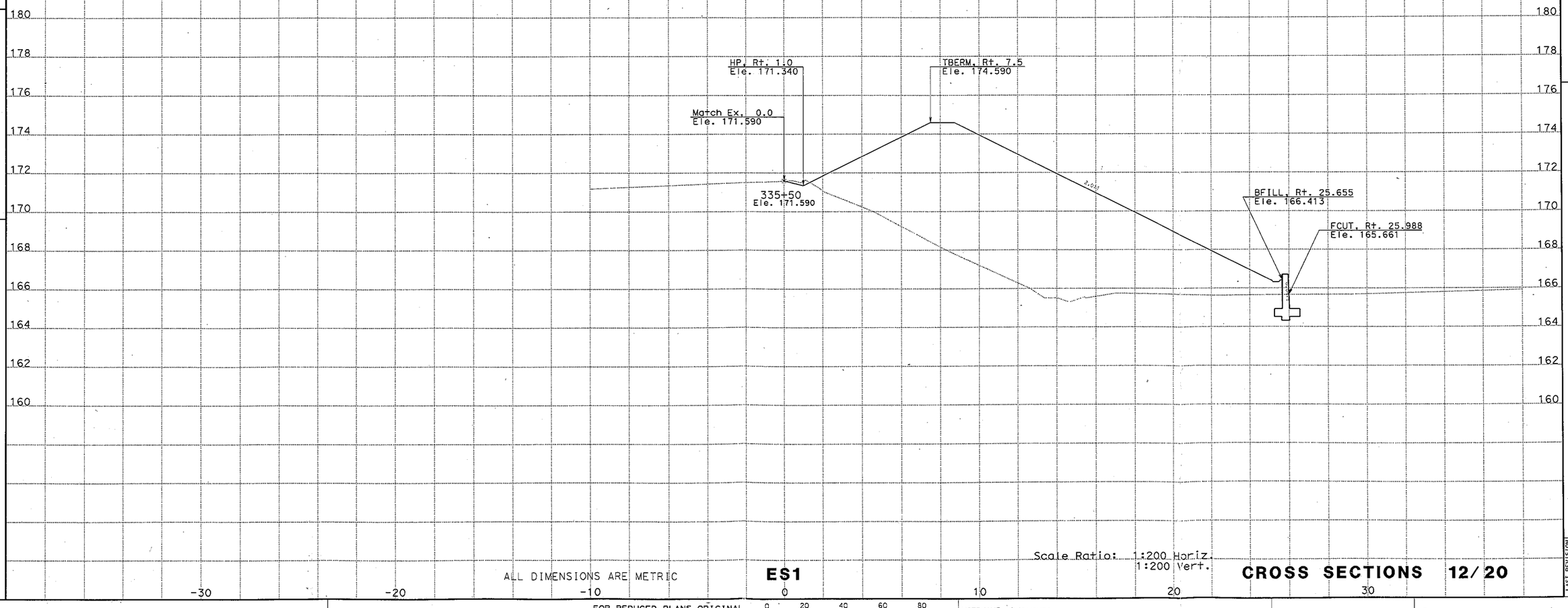

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES1

CROSS SECTIONS 12/20

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW4B1_RWall_Xsecs.dgn

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Caltrans

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DATE REVISED

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 12:57

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Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

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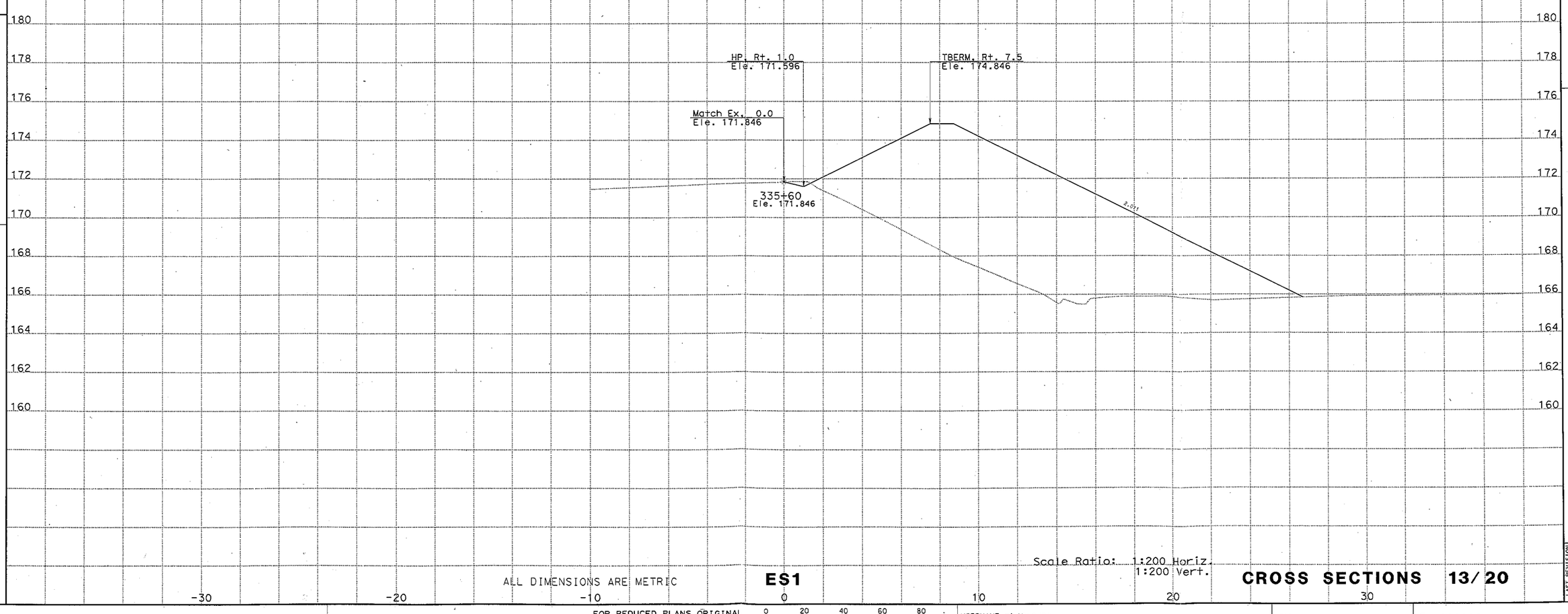

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

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CROSS SECTIONS 13/20

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DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 12:58

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW4B1_RWall_Xsecs.dgn

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

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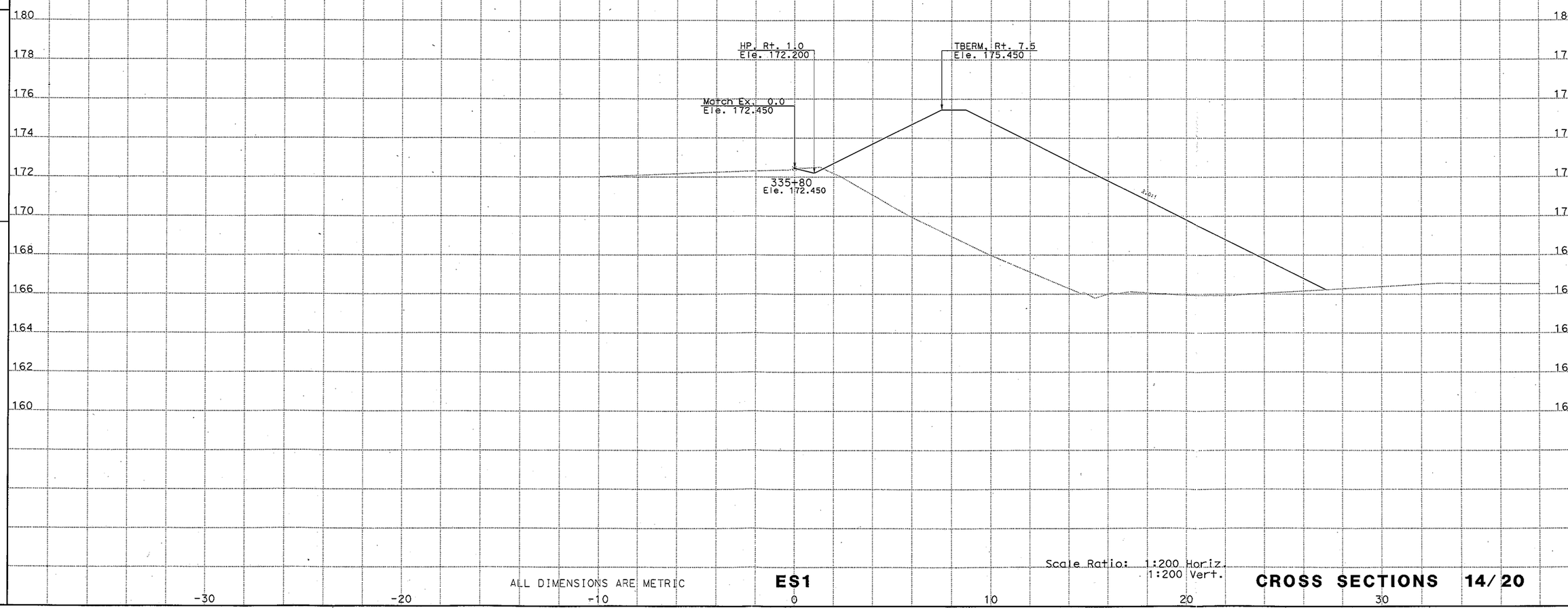

Scale Ratio: 1:200 Horiz.
1:200 Vert.

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ES1

CROSS SECTIONS 14/20

DATE | REVISED BY | DATE REVISED

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FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwcyne
DGN FILE => SW4B1_RWall_Xsecs.dgn

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

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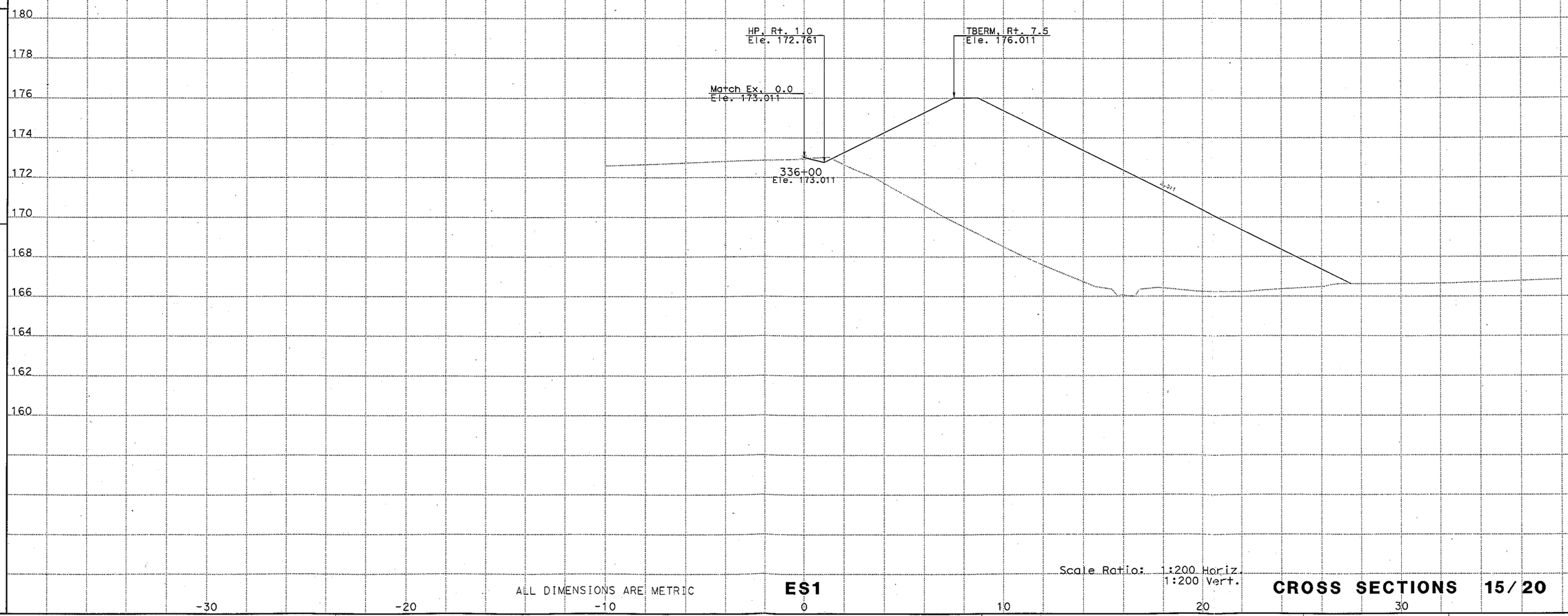

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES1

CROSS SECTIONS 15/20

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 12:59

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW4B1_RWall_Xsecs.dgn

CU 00000

EA 000000

DESIGN STUDY ONLY
SB4 - SOUND BERM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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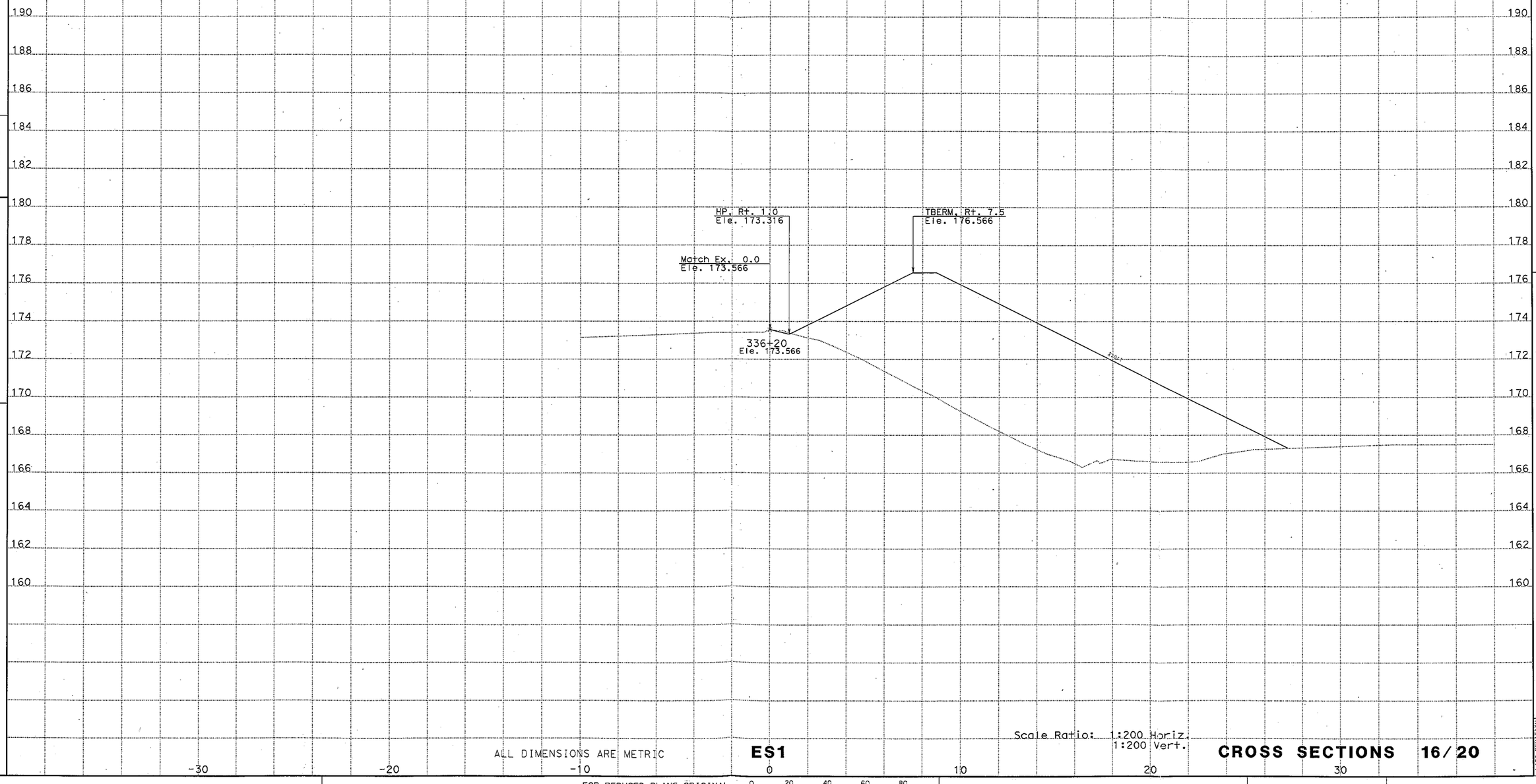

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES1

CROSS SECTIONS 16/20

LAST REVISION 00-00-00 | DATE PLOTTED => 03-MAR-2005 | TIME PLOTTED => 12:59

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW4B1_RWall_Xsecs.dgn

CU 00000

EA 000000

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SB4 - SOUND BERM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

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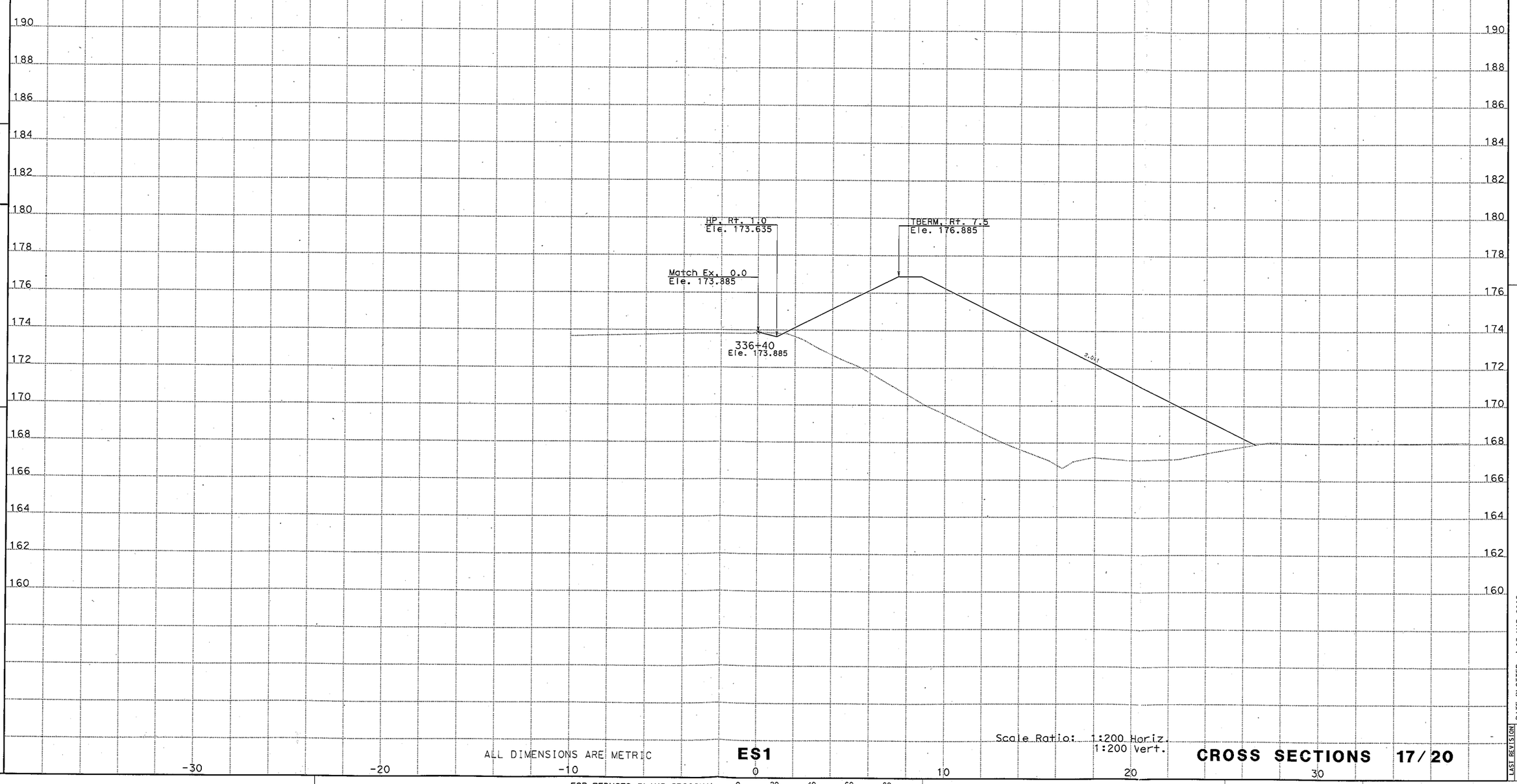

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES1

CROSS SECTIONS 17/20

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DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:00

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW4B1_RWall_Xsecs.dgn

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

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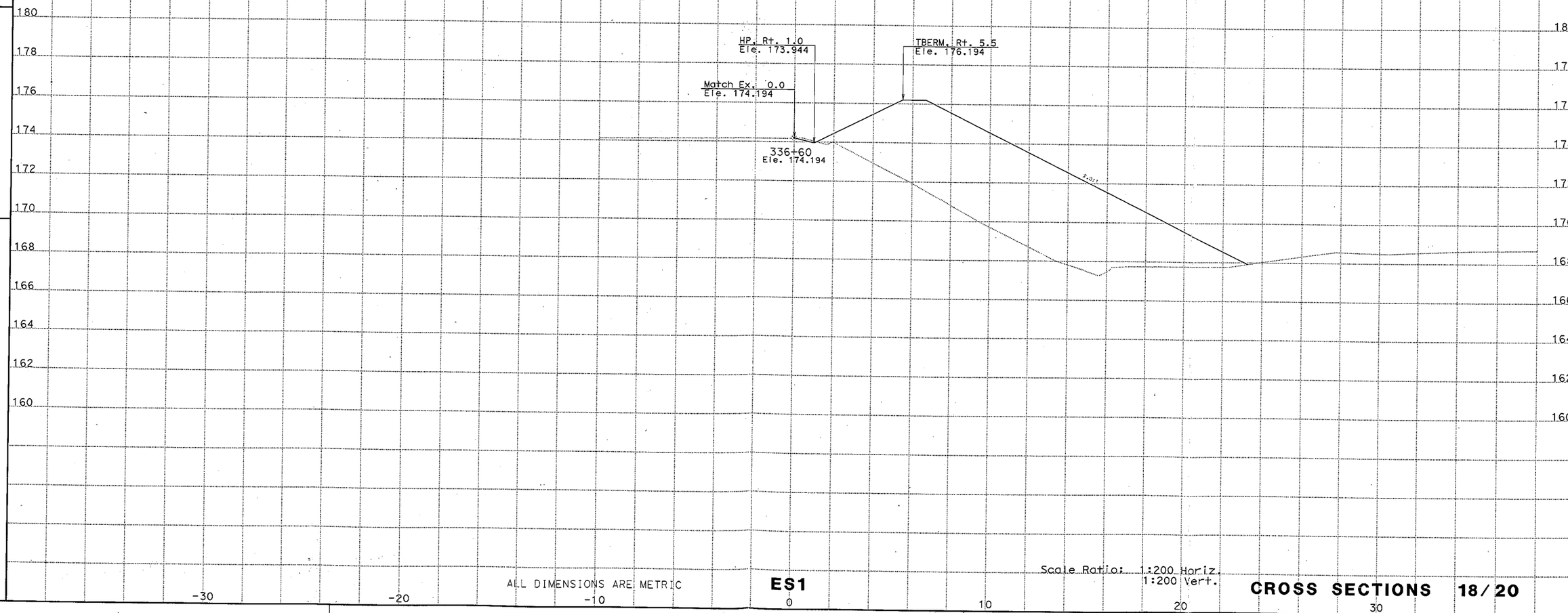

ALL DIMENSIONS ARE METRIC

ES1

Scale Ratio: 1:200 Horiz.
1:200 Vert.

CROSS SECTIONS 18/20

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DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:00

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwcyne
DGN FILE => SW4B1_RWall_Xsecs.dgn

CU 00000

EA 000000

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SB4 - SOUND BERM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS

Caltrans Metric

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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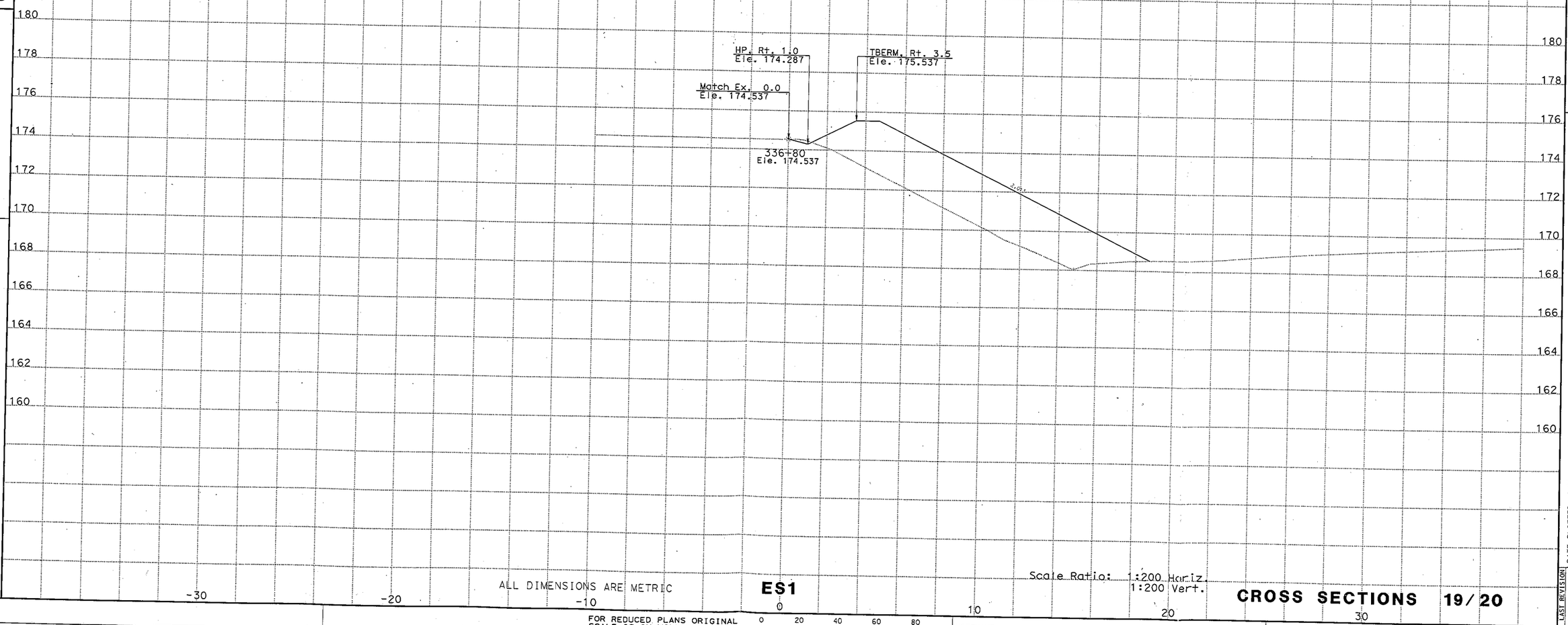

ALL DIMENSIONS ARE METRIC

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ES1

CROSS SECTIONS 19/20

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW4B1_RWall_Xsecs.dgn

CU 00000

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LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:00

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL	KILOMETER POST PROJECT	SHEET No	TOTAL SHEETS

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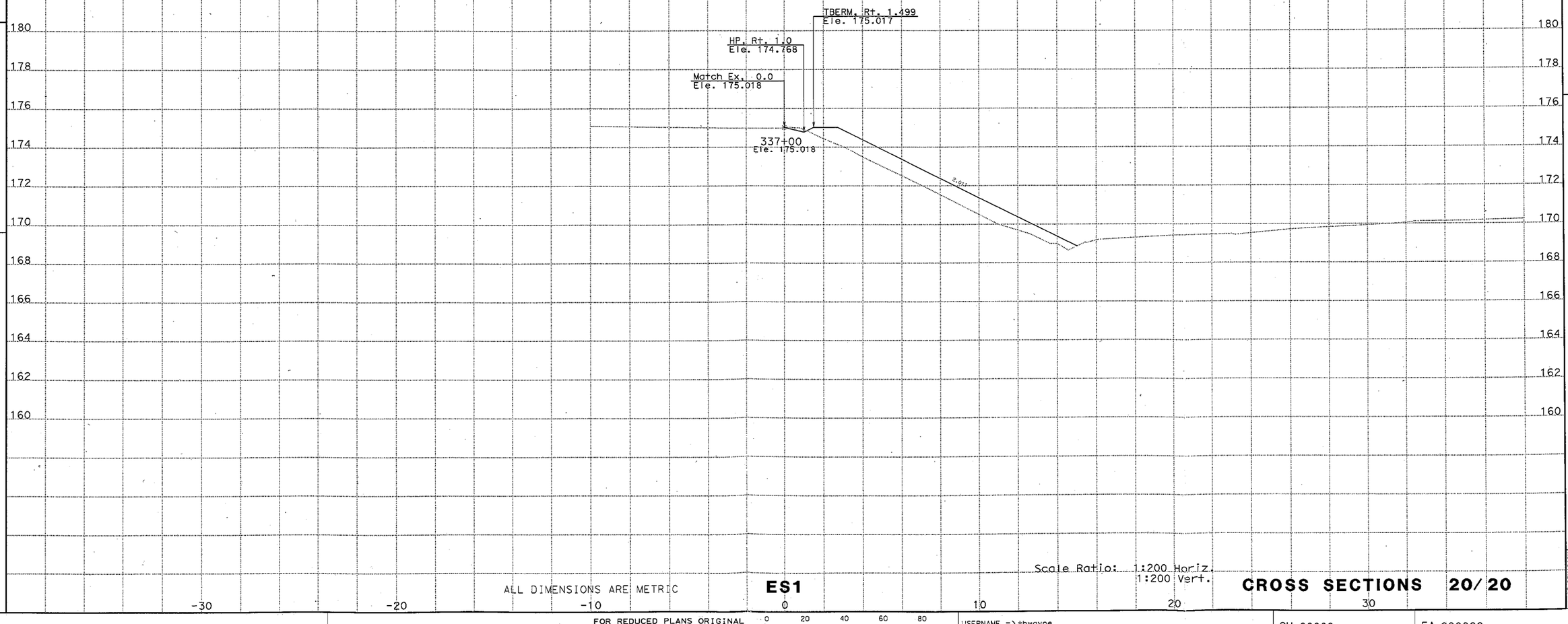

Scale Ratio: 1:200 Horiz.
1:200 Vert.

ALL DIMENSIONS ARE METRIC

ES1

CROSS SECTIONS 20/20

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne
DGN FILE => SW4B1_RWall_Xsecs.dgn

CU 00000

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Caltrans

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DATE REVISED

LAST REVISION 00-00-00

DATE PLOTTED => 03-MAR-2005
TIME PLOTTED => 13:01

LABORATORY TEST RESULTS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
OFFICE OF GEOTECHNICAL SUPPORT - GEOTECHNICAL LABORATORY

DENSITY - WATER CONTENT

JOB NUMBER 11-063801 DATE 25-Mar-05 TEST BY GR CHECKED BY LP 3/25/05

SAMPLE NO.	WET WT. +TARE (g)	DRY WT. +TARE (g)	WT. OF WATER (g)	TARE WT. (g)	WT. OF DRY SOIL (g)	% WATER	DIAM. SAMPLE (IN)	LENGTH SAMPLE (IN)	VOLUME (cm^3)	WET WT. + TARE (g)	TARE WT. (g)	WT. OF WET SOIL (g)	WET DENS (g/cm^3)	DRY DENS (g/cm^3)
R3-1-15.0'	164.7	148.1	16.6	62.3	85.8	19.3	1.94	4.11	199.0	553.0	140.2	412.8	2.07	1.74
R3A-1-10.5'	167.3	153.2	14.1	62.1	91.1	15.5	1.94	3.45	167.1	481.0	137.6	343.4	2.06	1.78

* Sample was mostly gravel
** Disintegrated while preparing for testing
*** Received dessicated - results may not represent true soil conditions

BORING LOGS

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S1-1	1/13/05	1/13/05	M Jandal & Mark Clark, Luis, Gary	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
150.2	Offset & Station	See Site Layout	North shoulder, west offramp to Second	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Asphalt Pavement Clayey Sand [SC], brown, moist (FILL)
2													- sand and gravel
3													
4			9										Silty Sand [SM], dense, brown, moist (rock blocked the tip of the sampler)
5			6								37		
6	2	Bag Sample	31										
7													- reddish brown
8													
9													Silty Sand (SM), dense, brown with ferrous nodules (ALLUVIUM)
10	3		34 50/4.5"								50+		- a rock was blocking the tip of the sampler
11													
12													
13	4												
14													- dark brown and gray
15			12 18								45		
16			27										
17	5												
18												▽	- wet
19													Sandy Clay [CL], firm, grayish brown, moist, medium plasticity
	6		3 3								8		

Continues on Page 2 of 2

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S1-1	1/13/05	1/13/05	M Jandal & Mark Clark, Luis, Gary	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
150.2	Offset & Station	See Site Layout	North shoulder, west offramp to Second	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level: Date Measured	Depth to Water	Total Hole Depth	Drilling Method	Drilling Equipment
			Hollow Stem Auger	Truck Mounted Drilling Rig

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Descriptions
21	7		5										Sandy Clay [CL], firm, grayish brown, moist, medium plasticity
22													
23													
24													
25			8 9								24		Silty Sand [SM], medium dense, very weathered, moist (Decomposed Granite)
26	8		15										
27													
28													
29													- light greenish gray
30	9		5 11								26		
31			15										The boring was terminated at 9.1 meters below ground surface. Groundwater was encountered at 5.5 meters during the drilling operation.
32													
33	10												
34													
35													
36													
37	11												
38													
39													
40	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S1-2	1/13/05	1/13/05	M Jandal & Mark Clark, Luis, Gary	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
151.9	Offset & Station	See Site Layout	North shoulder, west offramp to Second	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig
Total Hole Depth			

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Asphalt Pavement Silty Sand [SM], reddish brown, moist (FILL)
2													- sand and gravel
3													
4													- rock blocked tip of the sampler, bouncing hammer upon impact, no sample recovery
5													
6	2												
7													
8													
9													- rock blocked tip of the sampler, bouncing hammer upon impact, no sample recovery
10	3												
11													
12													
13	4												
14			16										Clayey Sand [SC], gray, moist, with cementation, 50% recovery (bouncing hammer)
15			50								50+		
16													Silty Sand [SM], dense, reddish brown, moist, fine to medium grained (ALLUVIUM)
17	5												- slightly clayey
18													
19													- brown, with ferrous nodules
20	6		17 39								50+		

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SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S1-2	1/13/05	1/13/05	M Jandal & Mark Clark, Luis, Garv	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
151.9	Offset & Station	See Site Layout	North shoulder, west offramp to Second	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
21	7		43										Silty Sand [SM], very dense, brown, moist, layered with ferrous nodules
22													
23													Sandy Silt [ML], very dense, brown, moist
24												▽	
25			8 9								21		Clayey Sand [SC], medium dense, brown, wet with ferrous nodules and mica flakes
26	8		12										The boring was terminated at 7.6 meters below ground surface. Groundwater was encountered at 7.3 meters during the drilling operation.
28													
29													
30	9												
31													
32													
33	10												
34													
35													
36													
37	11												
38													
39													
40	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S1-3	1/13/05	1/13/05	M Jandal & Mark Clark, Luis, Gary	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
151.5	Offset & Station	See Site Layout	North shoulder, west offramp to Second	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Asphalt Pavement Silty Sand [SM], light brown, medium to coarse grained
2													- sand and gravel (FILL)
3													
4													Silty Sand [SM], medium dense, reddish brown, moist (rock in the way, no sample recovery)
5			12 15								29		
6	2		14										
7													
8													
9	3												Sandy Clay [CL], reddish brown, moist, medium plasticity, (rock blocked tip of the sampler, bouncing hammer upon impact, no sample recovery), (ALLUVIUM)
10													
11	4												Silty Sand [SM], dense, reddish bown, moist, fine to medium grained
12													
13													
14													- with ferrous nodules
15			9 16								36		
16	5		20										- slightly clayey, very moist
17													
18												▽	- wet
19													Sandy Silt [ML], medium dense, brown, moist
20	6		6 8								18		

Continues on Page 2 of 2

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S1-3	1/13/05	1/13/05	M Jandal & Mark Clark, Luis, Gary	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
151.5	Offset & Station	See Site Layout	North shoulder, west offramp to Second	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig
Total Hole Depth			

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
			10										Sandy Silt [ML], medium dense, brown, moist
21													
22													
23	7												
24													
			12										Clayey Sand [SC], dense, brown, moist, cemented/formation with ferrous nodules and mica flakes
25			14								32		
			18										The boring was terminated at 7.6 meters below ground surface. Groundwater was encountered at 5.5 meters during the drilling operation.
26													
27	8												
28													
29													
30	9												
31													
32													
33	10												
34													
35													
36													
37	11												
38													
39													
40	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S1-4	1/12/05	1/12/05	M Jandal & Mark Clark, Luis, Gary	I-8, Aux. Lane, El Cajon	11-063801

Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
153.1	Offset & Station	See Site Layout	North shoulder, westbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig
Total Hole Depth			

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Asphalt Pavement Silty Sand [SM], brown, moist, fine to medium grained
2													- sand and gravel (FILL)
3													
4													- with cobbles
5			17 20								44		
6	2		24										
7													- reddish brown, dense
8													
9													
10	3		13 23								43		Clayey Sand [SC], dense, light gray and brown, damp, with ferrous nodules (ALLUVIUM)
11			20										
12													
13	4												
14													- dark brown and gray, with mica flakes
15			10 16								33		
16			17									▽	
17	5												
18													Sandy Clay [CL], stiff, grayish brown, moist, medium plasticity
19			3								11		Poorly Graded Sand [SP], medium dense, light gray and tan, medium to coarse grained (Decomposed Granite)
20	6		4 7										

The boring was terminated at 6.1 meters below ground surface. Groundwater was encountered at 4.9 meters during the drilling operation.

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S1-5	1/12/05	1/12/05	M Jandal & Mark Clark, Luis, Gary	I-8, Aux. Lane, El Cajon	11-063801

Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
156	Offset & Station	See Site Layout	North shoulder, westbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Drilling Method	Drilling Equipment
Hollow Stem Auger	Truck Mounted Drilling Rig

Groundwater Level	
Date Measured	Depth to Water

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Asphalt Pavement Silty Sand [SM], brown, damp
2													- sand and gravel (FILL)
3													
4			22										Sandy Gravel [GS], dense, light gray and brown, moist
5			20								34		
6			14										Sandy Clay [CL], very stiff, light brown, moist, medium plasticity (ALLUVIUM)
7	2												
8													Silty Sand [SM], dense, reddish brown, moist, fine to medium grained
9													
10	3		30/5"								50+		- no recovery, bouncing hammer upon impact
11													
12													
13	4												
14													- dense, slighty clayey with ferrous nodules
15			14 17								33		
16			16										
17	5												
18													
19													
	6		3 8								18		

Continues on Page 2 of 2

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S1-5	1/12/05	1/12/05	M Jandal & Mark Clark, Luis, Gary	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
156	Offset & Station	See Site Layout	North shoulder, westbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
21			10										Silty Sand [SM], medium dense, reddish brown, moist, fine to medium grained, slightly clayey, with ferrous nodules
22													
23	7												
24													
25			15 12								25		Well Graded Sand [SW], medium dense, gray and white, wet, no recovery
26			13										The boring was terminated at 7.6 meters below ground surface. Groundwater was encountered at 7.3 meters during the drilling operation.
27	8												
28													
29													
30	9												
31													
32													
33	10												
34													
35													
36													
37	11												
38													
39													
40	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S1-6	1/12/05	1/12/05	M Jandal & Mark Clark, Luis, Gary	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
159	Offset & Station	See Site Layout	North shoulder, westbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1	Bag Sample											Asphalt Pavement Silty Sand [SM], reddish brown, moist, fine to medium (FILL)
2													
3													
4													- medium dense, light gray, slightly clayey
5			20 14								25		
6	2		11										
8													
9													
10	3		13 8								16		Clayey Sand [SC], dense, light gray and brown, moist, high plasticity (ALLUVIUM)
11			8										
12													
13	4												
14													
15			50/2.5"								50+		- bouncing hammer upon impact, boulder
16													
17	5												
18													
19													
20	6		50/2.5"								50+		Silty Sand [SM], very dense, reddish brown, moist

The boring was terminated at 6.0 meters below ground surface. Drilling was moved 1.5 meter to east of the hole and an other boring was drilled (see Boring B-S1-6A for continuation)

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S1-6A	1/12/05	1/12/05	M Jandal & Mark Clark, Luis, Gary	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
159	Offset & Station	See Site Layout	North shoulder, westbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Asphalt Pavement Silty Sand [SM], reddish brown, moist, fine to medium (FILL)
2													
3													- medium dense, light gray, slightly clayey
4													
5													
6	2												- sand, gravel and cobbles
8													
9													
10	3		19 13								22		Clayey Sand [SC], medium dense, light gray and white, moist (ALLUVIUM)
11			9										
12													
13	4												
14													- reddish brown with ferrous nodules
15			8 10								21		
16			11										
17	5												
18													
19													- no recovery, bouncing hammer upon impact (boulder)
20	6												

Continues on Page 2 of 2

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S1-6A	1/12/05	1/12/05	M Jandal & Mark Clark, Luis, Gary	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
159	Offset & Station	See Site Layout	North shoulder, west offramp to Second	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig
Total Hole Depth			

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter .15 meter	SPT Blows per .3 meter SPT total	Graphic Log	Lithological Description
21													Silty Sand [SM], medium dense, reddish brown, slightly clayey with ferrous nodules
22													
23	7												
24			14										
25			13								29		
26			16										
28	8												
29													Clayey Sand [SC], medium dense, wet, broken rock pieces (Decomposed Granite)
30	9		7 8								20		
31			12										The boring was terminated at 9.1 meters below ground surface. Groundwater was encountered at 8.8 meters during the drilling operation.
32													
33	10												
34													
35													
36													
37	11												
38													
39													
	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S1-7	1/12/05	1/12/05	M Jandal & Mark Clark, Luis, Garv	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
161.1	Offset & Station	See Site Layout	North shoulder, westbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Descriptions
1	1												Asphalt Pavement Gravelly Silty Sand [SM], brown, moist
2													- sand and gravel (FILL)
3													
4			26										Sandy Gravel [GS], dense, gray, moist with clay lumps (FILL)
5			20								42		
6	2		22										
7													- boulders, difficult to drill
8													
9													- hammer bouncing upon impact, no sample recovery
10	3		30/5"								50+		
11													
12													- sand and gravel
13	4												
14													Clayey Gravel with Sand [GC], medium dense, moist, medium plastictiy clay (ALLUVIUM)
15			7 9								24		
16			15										
17	5												
18													
19													- hammer bouncing upon impact, no sample recovery
20	6		20										

Continues on Page 2 of 2

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S1-7	1/12/05	1/12/05	M Jandal & Mark Clark, Luis, Gary	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
161.1	Offset & Station	See Site Layout	North shoulder, westbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level: Date Measured	Depth to Water	Total Hole Depth	Drilling Method	Drilling Equipment
			Hollow Stem Auger	Truck Mounted Drilling Rig

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
21	7		5										Clayey Sand [SC], dense, dark brown and gray, moist, with 1/2" size gravel
22													
23													
24													
25			26 15								32		Silty Sand [SM], dense, reddish brown and gray, moist, slightly clayey (decomposed granite)
26	8		17										The boring was terminated at 7.6 meters below ground surface. Groundwater was not encountered during the drilling operation.
28													
29													
30	9												
31													
32													
33	10												
34													
35													
36	11												
37													
38													
39													
	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S2-1	1/19/05	1/19/05	M Jandal & Norm Webb, Alen, Gary	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
152.2	Offset & Station	See Site Layout	South shoulder, East onramp/E. Maine	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Asphalt Pavement Silty Sand [SM], brown, moist (FILL)
2													
3													
4													
5			11 8								16		Clayey Sand [SC], medium dense, brown, damp
6	2		8										Sandy Clay [CH], very stiff, light gray, moist, medium to high plasticity
7													
8													
9													
10	3		5 6								14		Lean Clay (CL), stiff, light gray, moist, medium plasticity , with lime content
11			8										
12													
13	4												
14													Silty Sand [SM], medium dense, brown, moist, slightly clayey with gravel and wood chipps (charcoal)
15			3 4								25		
16			21										
17	5												- broken glass [Fill]
18													
19													
20	6		3 4								9		

Continues on Page 2 of 2

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S2-1	1/19/05	1/19/05	M Jandal & Norm Webb, Alen, Gary	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
152.2	Offset & Station	See Site Layout	South shoulder, East onramp/E. Maine	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter .15 meter	SPT total	Graphic Log	Lithological Description
21			5										Clayey Silt [ML], loose, brown, very moist
22													
23	7												Lean Clay [CL], stiff, brown, moist, slightly sandy (ALLUVIUM)
24												▽	
25			6 / 10								24		
26			14										- very stiff, sandy with ferrous nodules
28	8												
29													
30	9		6 / 16								33		Sandy Silt [ML], dense, brown, moist with ferrous nodules
31			17										The boring was terminated at 9.1 meters below ground surface. Groundwater was encountered at 7.3 meters during the drilling operation.
32													
33	10												
34													
35													
36													
37	11												
38													
39													
	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S2-2	1/19/05	1/19/05	M Jandal & Norm Webb, Alen. Gary	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
151.8	Offset & Station	See Site Layout	South shoulder, East onramp/E. Maine	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Asphalt Pavement Silty Sand [SM], brown, moist (FILL)
2													
3													
4													
5			6 11								30		Clayey Sand [SC], medium dense, reddish brown, moist - stone blocked the tip of sampler
6	2		19										
7													- cobbles (hard to drill layer)
8													
9													- with granitic broken aggregate (1/2"-1")
10	3		14 13								19		
11			6										
12													- slow drilling (boulders)
13	4												
14													
15													
16													- drilled through a concrete drainage culvert box, the auger dropped 4 feet. The hole was plugged from the bottom (top of the culvert) and backfilled with dry bentonite chips. See B-S2-2A for continuation
17	5												
18													
19													
20	6												

Continues on Boring No. B-S2-2A

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S2-2A	1/19/05	1/19/05	M Jandal & Norm Webb, Alen, Gary	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
151.8	Offset & Station	See Site Layout	South shoulder, East onramp/E. Maine	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig
Total Hole Depth			

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter .15 meter	SPT Blows per .3 meter SPT total	Graphic Log	Lithological Description
1	1												Asphalt Pavement Silty Sand [SM], brown, moist (FILL)
2													
3													
4													
5													Clayey Sand [SC], medium dense, reddish brown, moist (ALLUVIUM) -dark brown, stone blocked the tip of sampler
6	2												
7													
8													
9													
10	3												- with granitic broken aggregate (1/2"-1")
11													
12													
13	4												
14													
15			9 18								45		Silty Sand [SM], dense, light brown, moist
16			27										
17	5												
18													
19													
20	6		4 5								15		- medium dense, brown, slightly clayey, with ferrous nodules

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SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S2-2A	1/19/05	1/19/05	M Jandal & Norm Webb, Alen. Gary	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
151.8	Offset & Station	See Site Layout	South shoulder, East onramp/E. Maine	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig
Total Hole Depth			

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
			10										Silty Sand [SM], medium dense, brown, moist, slightly clayey with ferrous nodules
21													
22													
23	7												
24													
			9									▽	- reddish brown, wet
25			9								17		
			8										
26													
27	8												
28													
29													
			6										- loose, brown, wet, fine grained, with mica flakes
30	9		5								10		
			5										The boring was terminated at 9.1 meters below ground surface. Groundwater was encountered at 7.5 meters during the drilling operation.
31													
32													
33	10												
34													
35													
36													
37	11												
38													
39													
40	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S2-3	1/20/05	1/20/05	M Jandal & Norm Webb, Alen, Gary	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
152.1	Offset & Station	See Site Layout	South shoulder, East onramp/E. Maine	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig
Total Hole Depth			

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Asphalt Pavement Silty Sand [SM], brown, moist
2		Bag Sample											- sand and gravel (FILL)
3													
4													
5			10 5								9		Silty Sand [SM], loose, brown, moist (ALLUVIUM)
6	2		4										
7													
8													
9													
10	3		6 20								39		- dense, silghty clayey, fine grained
11			19										
12													
13	4												
14													
15			6 8								19		- medium dense, dark brown, with ferrous nodules
16			11										
17	5												
18													
19												▽	- wet fine to medium grained, with mica flakes
20	6		9 6								11		

Continues on Page 2 of 2

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S2-3	1/20/05	1/20/05	M Jandal & Norm Webb, Alen, Gary	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
152.1	Offset & Station	See Site Layout	South shoulder, East onramp/E. Maine	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig
Total Hole Depth			

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter .15 meter	SPT total	Graphic Log	Lithological Description
21			5										Silty Sand [SM], medium dense, brown, wet, fine to medium grained with mica flakes
22													
23	7												
24													Clayey Sand [SC], medium dense, brown, moist, with mica flakes
25			6 7								17		Silty Sand [SM], medium dense, brown, moist, slightly clayey, fine to medium grained
26			10										
28	8												
29													
30	9		10 28								48		Sandy Gravel [GS], dense, gray and brown, moist (Decomposed Granite)
31			20										The boring was terminated at 9.1 meters below ground surface. Groundwater was encountered at 5.8 meters during the drilling operation.
32													
33	10												
34													
35													
36													
37	11												
38													
39													
40	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S2-4	1/20/05	1/20/05	M Jandal & Norm Webb, Alen. Garv	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
154.3	Offset & Station	See Site Layout	South shoulder, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig
Total Hole Depth			

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Asphalt Pavement Silty Sand [SM], brown, moist
2													- light gray, gravel and sand (FILL)
3													
4													Silty Sand [SM], medium dense, gray and brown, moist, fine to medium grained (SPT count is high due to a rock blocking the tip of the sampler)
5			6 27								45		
6	2		18										
7													- reddish brown, fine grained (ALLUVIUM)
8													
9													Fat Clay [CH], stiff, brown and gray, moist, high plasticity (SPT is not valid due to a rock blocking the tip of the sampler)
10	3		17 32								45		
11			50										Silty Sand [SM], medium dense, reddish brown, moist, fine to medium grained, slightly clayey
12													
13	4												- brown
14													- reddish brown
15			4 7								16		
16			9										
17	5												
18													
19													Sandy Gravel [GS], dense, brown and gray, moist (Decomposed Granite)
20	6		13 18								40		

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SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S2-4	1/20/05	1/20/05	M Jandal & Norm Webb, Alen. Garv	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
154.3	Offset & Station	See Site Layout	South shoulder, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Total Hole Depth

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter .15 meter	SPT Blows per .3 meter SPT total	Graphic Log	Lithological Descriptions
21	7		22										Sandy Gravel [GS], dense, brown and gray, moist (Decomposed Granite)
22													
23													
24			7										- medium dense
25			9								17		
26	8		8										The boring was terminated at 7.6 meters below ground surface. Groundwater was encountered at 7.3 meters during the drilling operation.
27													
28													
29													
30	9												
31													
32													
33	10												
34													
35													
36													
37	11												
38													
39													
40	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S2-5	1/20/05	1/20/05	M Jandal & Norm Webb, Alen, Gary	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
157.6	Offset & Station	See Site Layout	South shoulder, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Descriptions
1	1												Asphalt Pavement Silty Sand [SM], brown, moist (FILL)
2													- sand and gravel
3													
4													Sandy Clay [CL], very stiff, light gray, moist, medium plasticity
5			12 9								25		
6	2		14										- gravel (1/2"-1")
7													
8													- with white substance (lime treated)
9													
10	3		50/6"								50+		- no sample was recovered due to an encountered boulder
11													The boring was terminated due to difficulties in drilling, an other boring was drilled close by. Continues in another Boring No. B-S2-5A
12													
13	4												
14													
15													
16													
17	5												
18													
19													
20	6												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S2-5A	1/20/05	1/20/05	M Jandal & Norm Webb, Alen, Gary	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
157.6	Offset & Station	See Site Layout	South shoulder, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig
Total Hole Depth			

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Descriptions
1	1												Asphalt Pavement Silty Sand [SM], brown, moist (FILL)
2													- sand and gravel
3													
4													Sandy Clay [CL], very stiff, light gray, moist, medium plasticity
5													
6	2												- gravel (1/2"-1")
7													
8													- white substance (lime treated?)
9													
10	3		10 16								37		Clayey Sand [SC], dense, reddish brown, damp, with ferrous nodules
11			17										
12													
13	4												- moist
14													Sandy Silt [ML], medium dense, reddish brown, moist, slightly clayey (ALLUVIUM)
15			8 5								16		
16			11										Silty Sand [SM], medium dense, dark brown, moist, with ferrous nodules
17	5												
18													
19													
20	6		9 6								14		

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SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S2-5A	1/20/05	1/20/05	M Jandal & Norm Webb, Alen, Gary	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
157.6	Offset & Station	See Site Layout	South shoulder, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level: Date Measured	Depth to Water	Total Hole Depth	Drilling Method	Drilling Equipment
			Hollow Stem Auger	Truck Mounted Drilling Rig

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
21			8										Silty Sand [SM], medium dense, dark brown, moist, with ferrous nodules
22													
23	7												
24													Sandy Clay [CL], stiff, dark brown, moist, with ferrous nodules
25			10 9								18		Silty Sand [SM], medium dense, gray and brown, wet, fine to medium grained
26			9										
27	8												
28													
29													
30	9		5 6								15		- brown with mica flakes
31			9										
32													
33	10												
34													
35			9 15								38		Gravelly Sand [SP], dense, gray and brown, moist, medium grained (Decomposed Granite)
36			23										The boring was terminated at 10.7 meters below ground surface. Groundwater was encountered at 7.0 meters during the drilling operation.
37	11												
38													
39													
40	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S2-6	1/25/05	1/25/05	M Jandal & Norm Webb, Alen. Garv	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
160.4	Offset & Station	See Site Layout	South shoulder, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig
Total Hole Depth			

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1													Asphalt Pavement Poorly Graded Sand [SP], brown, moist (FILL)
2													- sand and gravel
3	1												Sandy Clay [CL], stiff, light gray, moist, medium plasticity
4			5										Silty Sand [SM], loose, light gray, moist
5			5								10		
6			5										
7	2												- gravel and cobbles, hard to auger layer
8													
9			5										Clayey Sand [SC], medium dense, light gray, moist with gravel
10	3		7								18		
11			11										
12													
13	4												
14			3										Silty Sand [SM], medium dense, light gray, moist, slightly clayey
15			6								12		
16			6										Sandy Clay [CL], stiff, dark brown, moist, medium plasticity (ALLUVIUM)
17	5												
18													
19													Clayey Sand [SC], medium dense, reddish brown, moist, fine to medium grained with ferrous nodules
20	6		3 13								22		

Continues on Page 2 of 2

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S2-6	1/25/05	1/25/05	M Jandal & Norm Webb, Alen, Garv	I-8, Aux. Lane, El Cajon	11-068301

Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
160.4	Offset & Station	See Site Layout	South shoulder, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Drilling Method	Drilling Equipment
Hollow Stem Auger	Truck Mounted Drilling Rig

Groundwater Level

Date Measured	Depth to Water

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
21	7		9										Clayey Sand [SC], medium dense, reddish brown, moist, fine to medium grained with ferrous nodules
22													
23													
24													
25			8 30								50+		Sandy Silt [ML], very dense, brown and gray, moist, slightly clayey
26	8		33										
28													Sandy Clay [CL], hard, reddish brown, moist, medium plasticity
29													
30	9		6 17								33		
31			16										The boring was terminated at 9.1 meters below ground surface. Groundwater was not encountered during the drilling operation.
32													
33	10												
34													
35													
36													
37	11												
38													
39													
	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-1	1/5/05	1/5/05	M Jandal & Mark Clark, Luis, Gary, Dan	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
156.2	Offset & Station	See Site Layout	20' north of the fence	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Augering	All Terrain Tracked Mounted Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Ice plants covered surface, Sandy Lean Clay [CL], dark brown, moist, medium plasticity
2													
3													
4			2										Clayey Sand [SC], loose, dark brown, moist, slightly silty, with ferrous noddules
5			2								7		
6			5										
7	2	Bag Sample											
8													
9													
10	3		9								20		
			9										
11			11										Sandy Clay [CL], brown, very stiff, moist, medium plasticity with ferrous nodules and mica flakes
12													
13	4												
14												▽	- wet
15		Sample											Silty Sand [SM], very dense, brown and gray, weathered, with mica flakes (decomposed granite)
16													
17	5												
18													
19													- greenish gray
20	6		36								50+		
			50/3"										

The boring was terminated at 6.1 meters below ground surface. Groundwater was encountered at 4.3 meters during the drilling operation.

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-2	1/5/05	1/5/05	M Jandal & Mark Clark, Luis, Gary, Dan	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
156.7	Offset & Station	See Site Layout	10' north of the fence, on ramp	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Augering	All Terrain Tracked Mounted Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Ice plants covered surface, Sandy Fat Clay with Gravel [CH], brownish gray, moist, high plasticity (FILL)
2													
3													
4													
5			4 / 8								20		Silty Sand [SM], medium dense, reddish brown, slightly moist, slightly clayey with ferrous nodules
6	2		12										
7													
8													
9													
10	3		12 / 16								38		Sandy Clay [CL], hard, brown, moist with calcareous nodules and ferrous nodules
11			22										
12													
13	4												
14													
15			17 / 19								49		
16			30										
17	5											▽	- wet
18													
19													
20	6		7 / 9								20		

Continues on Page 2 of 2

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-2	1/5/05	1/5/05	M Jandal & Mark Clark, Luis, Gary, Dan	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
156.7	Offset & Station	See Site Layout	10' north of the fence, on ramp	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Augering	All Terrain Tracked Mounted Rig
Total Hole Depth			

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
21	7		11										Sandy Clay [CL], very stiff, reddish brown, moist, with calcareous nodules and ferrous nodules
22													
23													
24													
25			10 16								43		
26	8		27										Clayey Sand [SC], dense, greenish gray, moist, (Decomposed Granite)
28													
29													
30	9		50/4"								50+		- very dense
31													The boring was terminated at 9.1 meters below ground surface. Groundwater was encountered at 5.2 meters during the drilling operation.
32													
33	10												
34													
35													
36													
37	11												
38													
39													
40	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-3	1/5/05	1/5/05	M Jandal & Mark Clark, Luis, Gary, Dan	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
157.0	Offset & Station	See Site Layout	10' North of the fence, on ramp	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Augering	All Terrain Tracked Mounted Rig
Total Hole Depth			

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter .15 meter	SPT Blows per .3 meter SPT total	Graphic Log	Lithological Description
1	1												Ice plants covered surface, Sandy Fat Clay with Gravel [CH], dark brown, moist, high plasticity, with gravel
2													
3													
4													
5			10 11								30		Silty Sand [SM], medium dense, reddish brown, slightly moist, slightly clayey with calcareous nodules and ferrous nodules
6	2		19										
8													
9													
10	3		7 12								22		
11			10									▽	- wet
12													
13	4												
14													
15			5 9								20		
16			11										Sandy Fat Clay [CH], very stiff, reddish brown and light gray, moist, high plasticity
17	5												
18													
19													
	6		20 50/5"								50+		Granite [DG], very dense, brown and gray, weathered, decomposed to gravel size rocks (bedrock)

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SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-3	1/5/05	1/5/05	M Jandal & Mark Clark, Luis, Gary, Dan	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
157.0	Offset & Station	See Site Layout	10' North of the fence, on ramp	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Augering	All Terrain Tracked Mounted Rig
Total Hole Depth			

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Descriptions
21													Granite [DG], very dense, brown and gray, weathered, decomposed to gravel size rocks (bedrock)
22													
23	7												
24													
25			50/3"								50+		
26													The boring was terminated at 7.6 meters below ground surface. Groundwater was encountered at 3.4 meters during the drilling operation.
27	8												
28													
29													
30	9												
31													
32													
33	10												
34													
35													
36													
37	11												
38													
39													
40	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-4	1/5/05	1/5/05	M Jandal & Mark Clark, Luis, Gary, Dan	I-8, Aux. Lane, El Cajon	11-063801

Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
159.2	Offset & Station	See Site Layout	6' North of the fence, eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Drilling Method	Drilling Equipment
Hollow Stem Augering	All Terrain Tracked Mounted Rig

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Groundwater Level: Date Measured / Depth to Water

Total Hole Depth

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Ice plants covered surface, Clayey Sand [SC], dark and light brown, moist, with ferrous nodules
2													
3													
4													
5			3 / 3								7		
6	2		4										Sandy Clay [CL], firm, reddish brown, moist, medium plasticity, with ferrous nodules and calcareous nodules
8													
9													
10	3		4 / 5								11	▽	Poorly Graded Sand [SP], medium dense, reddish brown, wet, fine grained, slighty clayey with ferrous nodules
11			6										
12													
13	4												
14													
15			9 / 8								16		Silty Sand [SM], medium dense, reddish brown, medium dense, wet, fine to medium grained, slightly clayey
16			8										
17	5												
18													
19													Sandy Gravel [GS], medium dense, brown and greenish gray, wet, (Ddecomposed Granite)
	6		6 / 6								17		

Continues on Page 2 of 2

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-4	1/5/05	1/5/05	M Jandal & Mark Clark, Luis, Garv, Dan.	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
159.2	Offset & Station	See Site Layout	6' North of the fence, eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Drilling Method	Drilling Equipment
Hollow Stem Augering	All Terrain Tracked Mounted Rig

Groundwater Level: Date Measured: ; Depth to Water:

Total Hole Depth:

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1, 2, 3, 4, 5	1		3, 3								7		Ice plants covered surface, Clayey Sand [SC], dark and light brown, moist, with ferrous nodules
6, 7, 8, 9, 10	2		4, 4, 5								11	▽	Sandy Clay [CL], firm, reddish brown, moist, medium plasticity, with ferrous nodules and calcareous nodules
11, 12, 13, 14, 15	3, 4		6, 9, 8								16		Poorly Graded Sand [SP], medium dense, reddish brown, wet, fine grained, slighty clayey with ferrous nodules
16, 17, 18, 19, 20	5, 6		8, 6, 6								17		Silty Sand [SM], medium dense, reddish brown, medium dense, wet, fine to medium grained, slightly clayey
													Sandy Gravel [GS], medium dense, brown and greenish gray, wet, (Ddecomposed Granite)

Continues on Page 2 of 2

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-4	1/5/05	1/5/05	M Jandal & Mark Clark, Luis, Garv, Dan	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
159.2	Offset & Station	See Site Layout	6' North of the fence, eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Drilling Method	Drilling Equipment
Hollow Stem Augering	All Terrain Tracked Mounted Rig

Groundwater Level: Date Measured / Depth to Water

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Ice plants covered surface, Clayey Sand [SC], dark and light brown, moist, with ferrous nodules
2													
3													
4													
5			3 / 3								7		
6	2		4										Sandy Clay [CL], firm, reddish brown, moist, medium plasticity, with ferrous nodules and calcareous nodules
8													
9													
10	3		4 / 5								11	▽	Poorly Graded Sand [SP], medium dense, reddish brown, wet, fine grained, slighty clayey with ferrous nodules
11			6										
12													
13	4												
14													Silty Sand [SM], medium dense, reddish brown, medium dense, wet, fine to medium grained, slightly clayey
15			9 / 8								16		
16			8										
17	5												
18													
19													Sandy Gravel [GS], medium dense, brown and greenish gray, wet, (Decomposed Granite)
	6		6 / 6								17		

Continues on Page 2 of 2

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-4	1/5/05	1/5/05	M Jandal & Mark Clark, Luis, Gary, Dan	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
159.2	Offset & Station	See Site Layout	6' North of the fence, eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level	
Date Measured	Depth to Water

Total Hole Depth

Drilling Method	Drilling Equipment
Hollow Stem Augering	All Terrain Tracked Mounted Rig

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
			11										Sandy Gravel [GS], medium dense, brown and greenish gray, wet, (Decomposed Granite)
21													
22													
23	7												
24													
			50/5"								50+		
25													The boring was terminated at 7.6 meters below ground surface. Groundwater was encountered at 3.4 meters during the drilling operation.
26													
27	8												
28													
29													
30	9												
31													
32													
33	10												
34													
35													
36													
37	11												
38													
39													
40	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-5	1/25/03	1/25/05	M Jandal & Norm Webb, Alen, Gary	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
161.2	Offset & Station	See Site Layout	South shoulder, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Asphalt Pavement Poorly Graded Sand [SP], brown, moist, fine to medium grained
2													- sand and gravel (FILL)
3													
4													
5			4 6								14		Lean Clay [CL], stiff, light gray, moist, low to medium plasticity
6	2		8										
8													- gravel and cobbles
9													
10	3		12 10								13		Sandy Silt [ML], medium dense, dark brown, moist, with decomposed organics (tree roots) and ferrous nodules (ALLUVIUM)
11			3										
12													
13	4												
14													
15			3 4								7		- loose, no recovery
16			3										
17	5												
18													
19												▽	Well Graded Sand [SW], very loose, brown and gray, wet
20	6		2 1								3		

Continues on Page 2 of 2

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-5	1/25/03	1/25/05	M Jandal & Norm Webb, Alen, Garv	I-8, Aux. Lane, El Cajon	11-068301

Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
161.2	Offset & Station	See Site Layout	South shoulder, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Drilling Method	Drilling Equipment
Hollow Stem Auger	Truck Mounted Drilling Rig

Groundwater Level: Date Measured / Depth to Water

Total Hole Depth

Lithological Descriptions: 1. Group Name 2. Group Symbol 3. Consistancy/Relative Density 4. Color 5. Moisture 6. Partical Size & Shape 7. Gradation 8. Plasticity 9. Structure 10. Cementation 11. Organics 12. Fill Material 13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
21			2										Sandy Clay [CL], soft, brown, moist with medium plasticity
22													
23	7												
24			4										Silty Sand [SM], medium dense, gray and brown, moist, slightly clayey with mica flakes
25			5								12		
26			7										
28	8												
29													
30	9		9 14								27		Well Graded Sand [SW], medium dense, brown, moist
31			13										
32													
33	10												Poorly Graded Sand [SP], very dense, light orange and greenish gray and brown, moist, fine to medium grained, (Decomposed Granite)
34													
35			25 32								50+		
36			35										The boring was terminated at 10.7 meters below ground surface. Groundwater was encountered at 5.8 meters during the drilling operation.
37	11												
38													
39													
	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-6	1/6/05	1/6/05	M Jandal & Mark Clark, Luis, Gary, Dan	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
160.0	Offset & Station	See Site Location	6' north of the fence, eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level: Date Measured	Groundwater Level: Depth to Water	Total Hole Depth	Drilling Method	Drilling Equipment
			Hollow Stem Augering	All Terrain Tracked Mounted rig

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Ice plant covered surface, Sandy Silt [ML], reddish brown, slightly moist, slightly clayey
2													
3													
4													
5			9 / 21								50+		- very dense (a rock plugged the tip of the sampler)
6	2		39										
8													Silty Sand [SM], medium dense, reddish brown, moist, slightly clayey, fine to medium grained with ferrous nodules and mica flakes
9													
10	3		7 / 8								19		
11			11										
12													
13	4												
14												▽	
15			3 / 5								11		- wet
16			6										
17	5												- brown
18													
19													
20	6		3 / 7								15		

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SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-6	1/6/05	1/6/05	M Jandal & Mark Clark, Luis, Gary, Dan	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
160.0	Offset & Station	See Site Location	6' north of the fence, eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Augering	All Terrain Tracked Mounted rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
			8										Sandy Clay [CL], grayish brown, stiff, moist, medium plasticity, with ferrous nodules
21													
22													
23	7												
24													
			27										Sandy Gravel [GS], very dense, gray, moist, (Decomposed Granite)
25			27								50+		
			29										The boring was terminated at 7.6 meters below ground surface. Groundwater was encountered at 4.3 meters during the drilling operation.
26													
27	8												
28													
29													
30	9												
31													
32													
33	10												
34													
35													
36													
37	11												
38													
39													
	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-7	1/6/05	1/6/05	M Jandal & Mark Clark, Luis, Garv, Dan	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
160.5	Offset & Station	See Site Location	20' north of the fence, eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Augering	All Terrain Tracked Mounted rig
Total Hole Depth			

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Ice plant covered surface, Clayey Sand [SC], dark brown, slightly moist
2													
3													
4													
5			4 / 4								8		Silty Sand [SM], loose, brown, moist, slightly clayey, fine to medim grained
6	2		4										
8													
9													
10	3		4 / 4								9		Well Graded Sand [SW], loose, brown, damp
11			5										
12													
13	4												
14												▽	
15			4 / 5								12		- medium dense, wet
16			7										
17	5												
18													
19													
20	6												Clayey Sand [SC], stiff, brown with ferrous nodules

Continues on Page 2 of 2

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-7	1/6/05	1/6/05	M Jandal & Mark Clark, Luis, Gary, Dan	I-8, Aux. Lane, El Cajon	11-068301

Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
160.5	Offset & Station	See Site Location	20' north of the fence, eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Augering	All Terrain Tracked Mounted rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Descriptions
21													Clayey Sand [SC], stiff, brown with ferrous nodules
22													
23	7												
24													
			9										
25			18								31		Sandy Gravel [GS], dense, brown, moist, (Decomposed Granite)
			13										
26													
2	8												
28													
29													
			50/3"										
30	9										50+		- very dense
31													The boring was terminated at 9.1 meters below ground surface. Groundwater was encountered at 4.3 meters during the drilling operation.
32													
33	10												
34													
35													
36													
37	11												
38													
39													
	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-8	1/25/03	1/25/05	M Jandal & Norm Webb, Alen. Gary	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
163.0	Offset & Station	See Site Layout	South shoulder, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig
Total Hole Depth			

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Asphalt Pavement Silty Sand [SM], brown, moist
2													- sand and gravel (FILL)
3													
4													
5			4 8								28		Sandy Clay [CL], very stiff, light gray, moist
6	2		20										Silty Sand [SM], medium dense, dark brown, moist, fine to medium grained (ALLUVIUM)
7		Bag Sample											
8													- gravel and cobbles
9													
10	3		3 2								4		- very loose
11	4		2										
12													
13													
14													
15			6 7								14	▽	Poorly Graded Sand [SP], medium dense, dark brown, wet, fine grained with mica flakes
16	5		7										Sandy Clay [CL], stiff, dark brown, moist, medium plasticity
17													
18													
19													
20	6		4 4								10		

Continues on Page 2 of 2

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-8	1/25/03	1/25/05	M Jandal & Norm Webb, Alen. Garv	I-8, Aux. Lane, El Cajon	11-068301

Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
163.0	Offset & Station	See Site Layout	South shoulder, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Drilling Method	Drilling Equipment
Hollow Stem Auger	Truck Mounted Drilling Rig

Groundwater Level: Date Measured | Depth to Water

Total Hole Depth

Lithological Descriptions: 1. Group Name 2. Group Symbol 3. Consistancy/Relative Density 4. Color 5. Moisture 6. Partical Size & Shape 7. Gradation 8. Plasticity 9. Structure 10. Cementation 11. Organics 12. Fill Material 13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Descriptions
21	7		6										Sandy Silt [ML], loose, dark brown, wet with mica flakes
22													
23													
24			3										Silty Sand [SM], loose, brown and gray, wet, fine grained
25			4								9		
26	8		5										
28													
29													- medium dense
30	9		5 / 6								14		
31			8										
32													
33	10												
34			30										Sandy Gravel [GS], very dense, gray, moist, (Decomposed Granite)
35			50/2"								50+		
36	11												The boring was terminated at 10.7 meters below ground surface. Groundwater was encountered at 4.6 meters during the drilling operation.
37													
38													
39	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-9	4/27/05	4/27/05	M Jandal & Brad Johnson, Norm Webb, Alen	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
161.5	Offset & Station	See Site Layout	20' north of the fence, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Ice Plants Silty Sand [SM], brown, moist
2													
3													
4													
5			1 1								3		Silty Sand [SM], very loose, dark brown, moist, fine to medium grained
6	2		2										
8													
9													
10	3		12 14								28		Clayey Sand [SC], medium dense, light brown, moist, with ferrous nodules
11			14										
12													
13	4												
14													
15			7 9								19		Sandy Silt [ML], medium dense, brown, moist, slightly clayey, with ferrous nodules
16			10										
17	5												
18												▽	- groundwater at 18'
19													Silty Sand [SM], medium dense, brown and light gray, moist, fine grained, with mica flakes
20	6		6 8								18		

Continues on Page 2 of 2

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3-9	4/27/05	4/27/05	M Jandal & Brad Johnson, Norm Webb, Alen	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
161.5	Offset & Station	See Site Layout	20' north of the fence, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Descriptions
21	7		10										Silty Sand [SM], medium dense, brown and light gray, moist, fine grained, with mica flakes
22													
23													
24			5										Well Graded Sand [SW], medium dense, reddish brown, wet
25			6								15		
26	8		9										
27			50/2"								50+		Sandy Gravel [GS], very hard, dark gray, moist (Decomposed Granite)
28													The boring was terminated at 8.3 meters below ground surface. Groundwater was encountered at 5.5 meters during the drilling operation.
29													
30	9												
31													
32													
33	10												
34													
35													
36													
37	11												
38													
39													
	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3R-1	1/4/05	1/4/05	M Jandal & Mark Clark, Luis, Gary, Dan	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
156.6	Offset & Station	See Site Layout	On ramp, north shoulder	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level: Date Measured	Depth to Water	Total Hole Depth	Drilling Method	Drilling Equipment
			Hollow Stem Augering	Truck mounted drilling rig

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Ice plants covered surface, Sandy Lean Clay with Gravel [CL], brownish gray, moist, medium plasticity
2													
3													
4													
5			11 / 13								26		- very stiff
6	2		13										
8													Clayey Sand [SC], medium dense, reddish brown, moist
9	3	Bag Sample											
10													
11													
12													
13	4												
14													
15		Sample											Sandy Fat Clay [CH], brown, moist high plasticity
16													
17	5												
18													Sandy Gravel [GS], very dense, light gray, (Decomposed Granite)
19													
20	6		45 / 50+								50+		

Continues on Page 2 of 2.

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3R-1	1/4/05	1/4/05	M Jandal & Mark Clark, Luis, Gary, Dan	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
156.6	Offset & Station	See Site Layout	On ramp, north shoulder	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level: Date Measured	Depth to Water	Total Hole Depth	Drilling Method	Drilling Equipment
			Hollow Stem Augering	Truck mounted drilling rig

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
21													Sandy Gravel [GS], very dense, light gray, (Decomposed Granite)
22													
23	7												
24													
			50/2.5"								50+		
25													
26													The boring was terminated at 7.6 meters below ground surface. Groundwater was not encountered during the drilling operation.
27	8												
28													
29													
30	9												
31													
32													
33	10												
34													
35													
36													
37	11												
38													
39													
40	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3R-2	1/25/05	1/25/05	M Jandal & Norm Webb, Alen and Gary	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
163.1	Offset & Station	See Site Layout Sta. 328+50	Eastbound, south shoulder	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Augering	Truck mounted drilling rig
Total Hole Depth			

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Asphalt Pavement Silty Sand [SM], brown, moist
2													
3													- sand and gravel (FILL)
4													- gravel and cobbles
5			4 9								29		Poorly Graded Sand [SP], medium dense, brown, moist, fine to medium grained with gravel
6	2		20										
8													- gravel and cobbles
9													
10	3		16 16								26		Clayey Sand [SC], medium dense, light gray, moist, with gravel and cobbles
11	4		10										
12													
13													
14													
15			8 14								28		Sandy Lean Clay [CL], very stiff, light brown and gray, moist, medium plasticity with gravel (ALLUVIUM)
16	5		14										
17													
18													
19													
20	6		3 6								20		- dark brown with ferrous nodules

Continues on Page 2 of 2

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3R-2	1/25/05	1/25/05	M Jandal & Norm Webb, Alen and Gary	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
163.1	Offset & Station	See Site Layout Sta. 328+50	Eastbound, south shoulder	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level: Date Measured	Depth to Water	Drilling Method	Drilling Equipment
		Hollow Stem Augering	Truck mounted drilling rig

Total Hole Depth

Lithological Descriptions: 1. Group Name 2. Group Symbol 3. Consistancy/Relative Density 4. Color 5. Moisture 6. Partical Size & Shape 7. Gradation 8. Plasticity 9. Structure 10. Cementation 11. Organics 12. Fill Material 13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
			14										Silty Sand [SM], medium dense, greenish gray, moist, fine to medium grained
21													
22													
23	7												
24													
			14										Sandy Lean Clay [CL], very stiff, dark brown, moist (a rock plugged the tip of the sampler)
25			16								27		
			11										
26													
27	8												
28													
29													Sandy Silt [ML], very loose, dark brown, moist with decomposed organics (tree roots)
			0										
30	9		0								0		- wet
			0										
31													
32													
33	10												
34													
			4										Clayey Sand [SC], medium dense, brown and gray, moist, with ferrous nodules
35			6								14		
			8										
36													The boring was terminated at 10.7 meters below ground surface. Groundwater was encountered at 8.8 meters below ground surface during the drilling operation.
37	11												
38													
39													
40	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3R-3	1/4/05	1/4/05	M Jandal & Mark Clark, Luis, Gary, Dan	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
159.9	Offset & Station	See Site Layout	On ramp, north shoulder	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level: Date Measured	Depth to Water	Total Hole Depth	Drilling Method	Drilling Equipment
			Hollow Stem Augering	Truck mounted drilling rig

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Ice plants covered surface, Sandy Fat Clay with Gravel [CH], brownish gray, moist, high plasticity
2													
3													
4													
5			8 5								11		Clayey Sand with Gravel [SC], medim dense, tan, slightly moist, 1/2"-1" gravel size
6	2		6										
7													
8													Sandy Gravel [GS], medium dense, tan, slightly moist, 1/2"-1 1/2" gravel size
9													
10	3		6 10								18		
11			8										Sandy Silt [ML], medium dense, reddish brown, moist, slightly clayey
12		Bag Sample											
13	4												
14													
15			6 3								6		- loose
16			3										
17	5												- dark brown
18												▽	Clayey Sand [SC], medium dense, reddish brown, wet
19													
20	6		6 8								17		

Continues on Page 2 of 2

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S3R-3	1/4/05	1/4/05	M Jandal & Mark Clark, Luis, Gary, Dan	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
159.9	Offset & Station	See Site Layout	On ramp, north shoulder	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Augering	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
			9										Clayey Sand [SC], medium dense, reddish brown, wet
21													
22													
23	7												
24													
			10										Sandy Lean Clay [CL], very stiff, dark brown, moist, low plasticity with ferrous nodules
25			13								26		
			13										
26													
27	8												
28													
29													
			38										Sandy Gravel [GS], very dense, light gray and gray, moist, (Decomposed Granite)
30	9		40								50+		
			43										
31													
32													
33	10												
34													
			38										
35			46								50+		
			50/4"										The boring was terminated at 10.7 meters below ground surface. Groundwater was encountered at 5.5 meters during the drilling operation.
36													
37	11												
38													
39													
40	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S4-1	1/27/05	1/27/05	M Jandal & Norm Webb, Alen, Gary	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
166.7	Offset & Station	See Site Layout	South shoulder, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter .15 meter	SPT Blows per .3 meter SPT total	Graphic Log	Lithological Description
1	1												Aspalt Pavement Silty Sand [SM], brown, moist (FILL)
2													- sand and gravel
3													- gravel and cobbles
4			4										Poorly Graded Sand [SP], medium dense, brown, moist, fine to medium grained with gravel
5			6								11		
6	2		5										
7													- gravel and cobbles
8													
9			7										Well Graded Sand [SW], loose, dark brown, moist (no recovery)
10	3		4								7		
11			3										
12													
13	4												
14			7										
15			11								20		Clayey Sand [SC], medium dense, brown, moist with ferrous nodules (ALLUVIUM)
16			9										
17	5												
18													
19													
20	6		7 8								18		

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SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S4-1	1/27/05	1/27/05	M Jandal & Norm Webb, Alen, Gary	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
166.7	Offset & Station	See Site Layout	South shoulder, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
21	7		10										Sandy Clay [CL], very stiff, dark brown, moist, medium plasticity
22													
23													
24			8										Sandy Silt [ML], medium dense, brown, moist, with mica flakes
25			6								12		
26	8		6										
27													
28													
29													
30	9		9 11								28		Silty Sand [SM], medium dense, reddish brown, moist, fine to medium grained
31			17										Lean Clay [CL], very stiff, brown and gray, moist
32													
33	10												
34													
35			16 50/5"								50+		Gravelly Silty Sand [SM], very dense, greenish gray, moist, (decomposed granite)
36													The boring was terminated at 10.7 meters below ground surface. Groundwater was encountered at 5.8 meters during the drilling operation.
37	11												
38													
39													
40	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S4-2	2/23/05	2/23/05	M Jandal & Mark Clark, Luis, Gary, Dan	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
163.1	Offset & Station	See Site Location	20' north of the fence, eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level: Date Measured	Depth to Water	Total Hole Depth	Drilling Method	Drilling Equipment
			Hollow Stem Augering	All Terrain Tracked Mounted rig

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1													Ice plant covered surface, Clayey Sand [SC], dark brown, moist (FILL)
2													
3	1												Silty Sand [SM], loose, dark brown, moist, slightly clayey, fine to medium grained
4													
5			1 2								6		- reddish brown with ferrous nodules and pebbles
6			4										
7	2												
8													
9													
10	3		18 17								37		- light brown, damp, slightly clayey
11			20										
12													
13	4												
14													
15			8 8								15		Sandy Silt [ML], medium dense, dark brown, moist, slightly clayey with mica flakes (ALLUVIUM)
16			7										
17	5											▽	
18													
19													
20	6		5 9								18		Well Graded Sand [SW], medium dense, bown, wet, with mica flakes

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SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S4-2	2/23/05	2/23/05	M Jandal & Mark Clark, Luis, Gary, Dan	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
163.1	Offset & Station	See Site Location	20' north of the fence, eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Augering	All Terrain Tracked Mounted rig
Total Hole Depth			

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Descriptions
			9										Well Graded Sand [SW], medium dense, bown, wet, with mica flakes
21													
22													
23	7												
24													
			10										
25			23								35		- dense, tan, cemented, formation, layered - brown, moist
			12										
26													
27	8												
28													
29													Silty Sand [SM], very dense, white, black and brown, moist (decomposed granite)
			10										
30	9		35								50+		
			35										The boring was terminated at 9.1 meters below ground surface. Groundwater was encountered at 5.2 meters during the drilling operation.
31													
32													
33	10												
34													
35													
36													
37	11												
38													
39													
	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S4-3	4/26/05	4/26/05	M Jandal & Brad Johnson, Norm Webb, Alen	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
163.5	Offset & Station	See Site Layout	20' north of fence, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level: Date Measured	Depth to Water	Total Hole Depth	Drilling Method	Drilling Equipment
			Hollow Stem Auger	Truck Mounted Drilling Rig

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Ice plants Silty Sand [SM], brown, moist (FILL)
2													
3													
4			2										Sandy Silt [ML], very loose, dark brown, moist, with mica flakes (ALLUVIUM)
5			1								2		
6			1										
7	2												
8													
9													
10	3		12 28								50+		Silty Sand [SM], very dense, reddish brown, fine to medium grained, with ferrous nodules and gravel
11			23										
12													- slightly clayey
13	4												
14													
15			4 8								12		
16			4										
17	5												
18													
19													
20	6		6 13								31	▽	Clayey Sand [SC], dense, orange and light gray,moist (decomposed granite)

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SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S4-3	4/26/05	4/26/05	M Jandal & Brad Johnson, Norm Webb. Alen	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
163.5	Offset & Station	See Site Layout	20' north of fence, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Descriptions
			18										Clayey Sand [SC], dense, orange and light gray,moist (decomposed granite)
21													
22													
23	7												
24			20										Well Graded Sand [SW], light gray and dark gray, moist (decomposed granite)
25			28								50+		
			33/4"										The boring was terminated at 7.6 meters below ground surface. Groundwater was encountered at 5.8 meters during the drilling operation.
26													
27	8												
28													
29													
30	9												
31													
32													
33	10												
34													
35													
36													
37	11												
38													
39													
40	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S4-4	4/27/05	4/27/05	M Jandal & Brad Johnson, Norm Webb, Alen	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
163.6	Offset & Station	See Site Layout	20' north of fence, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Drilling Method	Drilling Equipment
Hollow Stem Auger	Truck Mounted Drilling Rig

Groundwater Level: Date Measured: ; Depth to Water:

Total Hole Depth:

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1, 2, 3, 4	1												Ice plants Silty Sand [SM], brown, moist (FILL)
5			1 0								1	▽	Silty Sand [SM], very loose, dark brown, wet, fine to medium, slightly clayey
6, 7, 8	2		1										
9, 10	3		4 6								15		Sandy Clay [SC],medium dense, brown, moist, with ferrous nodules (ALLUVIUM)
11, 12, 13, 14	4		9										
15			5 12								24		Well Graded Sand [SW], medium dense, reddish brown and light brown, wet
16, 17, 18	5		12										
19, 20	6		17 12								29		Clayey Sand [SC], medium dense, dark gray and blue, moist (decomposed granite)

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SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S4-4	4/27/05	4/27/05	M Jandal & Brad Johnson, Norm Webb, Alen	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
163.6	Offset & Station	See Site Layout	20' north of fence, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Descriptions
21			17										Clayey Sand [SC], medium dense, dark gray and blue, moist (decomposed granite)
22													
23	7												
24													
25			25 40/4"								50+		- no recovery
26													The boring was terminated at 7.6 meters below ground surface. Groundwater was encountered at 5.8 meters during the drilling operation.
27	8												
28													
29													
30	9												
31													
32													
33	10												
34													
35													
36													
37	11												
38													
39													
40	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S4-5	1/27/03	1/27/05	M Jandal & Norm Webb, Alen, Gary	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
170.1	Offset & Station	See Site Layout	South shoulder, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level: Date Measured	Groundwater Level: Depth to Water	Total Hole Depth	Drilling Method	Drilling Equipment
			Hollow Stem Auger	Truck Mounted Drilling Rig

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Asphalt Pavement Well Graded Sand [SW], brown, moist (FILL)
2													
3													
4													
5			6 12								25		- medium dense, with gravel
6	2		13										
8													
9													
10	3		18 19								32		Gravelly SiltySand [SM], dense, dark gray, moist (FILL, decomposed granite)
11			13										
12													
13	4												
14													
15			6 4								6		Sandy Silt [ML], loose, dark brown, moist
16			2										
17	5												
18													
19													
20	6		9 6								9		Silty Sand [SM], loose, reddish brown, moist, slightly clayey with ferrous nodules (ALLUVIUM)

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SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S4-5	1/27/03	1/27/05	M Jandal & Norm Webb, Alen, Garv	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
170.1	Offset & Station	See Site Layout	South shoulder, Eastbound	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level: Date Measured	Depth to Water	Total Hole Depth	Drilling Method	Drilling Equipment
			Hollow Stem Auger	Truck Mounted Drilling Rig

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape.
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
21			3										Silty Sand [SM], loose, reddish brown, moist, slightly clayey with ferrous nodules
22													
23	7												
24													
25			5 8								18		
26			10										- wet
27	8												
28													
29													
30	9		6 18								33		
31			15										
32													
33	10												
34													Gravelly Silty Sand [SM], dense, red and gray, moist (decomposed granite)
35			5 17								45		
36			28										The boring was terminated at 10.7 meters below ground surface. Groundwater was encountered at 7.6 meters during the drilling operation.
37	11												
38													
39													
40	12												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S5-1	1/27/05	1/27/05	M Jandal & Mark Clark, Luis, Gary	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location	Purpose of work	Dist - Co. - Rte. - PM
178.4	Offset & Station See Site Layout South Shoulder, Eastbound	GDR Investigation	11-SD-8, 17.4/R18.7

Drilling Method	Drilling Equipment
Hollow Stem Auger	Truck Mounted Drilling Rig

Groundwater Level	
Date Measured	Depth to Water

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Asphalt Pavement Well Graded Sand [SW], brown, moist (FILL)
2													
3													
4			7										Gravelly Silty Sand [SM], medium dense, reddish brown and gray,moist, with mica flakes (FILL, decomposed granite)
5			8								18		
6	2		10										
7													- gravel and cobbles
8													
9													Silty Sand [SM], medium dense, gray and brown, moist, with gravel
10	3		3 8								14		
11			6										Sandy Silt [ML], medium dense, reddish brown, moist, with ferrous nodules (ALLUVIUM)
12													
13	4												
14													Poorly Graded Sand [SP], very dense, orange and gray, moist (decomposed granite)
15			23 50/5"								45		
16													The boring was terminated at 4.6 meters below ground surface. Groundwater was not encountered during the drilling operation.
17	5												
18													
19													
20	6												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S6-1	2/1/05	2/1/05	M Jandal & Norm, Steve and Allen	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location	Purpose of work	Dist - Co. - Rte. - PM
182.9	Offset & Station See Site Layout Condominium Complex, Parking # 66	GDR Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter .15 meter	SPT Blows per .3 meter SPT total	Graphic Log	Lithological Description
1	1												Asphalt Pavement Sand and Gravel (FILL)
2													Silty Sand [SM], medium dense, dark gray, moist, fine to medium grained, slightly clayey
3													
4													
5			4 6								16		
6			10										
7	2	Bag Sample											Clayey Sand [SC], medium dense, reddish brown, moist, with pebbles (ALLUVIUM)
8													
9													
10	3		28 30/2"								50+		Poorly Graded Sand [SP], very dense, orange and gray, moist (decomposed granite)
11													The boring was terminated at 3.0 meters below ground surface. Groundwater was not encountered during the drilling operation.
12													
13	4												
14													
15													
16													
17	5												
18													
19													
20	6												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S6-2	2/1/05	2/1/05	M Jandal & Norm Webb, Steve and Allen	I-8, Aux. Lane, El Cajon	11-063801

Top Hole Elev.	Location	Purpose of work	Dist - Co. - Rte. - PM
183.5	Offset & Station See Site Layout Condominum Complex, near #1130	GDR Investigation	11-SD-8, 17.4/R18.7

Groundwater Level: Date Measured	Depth to Water	Total Hole Depth	Drilling Method	Drilling Equipment
			Hollow Stem Auger	Truck Mounted Drilling Rig

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Asphalt Pavement Sand and Gravel (Fill) - encountered hard to drill concrete surface, moved 2.5' to west and drilled an other hole
2													
3													
4													
5			6 6								18		Silty Sand [SM], medium dense, brown, moist, slight clayey with gravel
6	2		12										
8													
9													
10	3		12 10								19		Silty Sand [SM], medium dense, brown and gray, moist, with gravel (FILL, decomposed granite)
11			9										
12													
13	4												Silty Sand [SM], medium dense to dense, light brown, moist with gravel (ALLUVIUM)
14													
15			50/5.5"								50+		Poorly Graded Sand [SP], very dense, orange and gray, moist (decomposed granite)
16													The boring was terminated at 4.6 meters below ground surface. Groundwater was not encountered during the drilling operation.
17	5												
18													
19													
	6												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S1-1	1/13/05	1/13/05	M Jandal & Mark Clark, Luis, Gary	I-8, Aux. Lane, El Cajon	11-068301

Top Hole Elev.	Location			Purpose of work	Dist - Co. - Rte. - PM
150.2	Offset & Station	See Site Layout	North shoulder, west offramp to Second	Foundation Investigation	11-SD-8, 17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	Hollow Stem Auger	Truck Mounted Drilling Rig

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Type	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
21			5										Sandy Clay [CL], firm, grayish brown, moist, medium plasticity
22													
23	7												
24													
25			8 9								24		Silty Sand [SM], medium dense, very weathered, moist (Decomposed Granite)
26			15										
2	8												
28													
29													
30	9		5 11								26		- light greenish gray
31			15										The boring was terminated at 9.1 meters below ground surface. Groundwater was encountered at 5.5 meters during the drilling operation.
32													
33	10												
34													
35													
36													
37	11												
38													
39													
	12												

LABORATORY TEST DATA

Summary of Laboratory Test Results

Sample I.D.	Depth (ft)	Unit Weight (pcf)	Moisture Content %	Specific Gravity	Passing #200 Sieve	liquid Limit	Plasticity Index	cohesion, c (psf)	Shear Angle (ϕ^o)	Compression Index, C_c	Compression Index, C_r
B-SR3-1	14										
	14.5		21.3	105	57					0.033	0.0172
	15		19.3			40	18				
B-S3-1	10										
	10.5		15.5		63	32	16				
	11		16.2					1060	22.6		

Table 1

DIST. MATL. ENGR.		PAVT. DESIGN.	
RESIDENT ENGR.			
CONST. DEPT.			

11-053237

BILLED

DATE RECEIVED MAR 3

CALC. BY _____ APPROV. BY _____

DATE REPORTED

STATE OF CALIFORNIA
DIVISION OF HIGHWAYS
SAMPLE SENT TO

Sample Ident. Card No.

○ PRELIMINARY TEST PRIOR TO AWARD OF CONTRACT ○ HDOTRS. LAB. ○ BRANCH LAB.

○ POTENTIAL SOURCE SAMPLED AFTER AWARD OF CONTRACT ○ DIST. LAB. FIELD NO. _____

○ CONTROL TEST ON MATERIALS ACTUALLY ENTERING INTO WORK LOT NO. _____ DIST. LAB. NO. _____ SHIPMENT NO. _____ CONTR. OR W.O. NO. _____

○ SPECIAL TESTS P.O. OR REQ. NO. _____ FED. NO. _____

DIST. 11 CO. SD RT. 8 P.M. 17.4/18.

LIMITS OF WORK _____

RES. ENG. OR SUPT. MOUSSA JANDAL

ADDRESS 7177 OPPORTUNITY RD

CONTRACTOR District 11 - Design

SAMPLE OF Soil

SAMPLED FROM I-8 / Second B-R3-2 DEPTH 10-15

LOCATION OF SOURCE RETAINING WALL 3

OWNER OR MANUFACTURER _____

THIS SAMPLE IS SHIPPED IN _____ (NO. CONTAINERS) AND IS ONE OF A GROUP OF _____ SAMPLES REPRESENTING _____ (TONS, GALS, BBLS, STA, ETC)

TOTAL QUANTITY AVAILABLE Bag DATE SAMPLED 1-4-05

TEST RESULTS DESIRED: ☒ NORMAL ☐ PRIORITY. DATE NEEDED 3-1-05

MATERIAL FOR USE IN _____

REMARKS: _____

COVER ADDITIONAL INFORMATION WITH LETTER

SAMPLED BY M. JANDAL TITLE TE (CIVIL)

GRADING ANALYSIS

SIEVE	AS RECVD.	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT ☐
3					
2-1/2					
2					
1-1/2					
1					
3/4					
1/2					
3/8					
4					
8					
16					
30					
50					
100					
200					
5u					
1u					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

BY TEST NO. DESCRIPTION

REMARKS: $SO_4^{=}$ Cl^-

Res. pH

Ω ohm/cm = 920

pH = 7.5

Cl^- Mg/Kg = 165

$SO_4^{=}$ Mg/Kg = 555

TEST RESULTS OF UNTREATED SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTH.
59325		

SPEC. DESIG. (USE WHEN APPLIC.)	ACT./OBJ.	AMOUNT

TEST SPECIMEN	A	B	C	D	E
COMPACTOR AIR PRESSURE P.S.I.					
INITIAL MOISTURE %					
MOISTURE AT COMPACTION %					
DRY DENSITY OF BRIQ., #./CU.FT.					
STABILOMETER VALUE "R"					
EXUDATION PRESS. P.S.I.					
THICK. BY STAB. FEET					
THICK. BY EXP. PRESS. FEET					

SURFACE LL. P.L. P.I.

BASE P.I. X % 200 SPEC.

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE; EXPANSION PRESSURE; AT EQUILIBRIUM SPEC.

S.E.: AS RECD.; CRUSHED; COMBINED

LART: GRADE 100; 500

DUR.: Df; Dc

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET) % CRUSHED PARTICLES

CLEANNESS VALUE SPEC. 75 MIN.

TEST NO.	SIZE	C.V.	%
	1/2"x3/4"		40
	1"x#4		60

WTD. AVERAGE SPEC. 75 MIN.

DM = _____ LB/CU FT @ _____ %

DM CORRECTED _____ LB/CU FT @ _____ %

RELATIVE COMPACTION _____ %

INSTRUCTIONS: _____

	201.1 PROC(SPEC)		205% CRUSHED		229.2 DUR. CSE
	201.2 PROC(ROUT)		206 SP. GR. CSE		301 R-VALUE
	202.1 S.A. CSE.		207 SP. GR. FINE		226 MOIST.
	202.2 S.A. FINE		211 LART		227 CLEAN.
	204 MPI.		217 S.E.	☒	CORROSION
	216 REL. COM.		229.1 DUR FINE		

11-AW-20 (REV. 3-69) FRONT

DIST. MATL. ENGR.		PAVT. DESIGN.	
RESIDENT ENGR.			
CONST. DEPT.			

1-056238

BILLED

DATE RECEIVED MAR 3

CALC. BY _____ APPROV. BY _____

DATE REPORTED

STATE OF CALIFORNIA
DIVISION OF HIGHWAYS
SAMPLE SENT TO

Sample Ident. Card No.

- ○ PRELIMINARY TEST PRIOR TO AWARD OF CONTRACT
- ○ POTENTIAL SOURCE SAMPLED AFTER AWARD OF CONTRACT
- ○ CONTROL TEST ON MATERIALS ACTUALLY ENTERING INTO WORK
- ○ SPECIAL TESTS

○ HDOTRS. LAB.
○ BRANCH LAB.
○ DIST. LAB. FIELD NO. _____

LOT NO. _____ DIST. LAB. NO. _____
SHIPMENT NO. _____ CONTR. OR W.O. NO. _____
P.O. OR REQ. NO. _____ FED. NO. _____

DIST. 11 CO. SD RT. 8 P.M. 17.4/18.
LIMITS OF WORK _____

RES. ENG. OR SUPT. MOUSSA JANDAL
ADDRESS 7177 OPPORTUNITY RD.
CONTRACTOR District 11 - Design

SAMPLE OF SOIL
SAMPLED FROM I-8/Second B-R3-1 DEPTH 5-10'
LOCATION OF SOURCE Retaining wall -R3

OWNER OR MANUFACTURER _____
THIS SAMPLE IS SHIPPED IN _____ (NO. CONTAINERS) AND IS ONE OF A GROUP OF _____ SAMPLES REPRESENTING _____ (TONS, GALS, BBLS, STA, ETC)
TOTAL QUANTITY AVAILABLE Bag DATE SAMPLED 1-4-05
TEST RESULTS DESIRED: ☒ NORMAL ☐ PRIORITY. DATE NEEDED 3-1-05

MATERIAL FOR USE IN _____
REMARKS: _____

COVER ADDITIONAL INFORMATION WITH LETTER
SAMPLED BY M. JANDAL TITLE TE (CIVIL)

TEST RESULTS OF UNTREATED SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTH.
59325		

SPEC. DESIG. (USE WHEN APPLIC.)	ACT./OBJ.	AMOUNT

GRADING ANALYSIS

SIEVE	AS RECVD.	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT ☐
3					
2-1/2					
2					
1-1/2					
1					
3/4					
1/2					
3/8					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:
BY TEST NO. DESCRIPTION

TEST SPECIMEN	A	B	C	D	E
COMPACTOR AIR PRESSURE P.S.I.					
INITIAL MOISTURE %					
MOISTURE AT COMPACTION %					
DRY DENSITY OF BRIQ., #./CU.FT.					
STABILOMETER VALUE "R"					
EXUDATION PRESS. P.S.I.					
THICK. BY STAB. FEET					
THICK. BY EXP. PRESS. FEET					

SURFACE LL. P.L. P.I.
BASE P.I. X % 200 SPEC.
SUBBASE
GRAVEL EQUIVALENT FACTOR
S.E. AS RECD. / CRUSHED / COMBINED
TRAFFIC INDEX
LART GRADE 100 / 500
R VALUE: EXUDATION PRESSURE
EXPANSION PRESSURE
AT EQUILIBRIUM SPEC.
DUR. Df / Dc
INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)
% CRUSHED PARTICLES

CLEANNESS VALUE SPEC. 75 MIN.

TEST NO.	SIZE	C.V.	%
	1/2"x3/4"		40
	1"x#4		60

WTD. AVERAGE SPEC. 75 MIN.

DM = _____ LB/CU FT @ _____ %
DM CORRECTED _____ LB/CU FT @ _____ %
RELATIVE COMPACTION _____ %
INSTRUCTIONS:

REMARKS: $SO_4^{=}$ Cl^-
Res. pH
Res Ω/cm = 695
pH = 7.3
Cl^- Mg/Kg = 390
$SO_4^{=}$ Mg/Kg = 855

	201.1 PROC(SPEC)		205% CRUSHED		229.2 DUR. CSE
	201.2 PROC(ROUT)		206 SP. GR. CSE		301 R-VALUE
	202.1 S.A. CSE.		207 SP.GR.FINE		226 MOIST.
	202.2 S.A. FINE		211 LART		227 CLEAN.
	204 HPI.		217 S.E.	X	CORROSION
	216 REL. COM.		229.1 DUR FINE		

11-JM-20 (REV. 3-69) FRONT

DIST. MATL. ENGR.		PAVT. DESIGN.	
RESIDENT ENGR.			
CONST. DEPT.			

11-05-3839

BILLED

DATE RECEIVED MAR 3

CALC. BY _____ APPROV. BY _____

DATE REPORTED

STATE OF CALIFORNIA
DIVISION OF HIGHWAYS

Sample Ident. Card No.

SAMPLE SENT TO

- ○ PRELIMINARY TEST PRIOR TO AWARD OF CONTRACT
- ○ POTENTIAL SOURCE SAMPLED AFTER AWARD OF CONTRACT
- ○ CONTROL TEST ON MATERIALS ACTUALLY ENTERING INTO WORK
- ○ SPECIAL TESTS

○ HDQTRS. LAB.
○ BRANCH LAB.
○ DIST. LAB. FIELD NO. _____

LOT NO. _____ DIST. LAB. NO. _____
SHIPMENT NO. _____ CONTR. OR W.O. NO. _____
P.O. OR REQ. NO. _____ FED. NO. _____

DIST. 11 CO. SD RT. 8 P.M. 17.4/18.

LIMITS OF WORK _____

RES. ENG. OR SUPT. MOUSSA JANDAL
ADDRESS 7177 OPPORTUNITY RD.
CONTRACTOR District 11 - Design

SAMPLE OF Soil
SAMPLED FROM B - R3A - 3
Retaining WALL DEPTH 0 - 5'
LOCATION OF SOURCE I-8 / Second

OWNER OR MANUFACTURER _____

THIS SAMPLE IS SHIPPED IN _____ (NO. CONTAINERS) AND IS ONE OF A GROUP OF _____ SAMPLES REPRESENTING 1 ~~500~~ 5 (TONS, GALS, BBLS, STA, ETC.)

TOTAL QUANTITY AVAILABLE Bag DATE SAMPLED 1-5-05

TEST RESULTS DESIRED: ☒ NORMAL ☐ PRIORITY. DATE NEEDED 3-1-05

MATERIAL FOR USE IN _____

REMARKS: _____

COVER ADDITIONAL INFORMATION WITH LETTER

SAMPLED BY M. JANDAL TITLE TE (CIVIL)

TEST RESULTS OF UNTREATED SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTH.
5 9 3 2 5		

SPEC. DESIG. (USE WHEN APPLIC.)	ACT./OBJ.	AMOUNT

GRADING ANALYSIS

SIEVE	AS RECVD.	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT ☐
3					
2-1/2					
2					
1-1/2					
1					
3/4					
1/2					
3/8					
4					
8					
16					
30					
50					
100					
200					
5u					
1u					

GRADING AS USED WAS OBTAINED AS FOLLOWS:
BY TEST NO. DESCRIPTION

TEST SPECIMEN	A	B	C	D	E
COMPACTOR AIR PRESSURE P.S.I.					
INITIAL MOISTURE %					
MOISTURE AT COMPACTION %					
DRY DENSITY OF BRIQ., #./CU.FT.					
STABILOMETER VALUE "R"					
EXUDATION PRESS. P.S.I.					
THICK. BY STAB. FEET					
THICK. BY EXP. PRESS. FEET					

SURFACE LL. P.L. P.I.

BASE P.I. X % 200 SPEC.

SUBBASE — S.E. — AS RECD. / CRUSHED / COMBINED

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX — LART — GRADE 100 / 500

R VALUE: EXUDATION PRESSURE; EXPANSION PRESSURE; AT EQUILIBRIUM SPEC.

DUR. Df Dc

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

% CRUSHED PARTICLES

CLEANNESS VALUE SPEC. 75 MIN.

TEST NO.	SIZE	C.V.	%
	1/2"x3/4"		40
	1"x#4		60

WTD. AVERAGE SPEC. 75 MIN.

DM= _____ LB/CU FT @ _____ %
DM CORRECTED _____ LB/CU FT @ _____ %
RELATIVE COMPACTION _____ %
INSTRUCTIONS: _____

REMARKS: $SO_4^{=}$ Cl^-
Res. pH
Res Ω/cm = 500
pH = 7.0
Cl^- Mg/kg = 550
$SO_4^{=}$ mg/kg = 1,920

	201.1 PROC(SPEC)		205% CRUSHED		229.2 DUR. CSE
	201.2 PROC(ROUT)		206 SP. GR. CSE		301 R-VALUE
	202.1 S.A. CSE.		207 SP.GR.FINE		226 MOIST.
	202.2 S.A. FINE		211 LART		227 CLEAN.
	204 MPI.		217 S.E.	X	CORROSION
	216 REL. COM.		229.1 DUR FINE		

11-30-10 (REV. 3-69) FRONT

DIST. MATL. ENGR.	PAVT. DESIGN.
RESIDENT ENGR.	
CONST. DEPT.	

11-05-3240

BILLED

DATE RECEIVED MAR 3

CALC. BY _____ APPROV. BY _____

DATE REPORTED

STATE OF CALIFORNIA
DIVISION OF HIGHWAYS
SAMPLE SENT TO

Sample Ident. Card No.

- ○ PRELIMINARY TEST PRIOR TO AWARD OF CONTRACT
- ○ POTENTIAL SOURCE SAMPLED AFTER AWARD OF CONTRACT
- ○ CONTROL TEST ON MATERIALS ACTUALLY ENTERING INTO WORK
- ○ SPECIAL TESTS

○ HDQTRS. LAB.
○ BRANCH LAB.
○ DIST. LAB. FIELD NO. _____

LOT NO. _____ DIST. LAB. NO. _____
SHIPMENT NO. _____ CONTR. OR P.O. NO. _____
P.O. OR REQ. NO. _____ FED. NO. _____

DIST. 11 CO. SD RT. 8 P.M. 17.4/18.8

LIMITS OF WORK _____

RES. ENG. OR SUPT. MOUSSA JANDAL
ADDRESS 7177 OPPORTUNITY RD.
CONTRACTOR District 11 - Design

SAMPLE OF Soil
SAMPLED FROM Top of second
B-S1-6 DEPTH 0-5"
LOCATION OF SOURCE SOUND WALL S1

OWNER OR MANUFACTURER _____

THIS SAMPLE IS SHIPPED IN _____ (NO. CONTAINERS) AND IS ONE OF A GROUP OF _____ SAMPLES REPRESENTING _____ (TONS, GALS, BBLS, STA, ETC)

TOTAL QUANTITY AVAILABLE Bag DATE SAMPLED 1-12-05

TEST RESULTS DESIRED: ☒ NORMAL ☐ PRIORITY. DATE NEEDED 3-1-05

MATERIAL FOR USE IN _____

REMARKS: _____

COVER ADDITIONAL INFORMATION WITH LETTER

SAMPLED BY M. JANDAL TITLE TE (CIVIL)

	201.1 PROC(SPEC)		205% CRUSHED		229.2 DUR. CSE
	201.2 PROC(ROUT)		206 SP. GR. CSE		301 R-VALUE
	202.1 S.A. CSE.		207 SP.GR.FINE		226 MOIST.
	202.2 S.A. FINE		211 LART		227 CLEAN.
	204 MPI.		217 S.E.		
	216 REL. COM.		229.1 DUR FINE		

GRADING ANALYSIS

SIEVE	AS RECVD.	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT ☐
3					
2-1/2					
2					
1-1/2					
1					
3/4					
1/2					
3/8					
4					
8					
16					
30					
50					
100					
200					
5u					
1u					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

BY TEST NO. DESCRIPTION

REMARKS: $SO_4 = Cl^-$
Res. pH
Res Ω/cm = 1,265
pH = 7.4

TEST RESULTS OF UNTREATED SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTH.
5 9 3 2 5		

SPEC. DESIG. (USE WHEN APPLIC.)	ACT./OBJ.	AMOUNT

TEST SPECIMEN	A	B	C	D	E
COMPACTOR AIR PRESSURE P.S.I.					
INITIAL MOISTURE %					
MOISTURE AT COMPACTION %					
DRY DENSITY OF BRIQ., #./CU.FT.					
STABILOMETER VALUE "R"					
EXUDATION PRESS. P.S.I.					
THICK. BY STAB. FEET					
THICK. BY EXP. PRESS. FEET					

SURFACE LL. P.L. P.I.

BASE P.I. x % 200 SPEC.

SUBBASE

S.E.: AS RECD. / CRUSHED / COMBINED

GRAVEL EQUIVALENT FACTOR

LART GRADE: 100 / 500

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE

EXPANSION PRESSURE

AT EQUILIBRIUM SPEC.

DUR.: Df / Dc

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

% CRUSHED PARTICLES

CLEANNESS VALUE SPEC. 75 MIN.

TEST NO.	SIZE	C.V.	%
	1/2"x3/4"		40
	1"x#4		60

WTD. AVERAGE SPEC. 75 MIN.

DM= _____ LB/CU FT @ _____ %

DM CORRECTED _____ LB/CU FT @ _____ %

RELATIVE COMPACTION _____ %

INSTRUCTIONS: _____

11-OM-20 (REV. 3-69) FRONT

DIST. MATL. ENGR.		PAVT. DESIGN.	
RESIDENT ENGR.			
CONST. DEPT.			

11-053841

BILLED

DATE RECEIVED MAR 3

CALC. BY _____ APPROV. BY _____

DATE REPORTED

STATE OF CALIFORNIA
DIVISION OF HIGHWAYS

Sample Ident. Card No.

SAMPLE SENT TO

- ○ PRELIMINARY TEST PRIOR TO AWARD OF CONTRACT
- ○ POTENTIAL SOURCE SAMPLED AFTER AWARD OF CONTRACT
- ○ CONTROL TEST ON MATERIALS ACTUALLY ENTERING INTO WORK
- ○ SPECIAL TESTS

○ HDOTRS. LAB.
○ BRANCH LAB.
○ DIST. LAB. FIELD NO. _____

LOT NO. _____ DIST. LAB. NO. _____
SHIPMENT NO. _____ CONTR. OR, W.O. NO. _____
P.O. OR REQ. NO. _____ FED. NO. _____

DIST. 11 CO. SD RT. 8 P.M. 17.4/18.

LIMITS OF WORK _____

RES. ENG. OR SUPT. MOUSSA JANDAL
ADDRESS 7177 OPPORTUNITY RD
CONTRACTOR District 11 - Design

SAMPLE OF SOIL
SAMPLED FROM I-8 / SECOND
B-S1-1 DEPTH 5-10'
LOCATION OF SOURCE SOUND WALL S1

OWNER OR MANUFACTURER _____

THIS SAMPLE IS SHIPPED IN _____ (NO. CONTAINERS) AND IS ONE OF A GROUP OF _____ SAMPLES REPRESENTING _____ (TONS, GALS, BBLS, STA, ETC.)

TOTAL QUANTITY AVAILABLE Bag DATE SAMPLED 1-13-05

TEST RESULTS DESIRED: ☒ NORMAL ☐ PRIORITY. DATE NEEDED 3-1-05

MATERIAL FOR USE IN _____

REMARKS: _____

COVER ADDITIONAL INFORMATION WITH LETTER

SAMPLED BY M. JANDAL TITLE TE (CIVIL)

	201.1 PROC(SPEC)	205% CRUSHED	229.2 DUR. CSE
	201.2 PROC(ROUT)	206 SP. GR. CSE	301 R-VALUE
	202.1 S.A. CSE.	207 SP.GR.FINE	226 MOIST.
	202.2 S.A. FINE	211 LART	227 CLEAN.
	204 MPI.	217 S.E.	
	216 REL. COM.	229.1 DUR FINE	

GRADING ANALYSIS

SIEVE	AS RECVD.	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT ☐
3					
2-1/2					
2					
1-1/2					
1					
3/4					
1/2					
3/8					
4					
8					
16					
30					
50					
100					
200					
5u					
1u					

GRADING AS USED WAS OBTAINED AS FOLLOWS:
BY TEST NO. DESCRIPTION

REMARKS: $SO_4^{=}$ Cl^-
Res. pH
Res Ω/CM = 820
pH = 7.4
Cl^- Mg/Kg = 180
$SO_4^{=}$ Mg/Kg = 980

TEST RESULTS OF UNTREATED SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTH.
59325		

SPEC. DESIG. (USE WHEN APPLIC.)	ACT./OBJ.	AMOUNT

TEST SPECIMEN	A	B	C	D	E
COMPACTOR AIR PRESSURE P.S.I.					
INITIAL MOISTURE %					
MOISTURE AT COMPACTION %					
DRY DENSITY OF BRIQ., #./CU.FT.					
STABILOMETER VALUE "R"					
EXUDATION PRESS. P.S.I.					
THICK. BY STAB. FEET					
THICK. BY EXP. PRESS. FEET					

SURFACE LL. P.L. P.I.

BASE P.I. X % 200 SPEC.

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE; EXPANSION PRESSURE; AT EQUILIBRIUM SPEC.

S.E.: AS RECD.; CRUSHED; COMBINED

LART: GRADE 100; 500

DUR.: Df; Dc

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

% CRUSHED PARTICLES

CLEANNESS VALUE SPEC. 75 MIN.

TEST NO.	SIZE	C.V.	%
	1/2"X3/4"		40
	1"X#4		60

WTD. AVERAGE SPEC. 75 MIN.

DM= _____ LB/CU FT @ _____ %
DM CORRECTED _____ LB/CU FT @ _____ %
RELATIVE COMPACTION _____ %
INSTRUCTIONS: _____

11-JM-10 (REV. 3-69) FRONT

DIST. MATL. ENGR.		PAVT. DESIGN.	
RESIDENT ENGR.			
CONST. DEPT.			

11-063842

BILLED

DATE RECEIVED MAR 3

CALC. BY _____ APPROV. BY _____

DATE REPORTED

STATE OF CALIFORNIA
DIVISION OF HIGHWAYS

Sample Ident. Card No.

SAMPLE SENT TO

- ○ PRELIMINARY TEST PRIOR TO AWARD OF CONTRACT
- ○ POTENTIAL SOURCE SAMPLED AFTER AWARD OF CONTRACT
- ○ CONTROL TEST ON MATERIALS ACTUALLY ENTERING INTO WORK
- ○ SPECIAL TESTS

○ HDOTRS. LAB.
○ BRANCH LAB.
○ DIST. LAB. FIELD NO. _____

LOT NO. _____ DIST. LAB. NO. _____
SHIPMENT NO. _____ CONTR. OR, P.O. NO. _____
P.O. OR REQ. NO. _____ FED. NO. _____

DIST. 11 CO. SD RT. 8 P.M. 17.4/18

LIMITS OF WORK _____

RES. ENG. OR SUPT. MOUSSA JANDAL
ADDRESS 7177 OPPORTUNITY RD.
CONTRACTOR District 11 - Design

SAMPLE OF Soil
SAMPLED FROM B-S2-3
I-8 / Second DEPTH 3-5
LOCATION OF SOURCE Sound wall S2

OWNER OR MANUFACTURER _____

THIS SAMPLE IS SHIPPED IN _____ (NO. CONTAINERS) AND IS ONE OF A GROUP OF _____ SAMPLES REPRESENTING _____ (TONS, GALS, BBLS, STA, ETC.)

TOTAL QUANTITY AVAILABLE Bag DATE SAMPLED 1-20-05

TEST RESULTS DESIRED: ☒ NORMAL ☐ PRIORITY. DATE NEEDED 3-1-05

MATERIAL FOR USE IN _____

REMARKS: _____

COVER ADDITIONAL INFORMATION WITH LETTER

SAMPLED BY M. JANDAL TITLE TE (CIVIL)

TEST RESULTS OF UNTREATED SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTH.
59325		

SPEC. DESIG. (USE WHEN APPLIC.)	ACT./OBJ.	AMOUNT

GRADING ANALYSIS

SIEVE	AS RECVD.	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT ☐
3					
2-1/2					
2					
1-1/2					
1					
3/4					
1/2					
3/8					
4					
8					
16					
30					
50					
100					
200					
5u					
1u					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

BY TEST NO. DESCRIPTION

TEST SPECIMEN	A	B	C	D	E
COMPACTOR AIR PRESSURE P.S.I.					
INITIAL MOISTURE %					
MOISTURE AT COMPACTION %					
DRY DENSITY OF BRIQ., #./CU.FT.					
STABILOMETER VALUE "R"					
EXUDATION PRESS. P.S.I.					
THICK. BY STAB. FEET					
THICK. BY EXP. PRESS. FEET					

SURFACE LL. P.L. P.I.

BASE P.I. X % 200 SPEC.

SUBBASE

GRAVEL EQUIVALENT FACTOR

S.E.: AS RECD. / CRUSHED / COMBINED

TRAFFIC INDEX

LART GRADE: 100 / 500

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRIUM SPEC.

DUR.: Df / Dc

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

% CRUSHED PARTICLES

CLEANNESS VALUE SPEC. 75 MIN.

TEST NO.	SIZE	C.V.	%
	1/2"x3/4"		40
	1"x#4		60

WTD. AVERAGE SPEC. 75 MIN.

DM= _____ LB/CU FT @ _____ %

DM CORRECTED _____ LB/CU FT @ _____ %

RELATIVE COMPACTION _____ %

INSTRUCTIONS:

REMARKS: $SO_4^{=}$ Cl^-

Res. pH

Res Ω/cm = 710

pH = 7.5

Cl^- mg/kg = 280

$SO_4^{=}$ mg/kg = 1,140

	201.1 PROC(SPEC)		205% CRUSHED		229.2 DUR. CSE
	201.2 PROC(ROUT)		206 SP. GR. CSE		301 R-VALUE
	202.1 S.A. CSE.		207 SP.GR.FINE		226 MOIST.
	202.2 S.A. FINE		211 LART		227 CLEAN.
	204 MPI.		217 S.E.	X	CORROSION
	216 REL. COM.		229.1 DUR FINE		

11-3W-20 (REV. 3-69) FRONT

DIST. MATL. ENGR.	PAVT. DESIGN.
RESIDENT ENGR.	
CONST. DEPT.	

J.O. 11-053843

DATE RECEIVED MAR 3

CALC. BY _____ APPROV. BY _____

BILLED

DATE REPORTED

STATE OF CALIFORNIA
DIVISION OF HIGHWAYS
SAMPLE SENT TO

Sample Ident. Card No.

- ○ PRELIMINARY TEST PRIOR TO AWARD OF CONTRACT
- ○ POTENTIAL SOURCE SAMPLED AFTER AWARD OF CONTRACT
- ○ CONTROL TEST ON MATERIALS ACTUALLY ENTERING INTO WORK
- ○ SPECIAL TESTS

○ HDOTRS. LAB. ○ BRANCH LAB. ○ DIST. LAB. FIELD NO. _____

LOT NO. _____ DIST. LAB. NO. _____

SHIPMENT NO. _____ CONTR. OR P.O. NO. _____

P.O. OR REQ. NO. _____ FED. NO. _____

DIST. 11 CO. SD RT. 8 P.M. 17.4/18.

LIMITS OF WORK _____

RES. ENG. OR SUPT. MOUSSA JANDAL

ADDRESS 7177 OPPORTUNITY RD.

CONTRACTOR District 11 - Design

GRADING ANALYSIS

SIEVE	AS RECVD.	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT ☐
3					
2-1/2					
2					
1-1/2					
1					
3/4					
1/2					
3/8					
4					
8					
16					
30					
50					
100					
200					
5u					
1u					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

BY TEST NO. DESCRIPTION

REMARKS: $SO_4^=$ Cl^-

Res. pH

Res Ω/cm = 1,990

pH = 7.6

TEST RESULTS OF UNTREATED SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTH.
59325		

SPEC. DESIG. (USE WHEN APPLIC.) | ACT./OBJ. | AMOUNT

TEST SPECIMEN	A	B	C	D	E
COMPACTOR AIR PRESSURE P.S.I.					
INITIAL MOISTURE %					
MOISTURE AT COMPACTION %					
DRY DENSITY OF BRIQ., #./CU.FT.					
STABILOMETER VALUE "R"					
EXUDATION PRESS. P.S.I.					
THICK. BY STAB. FEET					
THICK. BY EXP. PRESS. FEET					

SURFACE LL. P.L. P.I.

BASE P.I. x % 200 SPEC.

SUBBASE

GRAVEL EQUIVALENT FACTOR

S.E. AS RECD. / CRUSHED / COMBINED

TRAFFIC INDEX

LART GRADE 100 / 500

R VALUE: EXUDATION PRESSURE / EXPANSION PRESSURE / AT EQUILIBRIUM SPEC.

DUR. Df / Dc

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

% CRUSHED PARTICLES

CLEANNESS VALUE SPEC. 75 MIN.

TEST NO.	SIZE	C.V.	%
	1/2"x3/4"		40
	1"x#4		60

WTD. AVERAGE SPEC. 75 MIN.

DM= _____ LB/CU FT @ _____ %

DM CORRECTED _____ LB/CU FT @ _____ %

RELATIVE COMPACTION _____ %

INSTRUCTIONS:

SAMPLE OF SOIL

SAMPLED FROM I-8/Second B-S3B-3 DEPTH 5-10

LOCATION OF SOURCE SOUND WALL S3

OWNER OR MANUFACTURER _____

THIS SAMPLE IS SHIPPED IN _____ (NO. CONTAINERS) AND IS ONE OF A GROUP OF _____ SAMPLES REPRESENTING _____ (TONS, GALS, BBLS, STA, ETC)

TOTAL QUANTITY AVAILABLE Bag DATE SAMPLED 1-25-05

TEST RESULTS DESIRED: ☒ NORMAL ☐ PRIORITY. DATE NEEDED 3-01-05

MATERIAL FOR USE IN _____

REMARKS: _____

COVER ADDITIONAL INFORMATION WITH LETTER

SAMPLED BY M. JANDAL TITLE TE (CIVIL)

	201.1 PROC(SPEC)		205% CRUSHED		229.2 DUR. CSE
	201.2 PROC(ROUT)		206 SP. GR. CSE		301 R-VALUE
	202.1 S.A. CSE.		207 SP.GR.FINE		226 MOIST.
	202.2 S.A. FINE		211 LART		227 CLEAN.
	204 MPI.		217 S.E.	X	Corrosions
	216 REL. COM.		229.1 DUR FINE		

11-JM-10 (REV. 3-69) FRONT

DIST. MATE[illegible]	PAVE[illegible] SECTION
RESIDENT [illegible]	
CONST. DEPT.	

11- 05-2219

BILLED

DATE RECEIVED MAR 3

CALC. BY _____ APPROV. BY _____

DATE REPORTED

STATE OF CALIFORNIA
DIVISION OF HIGHWAYS

Sample Ident. Card No.

SAMPLE SENT TO

- ○ PRELIMINARY TEST PRIOR TO AWARD OF CONTRACT
- ○ POTENTIAL SOURCE SAMPLED AFTER AWARD OF CONTRACT
- ○ CONTROL TEST ON MATERIALS ACTUALLY ENTERING INTO WORK
- ○ SPECIAL TESTS

○ HDQTRS. LAB.
○ BRANCH LAB.
○ DIST. LAB. FIELD NO. _____

LOT NO. _____ DIST. LAB. NO. _____
SHIPMENT NO. _____ CONTR. OR W.O. NO. _____
P.O. OR REQ. NO. _____ FED. NO. _____

DIST. 11 CO. SD RT. 8 P.M. 17.4/18.
LIMITS OF WORK _____

RES. ENG. OR SUPT. MOUSSA JANDAL
ADDRESS 7177 OPPORTUNITY RD.
CONTRACTOR District 11- Design

SAMPLE OF Soil
SAMPLED FROM B-56-3
I-8 / second DEPTH 5-10'
LOCATION OF SOURCE Soundwall-56

OWNER OR MANUFACTURER _____
THIS SAMPLE IS SHIPPED IN _____ (NO. CONTAINERS) AND IS ONE OF A GROUP OF _____ SAMPLES REPRESENTING _____ (TONS, GALS, BBLS, STA, ETC.)
TOTAL QUANTITY AVAILABLE Bag DATE SAMPLED 2-1-05
TEST RESULTS DESIRED: ☒ NORMAL ☐ PRIORITY. DATE NEEDED 3-1-05

MATERIAL FOR USE IN _____
REMARKS: _____

COVER ADDITIONAL INFORMATION WITH LETTER
SAMPLED BY M. JANDAL TITLE TE (CIVIL)

TEST RESULTS OF UNTREATED SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTH.
5 9 3 2 5		

SPEC. DESIG. (USE WHEN APPLIC.)	ACT./OBJ.	AMOUNT

GRADING ANALYSIS

SIEVE	AS RECVD.	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT ☐
3					
2-1/2					
2					
1-1/2					
1					
3/4					
1/2					
3/8					
4					
8					
16					
30					
50					
100					
200					
5u					
1u					

GRADING AS USED WAS OBTAINED AS FOLLOWS:
BY TEST NO. DESCRIPTION

TEST SPECIMEN	A	B	C	D	E
COMPACTOR AIR PRESSURE P.S.I.					
INITIAL MOISTURE %					
MOISTURE AT COMPACTION %					
DRY DENSITY OF BRIQ., #./CU.FT.					
STABILOMETER VALUE "R"					
EXUDATION PRESS. P.S.I.					
THICK. BY STAB. FEET					
THICK. BY EXP. PRESS. FEET					

SURFACE LL. P.L. P.I.
BASE P.I. X % 200 SPEC.
SUBBASE
GRAVEL EQUIVALENT FACTOR
TRAFFIC INDEX

S.E.	
AS RECD.	
CRUSHED	
COMBINED	

LART		
GRADE	100	
	500	

R VALUE		
EXUDATION PRESSURE		
EXPANSION PRESSURE		
AT EQUILIBRIUM	SPEC.	

DUR.	
Df	
Dc	

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET) % CRUSHED PARTICLES

CLEANNESS VALUE		SPEC.	75 MIN.
TEST NO.	SIZE	C.V.	%
	1/2"x3/4"		40
	1"x#4		60
WTD. AVERAGE		SPEC.	75 MIN.

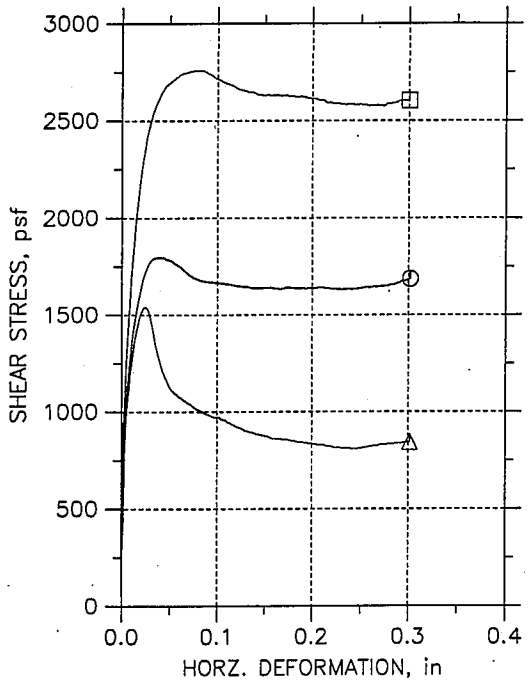
DM= _____ LB/CU FT @ _____ %
DM CORRECTED _____ LB/CU FT @ _____ %
RELATIVE COMPACTION _____ %
INSTRUCTIONS: _____

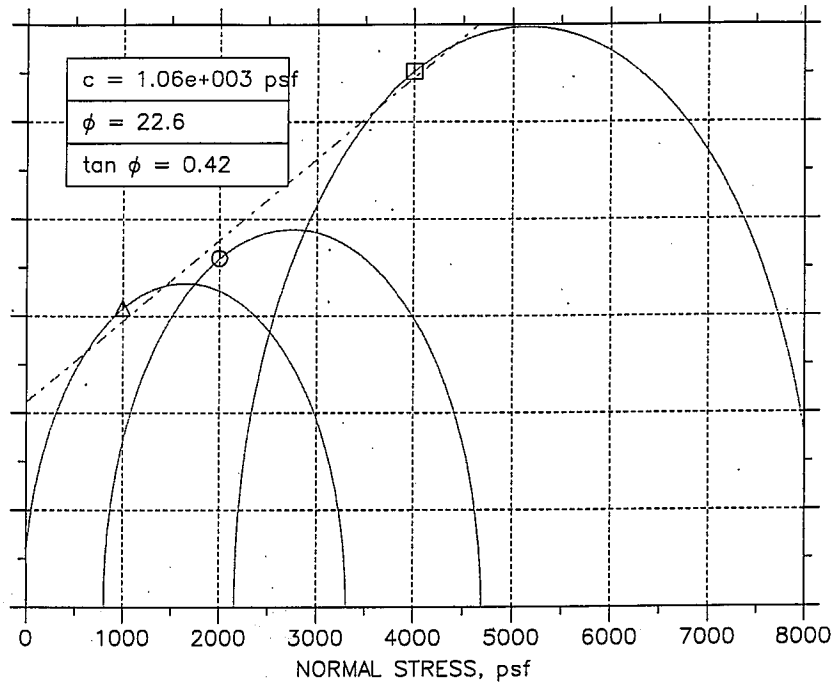
REMARKS: $SO_4^{=}$ Cl^{-}
Res. pH
Res/Ω cm = 2,900
pH = 7.6

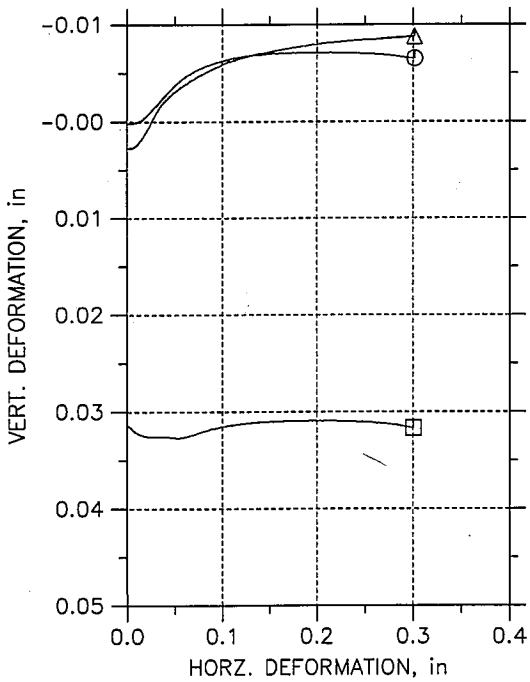
	201.1 PROC(SPEC)		205% CRUSHED		229.2 DUR. CSE
	201.2 PROC(ROUT)		206 SP. GR. CSE		301 R-VALUE
	202.1 S.A. CSE.		207 SP.GR.FINE		226 MOIST.
	202.2 S.A. FINE		211 LART		227 CLEAN.
	204 MPI.		217 S.E.	X	Corrosion
	216 REL. COM.		229.1 DUR FINE		

11-[illegible]-10 (REV. 3-69) FRONT

DIRECT SHEAR TEST REPORT







Symbol		⦶	△	⊡	
Test No.		05-015a	05-015b	05-015c	
Sample No.		11a	11b	11c	
Shape		Circular	Circular	Circular	
Initial	Dimension, in	2.375	2.375	2.375	
	Area, in^2	4.4301	4.4301	4.4301	
	Height, in	1	1	1	
	Water Content, %	18.53	17.69	17.58	
	Dry Density, pcf	76.103	77.307	76.791	
	Saturation, %	40.58	39.84	39.13	
	Void Ratio	1.2558	1.2207	1.2356	
Consol. Height, in		0.99993	0.99713	0.96876	
Consol. Void Ratio		1.2557	1.2143	1.1658	
Final	Water Content, %	18.08	17.91	20.49	
	Dry Density, pcf	75.614	76.638	79.307	
	Saturation, %	39.13	39.71	48.39	
	Void Ratio	1.2704	1.2401	1.1647	
Normal Stress, psf		2000.2	999.86	4000.5	
Max. Shear Stress, psf		1794.6	1538.4	2756.4	
Ult. Shear Stress, psf		1682.4	840.95	2601.4	
Time to Failure, min		26.001	18.002	54.004	
Disp. Rate, in/min		0.0016	0.0016	0.0016	
Specific Gravity		2.75	2.75	2.75	
Liquid Limit		0	0	0	
Plastic Limit		0	0	0	
Plasticity Index		0	0	0	

Project: I-80,Second to Greenfield	
Location: 11-SD-17.4	
Project No.: 11-063801	
Boring No.: R3A-1-11'	
Sample Type: 2.33 X 1.0	

Description: Brown, silty clay, moist.Sample are from one brass tube(2X4)Test specimens are pached VP 3/24 CTH

Remarks: Direct shear testing&reporting are in accordance with ASTM D3080.Shear device used in testing is a SHEAR TRACII.

Thu, 24-MAR-2005 11:18:19

STA... OF CALIFORNIA
DEPT OF TRANSPORTATION
GEOTECHNICAL LAB

E.A. 11-063801

Br. #

CLASSIFICATION TEST SUMMARY

LOCATION	% FINER THAN															ATT. LIMITS		Gs	AS RECEIVED		LAB. COMP	
Sample I.D.	1 1/2	1	3/4	1/2	3/8	4	8	16	30	50	100	200	5μ	2μ	1μ	LL	PI		γ_d	%m	γ_d	%m
R3-1-14.5'						100	99	97	91	82	70	57	24	-	10					21.3		
R3-1-15.0'																40	18			19.3		
R3A-1-10.5'																32	16			15.5		
R3A-1-11.0'							100	98	93	85	74	63	34	-	16					16.2		

NP - Non-plastic
* Sample received fractured -- Not suitable for testing
** Sample disintegrated while preparing for testing -- Not suitable for testing
*** Sample received desiccated -- Test results may not represent the true soil conditions

STA... OF CALIFORNIA
DEPT OF TRANSPORTATION
GEOTECHNICAL LAB

E.A. 11-063801

Br. #

CLASSIFICATION TEST SUMMARY

LOCATION	% FINER THAN															ATT. LIMITS		Gs	AS RECEIVED		LAB. COMP	
Sample I.D.	1 1/2	1	3/4	1/2	3/8	4	8	16	30	50	100	200	5μ	2μ	1μ	LL	PI		γ_d	%m	γ_d	%m
R3-1-14.5'						100	99	97	91	82	70	57	24	-	10					21.3		
R3-1-15.0'																				19.3		
R3A-1-10.5'																32	16			15.5		
R3A-1-11.0'																				16.2		

NP - Non-plastic
* Sample received fractured -- Not suitable for testing
** Sample disintegrated while preparing for testing -- Not suitable for testing
*** Sample received desiccated -- Test results may not represent the true soil conditions

CONSOLIDATION TEST DATA

Project: I-8, SECOND TO GREENFIELD
Boring No.: R3
Sample No.: 1-14.5'
Test No.: 05-070-G3

Location: 11-SD-17.4/R18.7
Tested By: KS
Test Date: 03/18/05
Sample Type: BRASS TUBE

Project No.: 11-063801
Checked By: WP3/NS CTH
Depth: 14.5'
Elevation:

Soil Description: MOIST, STIFF, REDDISH BROWN SILT WITH CLAY
Remarks:

Specific Gravity: 2.78
Initial Void Ratio: 0.65
Final Void Ratio: 0.57

Liquid Limit: 0
Plastic Limit: 0
Plasticity Index: 0

Initial Height: 0.75 in
Specimen Diameter: 1.94 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID		RING		
Wt. Container + Wet Soil, gm	92.2	92.2	92	92
Wt. Container + Dry Soil, gm	79.4	79.4	79.4	79.4
Wt. Container, gm	17.9	17.9	17.9	17.9
Wt. Dry Soil, gm	61.5	61.5	61.5	61.5
Water Content, %	20.81	20.81	20.49	20.49
Void Ratio	---	0.65	0.57	---
Degree of Saturation, %	---	89.30	99.05	---
Dry Unit Weight, pcf	---	105.25	110.11	---

CONSOLIDATION TEST DATA

Project: I-8, SECOND TO GREENFIELD
Boring No.: R3
Sample No.: 1-14.5'
Test No.: 05-070-G3

Location: 11-SD-17.4/R18.7
Tested By: KS
Test Date: 03/18/05
Sample Type: BRASS TUBE

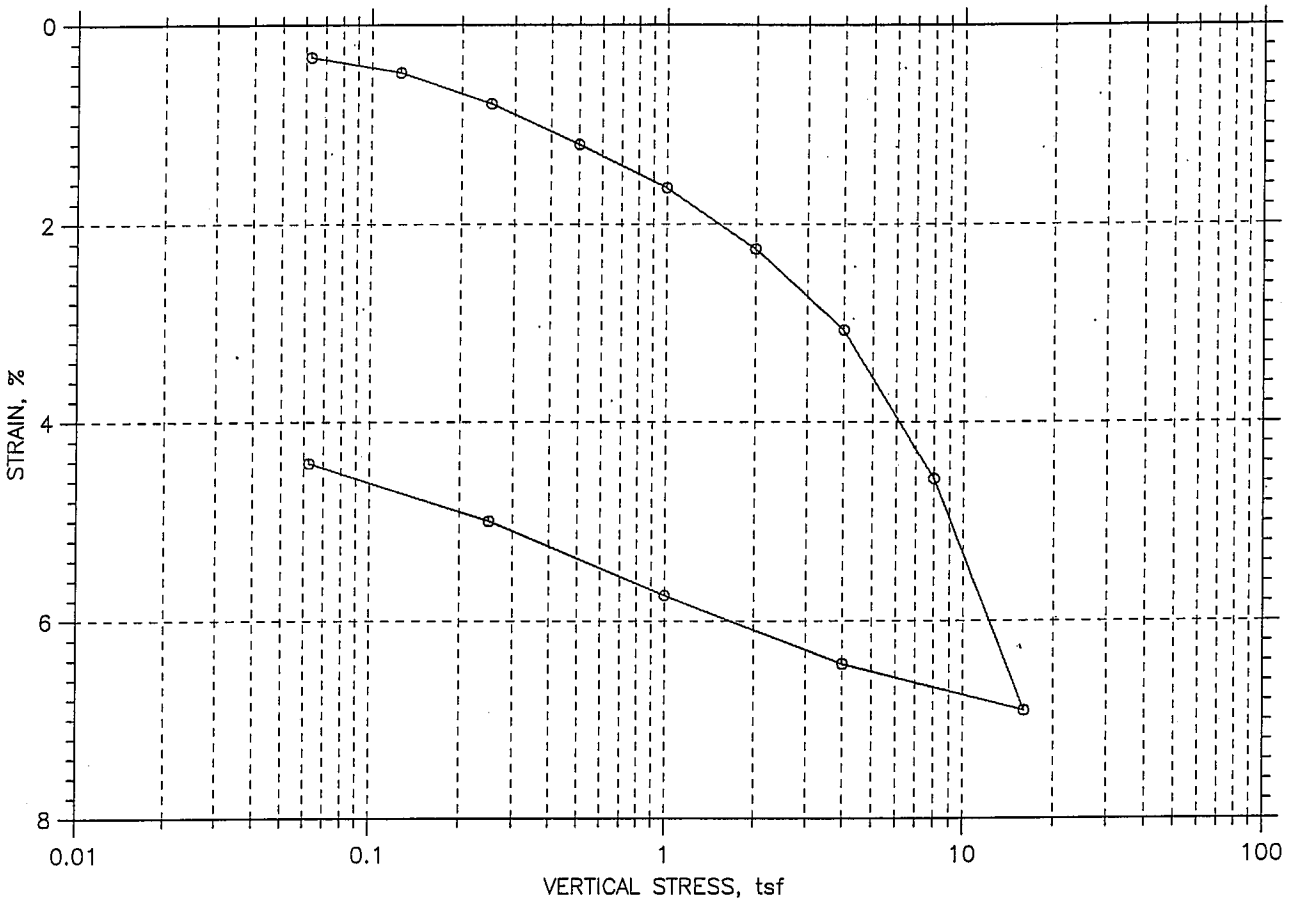
Project No.: 11-063801
Checked By:
Depth: 14.5'
Elevation:

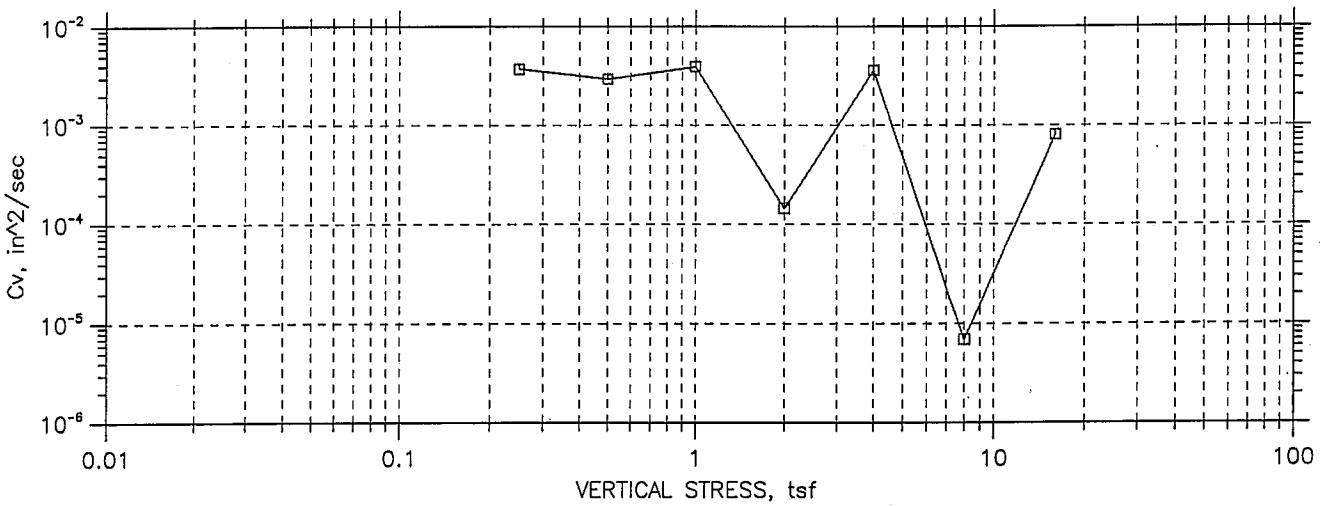
Soil Description: MOIST, STIFF, REDDISH BROWN SILT WITH CLAY
Remarks:

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. in^2/sec	Coefficient of Consolidation Log in^2/sec	Coefficient of Consolidation Ave. in^2/sec
1	0.0625	0.002469	0.642	0.33	0.0	0.0	0.00e+000	0.00e+000	0.00e+000
2	0.125	0.003606	0.639	0.48	0.0	0.0	0.00e+000	0.00e+000	0.00e+000
3	0.25	0.005964	0.634	0.80	0.1	0.0	3.69e-003	0.00e+000	3.69e-003
4	0.5	0.00901	0.627	1.20	0.2	0.0	2.93e-003	0.00e+000	2.93e-003
5	1	0.0123	0.620	1.64	0.1	0.0	3.91e-003	0.00e+000	3.91e-003
6	2	0.0169	0.610	2.25	0.1	6.0	3.12e-003	7.37e-005	1.44e-004
7	4	0.02305	0.597	3.07	0.1	0.0	3.60e-003	0.00e+000	3.60e-003
8	8	0.0343	0.572	4.57	0.4	122.7	1.20e-003	3.49e-006	6.95e-006
9	16	0.0518	0.533	6.91	0.7	0.3	5.90e-004	1.24e-003	8.00e-004
10	4	0.04825	0.541	6.43	0.3	0.0	1.40e-003	0.00e+000	1.40e-003
11	1	0.04307	0.553	5.74	1.5	1.0	2.80e-004	4.16e-004	3.34e-004
12	0.25	0.03748	0.565	5.00	3.8	2.5	1.10e-004	1.64e-004	1.32e-004
13	0.0625	0.03313	0.574	4.42	13.8	17.2	3.05e-005	2.44e-005	2.71e-005

CONSOLIDATION TEST DATA

SUMMARY REPORT



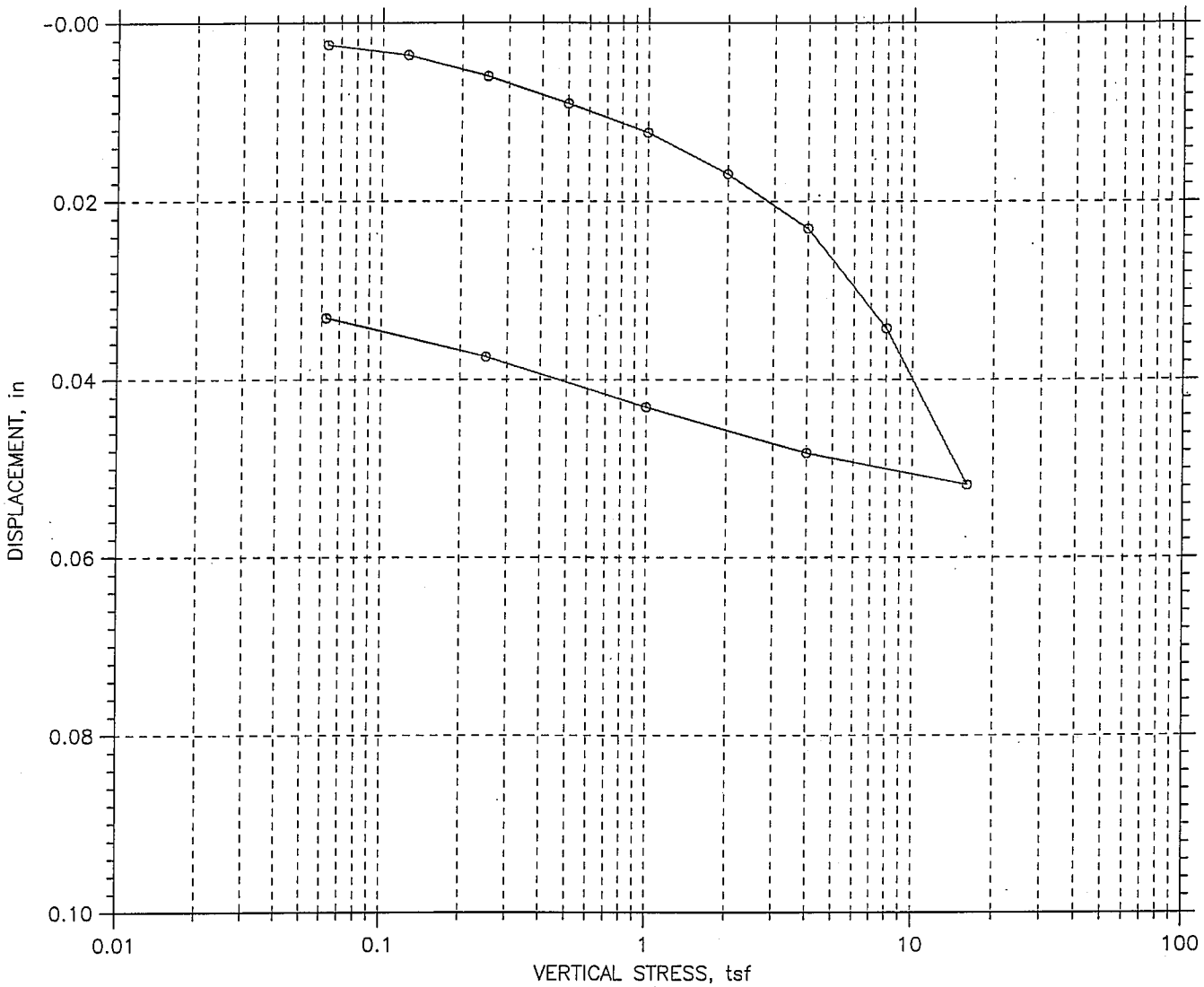


Project: I-8, SECOND TO GREENFIELD	Location: 11-SD-17.4/R18.7	Project No.: 11-063801
Boring No.: R3	Tested By: KS	Checked By:
Sample No.: 1-14.5'	Test Date: 03/18/05	Depth: 14.5'
Test No.: 05-070-G3	Sample Type: BRASS TUBE	Elevation:
Description: MOIST, STIFF, REDDISH BROWN SILT WITH CLAY		
Remarks:		

Fri 25-MAR-2005 14:39:58

CONSOLIDATION TEST DATA

SUMMARY REPORT



					Before Test	After Test
Overburden Pressure, tsf:				Water Content, %	20.81	20.49
Preconsolidation Pressure, tsf:				Dry Unit Weight, pcf	105.25	110.11
Compression Index:				Saturation, %	89.30	99.05
Diameter: 1.944 in		Height: 0.75 in		Void Ratio	0.65	0.57
LL: 0	PL: 0	PI: 0	GS: 2.78			

Project: I-8, SECOND TO GREENFIELD	Location: 11-SD-17.4/R18.7	Project No.: 11-063801
Boring No.: R3	Tested By: KS	Checked By:
Sample No.: 1-14.5'	Test Date: 03/18/05	Depth: 14.5'
Test No.: 05-070-G3	Sample Type: BRASS TUBE	Elevation:
Description: MOIST, STIFF, REDDISH BROWN SILT WITH CLAY		
Remarks:		

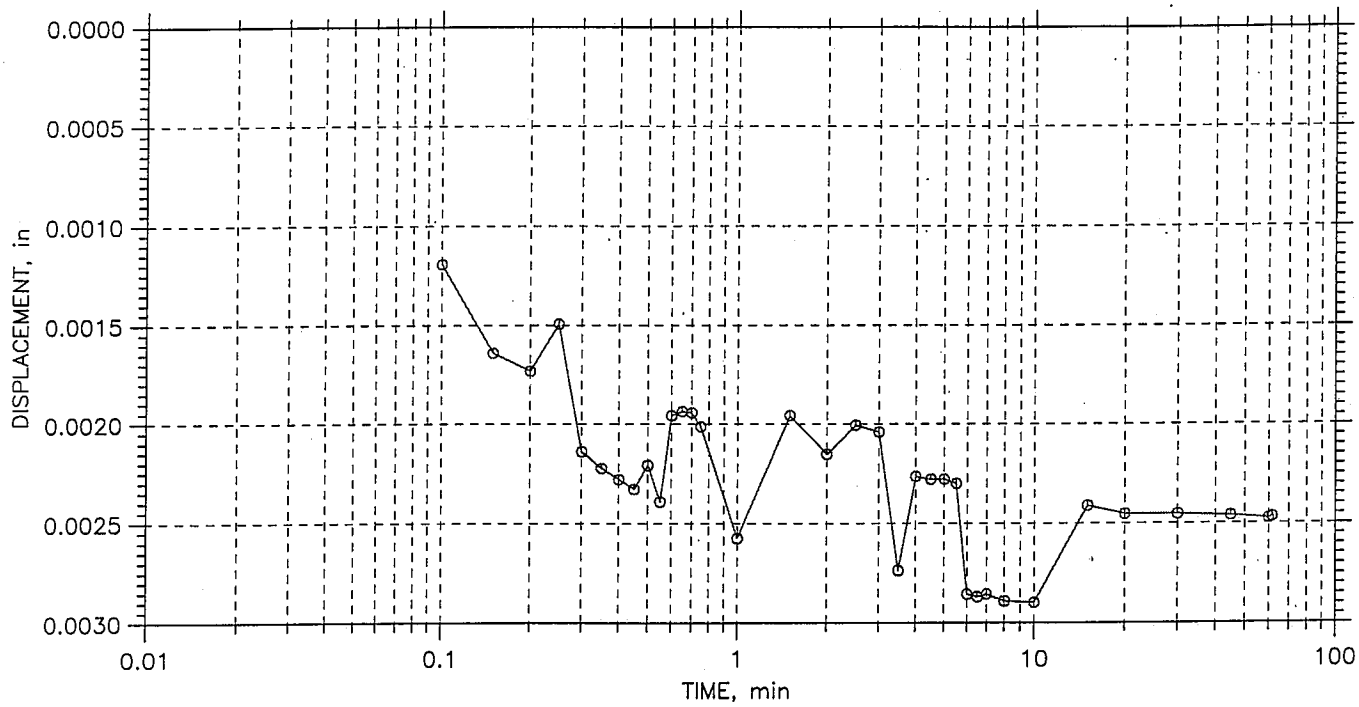
Fri 25-MAR-2005 14:40:06

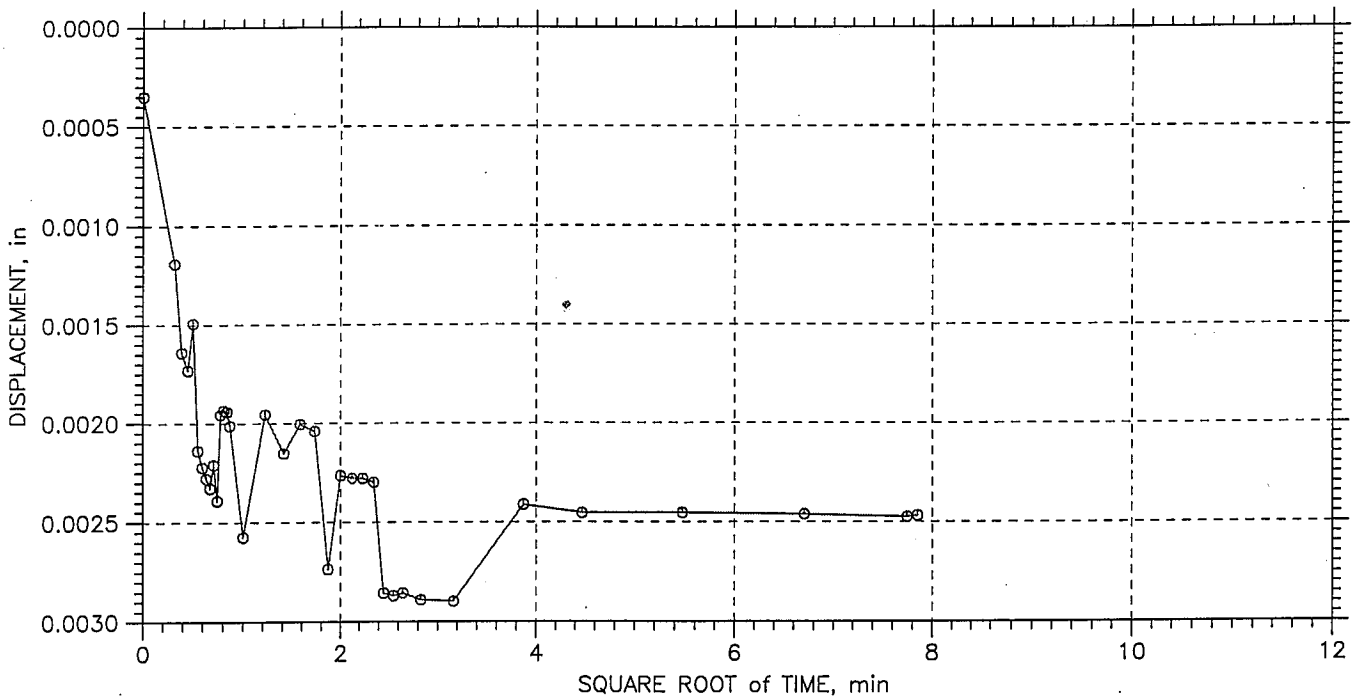
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 1 of 13

Stress: 6.25e-002 tsf





Project: I-8, SECOND TO GREENFIELD	Location: 11-SD-17.4/R18.7	Project No.: 11-063801
Boring No.: R3	Tested By: KS	Checked By:
Sample No.: 1-14.5'	Test Date: 03/18/05	Depth: 14.5'
Test No.: 05-070-G3	Sample Type: BRASS TUBE	Elevation:
Description: MOIST, STIFF, REDDISH BROWN SILT WITH CLAY		
Remarks:		

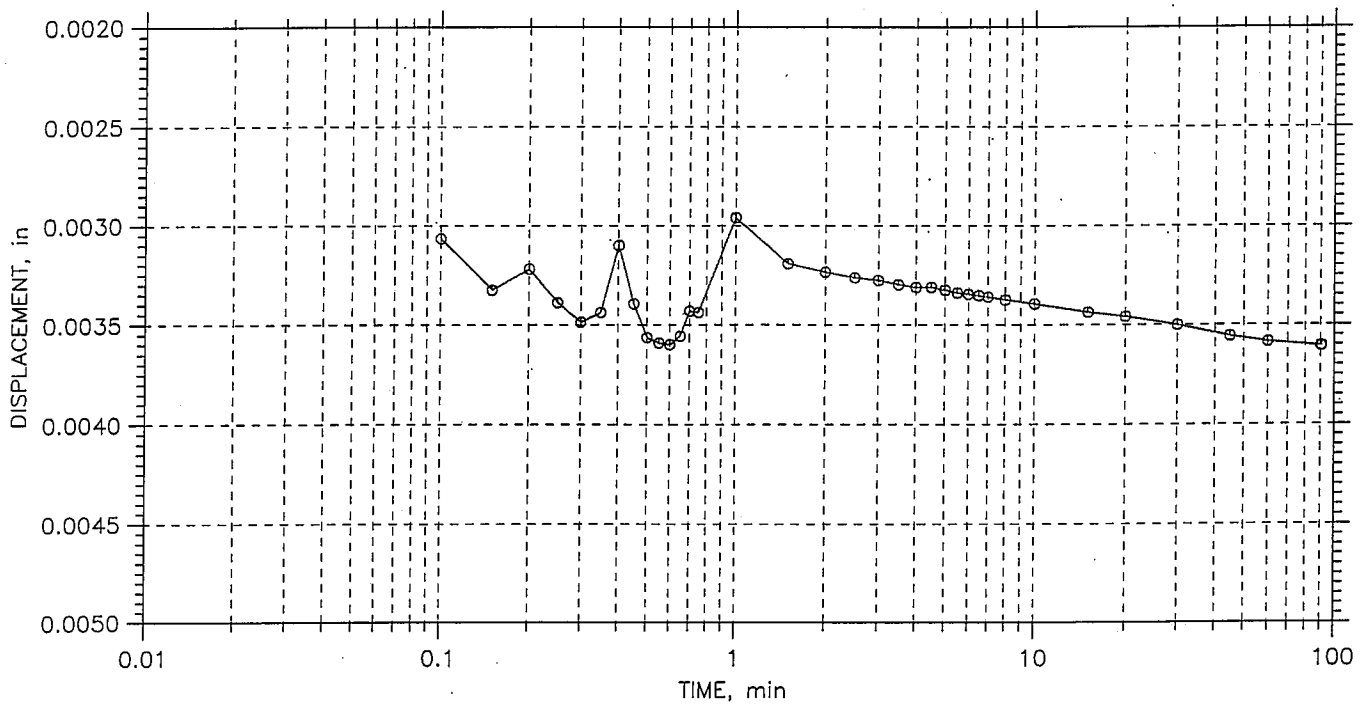
Fri 25-MAR-2005 14:40:06

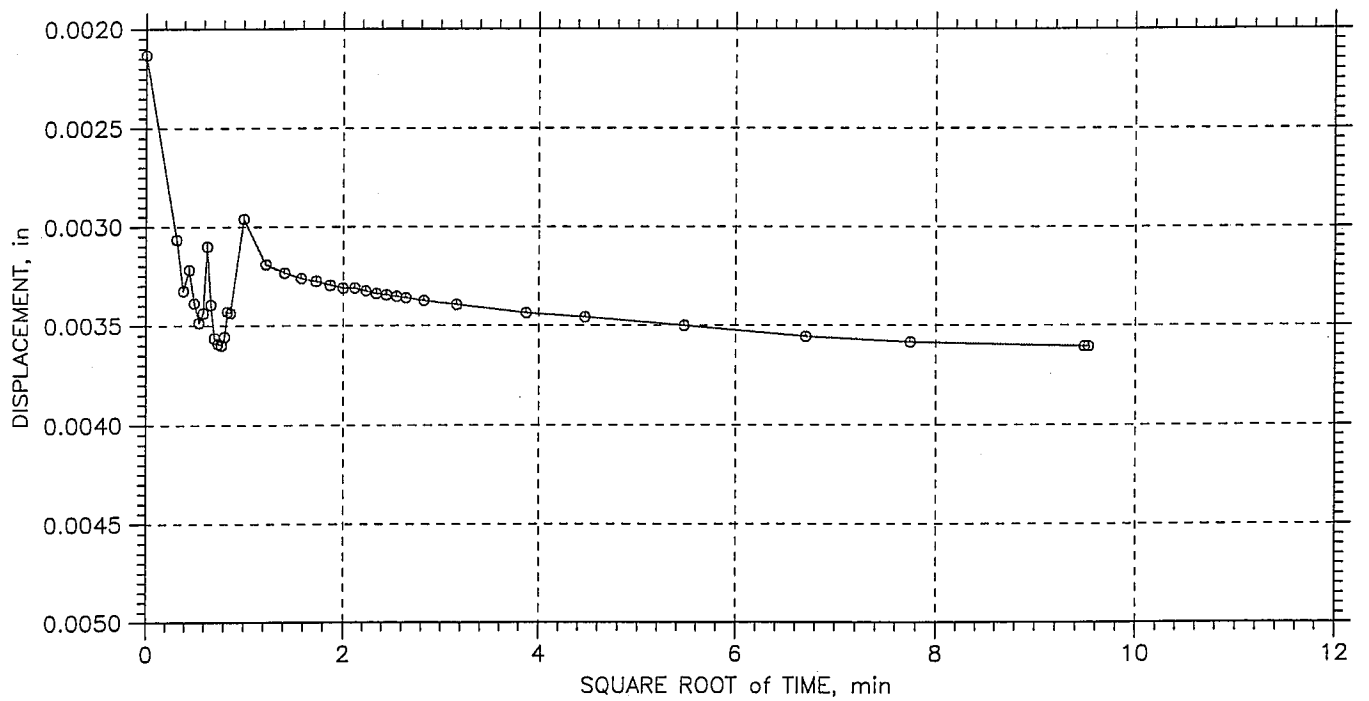
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 2 of 13

Stress: 0.125 tsf





Project: I-8, SECOND TO GREENFIELD	Location: 11-SD-17.4/R18.7	Project No.: 11-063801
Boring No.: R3	Tested By: KS	Checked By:
Sample No.: 1-14.5'	Test Date: 03/18/05	Depth: 14.5'
Test No.: 05-070-G3	Sample Type: BRASS TUBE	Elevation:
Description: MOIST, STIFF, REDDISH BROWN SILT WITH CLAY		
Remarks:		

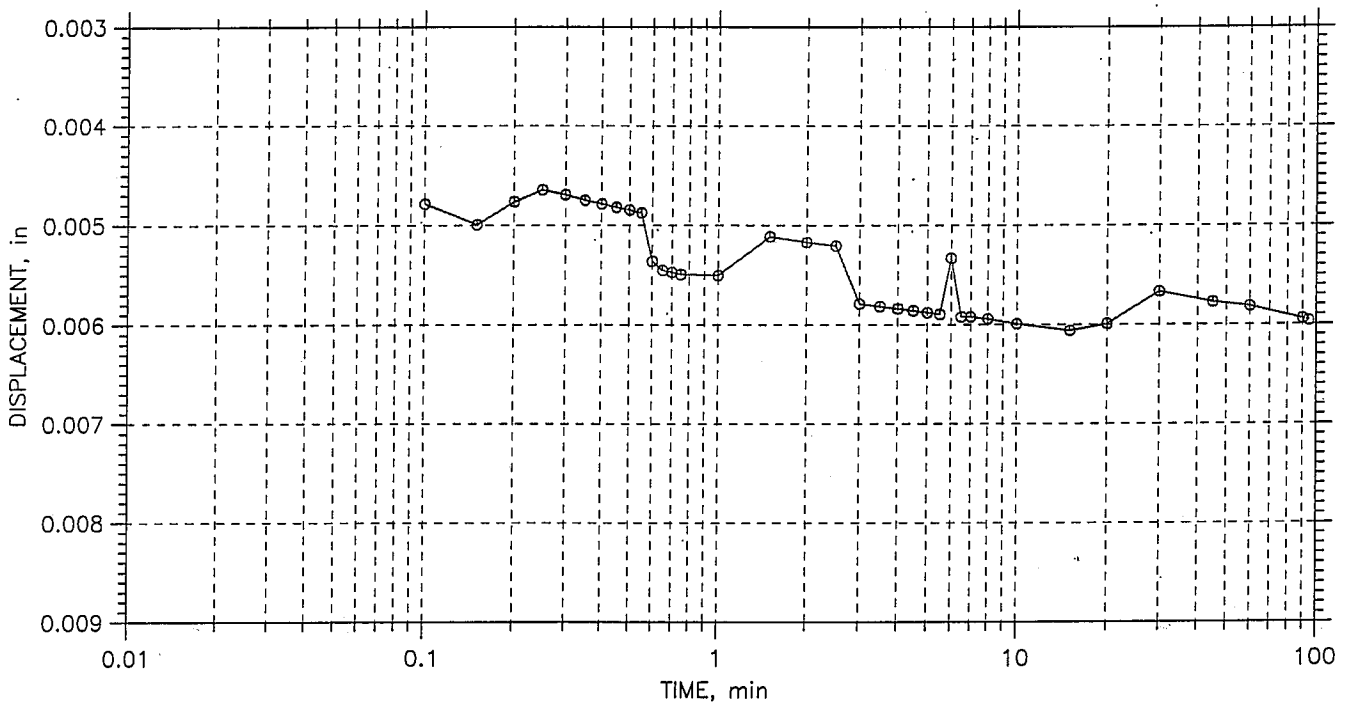
Fri 25-MAR-2005 14:40:06

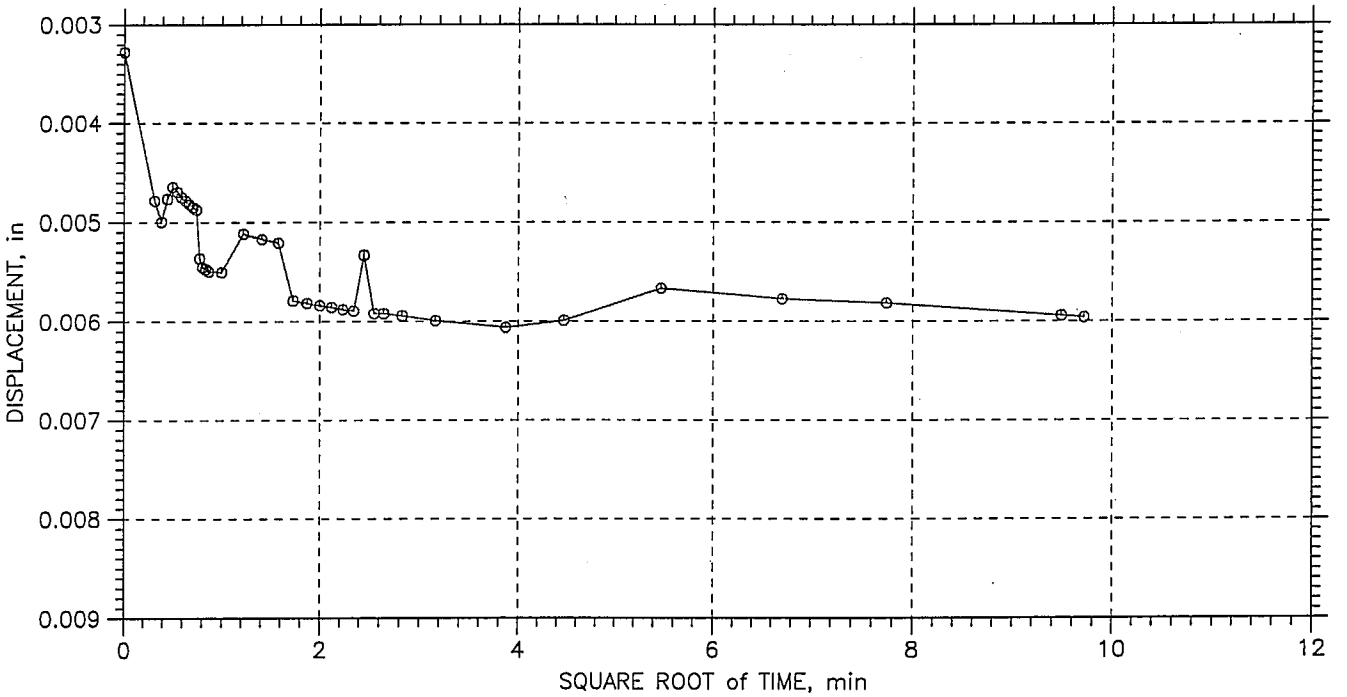
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 3 of 13

Stress: 0.25 tsf





Project: I-8, SECOND TO GREENFIELD	Location: 11-SD-17.4/R18.7	Project No.: 11-063801
Boring No.: R3	Tested By: KS	Checked By:
Sample No.: 1-14.5'	Test Date: 03/18/05	Depth: 14.5'
Test No.: 05-070-G3	Sample Type: BRASS TUBE	Elevation:
Description: MOIST, STIFF, REDDISH BROWN SILT WITH CLAY		
Remarks:		

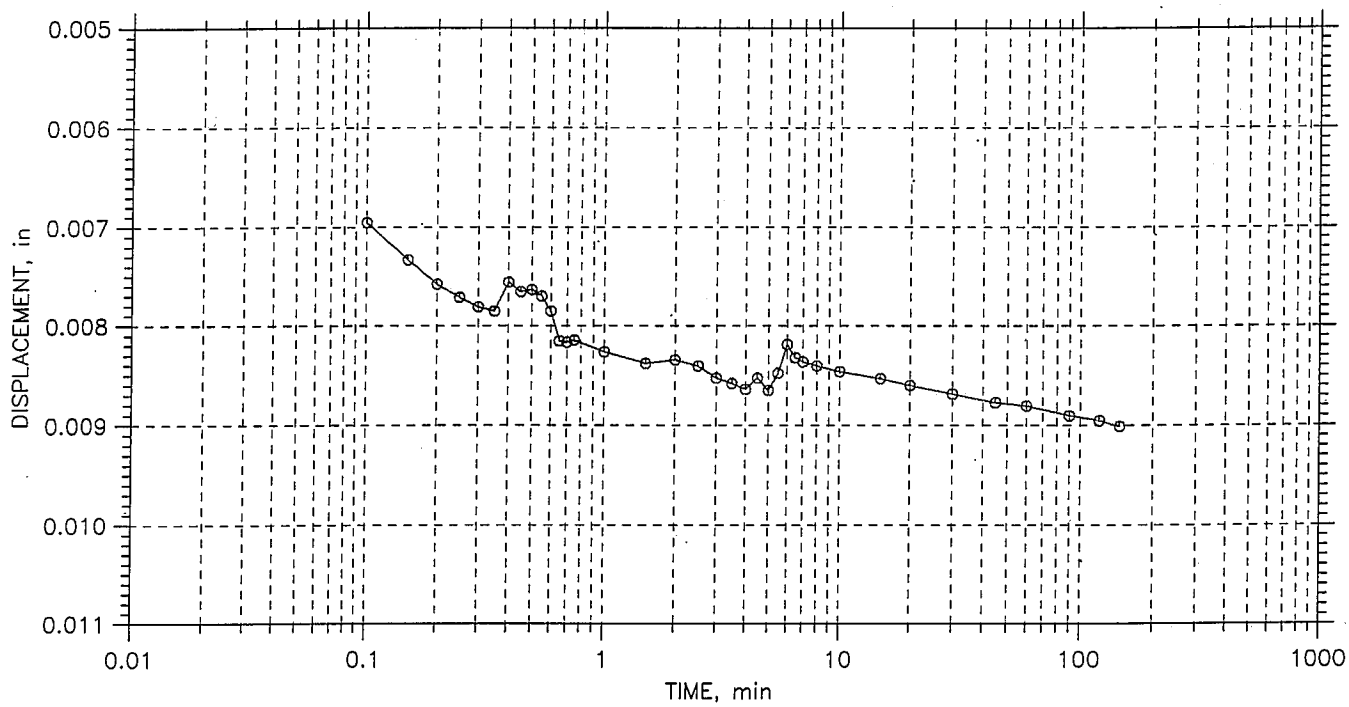
Fri 25-MAR-2005 14:40:06

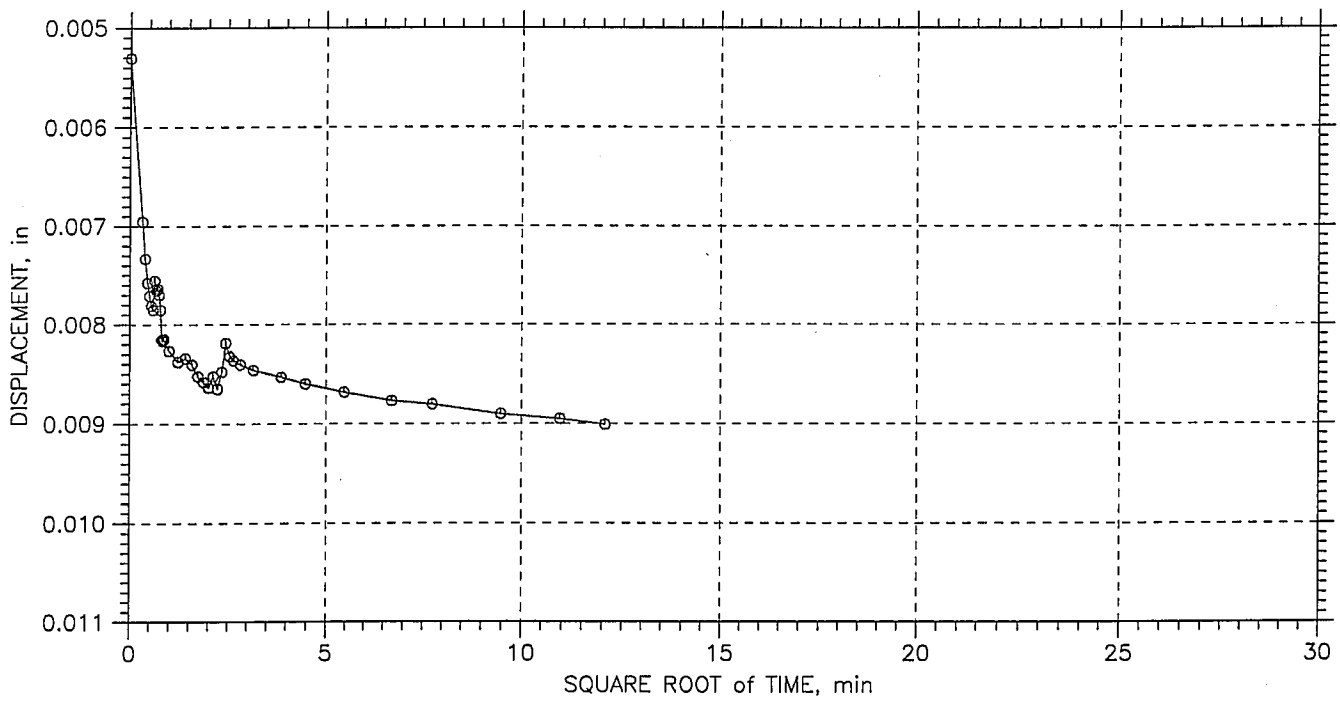
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 4 of 13

Stress: 0.5 tsf





Project: I-8, SECOND TO GREENFIELD	Location: 11-SD-17.4/R18.7	Project No.: 11-063801
Boring No.: R3	Tested By: KS	Checked By:
Sample No.: 1-14.5'	Test Date: 03/18/05	Depth: 14.5'
Test No.: 05-070-G3	Sample Type: BRASS TUBE	Elevation:
Description: MOIST, STIFF, REDDISH BROWN SILT WITH CLAY		
Remarks:		

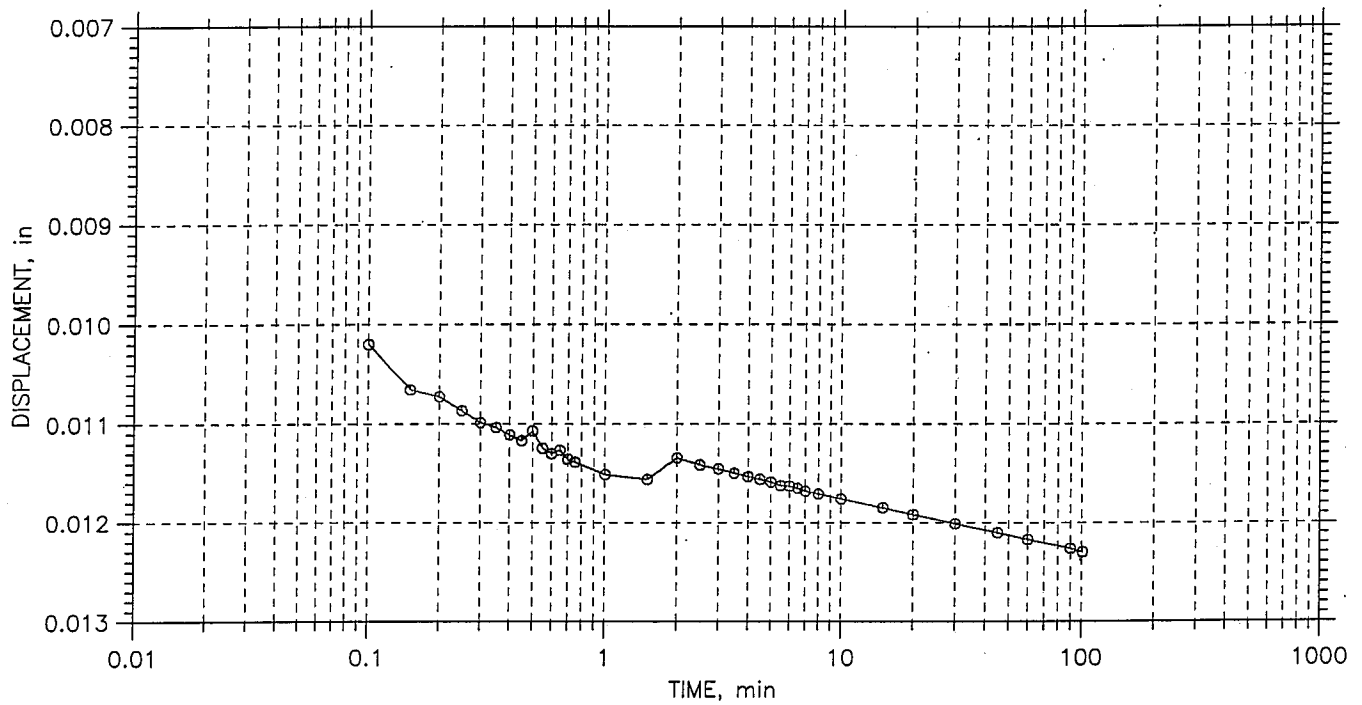
Fri 25-MAR-2005 14:40:07

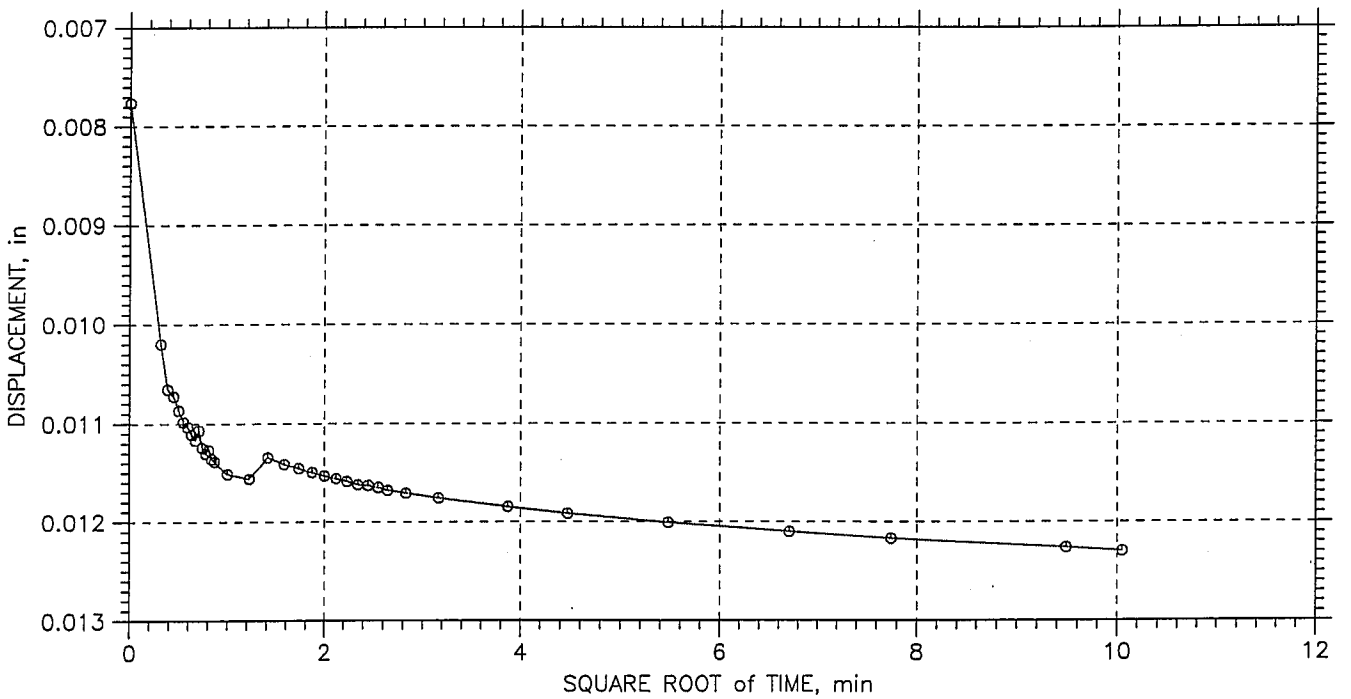
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 5 of 13

Stress: 1. tsf





Project: I-8, SECOND TO GREENFIELD	Location: 11-SD-17.4/R18.7	Project No.: 11-063801
Boring No.: R3	Tested By: KS	Checked By:
Sample No.: 1-14.5'	Test Date: 03/18/05	Depth: 14.5'
Test No.: 05-070-G3	Sample Type: BRASS TUBE	Elevation:
Description: MOIST, STIFF, REDDISH BROWN SILT WITH CLAY		
Remarks:		

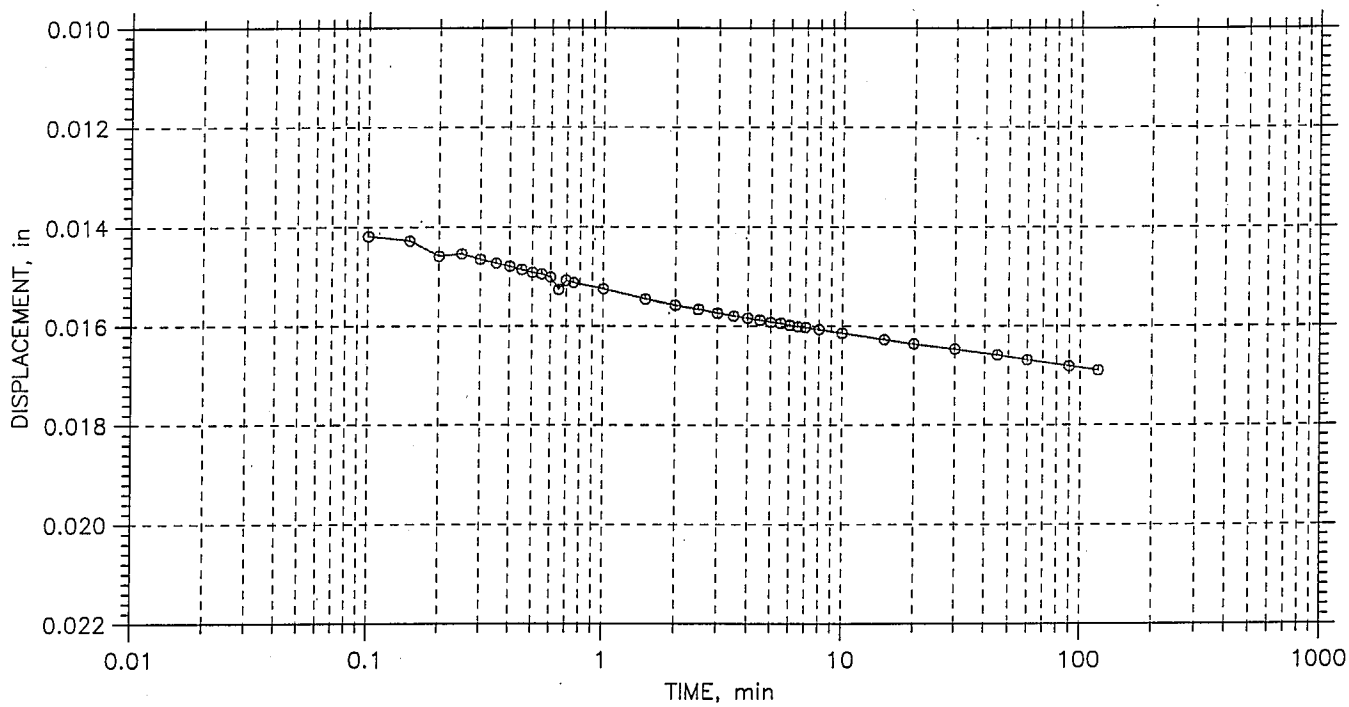
Fri 25-MAR-2005 14:40:07

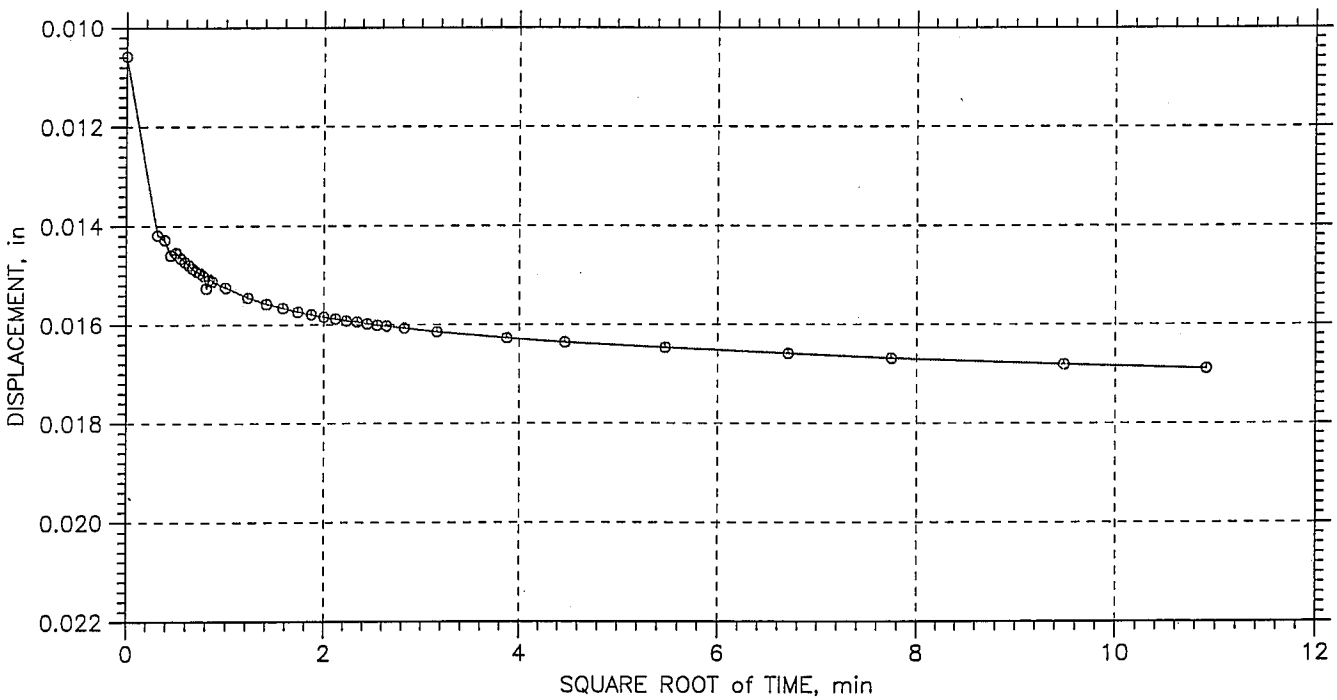
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 6 of 13

Stress: 2. tsf





Project: I-8, SECOND TO GREENFIELD	Location: 11-SD-17.4/R18.7	Project No.: 11-063801
Boring No.: R3	Tested By: KS	Checked By:
Sample No.: 1-14.5'	Test Date: 03/18/05	Depth: 14.5'
Test No.: 05-070-G3	Sample Type: BRASS TUBE	Elevation:
Description: MOIST, STIFF, REDDISH BROWN SILT WITH CLAY		
Remarks:		

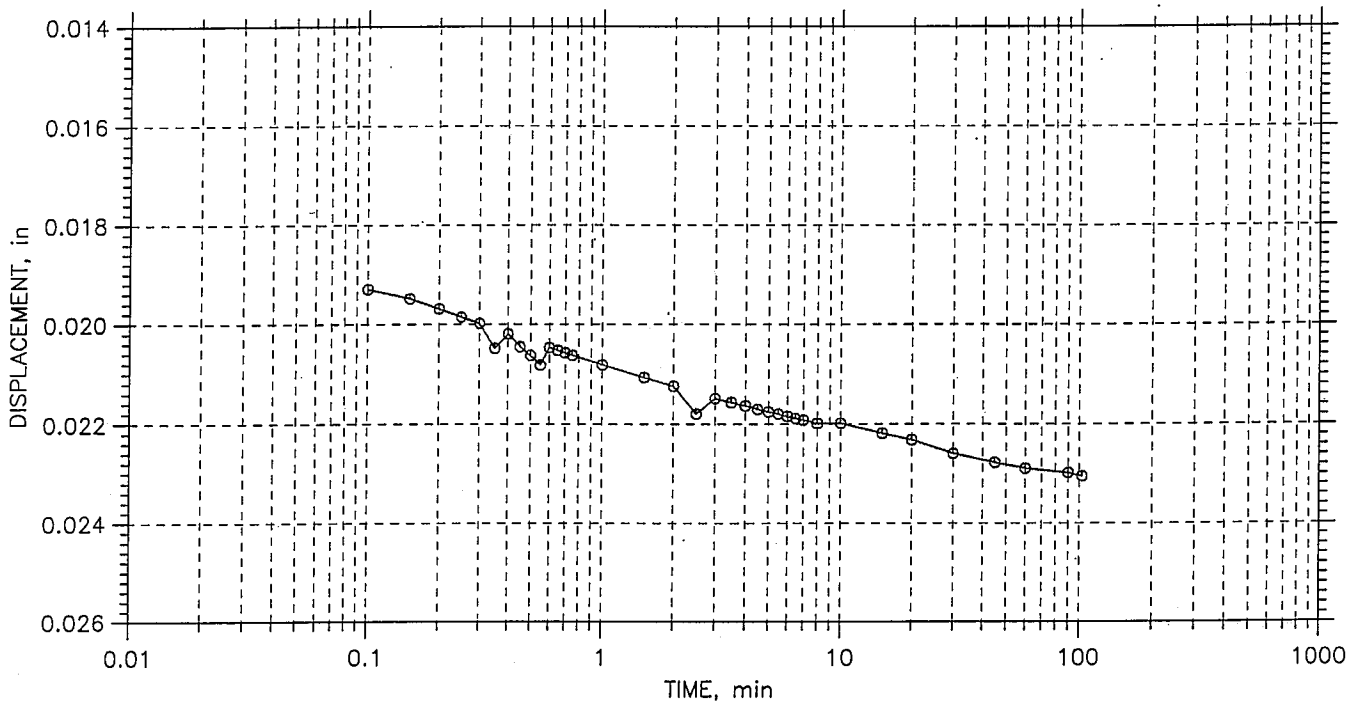
Fri 25-MAR-2005 14:40:07

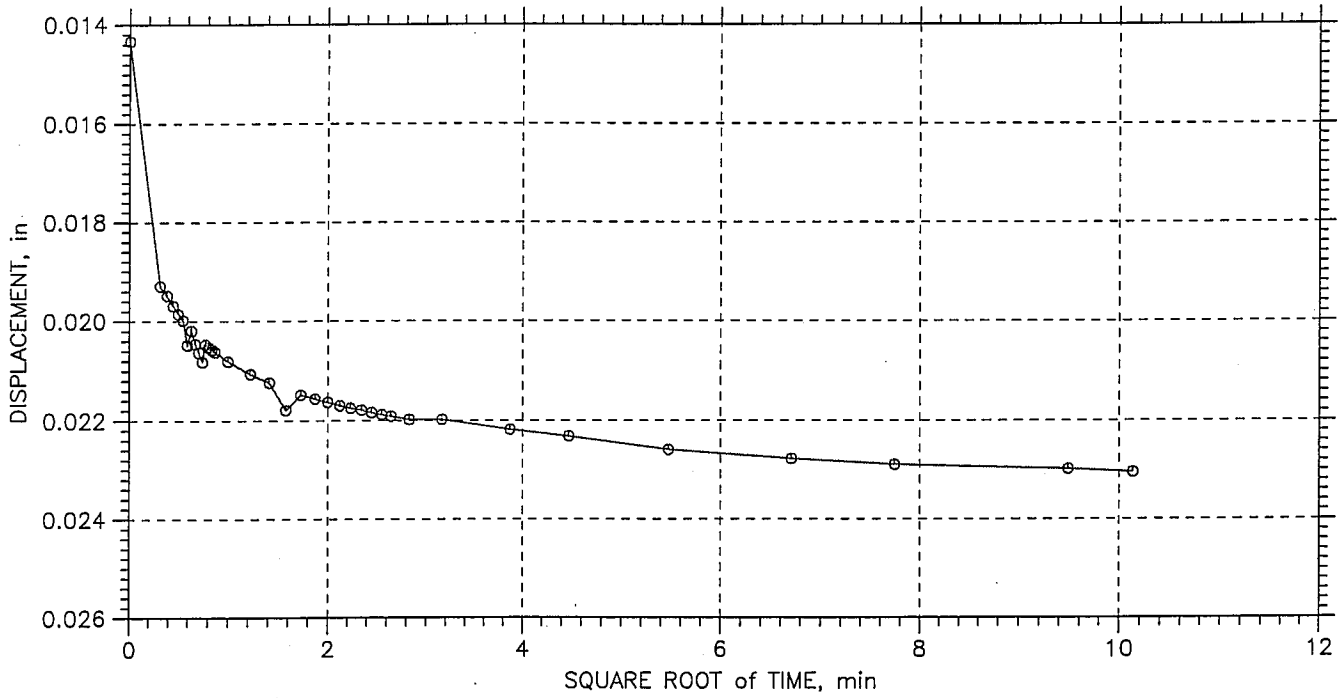
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 7 of 13

Stress: 4. tsf





Project: I-8, SECOND TO GREENFIELD	Location: 11-SD-17.4/R18.7	Project No.: 11-063801
Boring No.: R3	Tested By: KS	Checked By:
Sample No.: 1-14.5'	Test Date: 03/18/05	Depth: 14.5'
Test No.: 05-070-G3	Sample Type: BRASS TUBE	Elevation:
Description: MOIST, STIFF, REDDISH BROWN SILT WITH CLAY		
Remarks:		

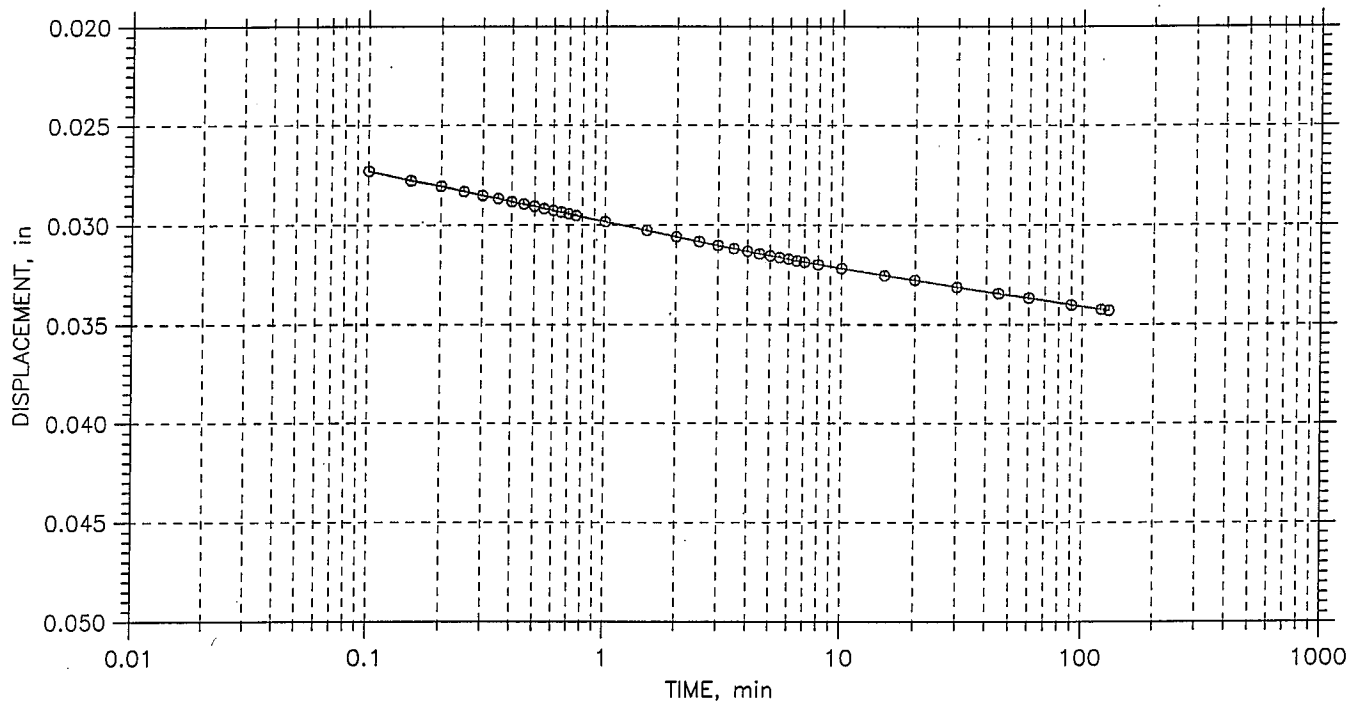
Fri 25-MAR-2005 14:40:07

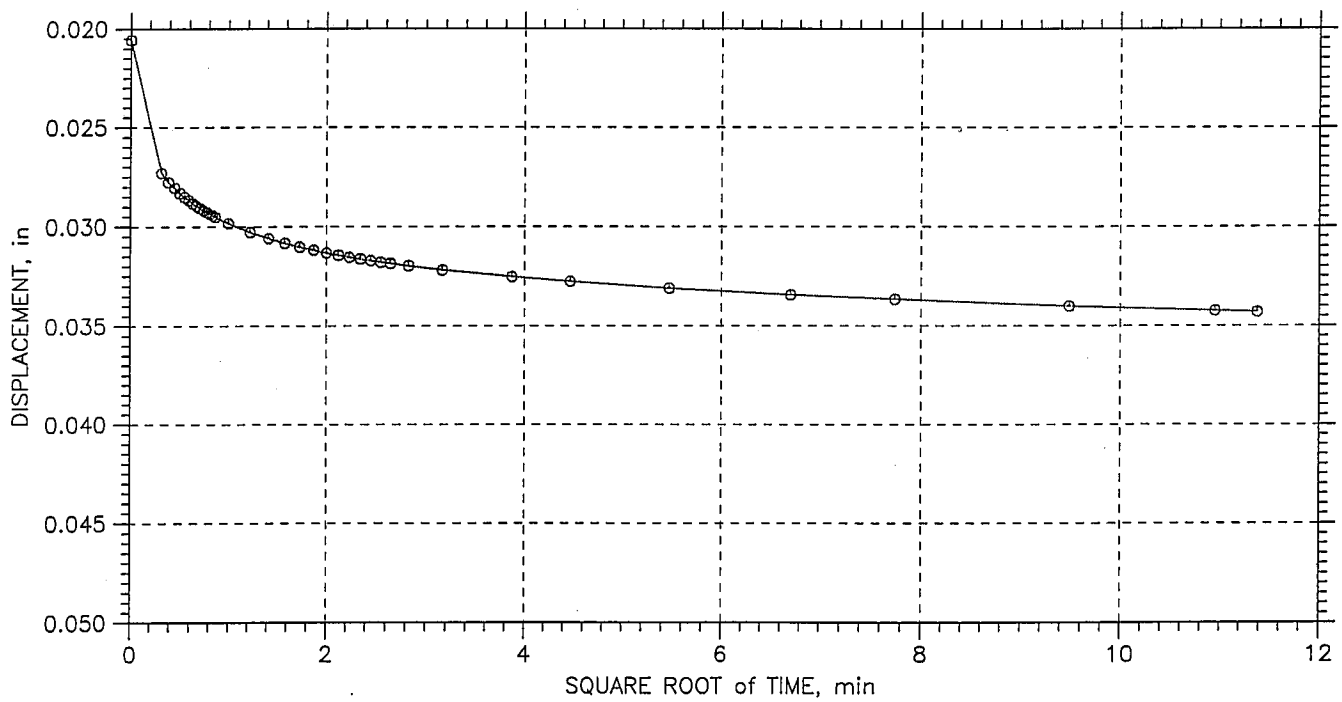
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 8 of 13

Stress: 8. tsf





Project: I-8, SECOND TO GREENFIELD	Location: 11-SD-17.4/R18.7	Project No.: 11-063801
Boring No.: R3	Tested By: KS	Checked By:
Sample No.: 1-14.5'	Test Date: 03/18/05	Depth: 14.5'
Test No.: 05-070-G3	Sample Type: BRASS TUBE	Elevation:
Description: MOIST, STIFF, REDDISH BROWN SILT WITH CLAY		
Remarks:		

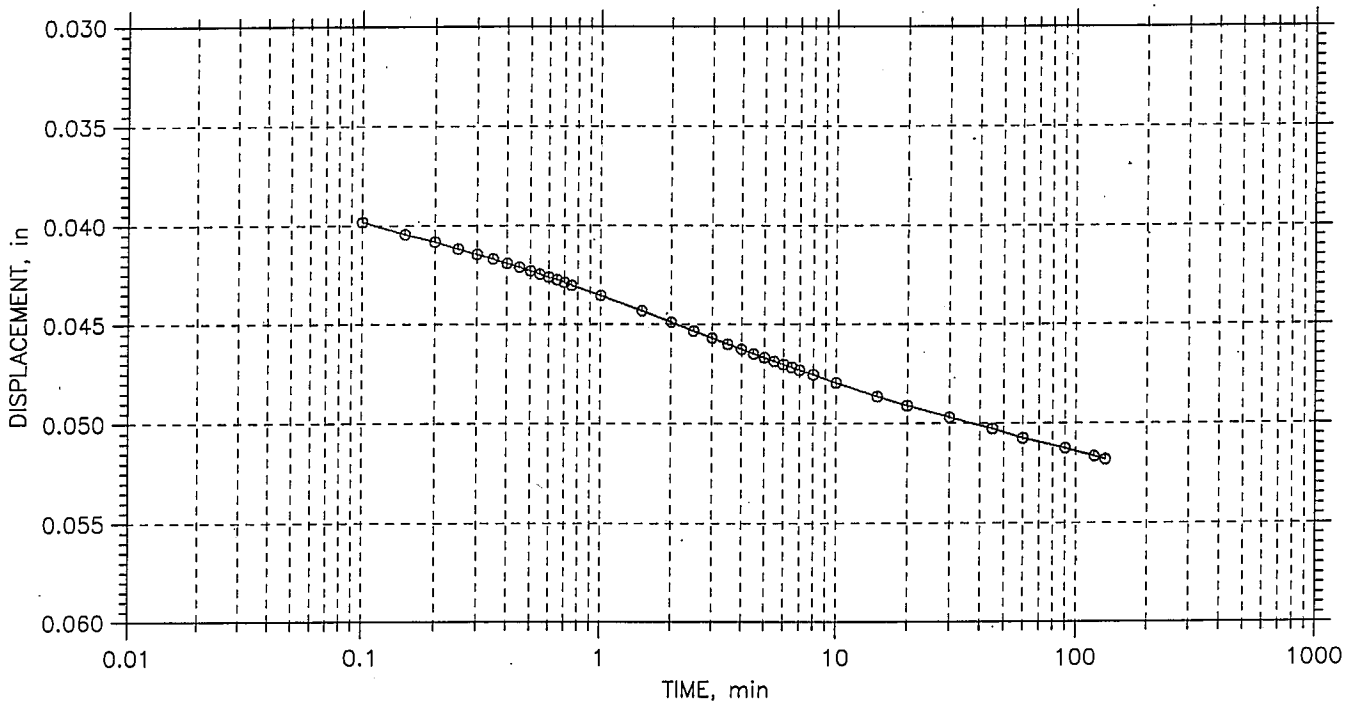
Fri 25-MAR-2005 14:40:07

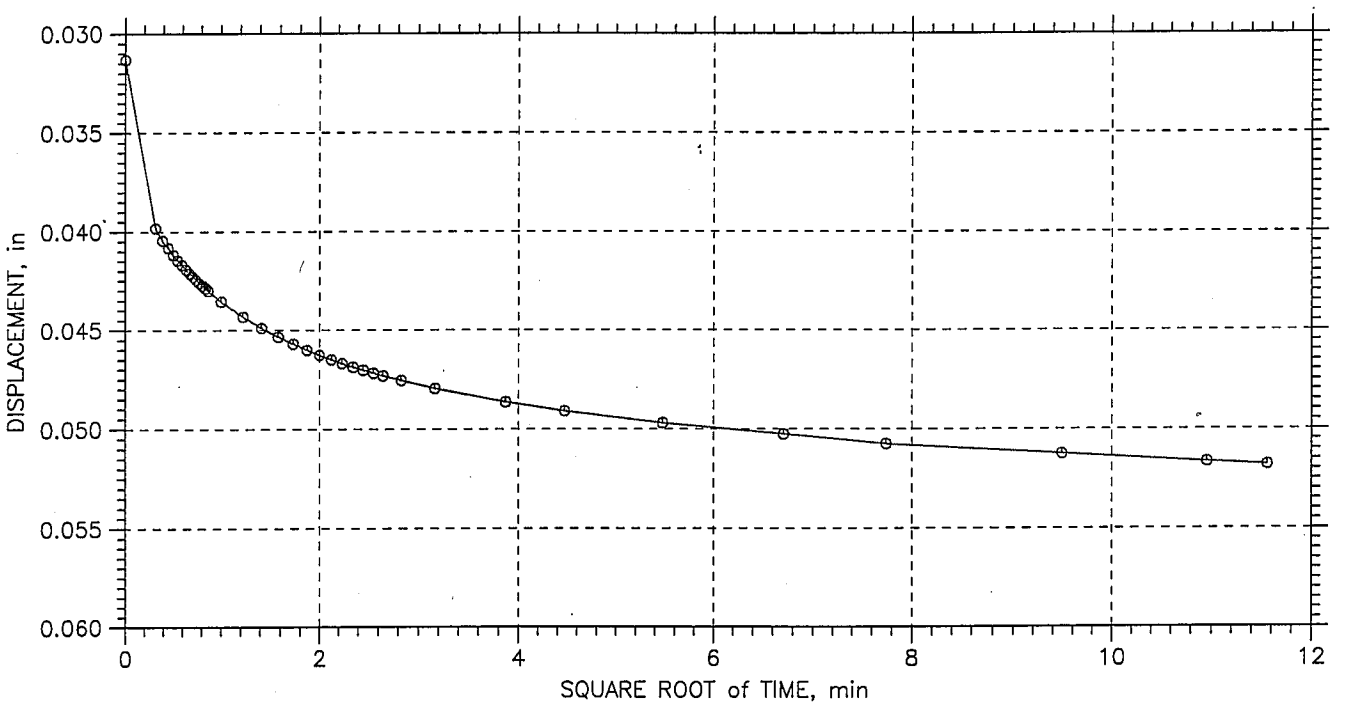
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 9 of 13

Stress: 16. tsf





Project: I-8, SECOND TO GREENFIELD	Location: 11-SD-17.4/R18.7	Project No.: 11-063801
Boring No.: R3	Tested By: KS	Checked By:
Sample No.: 1-14.5'	Test Date: 03/18/05	Depth: 14.5'
Test No.: 05-070-G3	Sample Type: BRASS TUBE	Elevation:
Description: MOIST, STIFF, REDDISH BROWN SILT WITH CLAY		
Remarks:		

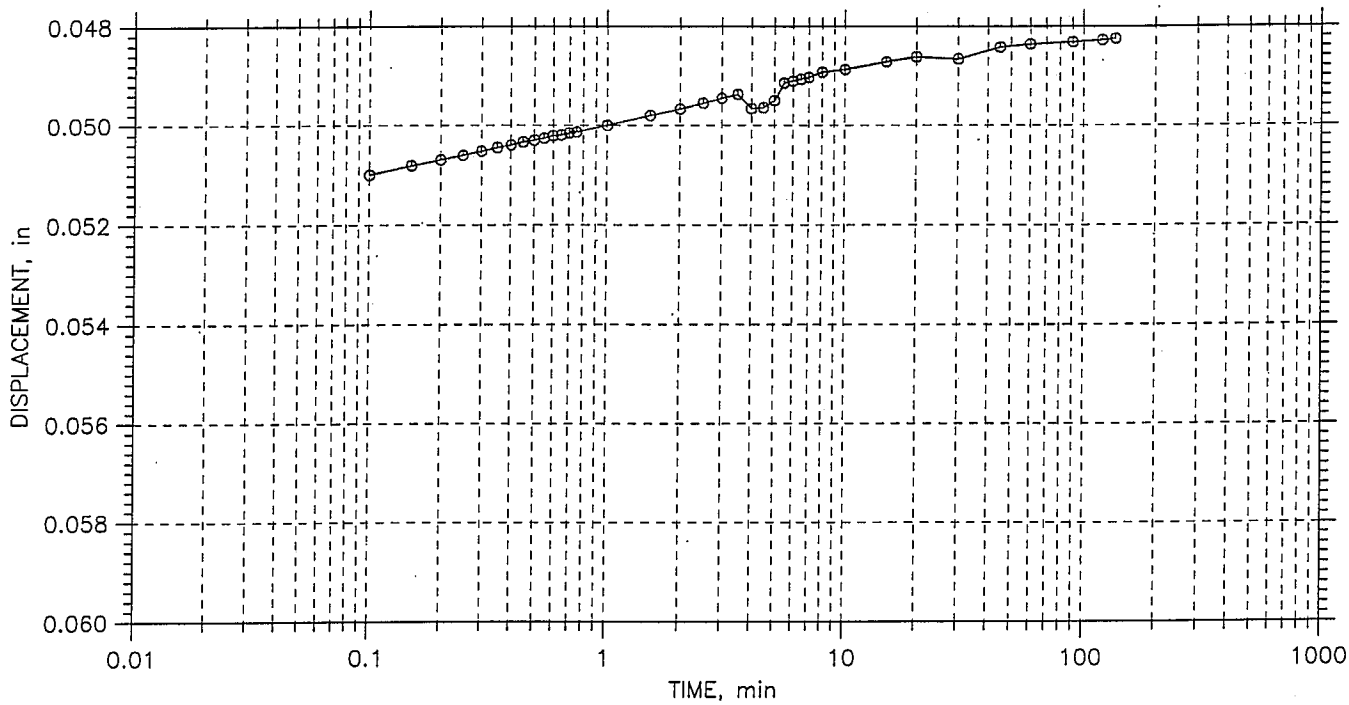
Fri 25-MAR-2005 14:40:07

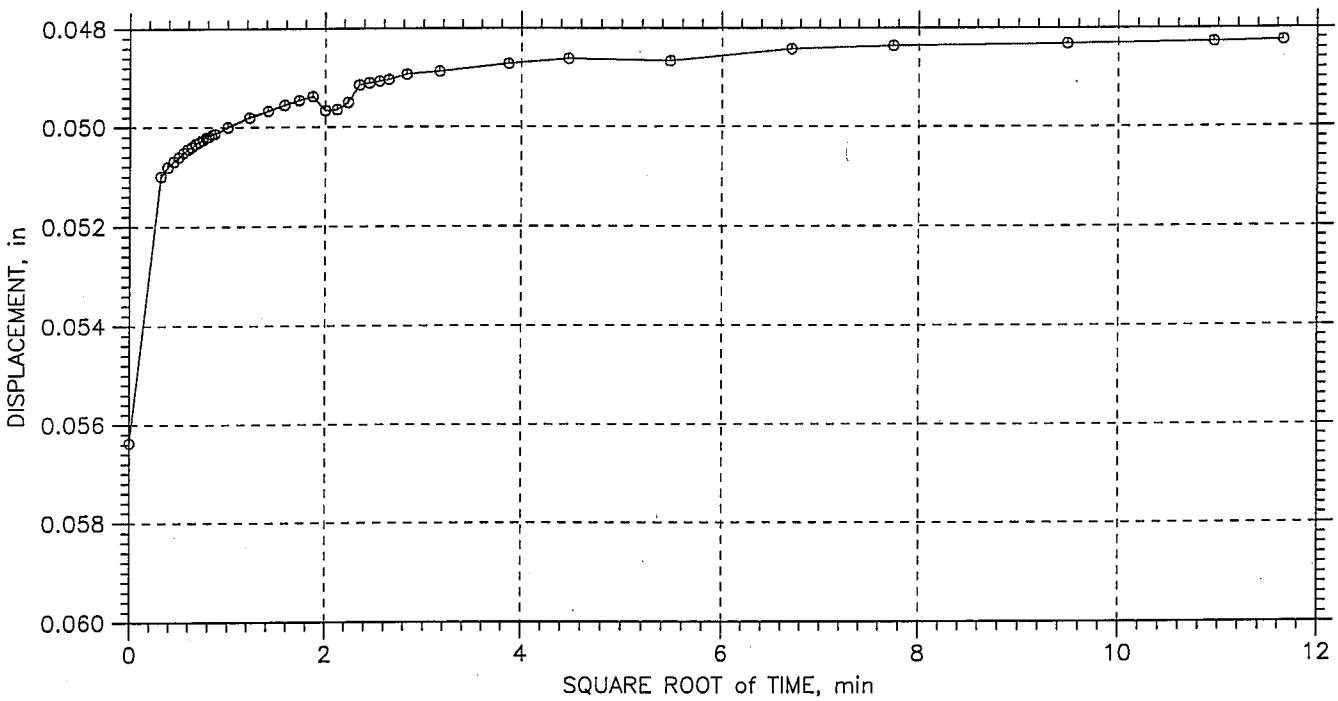
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 10 of 13

Stress: 4. tsf





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Boring No.: R3	Tested By: KS	Checked By:
Sample No.: 1-14.5'	Test Date: 03/18/05	Depth: 14.5'
Test No.: 05-070-G3	Sample Type: BRASS TUBE	Elevation:
Description: MOIST, STIFF, REDDISH BROWN SILT WITH CLAY		
Remarks:		

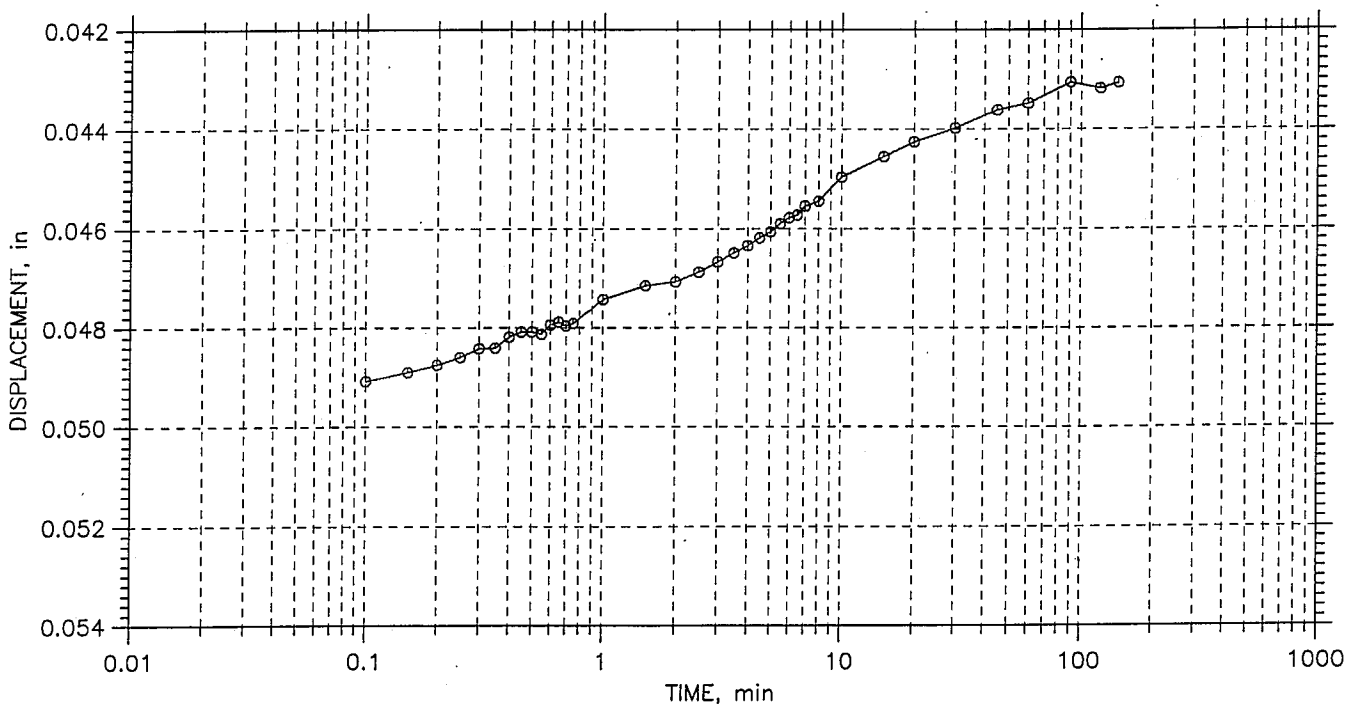
Fri 25-MAR-2005 14:40:07

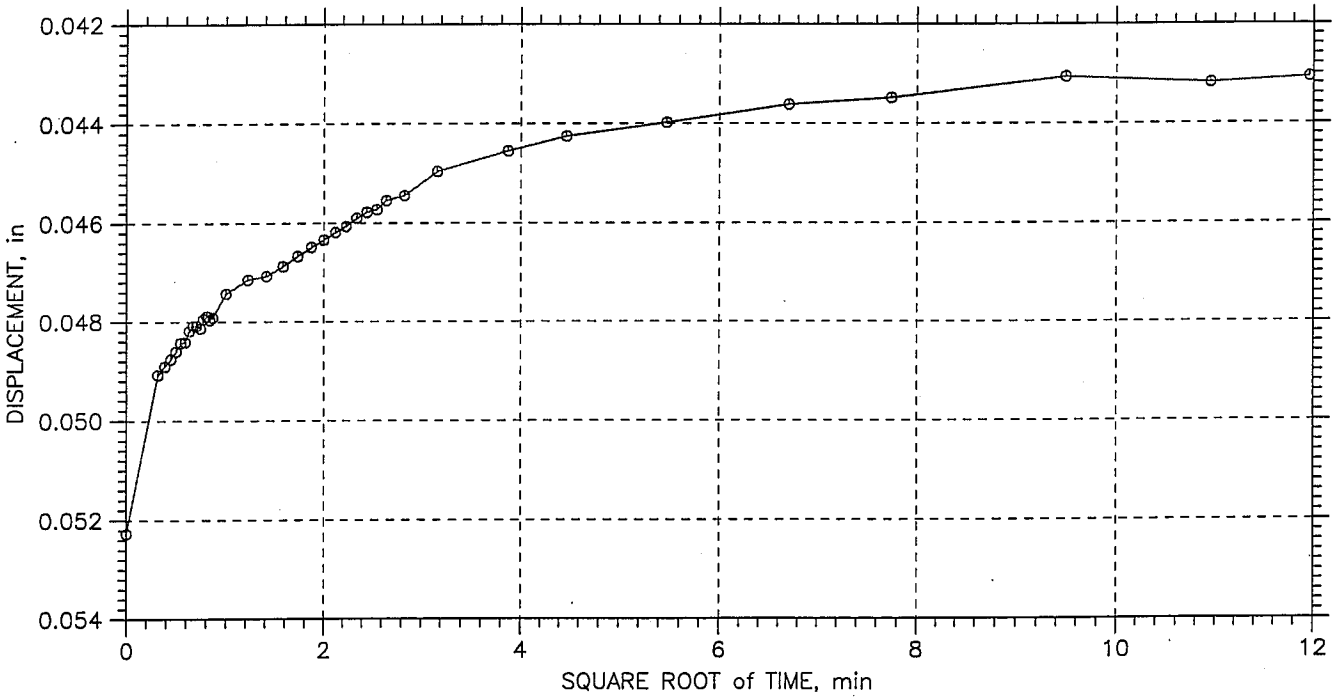
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 11 of 13

Stress: 1. tsf





Project: I-8, SECOND TO GREENFIELD	Location: 11-SD-17.4/R18.7	Project No.: 11-063801
Boring No.: R3	Tested By: KS	Checked By:
Sample No.: 1-14.5'	Test Date: 03/18/05	Depth: 14.5'
Test No.: 05-070-G3	Sample Type: BRASS TUBE	Elevation:
Description: MOIST, STIFF, REDDISH BROWN SILT WITH CLAY		
Remarks:		

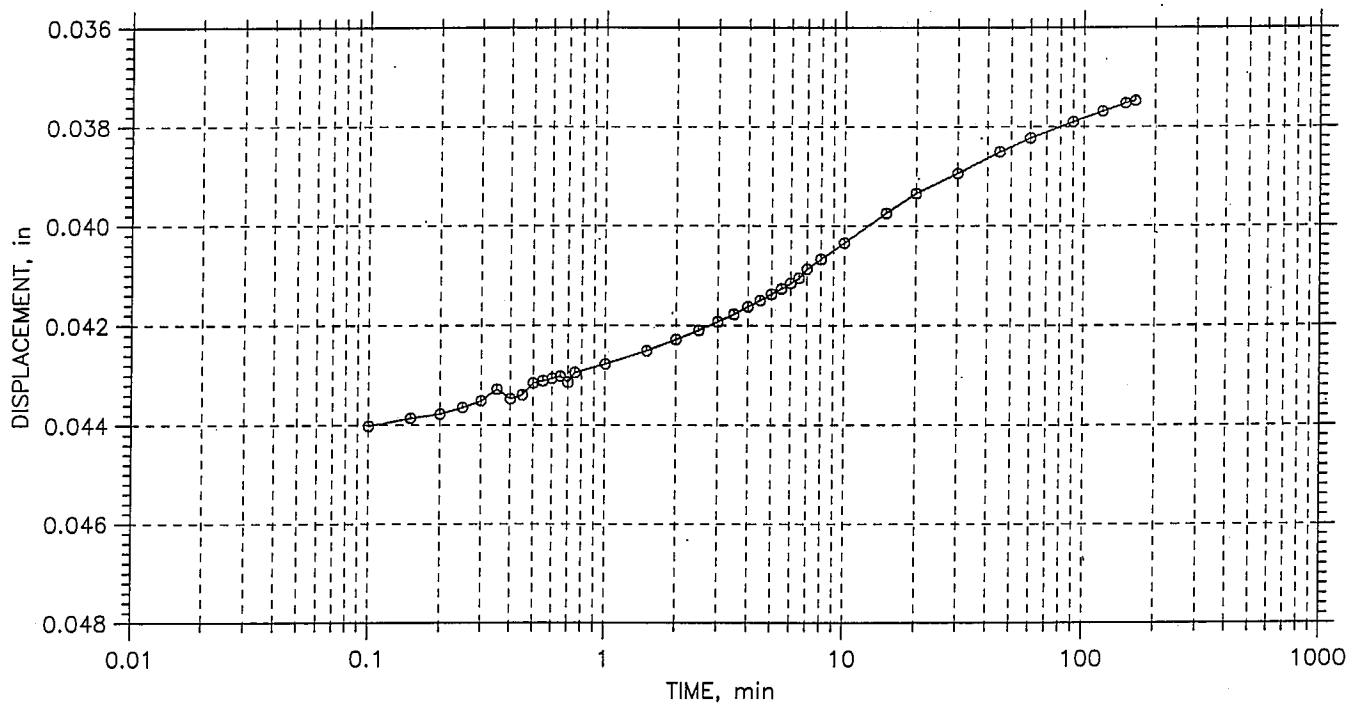
Fri, 25-MAR-2005 14:40:07

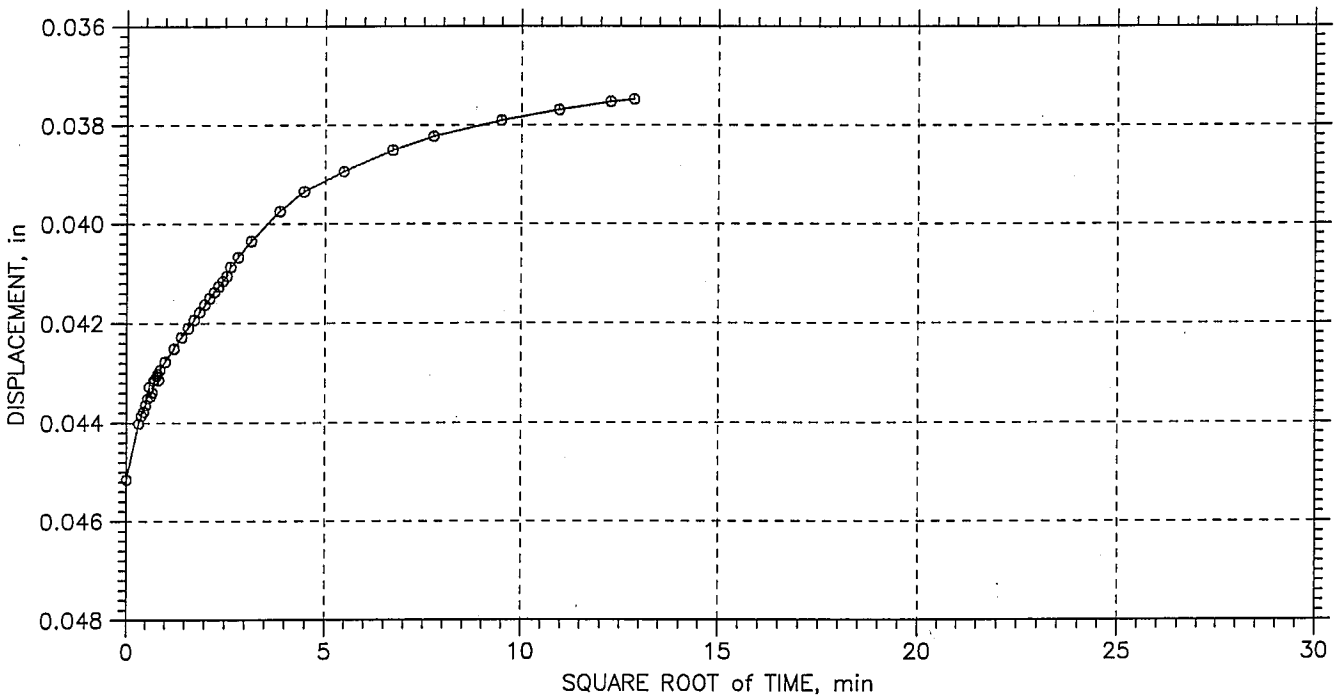
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 12 of 13

Stress: 0.25 tsf





Project: I-8, SECOND TO GREENFIELD	Location: 11-SD-17.4/R18.7	Project No.: 11-063801
Boring No.: R3	Tested By: KS	Checked By:
Sample No.: 1-14.5'	Test Date: 03/18/05	Depth: 14.5'
Test No.: 05-070-G3	Sample Type: BRASS TUBE	Elevation:
Description: MOIST, STIFF, REDDISH BROWN SILT WITH CLAY		
Remarks:		

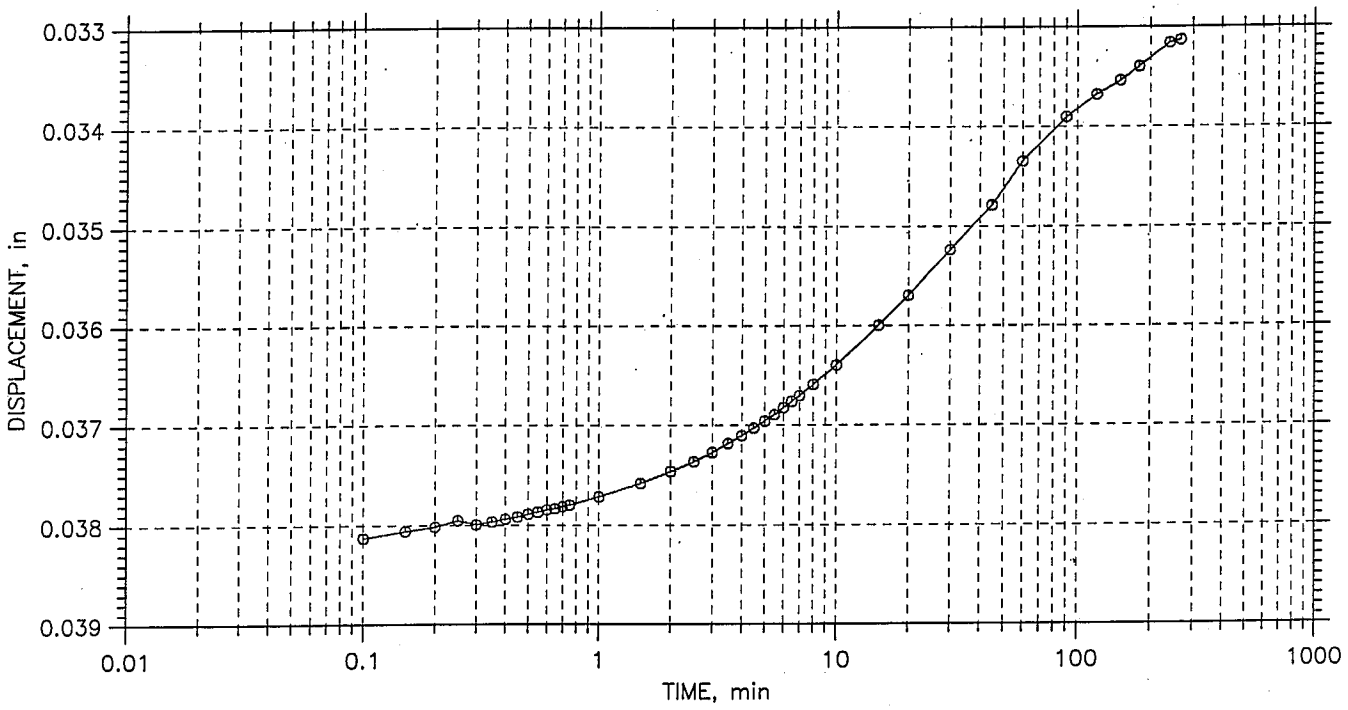
Fri 25-MAR-2005 14:40:07

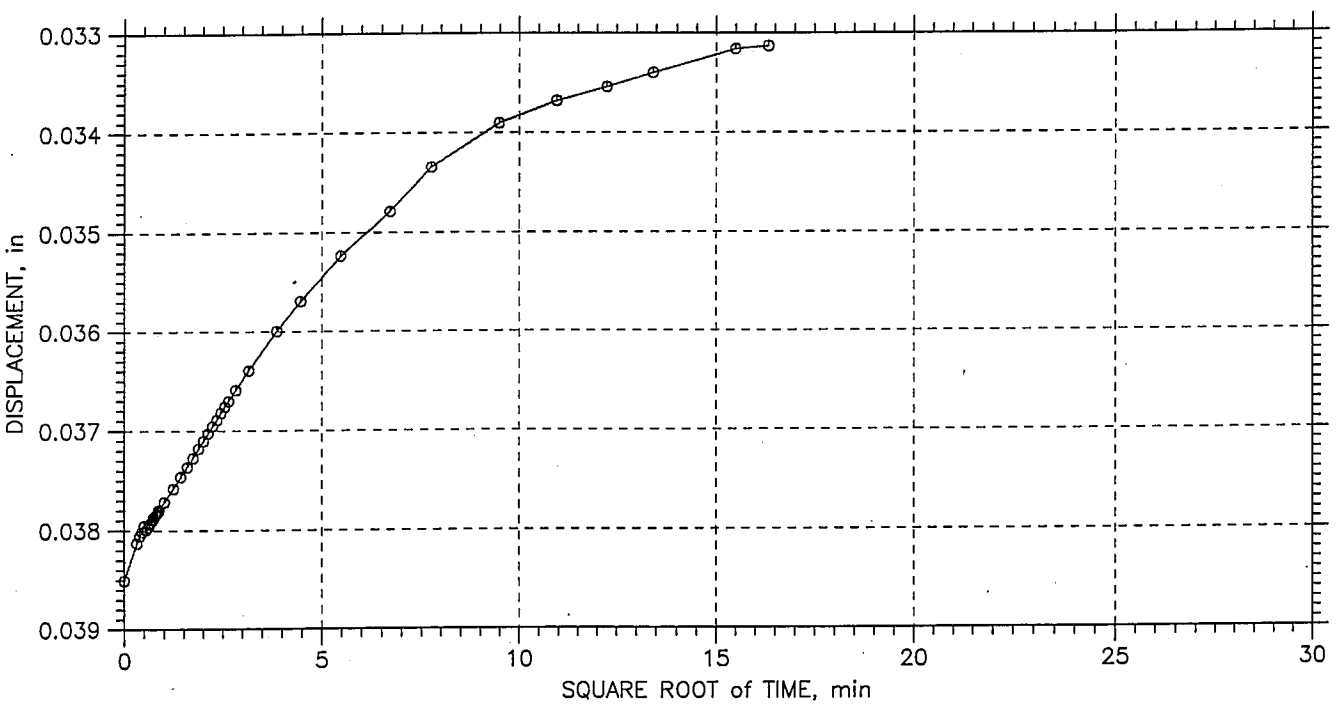
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 13 of 13

Stress: 6.25e-002 tsf





Project: I-8, SECOND TO GREENFIELD	Location: 11-SD-17.4/R18.7	Project No.: 11-063801
Boring No.: R3	Tested By: KS	Checked By:
Sample No.: 1-14.5'	Test Date: 03/18/05	Depth: 14.5'
Test No.: 05-070-G3	Sample Type: BRASS TUBE	Elevation:
Description: MOIST, STIFF, REDDISH BROWN SILT WITH CLAY		
Remarks:		

Fri 25-MAR-2005 14:40:07

Geology Hazard Review

State of California

Business, Transportation and Housing Agency

M E M O R A N D U M

451

To: Waldo R. Lopez
Transportation Engineer
District 11 Design Branch
(M.S. B8)

Date: September 5, 1997

File: 11-SD-8
KP 28.0/R30.1
Auxiliary Lane-Soundwall
11-06380K

From: DEPARTMENT OF TRANSPORTATION
Engineering Service Center-Office of Structural Foundations
Roadway Geotechnical (South)

Subject: Geologic Hazard Review

Per your request of 08/07/97, we have conducted a preliminary geotechnical site assessment. To assist our investigation, you provided: 1) Xerox copies of black and white aerial photographs of the project corridor; proposed improvements were delineated upon these figures. 2) Preliminary 1:2000 (metric) scale plans of proposed improvements; 3)conceptual sketch cross sections at no scale; and 4) a vicinity map comprised of a copied page from Thomas Brother's Maps with the project interval highlighted.

Field investigation was conducted on August 20, 1997. At that time, the weather was hot, clear, and dry; several months had elapsed since the last significant rain.

SCOPE

The investigation was conducted to evaluate compatibility of proposed enhancements with existing site conditions. It was limited to a windshield survey of site conditions, review of as-built plans, review of relevant unpublished and published geologic reports and maps, and a review of Caltrans archival reports regarding proposed or completed work within the limits of the referenced project.

SITE DESCRIPTION

The project is located within the interior upland physiomorphic province. This arid province is characterized by steep sided hills, canyons, and intermediate valleys.

The project is located in incorporated San Diego County within the city of El Cajon. The project lies within a moderately to densely developed suburbial fringe lying east of the city center. The south side of the project corridor is bordered by single family homes, apartments and condominiums, schools, and small parcels of undeveloped land. Development along the north side of the project is more

contiguous and includes small businesses in addition to those features described for the south-side. Landscaping is comprised of mature trees and shrubs on both sides of the highway.

Interstate 8 generally trends east-west. Between the Main Street Under-crossing and Greenfield Drive (the eastern project limit) a gentle horizontal curve culminates in a general northeast-southwest highway trend. This segment of I-8 traverses a gentle grade with elevation increasing to the east. Grade along this interval is predominately comprised of engineered embankment; however, there are several short intervals where the highway is founded upon original (natural) ground.

The existing highway is comprised of 4 portland concrete lanes - 2 eastbound and 2 westbound. Eastbound and westbound traffic lanes are separated by an unpaved center-median lacking any sort of traffic barrier. Centerline of the median is landscaped with mature oleander bushes.

Forester Creek drainage enters into the project corridor midway between Greenfield and Main Street. This significant drainage is contained by a trapezoidal concrete lined ditch that parallels the state right-of-way. A small unlined tributary that originates along Greenfield Drive and parallels the offramp and eastbound lanes conjoins the main Forester Creek drainage unit just east of Main Street. At Main Street, the water course crosses to the north side of the freeway. Between Main Street and Second Street, this drainage unit parallels the westbound lanes just north of the state right-of-way.

TOPOGRAPHY

This area is comprised of a broad valley, surrounded by low dome shape hills. Small mammiform hills speckle the valley floor. The valley floor rises gradually from west to east and abuts the foothills of the Laguna Mountains. Interstate 8 crosses this valley by a series of cuts and fills. Cut slope angles vary with material. Embankment slope angles are typically 1:1.5. Fill slopes are in excellent condition along this interval.

Area drainage is dendritic and most of the tributaries join Forester Creek, a significant tributary to the San Diego River. The areas smaller tributary drainages are typically southeasterly flowing ephemeral creeks, many of which have engineered features.

PROPOSED CONSTRUCTION

The proposed project constructs an eastbound auxiliary lane along eastbound I-8 between Second Avenue (Ave.) and Greenfield Drive(Dr.); it widens to the inside of the existing eastbound travel lanes between the second avenue undercrossing (U.C.)and Greenfield Dr.; it widens to the inside of the existing eastbound lanes between the East Main Street (St.) U.C. and the Broadway U.C.; it replaces the

existing Grape Street Pedestrian Over-crossing (O.C.); and it constructs soundwalls along the outside of the eastbound lanes between Second Ave. and Greenfield Dr.

GEOLOGIC UNITS

The area geology has been mapped by H. Weber (1958-1959) and O. P. Jenkins (1962) and numerous other investigators. This segment of I-8 lies entirely within the Peninsular Range Geomorphic Province, one of the 11 provinces that comprise California. The areas has relatively few lithologic units; however, those present may exhibit a very broad range of properties. Generally the area is underlain by metamorphosed crystalline rock that is the altered remnants of pre-granitic lithologies (called roof pendants) and igneous intrusive bodies of Mesozoic age of the Peninsular Batholith. These rocks are variably mantled by materials derived from the in-place weathering and decomposition of the parent rock (generally known as regolith, grus, or decomposed granite) and by alluvial and colluvial deposits and by artificial fills.

The following Lithologic units are present in the vicinity of the proposed project.

Artificial Fills:

Fills created by the activities of man derived from locally occurring materials (soils and rock) placed either in accordance with accepted engineering practice (engineered fills) or without regard to engineering standards and practices (non-engineered or undocumented fills). Grain sizes range from clay sized particles to boulder sized clasts.

Alluvial and Colluvial Deposits:
Clay, Silt, sand, gravel, and boulder deposits transported and deposited by river and stream currents. clays, silts, sands, gravel, and boulder deposits transported by gravity flow and slope wash.

Very Intensely Weathered Cretaceous Granitic, Gabroic Rocks and Metavolcanic rock- Undifferentiated(decomposed granite- D.G.)
Grade IA, IB, IC Residual soils and saprolites derived from the in-place decomposition of the intrusive rocks. Decomposition products include clays, silts, sands, gravels, and boulders. Some may retain residual rock fabric that disaggregates easily. These materials are essentially a soil that is highly susceptible to erosion.

Cretaceous Granitic and Gabroic Rocks - undifferentiated
Type IIA, IIB, and type III intrusive igneous rocks of varying chemistry. Rock quality varies with degree of fracturing and weathering. Outcrop characteristics vary drastically from location to location. Outcrops will vary from moderately hard weathered rock to very hard fresh rock.

Texture may vary from Residual core stones in a Decomposed matrix where the rock component is dominant to massive crystalline rock bodies. Outcrops may vary from very intensely fractured to un-fractured. Some outcrops may show foliation and gneissic textures due to contact metamorphosis. Chemistries include Granite, granodiorite, quartz diorite, gabbros, and other mafic bodies. Rock texture can vary from aphanitic to pegmatitic.

Jurassic Santiago Peak Volcanics

Metavolcanic rocks comprised volcanic metamorphosed volcanic rocks ranging in chemistry from rhyolite to andesite. These extrusives are predominately aphanitic, although breccias are common. There are minor slates, and shales with in the formation. These rocks typically weather to an expansive clay.

The majority of the existing facility has been developed upon engineered fills. The fills appear to be heterogeneous and contain significant concentrations of cobbles and boulders of various lithologies. Natural materials comprised of decomposed to fresh granitic rock were observed at grade between station 338+50 and Greenfield Dr.

SEISMICITY AND FAULTING

No active fault traces have been mapped within the project interval; however, the sight is susceptible to strong seismogenic shaking created by rupture along the areas regional faults. The nearest significant active fault zone is the Rose Canyon Fault Zone which is considered the design fault for this area.

The following data was derived from an Eqsearch analysis a computer software application written by Thomas Blake. The attenuation relation used was Campbell (1994) hard rock. Accelerations are estimated using a Repeatable Horizontal Ground acceleration (RHGA) attenuation factor of 0.65 for events within 32km of the reference point. There have been more than 282 seismic events within a 100km radius of the site within the last 197 years. The nearest historical quake was a magnitude 6.7 quake that occurred in 1892. The estimated epicenter was 60km west of the site. The maximum historical site RHGA acceleration (estimated) was 0.134g generated by a magnitude 5.7 event occurring approximately 13km from the site.

Table 1: Seismic parameters for active faults within 100 km of the project site. Accelerations are provided as repeatable horizontal ground accelerations (output from Thomas Blake's EQFault software) Attenuation relation: Campbell & Bozorgnia (1994).

ABBREVIATED FAULT NAME	APPROX.DISTANCE km	MAX. CREDIBLE EVENT MAG. (RHGA ACC. g)	MAX. PROBABLE EVENT MAG.(RHGA ACC. g)
Borrego Mtn. (San Jacinto)	84	6.50 (0.029)	6.25 (0.023)
Casa Loma Creek (San Jacinto)	87	7.50 (0.065)	7.00 (0.042)
Coyote Creek (San Jacinto)	81	7.50 (0.073)	6.00 (0.019)
Elsinore	47	7.50 (0.150)	6.75 (0.084)
Offshore Zone of Deformation	61	7.50 (0.110)	6.0 (0.030)
Rose Canyon	23	7.5 (0.205)	6.25 (0.097)
San Clemente	91	7.5 (0.061)	6.25 (0.020)
Superstition Mountain (San Jacinto)	96	7.00 (0.036)	6.00 (0.015)

The nearest known active fault is the Rose Canyon Fault which is expressed 23km to the west and is considered to have an MCE of 7.5.

The largest maximum-credible peak site acceleration is 0.4 from the California Seismic Hazard Map 1995 by Lalliana Mualchin and (DMG OFR92-1).

Site geology and geometry may promote constructive amplification of seismogenic waves.

LIQUEFACTION

Conditions conducive to liquefaction were not observed within the vicinity; however, they could exist. Liquefaction potential will be evaluated during the Geotechnical Design Report (GDR) phase of project development.

GROUNDWATER

No seeps or springs were observed within the proposed project corridor; however, these features are common in such terrain. It would be unusual for such features to be entirely absent across the corridor. In this type of terrain, seeps and springs are typically seasonal. Flow and seepage may continue for months following rains and may run all year after heavy rain seasons. Groundwater conditions will be evaluated during the Geotechnical Design Report (GDR) phase of project development.

Foundation of the majority of the proposed improvements will be predominately confined to existing engineered embankment; therefore, we do not anticipate that perched water will be a design or construction concern. It should be noted that perched groundwater may be present at foundations elevations of existing and proposed bridges.

The project crosses Forester Creek a significant ephemeral stream . Area drainage patterns are radial, parallel to dendritic. Within the project, drainage is predominately sheet flow toward engineered drainage structures. Slope drainage is predominately sheet flow toward engineered drainage structures. Flooding and over-topping of the existing facility has not occurred. The highway is not vulnerable to scour and erosion along this interval.

Portions of the project are adjacent to engineered and incidental drainage features; some of these may be impacted by the project. It should be noted that some portions of the alignment parallel natural and engineered contours thus crossing perpendicular to sheet flow gradients. .Walls may act as artificial barriers to sheet-flow thereby concentrating runoff. Engineered drainage's should be provided to prevent ponding and exaggerated erosion.

RIPPABILITY - DRILLABILITY

Rippability is defined as the ability of a bulldozer with a ripper hook to rip out rock. Both rippable and non-rippable materials are present within the proposed project; however, we anticipate that the majority of the materials that will be encountered at foundation depths for lane enhancements and soundwalls will be rippable by heavy construction equipment.

Light blasting may be required in the interval between station 338+50 and Greenfield Dr. If they exist, the areas requiring blasting will be identified during the Geotechnical Design Report (GDR) phase of project development.

Drillability refers the ability to progress drilled shafts with standard construction drill rigs at efficient production rates. Boulders and granitic rock require specialized drilling equipment to advance holes. Boulders, cobbles, and gravels can predispose a shaft to belling, collapse, or drift.

The existing fills contain gravels comprised of cobbles and boulders these may be very problematic to drilling operations. Intervals comprised of granitics and granitic residuum may not be drillable at production rates. Drillability will be evaluated during the Geotechnical Design Report (GDR) phase of project development.

COMPRESSIBLE AND EXPANSIVE SOILS

Expansive soils were not identified within the project corridor. Proposed project improvements are confined to existing engineered embankment. We do not anticipate that low bearing strength or compressible materials will be encountered.

SLOPE STABILITY

No significant slope failures were observed within the project interval. Conditions indicating the potential for deep seated slope failures were not observed. Side hill fills will have to be keyed into slopes. Remedial grading will be required to remove soft and loose residual, colluvial, and alluvial soils prior to embankment construction.

EROSION AND CORROSION

Erosion potential varies from highly susceptible to essentially non-erodable. Embankment fills are highly susceptible to erosion. Concentrated run-off must be directed away from embankment faces and toes.

The corrosion potential of site materials will have to be evaluated during the GDR.

CONCLUSIONS

The site is conducive to the proposed project; however, adverse geotechnical conditions have been identified with in the proposed corridor. These conditions will addressed during the Geotechnical Design Phase of project development. These conditions include:

- RIPPABILITY DRILLABILITY
- SOIL BEARING CAPACITIES
- SOIL CORROSIVITY
- EROSION

Specific foundation recommendations will be made during the Foundation investigation - Geotechnical Design Report Phase of Project Development.

A memorandum from the Transportation Laboratory to the Division of Structures indicates that wind loading is the critical factor with respect to soundwall foundation design. Translab indicates that cast in drill hole (C.I.D.H.) piles are generally the most economical soundwall foundation choice; however, site conditions may not be conducive to C.I.D.H. piles. Alternatives Soundwall foundations for this project include spread footings and trench footings.

Borings will be required to evaluate site conditions and to develop foundation recommendations. Borings will be placed at required intervals along the proposed wall layouts and along intervals of the proposed widening and lane additions.

A foundation investigation by the office of structures will be required for the proposed pedestrian overcrossing.

If you require additional information, please contact Joe Egan at 467-4051 or Jeff Kermode at 467-4062.

Written By:

Jeff Kermode

Jeff Kermode
Associate Engineering Geologist
Roadway Geotechnical South
District 11

Reviewed By:

Joseph P. Egan
Senior Engineering Geologist
Roadway Geotechnical South
District 11

JPE:JK:es
cc: K. Jackura (RGES,South)
R. Hopkins (D1)
D. Walcott (B8)
J. Egan (04)
J. Kermode (04)
Project File (8K28GHS.doc)
RGES.01

REGISTERED GEOLOGIST
JOSEPH P. EGAN, JR.
No. 1146
CERTIFIED
ENGINEERING
GEOLOGIST
EXP 1-31-98
STATE OF CALIFORNIA

State of California

Business, Transportation and Housing Agency

Memorandum

To: Chadwick Lau
Project Engineer
District 11 Design

Date: January 31, 2007
File: 11-SD-8, PM 17.4/18.7
EA 11-063801

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
Geotechnical Services
Office of Geotechnical Design - South

Subject: I-8: Greenfield Median Lane Widening- Revised Retaining Wall Foundation Recommendations

As requested by you the Office of Geotechnical Engineering Design South 2 (South-2) has reviewed the proposed changes that were made to the I-8 Greenfield Median Lane Widening project subsequent to the transmittal of our Foundation Report for the project. Our Foundation Report that addressed all the retaining walls and sound walls for the project prior to the design changes that were recently made, was issued on June 30, 2005. This letter presents the results of our evaluation of the design changes and our revised foundation recommendations for the retaining wall.

It is our understanding that one of the two retaining walls required to accommodate the lane addition and the sound berm barrier will now range in height from 1.0 to 3.2 meters between Stations 328 through 332 instead of the previously proposed height of 1.2 to 5.5 meters. This wall will run roughly parallel to Forrester Creek and about 2 to 3 meters adjacent to it The other wall will range in height from 1.0 to 2.4 meters and will extend from Station 334+00 to 334+60. No wall is required between Stations 332+60 through 333+40. Thus the maximum heights of the wall have been significantly reduced. This reduction in wall height justifies a review of our settlement calculations in order to determine whether pile foundations are still required for support of the walls.

Our settlement calculations of the retaining walls were based on a cross section developed by Michael Pedersen of your office and faxed to us on 1-29-07. The cross section shows a modified concrete barrier at the edge of pavement. The sound berm barrier originates behind the concrete barrier and slopes up at 1:2 to a height of about 2.8 meters. The top bench width of the berm is about 1.2 meters. The slope from top of bench to top of retaining wall is at about 1:2.

The settlement estimate was based on soil boring information previously developed and presented in our June30, 2005 report. The Hough method of analysis was used to calculate settlements of the retaining walls supported on a spread footing. Our calculations show a maximum total settlement of approximately 33 mm (1.30 inches). In our experience this value of

total settlement is not deemed to be excessive. It should be noted that the Hough method of analysis usually overestimates actual settlements by a factor of about 2.

Based on the above discussion it is our recommendation that the retaining walls be supported on spread footings instead of piles as previously recommended.

If you have any questions please feel free to call the undersigned at 858-467-4054.

Zia Yazdani
Associate Materials and Research Engineer

Zia Yazdani

REGISTERED PROFESSIONAL ENGINEER
ZIAULLAH YAZDANI
No. 2110
Exp. 3-31-2007
GEOTECHNICAL
STATE OF CALIFORNIA

cc: Abbas Abghari
Brian Hinman BH
Michael Pedersen
OGDS2 Files

State of California | Business, Transportation and Housing Agency

2.0 ADDENDUM

Flex Your Power!
Be energy efficient!

To: Mr. Michael J. Webster
Project Design (M.S. 333)

Date: May 18, 2007
File: 11-SD-8
KP 28.0/R30.1
PM 17.4/R18.7
EA 11 – 167891

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
Geotechnical Services
Office of Geotechnical Design – South 2, Branch D

Subject: Foundation Report for Proposed Sound Walls

This letter is an addendum to the previously submitted Foundation Report (FR), dated July 12, 2005, for the proposed retaining walls and sound walls to be constructed on Interstate 8 (I-8), from Second Street to Greenfield Drive in the City of El Cajon, San Diego County, California. This letter contains additional information and clarifications pertaining to the sound wall foundations. The information presented in this addendum supercedes any previously provided information in the Foundation Report or any other document that addresses the sound wall foundations. The sound walls that are affected in this addendum's modifications are Sound Walls SB1, SB2, SB5, and SB6.

At the request of the design engineer, additional field investigations were conducted in the area of Sound Wall 6 to better define the profile of the top of bedrock elevation, which was previously encountered at the locations of Borings B-S6-1 and B-S6-2. Three additional borings (B-S6-1A, B-S6-2A and B-S6-2B) were located between borings B-S6-1 and B-S6-2 along the alignment of sound wall 6. These borings were advanced to the top bedrock using 6-inch outside diameter hollow stem augers and Mobile Rig B47. Standard Penetration Tests (SPT) were performed for each of the borings at 1.5m intervals using automatic driving hammer. Reference can be made in the FR for any additional information regarding the drilling operational procedures.

The subsurface soil conditions uncovered by the additional field investigations indicate that the soil conditions are similar in types to the soil described in the FR. Three soil layers were encountered. The upper layer is a fill material that varies in depth from about 1.8m at the

location of Boring B-S6-2A to about 2.4m at the location of Boring B-S6-2B below existing ground surface (EGS). The fill material consists of mostly dark brown, reddish brown, brown, gray and light gray, medium dense to very dense, slightly clayey silty sand and gravelly silty sand with cobbles and occasional boulders. Underlying the fill materials is a layer of alluvial soils that varies in depths from about 0.6m at the location of Boring B-S6-2A to about 2.1m at the location of Boring B-S6-1A below EGS. The alluvial layer consists of dark brown very dense clayey sand and yellow, green and brown, soft to stiff clayey silt and silty clay. The lower layer of the subsurface soil is decomposed granitic rock (bedrock). The top of the bedrock was encountered at depths varying from 2.5m at the location of Boring B-S6-2B to about 4.2m at the location of Boring B-S6-1A. The bedrock soils consisted of mostly black, dark brown, brown, tan and light gray, very dense, well graded sand and poorly graded sand.

An additional boring B-S6-3 was located at approximately 1.5m to the south of an existing retaining wall that is constructed along the northern property line of the condominium complex. The purpose of this boring is to determine the depth and the extent of the width of the existing wall footing. The boring was terminated at approximately 1.8m below EGS after a soft concrete mass was detected at the bottom of the boring. Location for Boring B-S6-3 is shown on the Layout Sheet L-7, which is attached to this letter.

In the recommendation section of the Foundation Report, as an alternative, it was recommended that the sound walls be supported on cast in drilled hole (CIDH) pile cap foundations. It was also recommended that the tip of the piles should extend to the top of bedrock, which varies in elevation as it was determined by the FR field investigation. This recommendation was based on anticipated shallow bedrock depths in some of the areas along the alignment of the sound walls. In cases where top of bedrock is encountered at deeper elevations, the Standard Plan pile length for Sound Wall Masonry Block on Pile Cap Details (page 295) may be used. All sound walls foundation types should be Case 2 (pile cap founded in level ground on one side and sloping on the other side). A soils friction angle of 32° should be used in the selection of pile depth based on the Standard Plans.

The frequent location of existing utility lines in the area where the sound wall is proposed, had limited the foundation design alternative to CIDH pile. The additional investigation has further defined the profile of the top of the bedrock elevation along the alignment of Sound Wall 6. The new information has also verified that the top of the bedrock at the alignment is sufficiently weathered and may be excavated with convectional drilling equipment for the total design length of the CIHD piles.

If you have any questions or comments regarding this document, please call Moussa Jandal at (858) 637-5545.

Moussa H Jandal

REGISTERED PROFESSIONAL ENGINEER
MOUSSA H. JANDAL
69265
Expires 06/30/08
CIVIL
STATE OF CALIFORNIA

Moussa Jandal
TE (civil)

Attachments
Boring Logs (B-S6-1A, B-S6-2A, B-S6-2B)
Boring Location-Layout Sheet (L-7)

cc Brian Hinman BH
File

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S6-1A	5/10/2007	5/10/2007	M Jandal/Larry,Don, James	I-8, Second St. to Greenfield	11-167891

Top Hole Elev.	Location	Purpose of work	Dist - Co. - Rte. - PM
184.6m	Station/Offset: 340+20/R25 Ref Line: "R3G1"	Soundwall 6	11-17.4/R18.7

Groundwater Level: Date Measured	Depth to Water	Drilling Method	Drilling Equipment
		6-in Dia. Hollow Stem Auger	Mobil Rig (B47)

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Number	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT total	Graphic Log	Lithological Description
1	1												Silty Sand [Fill], medium dense, dark reddish brown, moist, fine to medium grained, slightly clay with gravel and cobbles
2													
3													
4													
5			5										- light gray, wet, with boulder
6	2		4 9								13		
8													
9													182.2m Sandy Silt (ML), loose, dark brown, wet, slightly clayey [ALLUVIUM]
10	3		4										
11			4 5								9		
12													
13	4												
14													180.3m Well Graded Sand (SW), very dense, black, brown and tan, moist, (decomposed granitic rock)
15			23										
16	5		31 46								77		
17													
18													
19													
20	6												

End of boring at 178.5m. Ground water was not encountered during the drilling operations.

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S6-2A	5/10/2007	5/10/2007	M Jandal/Larry,Don, James	I-8, Second St. to Greenfield	11-167891

Top Hole Elev.	Location	Purpose of work	Dist - Co. - Rte. - PM
184.0m	Station/Offset: 341+15/R25 Ref Line: "R3G1"	Soundwall 6	11-17.4/R18.7

Groundwater Level: Date Measured	Depth to Water	Drilling Method	Drilling Equipment
		6-in Dia. Hollow Stem Auger	Mobil Rig (B47)

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Number	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1													Silty Sand [Fill], medium dense, dark reddish brown, moist, fine grained, slightly clay
2													
3	1												- gray, fine to medium grained
4													
5			23										
			10								22		
6			12										182.2m
7	2												Clayey Sand (SC), medium dense, dark brown, moist, with gravel [ALLUVIUM]
8													
													181.6m
9													Well Graded Sand (SW), very dense, gray, brown and black, moist, [decomposed granitic rock]
10	3		24										
			50/5"								50+		
11													
12													
13	4												
14			20										180.0m, refural by augering/bouncing hammer
15													End of boring at 180.0m. No ground water was encountered during the drilling operations.
16													
17	5												
18													
19													
20	6												

SOILS AND GEOLOGICAL EXPLORATION LOG

Boring No.	Date Started	Date Ended	Geologist & Crew	Project Name	EA
B-S6-2B	5/10/2007	5/10/2007	M Jandal/Larry,Don, James	I-8, Second St. to Greenfield	11-167891

Top Hole Elev.	Location	Purpose of work	Dist - Co. - Rte. - PM
183.7m	Station/Offset: 340+91/R25 Ref Line: "R3G1"	Soundwall 6	11-17.4/R18.7

Groundwater Level		Drilling Method	Drilling Equipment
Date Measured	Depth to Water	6-in Dia. Hollow Stem Auger	Mobil Rig (B47)

Total Hole Depth

Lithological Descriptions

1. Group Name
2. Group Symbol
3. Consistancy/Relative Density
4. Color
5. Moisture
6. Partical Size & Shape
7. Gradation
8. Plasticity
9. Structure
10. Cementation
11. Organics
12. Fill Material
13. Other

Boring Depth (ft)	Boring Depth (meter)	Sample Number	SPT	CA Modified	Coring	Total Recovery	% Recovery	RQD	Lab Work Assigned	SPT Blows per .3 meter: .15 meter	SPT Blows per .3 meter: SPT total	Graphic Log	Lithological Description
1	1												Silty Sand [Fill], medium dense, dark reddish brown, moist, fine to medium grained, slightly clay with gravel and cobbles
2													
3													
4													182.1m
5			46										Gravely Silty Sand [Fill], very dense, brown, moist, slightly clayey
6	2		27 24								51		
7													
8													
9													
10	3		11										180.7m
11	4		11 18								29		Silty Clay (CL), very stiff, yellow, green and brown, moist [ALLUVIUM]
12													
13													
14													179.3m
15			50/4"								50+		Poorly Graded Sand (SW), very dense, black, brown and tan, moist, fine to medium grained [decomposed granitic rock]
16	5												
17													End of boring at 179.1m. Ground water was not encountered during the drilling operation.
18													
19													
20	6												

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	8	28.0/30.1	7	

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

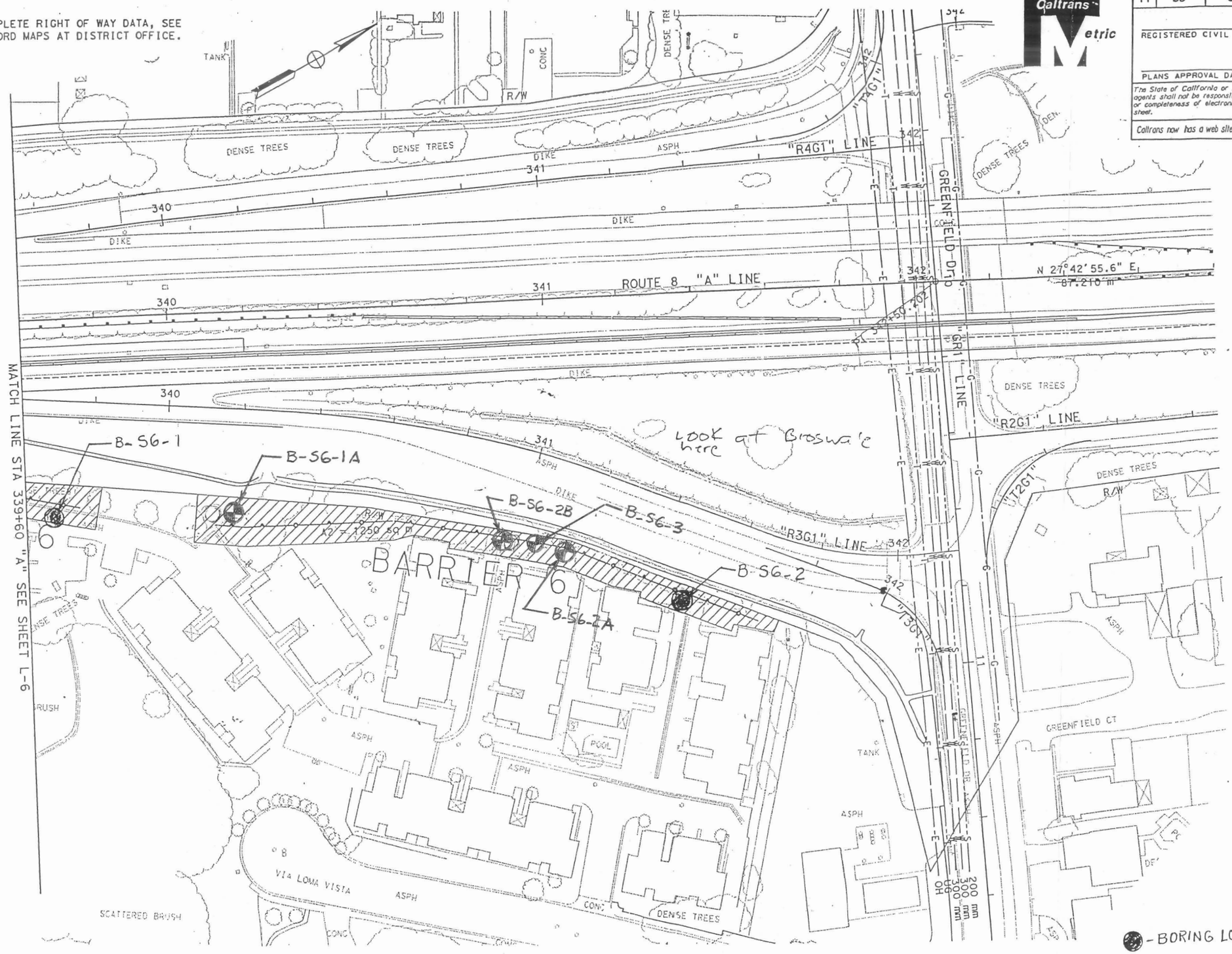
The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

Caltrans Metric

NOTES:

FOR COMPLETE RIGHT OF WAY DATA, SEE R/W RECORD MAPS AT DISTRICT OFFICE.



● - BORING LOCATION

LAYOUT

SCALE 1:500

L-7

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER P.E. HERE

CALCULATED/DESIGNED BY

CHECKED BY

DATE REVISED BY

DATE REVISED

LAST REVISION 02-27-03

DATE PLOTTED => 28-JUL-2003

TIME PLOTTED => 15:03

Zia Yazdani/HQ/Caltrans/CAGov
12/09/2008 01:07 PM

To Wayne X Nguyen/D11/Caltrans/CAGov@DOT
cc Brian Hinman/HQ/Caltrans/CAGov@DOT
bcc
Subject Re: EA063801 - Sound Wall 1-5 Soil Friction Angle Confirmation

History: This message has been replied to.

This is to confirm that a phi angle of 35 degrees should be used for the design of all the sound walls for the project as recommended in the referenced June 30, 2005 foundation report. I concur with using Case 2 and a soil friction angle of 35 degrees. The Addendum report dated May 18, 2007 signed by Moussa Jandal shows an incorrect value of the phi angle (32 degrees) which appears to be a typographical error. We regret the error.
Wayne X Nguyen/D11/Caltrans/CAGov

Wayne X Nguyen/D11/Caltrans/CAGov
12/09/2008 12:20 PM

To Zia Yazdani/HQ/Caltrans/CAGov@DOT
cc Carlos Cortez/D11/Caltrans/CAGov@DOT, Chad Lau/D11/Caltrans/CAGov@DOT, Michael Webster/D11/Caltrans/CAGov@DOT
Subject EA063801 - Sound Wall 1-5 Soil Friction Angle Confirmation

Zia,

As we discussed this morning, please confirm for our record that the attached document (Soundwall_Addendum.pdf)
has a typo error for soil friction angle of 32 degrees. In the foundation report dated June 30, 2005 (Geotech_Report.doc),
soil friction angle for all soundwall of 35 degrees has been recommended. Please confirm.

In addition, we have made changes to our sound barrier called "Barrier Berm/Retaining Wall SB3" on page 8 of the
Geotech Report. This is now a soundwall instead of a retaining wall. This new soundwall SW3 is 1.3 m to the right
outside edge of shoulder of I-8 Eastbound, and is 153 m long. Boring B-S3R-2 is within our new soundwall SW3 foot
print. We will proceed by using Case 2 and soil friction angle of 35 degrees, similar to soundwall SW1, SW2 and SW4;
unless advised otherwise. Please comment.

Soundwall_Addendum.pdf Geotech_Report.doc

Call me if you have any questions.
Thank You,
Wayne Nguyen
Design Engineer
(619) 688-3386

Memorandum

To : Wayne Nguyen (MS 333)
Project Engineer
Design

Date: July 23, 2007

File: 11-SD-8
KP 28.0/R30.1
(PM 17.4/R18.7)
EA 11-063801

From : **DEPARTMENT OF TRANSPORTATION - DISTRICT 11**
PAVEMENT ENGINEERING SECTION

Subject: **STRUCTURAL SECTION RECOMMENDATIONS**

In accordance with your request, the following structural section recommendations for a new inside lane on EB I-8 from 2nd Street to Greenfield Drive.

The following structural section recommendations are based on a 40 year Traffic Index (TI) of 13.5 for the main lanes. The TI for the inside lane, 11.0, is 20% of the main lane ESAL, which is in accordance with the Highway Design Manual, Section 600. The basement soil R-value of 15 has been obtained from other projects constructed in the vicinity of this project.

Since the designer has chosen an AC shoulder, the PCC pavement is designed with a no lateral support condition.

Inside Lane

(TI = 11.0, R-value = 15)

240 mm JPCP
120 mm HMA-A (ACB-A)
165 mm AB – Class 2

Inside Shoulder

(TI = 7.0, R-value = 15)

Alternate 1	Alternate 2
105 mm AC (Type A)	105 mm AC (Type A)
330 mm AB – Class 2	225 mm AB – Class 2
	105 mm AS – Class 4

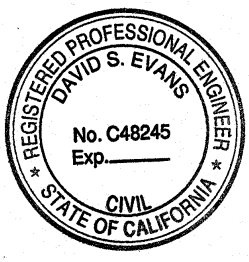
Design Notes

1. The recommended aggregate grading for AC (Type A) is dense graded, 19 mm maximum, coarse.

2. JPCP is Jointed Plane Concrete Pavement as described in HDM Section 600.

If you have questions with regards to this memorandum, please contact me at 858-467-4056 or FAX at 858-467-4063.

David Evans
District Pavement Engineer
District 11 Materials Lab



cc: A Padilla (DME)
G Vettese (MS 330)
C Lau (MS 333)
8.063801.ss.doc

State of California | Business, Transportation and Housing Agency

Memorandum

To: **David Nagy**
Senior Environmental Planner
Environmental Analysis

Date: September 7, 2007
File: 11-SD-8
EA: 063801
PM: 17.4/R18.7

From: **Joel Kloth**
Engineering Geologist
Environmental Engineering

Subject: Hazardous Waste Review for Route 8, Second Avenue to Greenfield Avenue, Soundwall and Widening Project

Environmental Engineering has performed a review of the potential for encountering hazardous waste issues/materials within Department right-of-way for the subject project. The investigation included evaluating the subject site and adjacent properties for potential hazardous waste issues/materials, and for aerially deposited lead (ADL) in soil on the subject site. The project will involve widening the eastbound median, and constructing soundwalls along the shoulders.

OFF SITE IISSUES:

Records available on web sites from the Regional Water Control Board and the County of San Diego Department of Environmental Health were reviewed. Several service stations are located adjacent to Route 8. They do not appear to have a hazardous waste material/issue impact on the project, except one. One service station located at the southeast corner of the intersection of Route 8 and Greenfield Drive and has petroleum hydrocarbon impacted groundwater beneath the service station site and a portion of the Sunset Hills Terrace Condos. Drilling of a geotechnical boring in the vicinity of a proposed soundwall on the Sunset Hills Terrace Condos property indicated that groundwater was not encountered up to a depth of 4.6 meters below grade, below the proposed depth of the soundwall footing. Therefore, the potential for encountering petroleum hydrocarbons from the service station is low.

PAINT STRIPE:

According to the proposed construction methodology, yellow paint stripe that may contain hazardous concentrations of lead will be removed with asphalt. Therefore, yellow paint stripe will not be a hazardous waste issue.

AERIALLY DEPOSITED LEAD:

Review of current plans for the subject project indicated that further ADL study is not necessary. Below are the current ADL soil handling criteria that have changed since the 2001 ADL study was performed due to regulatory changes and design modifications.

Median:

The median on Route 8 between Second and Greenfield Avenues does not have hazardous lead concentrations. Soil excavated on Route 8 in the median for this project does not invoke the DTSC lead variance. The soil may be handled as "clean material" with regard to ADL for reuse onsite or offsite.

Westbound And Eastbound Shoulders:

The following applies to soil excavated up to 6 meters laterally away from the westbound and eastbound shoulders of Route 8, to a depth of 0.4 meters, between Second and Greenfield Avenues. The soil has hazardous lead concentrations based on an 80% up to 6 meters laterally from the edge of pavement and to a depth of 0.4 meters. This will invoke the DTSC lead variance issued to the Department. This soil must be reused onsite by being placed beneath 0.3 meters of clean material, at least 1.5 meters above the maximum groundwater. Soil excavated below a depth of 0.4 meters and beyond 6 meters laterally from the edge of pavement does not contain hazardous lead concentrations and the DTSC variance is not invoked. This soil may be reused onsite as "clean material" with regard to ADL.

A site specific Health and Safety Plan shall be prepared for the proposed construction activities on Route 8 which include measures that limit exposure of lead affected soil to persons working onsite, and use of

proper Personal Protective Equipment. Persons working with the soil containing hazardous concentrations of lead shall have training in accordance with Title 8 of the CCR 1532.1(e)(2)(B). These Title 8 CCR criteria are found in the office engineers' standard specifications.

The Department of Toxic Substances Control (DTSC) must be notified in writing by the Project Engineer at least 30 days before excavation of lead impacted soil. Additionally, relocated lead-contaminated soils must be shown on the project as-built plans. The Project Engineer must also have NPDES/Stormwater Compliance notify the Regional Water Quality Control Board of the field activities in writing at least 30 days prior to initiating field activities.

Other potential hazardous waste issues/materials are not anticipated on this project. If you have questions call (619) 688-3146.

Joel Kloth, PG
Engineering Geologist
Environmental Engineering

cc: Jayne Dowda
Files

LIMITED AERIALLY DEPOSITED LEAD ASSESSMENT INTERSTATE 8 2ND STREET TO GREENFIELD DRIVE EL CAJON, CALIFORNIA PM 17.7/R18.7 TASK ORDER NO. 11-063800-VO CONTRACT NO. 43A0012

PREPARED FOR:
California Department of Transportation
2829 Juan Street
San Diego, California 92110

PREPARED BY:
Ninyo & Moore Geotechnical and Environmental Sciences Consultants
5710 Ruffin Road
San Diego, California 92123

March 28, 2001
Project No. 104330001

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Appendix D – Statistical Calculation Data Output
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1. INTRODUCTION

With receipt of authorization to proceed and in general accordance with Task Order No. 11-063800-VO, Contract No. 43A0012, we have performed a limited assessment of subsurface soil at a segment of Interstate 8, between 2nd Street and Greenfield Drive, in El Cajon, San Diego County, California (Figure 1). The purpose of this activity was to provide information regarding the presence of aerially deposited lead in near-surface soil along the eastbound and westbound shoulders, and the median of Interstate 8. We understand that this information will be used to determine if special handling of soils will be needed during the proposed construction activities. Provided specific measures are taken in accordance with the California Department of Toxic Substances Control (DTSC) Variance, dated September 22, 2000. Additional statistical evaluation of analytical results was conducted on the approval of Caltrans Contract Manager Mr. Joel Kloth.

2. SCOPE OF WORK

Based upon the activities proposed, our scope of work included the following tasks:

- Develop and implement a site specific health and safety plan. The health and safety plan was reviewed and approved by the contract manager prior to the implementation of field activities.
- Coordination with Caltrans Environmental Engineering personnel to select soil sample locations. Fifty-nine locations were selected, approximately 100 meters (m) apart, as shown on Figure 2. Sixty-six soil samples were collected from the eastbound shoulder of Interstate 8 at approximately 15cm, 30cm, and 60cm below ground surface (bgs). Forty-eight soil samples were collected from the westbound shoulder of Interstate 8 at approximately 15cm, 30cm, and 60cm bgs. Fifty-six soil samples were collected from the center median of I-8 at approximately 15cm, 30cm, and 60cm bgs.
- Secure permission from Caltrans for soil sample collection activities.
- Markout of proposed boring locations with Caltrans personnel to confirm that no conflicts existed with underground utilities. Boring locations are shown on Figure 2, and on Sheets 1 through 8 in Appendix A.
- Locate borings using the Global Positioning System (GPS) to one-meter accuracy. A Magellan ProMARK X handheld GPS receiver using 120 fixes averaged over two minutes for each boring location was used to provide accuracy approaching one meter.

- Collect soil samples on December 27 and 28, 2000, using a 9-cm diameter hand auger. Sampling equipment was decontaminated prior to sampling each boring using a three-step wash and rinse using non-phosphate Liquinox® detergent, and potable and deionized water. Soil borings were backfilled with cuttings.

- Analyze soil samples for total lead using Environmental Protection Agency (EPA) test method 7420. A random selection of ten percent of the soil samples collected (totaling 17), were analyzed for pH using EPA test method 9045. The soil samples that contained total lead greater than 50 milligrams per kilogram (mg/kg) and less than 1,000 mg/kg were additionally tested for soluble lead using the waste extraction test (WET) with citric acid as the extraction using EPA test method 7420. Soil samples with soluble lead citric concentrations greater than 5.0 milligrams per liter (mg/ℓ) were also tested for soluble lead with de-ionized water as the extraction using EPA test method 7420. Analytical results are summarized in Appendix B.

- Perform statistical analysis to normalize data, divide into 12 separate data sets for eastbound, westbound, and median by depth; calculate confidence intervals for both 80 and 95 upper confidence level (UCL); and correlate total and soluble lead.

- Prepare and deliver GPS location data and laboratory analytical data electronically in Microsoft Excel format per Caltrans specifications.

- Prepare a report presenting our methodology, findings, and conclusions.

3. SOIL LEAD ASSESSMENT FINDINGS

In accordance with Caltrans electronic data submittal guidance, the boring locations, sample identifiers, and analytical results are presented on Excel spreadsheets (Appendix C). Per the work order, statistical analyses of the data were to have been performed on four separate sets: one for each of the three depths (15cm, 30cm, and 60cm), and all data. However, it was clear from initial inspection of the data, that the eastbound, westbound, and median data were, in fact, separate data sets. With approval from the Caltrans Project Manager, Ninyo & Moore performed additional statistical analyses for the eastbound, westbound, and median data sets. The statistical calculations are also presented by sample depth (Appendix D). A summary of statistical calculations is presented on Table 1. Laboratory analytical reports and chain-of-custody documentation are presented in Appendix E. Due to auger refusal in the center median, many of the 60cm samples were collected at 45cm or not collected at all. For the purposes of statistical analysis the 45cm samples were grouped with the 60cm samples.

It is our understanding that these findings will be used to assess the suitability of the soil for re-use within the Caltrans right-of-way. In accordance with Caltrans guidance for such data, each datum point was normalized using the natural logarithm, ln(x), and the means, standard deviations, and 80% and 95% upper confidence levels ($UCL_{.80}$ and $UCL_{.95}$) were calculated.

Ten percent of the samples (17) were randomly selected for pH analysis. The pH values ranged from 5.20 to 8.34, for the 17 samples.

One hundred and seventy samples were collected for this project. Ninety eight soil samples contained concentrations of total lead that exceeded 10 times the Title 22 STLC (50 mg/kg), but did not exceed the Title 22 TTLC (1,000 mg/kg); these samples were subsequently tested for soluble lead by the WET test using citric acid as the extractant. Fifty-one of these samples were equal to or greater than the Title 22 STLC (5 mg/ℓ), and were subsequently tested for soluble lead using de-ionized water as the extractant. The correlation between the soluble and total lead results varied, and generally correlation was poor, as shown on Table 1.

As shown on Table 1, soluble lead, rather than total lead, tends to be the limiting factor. The soluble lead action level using citric acid as the extractant is 5.0 mg/ℓ. The total lead action level is 350 mg/kg. In summary, the $UCL_{.95}$ of the mean concentration was greater than the 5.0 mg/ℓ soluble lead action level:

- 15cm, 30cm, and 60cm in the eastbound shoulder, and
- 15cm and 30cm in the westbound shoulder.

The $UCL_{.95}$ was less than both action levels for the median.

4. CONCLUSIONS

The California Environmental Protection Agency DTSC Variance 00-H-VAR-06 provides that Caltrans will "manage soil containing lead at concentrations such that it is considered a hazardous waste" (1,000 mg/kg total lead; 5 mg/ℓ soluble lead using the WET test) unless the following criteria are met:

- The total lead soil concentrations are less than 350 parts per million (ppm).
- The soluble lead concentrations (using de-ionized water extraction) are less than 500 µg/ℓ.
- The pH result are greater than 5.

The Task Order No. 11-063800-VO, Contract No. 43A0012, dated November 13, 2000, states that the $UCL_{.95}$ of the mean concentration is used to evaluate the soil for presence of hazardous or non-hazardous lead concentrations that may be relinquished to a contractor for use as clean soil on another site, or for disposal as hazardous waste. The $UCL_{.80}$ of the mean concentration is used to evaluate the soil for presence of hazardous or non-hazardous lead characterization of soil that may be re-used on-site.

Based on these criteria, we provide the following conclusions:

- ***Eastbound shoulder of I-8:*** The $UCL_{.95}$ calculated for total lead at 15cm, 30cm, and 60cm exceeded the action level of 350 ppm (See Table 1 and Appendix B). The $UCL_{.95}$ calculated for soluble lead at 15cm, 30cm, and 60cm exceeded 5 mg/ℓ. This material is considered hazardous and must be disposed at a Class I landfill if relinquished to a contractor. The $UCL_{.80}$ for total lead at 15cm exceeded 350 ppm and soluble lead at 15cm and 30cm exceeded 5 mg/ℓ. Soil to a depth of 15cm must be disposed at a Class I landfill. For re-use onsite as fill material, soil from 15cm to 60cm may be reused under 30cm of clean soil, and more than 150cm above the water table.

- ***Westbound shoulder of I-8:*** The $UCL_{.95}$ calculated for total lead at 15cm exceeded 350 ppm (See Appendix B). The $UCL_{.95}$ calculated for soluble lead at 15cm and 30cm exceeded 5 mg/ℓ. Soil at 15cm and 30cm is considered hazardous. Soil to a depth of 30cm must be disposed at a Class I landfill if relinquished to a contractor. Soil from 30cm to 60cm may be reused under DTSC variance using the $UCL_{.80}$. The $UCL_{.80}$ for total lead at 15cm, 30cm and 60cm did not exceed 350 ppm, but the $UCL_{.80}$ for soluble lead exceeded 5 mg/ℓ at 15cm and 30cm. For re-use as fill material onsite, soil to a depth of 30cm may be reused under 30cm of clean soil, and more than 150cm above the water table.

- ***Center median of I-8:*** The $UCL_{.95}$ and $UCL_{.80}$ calculated for both total and soluble lead did not exceed 350 mg/kg total lead or 5 mg/ℓ soluble lead. This material is suitable without special handling for export or for reuse as clean soil onsite with regard to lead concentrations .

The 51 soluble lead results (using de-ionized water extraction) are not greater than 500 µg/ℓ (See Appendix C). The greatest concentration reported was 500 µg/ℓ. The pH results are within DTSC variance specifications, greater than 5 pH units (See Appendix C).

5. LIMITATIONS

The environmental services described in this report have been conducted in general accordance with current regulatory guidelines and the standard-of-care exercised by environmental consultants performing similar work in the project area. No warranty, expressed or implied, is made regarding the professional opinions presented in this report. Variations in site conditions may exist and conditions not observed or described in this report may be encountered during subsequent activities. Please also note that this study did not include an evaluation of geotechnical conditions or potential geologic hazards.

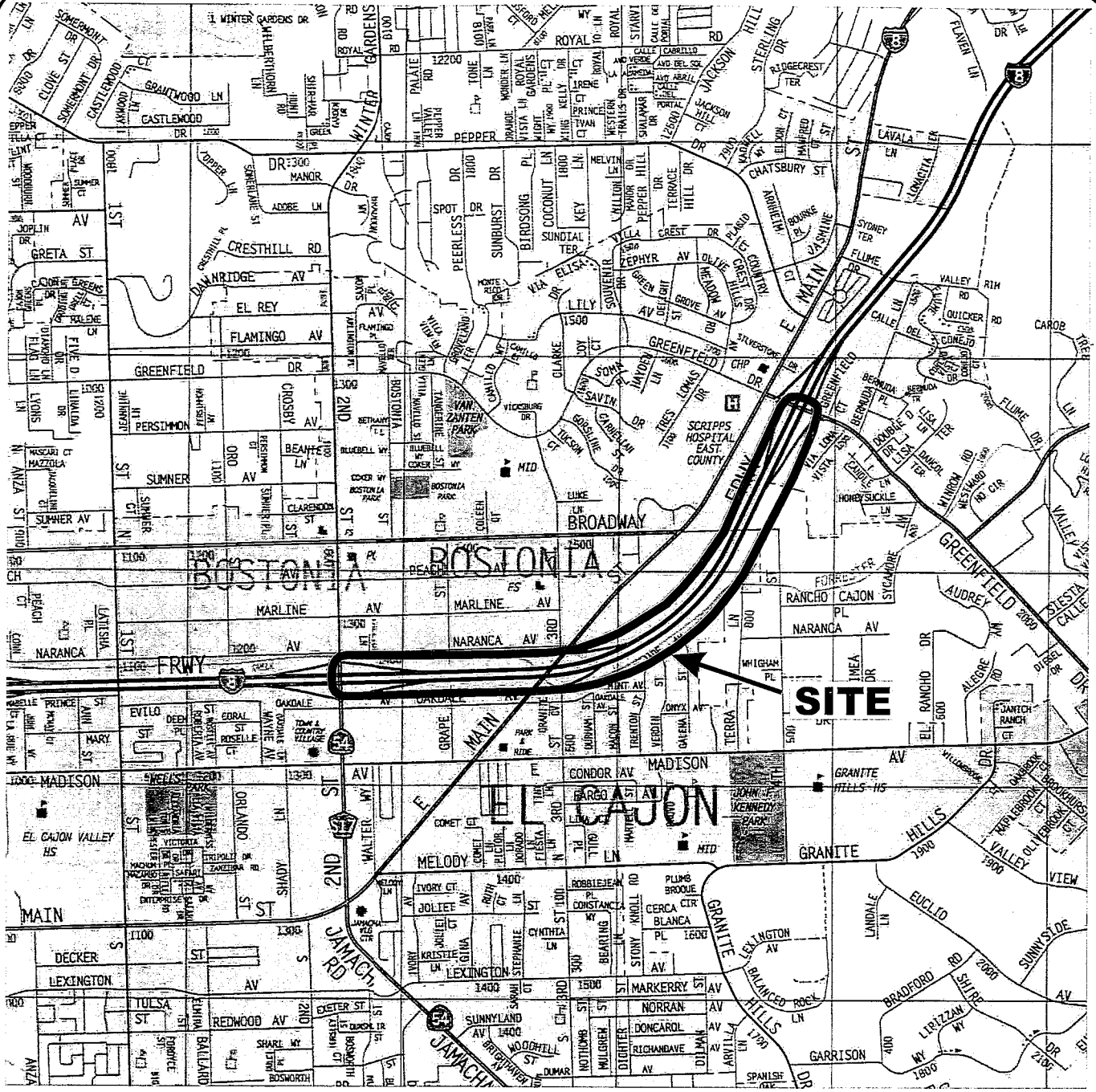
Ninyo & Moore's opinions and recommendations regarding environmental conditions, as presented in this report, are based on limited subsurface assessment and chemical analysis. Further assessment of potential adverse environmental impacts from past on-site and/or nearby use of hazardous materials may be accomplished by a more comprehensive assessment. The samples collected and used for testing, and the observations made, are believed to be representative of the area(s) evaluated; however, conditions can vary significantly between sampling locations. Variations in soil and/or groundwater conditions will exist beyond the points explored in this evaluation.

The environmental interpretations and opinions contained in this report are based on the results of laboratory tests and analyses intended to detect the presence and concentration of specific chemical or physical constituents in samples collected from the subject site. The testing and analyses have been conducted by an independent laboratory which is certified by the State of California to conduct such tests. Ninyo & Moore has no involvement in, or control over, such testing and analysis. Ninyo & Moore, therefore, disclaims responsibility for any inaccuracy in such laboratory results.

Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires any additional information, or has questions regarding content, interpretations presented, or completeness of this document.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.



REFERENCE: SAN DIEGO COUNTY THOMAS BROS. MAP, DATED 1999.

G:4330-01SLM

Ninyo & Moore

SITE LOCATION MAP

INTERSTATE 8
2ND STREET TO GREENFIELD DRIVE
EL CAJON, CALIFORNIA

PROJECT NO.	DATE	FIGURE
104330001	3/01	1

LEGEND

Match Lines | Interstate 8 | Sample Locations | CALTRANS Corridor

Map sheets 1-8 provided in Appendix A

500 0 500 1000 Meters

N

Note: The information presented on this map is primarily intended for planning purposes and should not be construed as definitive. The information presented is a collection of the most readily available data at the time of compilation. Much of the information was transferred from maps of differing scales. Therefore, the accuracy is limited. Boring locations are based on site reconnaissance, and are not a record of survey. Date of data compilation, January 2001.

Digital data provided by SANGIS Geographical Information Services.

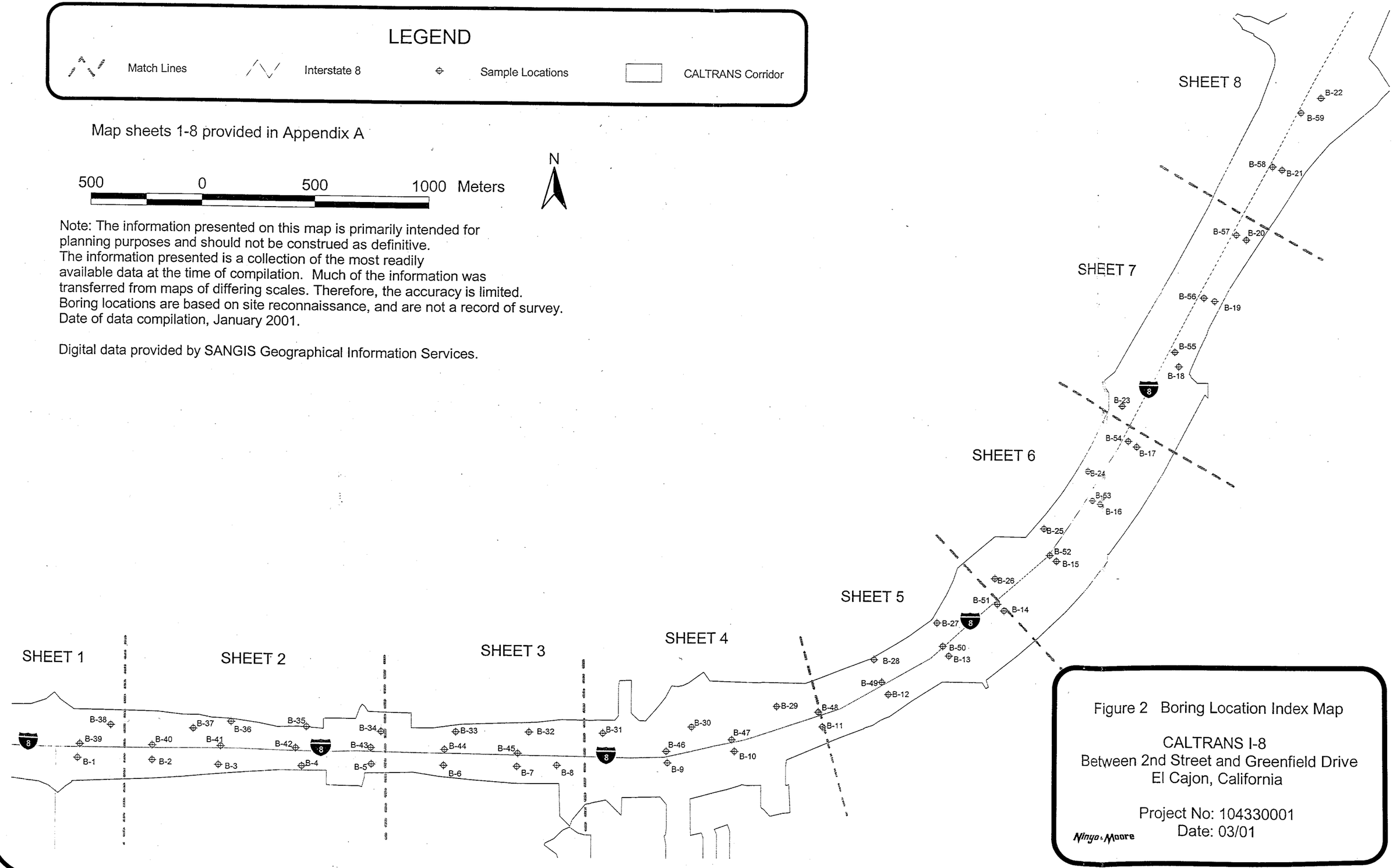


Figure 2 Boring Location Index Map

CALTRANS I-8
Between 2nd Street and Greenfield Drive
El Cajon, California

Project No: 104330001
Date: 03/01

Ninyo & Moore

Table 1: Summary of Statistical Calculations for Total and Soluble Lead

Total Lead

Sample Set	Number of Points (n)	Mean Normal	Mean Log	Standard Deviation Normal	Standard Deviation Log	Normal R	Normal UCL 80%	Normal UCL 95%	Log R	Log UCL 80%	Log UCL 95%	Exponent UCL 80%	Exponent UCL 95%
Eastbound I-8 @ 15cm	22	1529.08	6.41	3342.15	1.29	0.616	2543.04	3940.03	0.976	6.77	6.98	871.31	1074.92
Eastbound I-8 @ 30cm	22	607.80	5.36	1132.40	1.44	0.718	1301.81	2293.10	0.987	5.77	6.00	320.54	403.43
Eastbound I-8 @ 60cm	22	596.75	5.20	919.72	1.73	0.805	2269.21	4899.13	0.963	5.69	5.97	295.89	391.51
Eastbound - All	*66*	*911.21*	*5.67*	*2119.00*	*1.57*	*0.607*	*1248.90*	*1432.10*	*0.963*	*5.91*	*6.05*	*368.71*	*424.11*
Westbound I-8 @ 15cm	16	399.42	5.46	398.87	1.14	0.919	836.50	1349.37	0.991	5.84	6.07	343.78	432.68
Westbound I-8 @ 30cm	16	207.06	4.37	310.23	1.54	0.806	640.67	1627.19	0.979	4.89	5.20	132.95	181.27
Westbound I-8 @ 60cm	10	198.73	8.05	268.02	9.26	0.845	610.85	1050.17	0.989	4.91	5.19	135.64	179.47
Westbound - All	*48*	*268.40*	*4.75*	*336.44*	*1.45*	*0.870*	*331.53*	*366.10*	*0.986*	*5.02*	*5.17*	*151.41*	*175.91*
Median I-8 @ 15cm	21	79.47	4.04	63.60	0.92	0.934	125.35	162.31	0.976	4.30	4.45	73.70	85.63
Median I-8 @ 30cm	21	92.11	3.51	162.90	1.42	0.750	181.81	298.59	0.988	3.92	4.16	50.40	64.07
Median I-8 @ 60cm	14	42.30	3.27	38.82	1.11	0.945	94.86	161.92	0.977	3.67	3.91	39.25	49.90
Median - All	*56*	*74.92*	*3.65*	*108.95*	*1.20*	*0.768*	*93.80*	*104.09*	*0.992*	*3.86*	*3.97*	*47.47*	*52.98*
All I-8 @ 15cm	59	706.77	5.66	2124.11	1.57	0.517	358.48	553.55	0.990	5.91	6.05	368.50	422.18
All I-8 @ 30cm	59	315.58	4.44	743.00	1.65	0.641	125.39	193.63	0.995	4.71	4.86	111.44	129.63
All I-8 @ 60cm	52	325.01	4.44	654.69	1.67	0.714	117.88	182.27	0.986	4.74	4.91	114.91	135.42

Notes: cm = centimeters UCL = Upper confidence limit R = Correlation Coefficient Shading indicates UCL concentration exceeds the action level of 350 mg/kg.
See statistical analysis, Minitab software output, Appendix C. Concentrations expressed in milligrams per kilograms (mg/kg).

Soluble Lead

Sample Set	Number of Points (n)	Correlation	Slope	Intercept	Mean-Soluble Lead $UCL_{.80}$	Mean-Soluble Lead $UCL_{.95}$
[redacted]	15	0.42	0.0053	4.69	9.27	10.33
[redacted]	14	0.48	0.0036	3.95	5.11	5.41
Eastbound I-8 @ 60cm	11	0.74	0.010	1.80	4.77	5.73
[redacted]	*40*	*0.58*	*0.007*	*3.45*	*5.95*	*6.33*
[redacted]	14	0.81	0.0224	2.26	9.96	11.95
[redacted]	10	0.96	0.0370	1.03	5.94	7.73
Westbound I-8 @ 60cm	10	0.86	0.0270	-0.13	3.52	4.71
[redacted]	*34*	*0.84*	*0.026*	*1.54*	*5.41*	*6.04*
Median I-8 @ 15cm	13	0.90	0.0416	0.79	3.86	4.35
Median I-8 @ 30cm	8	0.41	0.0070	4.11	4.47	4.56
Median I-8 @ 60cm	4	-0.82	-0.0968	15.48	*	*
Median - All	*25*	*0.36*	*0.008*	*4.49*	*4.89*	*4.94*
All I-8 @ 15cm	59	0.62	0.0128	3.61	8.34	9.03
All I-8 @ 30cm	59	0.53	0.0123	3.34	4.71	4.94
All I-8 @ 60cm	52	0.65	0.0143	2.31	3.96	4.25

Note: *The negative correlation between total and soluble lead data sets indicates that UCLs of the mean cannot be determined from the data. Shading indicates UCL concentration exceeds the action level of 5 mg/L.
Concentrations expressed in milligrams per liter (mg/L).

no longer applicable
8-29-07
JCK

use 80% UCL onsite to 0.4 meters

Linda S. Adams
Acting Secretary for Environmental Protection

California Regional Water Quality Control Board

San Diego Region

Over 50 Years Serving San Diego, Orange, and Riverside Counties
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http:// www.waterboards.ca.gov/sandiego

Arnold Schwarzenegger
Governor

Action on Request for
Clean Water Act Section 401 Water Quality Certification
and General Waste Discharge Requirements for
Discharge of Dredged and/or Fill Materials

PROJECT: Interstate 8/Greenfiled Auxiliary Lane Project
(File No. 08C-093, WDID No. 9000001869)

APPLICANT:

Mr. Lou Melendez
California Department of Transportation
District 11, MS-242
4050 Taylor Street
San Diego, CA 92110

CIWQS:
Reg. Measure ID: 358236
Place ID: 730528
Party ID: 7222

ACTION:

☐ Order for Low Impact Certification

☑ Order for Technically-conditioned Certification

☑ Enrollment in Order No. 2003-017 DWQ

☐ Order for Denial of Certification

☐ Waiver of Waste Discharge Requirements

☐ Enrollment in Isolated Waters Order No. 2004-004 DWQ

The project proposes to construct an eastbound auxiliary lane on Interstate 8 from Second Street to Greenfield Avenue in the City of El Cajon. The project will also include sound abatement walls, drainage improvements, berms and landscaping. Seven new and replaced drainage structures will be constructed that will flow into Forrester Creek in a section of the creek that is completely concrete lined.

STANDARD CONDITIONS:

The following three standard conditions apply to <u>all</u> certification actions, except as noted under Condition 3 for denials (Action 3).

1. This certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to section 13330 of the California Water Code and section 3867 of Title 23 of the California Code of Regulations (23 CCR).

2. This certification action is not intended and must not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent certification application was filed pursuant to 23 CCR subsection 3855(b) and the application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.

3. The validity of any non-denial certification action (Actions 1 and 2) must be conditioned upon total payment of the full fee required under 23 CCR section 3833, unless otherwise stated in writing by the certifying agency.

ADDITIONAL CONDITIONS:

In addition to the three standard conditions, the California Department of Transportation (Caltrans) must satisfy the following:

A. GENERAL CONDITIONS:

1. Caltrans must, at all times, fully comply with the engineering plans, specifications and technical reports submitted to the California Regional Water Quality Control Board, San Diego Region (Regional Board), to support this 401 Water Quality Certification and all subsequent submittals required as part of this certification and as described in Attachment 1. The conditions within this certification must supersede any conflicting provisions within such plans submitted prior to the certification action.

2. During construction, Caltrans must maintain a copy of this certification at the project site so as to be available at all times to site personnel and agencies.

3. Caltrans must permit the Regional Board or its authorized representative at all times, upon presentation of credentials:

    a. Entry onto project premises, including all areas on which wetland fill or wetland mitigation is located or in which records are kept.
    b. Access to copy any records required to be kept under the terms and conditions of this certification.
    c. Inspection of any treatment equipment, monitoring equipment, or monitoring method required by this certification.
    d. Sampling of any discharge or surface water covered by this Order.

4. Caltrans must notify the Regional Board within 24 hours of any unauthorized discharge, including hazardous or toxic materials, to waters of the U.S. and/or State; measures that were implemented to stop and contain the discharge; measures implemented to clean-up the discharge; the volume and type of materials discharged and recovered; and additional best management practice (BMPs) or other measures that will be implemented to prevent future discharges.

5. Caltrans must, at all times, maintain appropriate types and sufficient quantities of materials onsite to contain any spill or inadvertent release of materials that may cause a condition of pollution or nuisance if the materials reach waters of the U.S. and/or State.

6. In the event of any violation or threatened violation of the conditions of this certification, the violation or threatened violation must be subject to any remedies, penalties, process or sanctions as provided for under State law. For purposes of section 401(d) of the Clean Water Act, the applicability of any State law authorizing remedies, penalties, process or sanctions for the violation or threatened violation constitutes a limitation necessary to assure compliance with the water quality standards and other pertinent requirements incorporated into this certification.

7. In response to a suspected violation of any condition of this certification, the Regional Board may require the holder of any permit or license subject to this certification to furnish, under penalty of perjury, any technical or monitoring reports the Regional Board deems appropriate, provided that the burden, including costs, of the reports must bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports.

8. In response to any violation, or anticipated violation of the conditions of this certification, the Regional Board may add to or modify the conditions of this certification as appropriate to ensure compliance.

9. Caltrans must comply with the requirements of State Water Resources Control Board Water Quality Order No. 2003-0017-DWQ, Statewide General Waste Discharge Requirements for discharges of dredged or fill material that have received State Water Quality Certification. These General Waste Discharge Requirement are accessible at: http://www.waterboards.ca.gov/cwa401/docs/generalorders/go_wdr401regulated_projects.pdf.

B. PROJECT CONDITIONS:

1. Prior to the start of the project Caltrans must educate all personnel on the requirements in this certification, pollution prevention measures, spill response, and BMP implementation and maintenance.

2. Caltrans must notify the Regional Board in writing at least 5 days prior to the actual commencement of dredge, fill, and discharge activities.

3. Caltrans must comply with the requirements of State Water Resources Control Board Water Quality Order No. 99-06-DWQ, NPDES No. CAS000003, the NPDES Permit for Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans), July 1999.

4. Water containing mud, silt, or other pollutants from equipment washing or other activities, must not be discharged to waters of the United States and/or the State or placed in locations that may be subjected to storm flows.

5. All surface waters, including ponded waters, must be diverted away from areas undergoing grading, construction, excavation, vegetation removal, and/or any other activity which may result in a discharge to the receiving water. Diversion activities must not result in the degradation of beneficial uses or exceedance of water quality objectives of the receiving waters. Any temporary dam or other artificial obstruction constructed must only be built from materials such as clean gravel which will cause little or no siltation. Normal flows must be restored to the affected stream immediately upon completion of work at that location.

6. Substances hazardous to aquatic life including, but not limited to, petroleum products, raw cement/concrete, asphalt, and coating materials, must be prevented from contaminating the soil and/or entering waters of the United States and/or State. BMPs must be implemented to prevent such discharges during each project activity involving hazardous materials.

7. Discharges of concentrated flow during construction or after completion must not cause downstream erosion or damage to properties or stream habitat.

C. POST CONSTRUCTION STORM WATER MANAGEMENT:

1. A bio-swale will be constructed to treat stormwater runoff from the project as described in the 401 certification application (Figure 4) submitted for this, and will be sized to treat a total of 21.1 acres of impervious and pervious surface (150% of total impervious surface within the project area).

2. Post-construction BMPs (Bio-swale) must be installed and functional prior to completion of of project. Caltrans will provide documentation that the proposed BMPs have been completed prior to the projects completion.

3. Caltrans assumes responsibility for the inspection and maintenance of all post-construction structural BMPs in perpetuity.

4. Caltrans will keep records regarding inspections and maintenance in order to assess the performance of the systems and determine whether adaptations are necessary to protect receiving waters. These records will be made available to the Regional Board upon request.

D. STREAM PHOTO DOCUMENTATION PROCEDURE:

1. Caltrans must conduct photo documentation of the project site, including areas of temporary impact, prior to and after project construction, including all areas of permanent and temporary impact, prior to and after project construction. Photo-documentation will be submitted to the Regional Board within 60 days of project completion.

E. R EPORTING:

1. All information requested in this Certification is pursuant to California Water Code (CWC) section 13267. Civil liability may be administratively imposed by the Regional Board for failure to furnish requested information pursuant to CWC section 13268.

2. All reports and information submitted to the Regional Board must be submitted in both hardcopy and electronic format, with a cover referencing the subject project and certification number.

3. All applications, reports, or information must be submitted to:

Executive Officer
California Regional Water Quality Control Board
San Diego Region
Attn: 401 Certification No. 08C-088, Central Watershed Unit
9174 Sky Park Court, Suite 100
San Diego, California 92123

F. SIGNATORY REQUIREMENT

1. All applications, reports, or information submitted to the Regional Board must be signed as follows:

   a) For a corporation, by a responsible corporate officer of at least the level of vice president.
   b) For a partnership or sole proprietorship, by a general partner or proprietor, respectively.
   c) For a municipality, or a state, federal, or other public agency, by either a principal executive officer or ranking elected official.

2. A duly authorized representative of a person designated in Items 1.a. through 1.c. above may sign documents if:

    a) The authorization is made in writing by a person described in Items 1.a. through 1.c. above.
    b) The authorization specifies either an individual or position having responsibility for the overall operation of the regulated activity.
    c) The written authorization is submitted to the Regional Board Executive Officer.

3. All applications, reports, or information submitted to the Regional Board Executive Officer must be certified as follows:

    "I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

REGIONAL WATER QUALITY CONTROL BOARD CONTACT PERSON:

Christopher Means
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123
858-637-5581
cmeans@waterboards.ca.gov

WATER QUALITY CERTIFICATION:

I hereby certify that the proposed discharge, **Interstate 8/Greenfiled Auxiliary Lane Project** (Certification No. 08C-093) will comply with the applicable provisions of sections 301 ("Effluent Limitations"), 302 ("Water Quality Related Effluent Limitations"), 303 ("Water Quality Standards and Implementation Plans"), 306 ("National Standards of Performance"), and 307 ("Toxic and Pretreatment Effluent Standards") of the Clean Water Act. This discharge is also regulated under State Water Board Order No. 2003-0017-DWQ, "General Waste Discharge Requirements for Dredged or Fill Discharges that have Received State Water Quality Certification," which requires compliance with all conditions of this Water Quality Certification. Please note that this certification is conditional and, should new information come to our attention that indicates a water quality problem, the Regional Board may issue waste discharge requirements at that time.

Except insofar as may be modified by any preceding conditions, all certification actions are contingent on (a) the discharge being limited and all proposed mitigation being completed in strict compliance with the applicants' project description and/or on the attached Project Information Sheet, and (b) on compliance with all applicable requirements of the Regional Water Quality Control Board's Water Quality Control Plan (Basin Plan).

John H Robertus

JOHN H. ROBERTUS
Executive Officer
Regional Water Quality Control Board

2/4/2009
Date

Attachments:

1. Project Information
2. Distribution List
3. Location Map
4. Photos, and BMP diagrams

ATTACHMENT 1
PROJECT INFORMATION

Applicant:	Mr. Lou Melendez Project Manager Caltrans District 11, MS-242 4050 Taylor Street San Diego, CA 92110
Applicant Representatives:	Mr. Bruce April Caltrans District 11, MS-242 4050 Taylor Street San Diego, CA 92110
Project Name:	Interstate 8/Greenfiled Auxiliary Lane Project (08C-093)
Project Location:	The project is located between Second Street (kilopost 28.0) and Greenfield Drive along the Interstate 8 Freeway, in the City of El Cajon.
Type of Project:	Auxiliary Lane Construction
Need for Project:	To improve traffic flow on Interstate 8
Project Description:	The project proposes to construct an eastbound auxiliary lane on Interstate 8 from Second Street to Greenfield Avenue in the City of El Cajon. The project will also include sound abatement walls, drainage improvements, berms and landscaping. Seven new and replaced drainage structures will be constructed that will flow into Forrester Creek in a section of the creek that is completely concrete lined.
Federal Agency/Permit:	U.S. Army Corps of Engineers §404, NWP 3 (Non-reporting) , Stephanie Hall
Other Required Regulatory Approvals:	n/a
California Environmental Quality Act (CEQA) Compliance:	On December 3, 2008 Caltrans, acting as lead agency, determined that the proposed project was categorically exempt from CEQA (Class 1, PRC 21084; 14 CCR 15300 et seq.)
Receiving Water:	Forrester Creek
Affected Waters of the United States:	Permanent: ACOE unvegetated waters of the US: 0.007 acre (concrete lined channel)
Dredge Volume:	n/a

Related Projects Implemented/to be Implemented by the Applicant(s):	none
Compensatory Mitigation:	Impacts are minimal and occur in a concrete lined channel. Mitigation is not being proposed or required.
Best Management Practices (BMPs):	Construction based best management practices will be employed during construction in accordance with Caltrans Statewide Stormwater permit requirements
Fees:	Total Due: $640.00 Total Paid: $640.00 (check No. 082-285174, 082-296940)
CIWQS:	Regulatory Measure ID: 355651 Place ID: 729419 Party ID: 7222

ATTACHMENT 2
DISTRIBUTION LIST

Ms. Pam Beare
California Department of Fish and Game
South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123

State Water Resources Control Board
Division of Water Quality
401 Water Quality Certification and Wetlands Unit
P.O. Box 100
Sacramento, CA 95812-0100

Mr. Bruce April
Chief, Environmental Stewardship
Caltrans District 11, MS-242
4050 Taylor Street
San Diego, CA 92110

Ms. Stephanie Hall
U.S. Army Corps of Engineers, Regulatory Branch
P.O Box 532711
Los Angeles, CA 90053-2325

Ms. Elizabeth Goldman
Wetlands Regulatory Office
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street
San Francisco, CA 94105

Attachment No. 3

Project Location Map

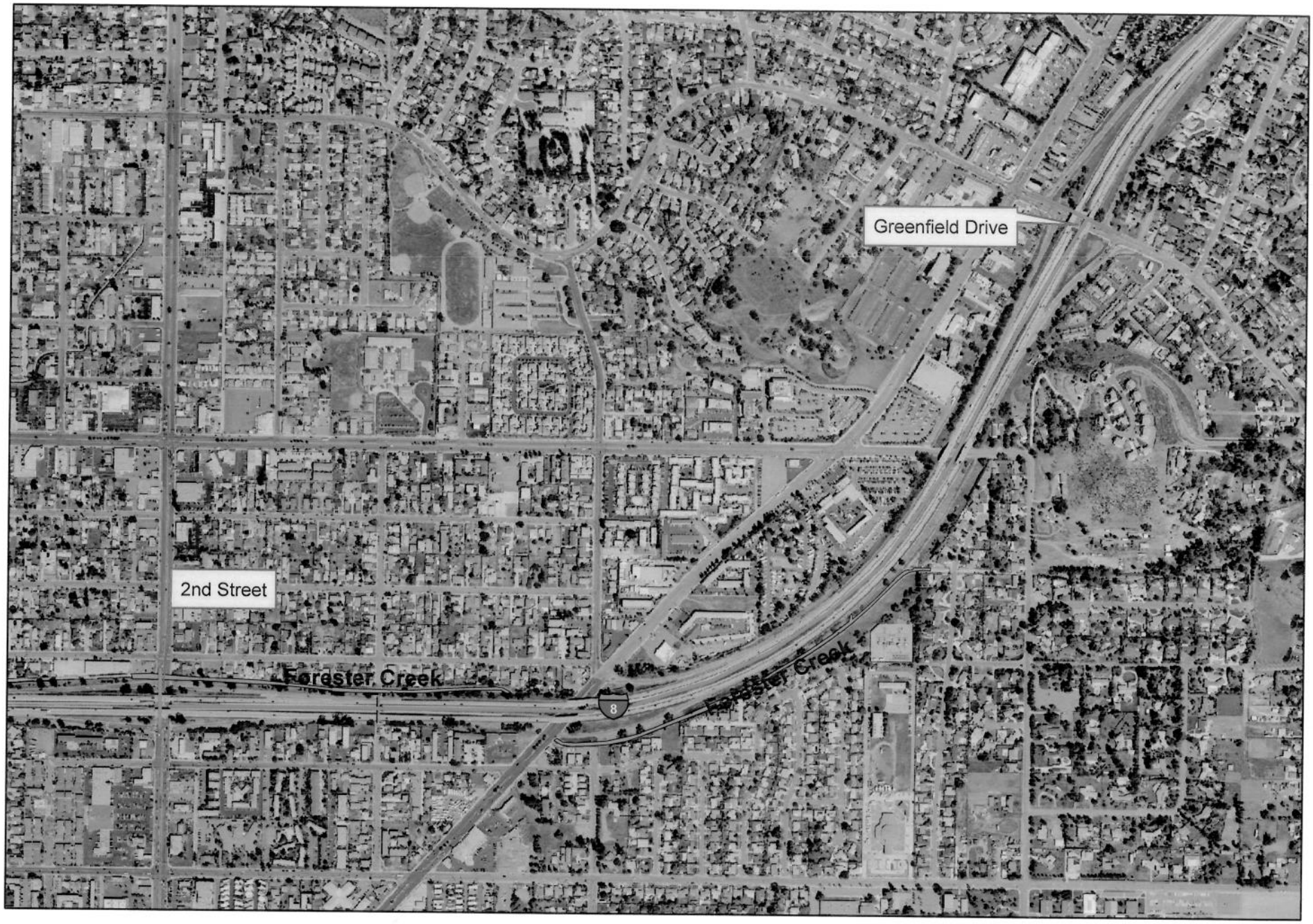

Figure 1. Project Location

N

Attachment No. 4

Site Photos, BMP Diagram

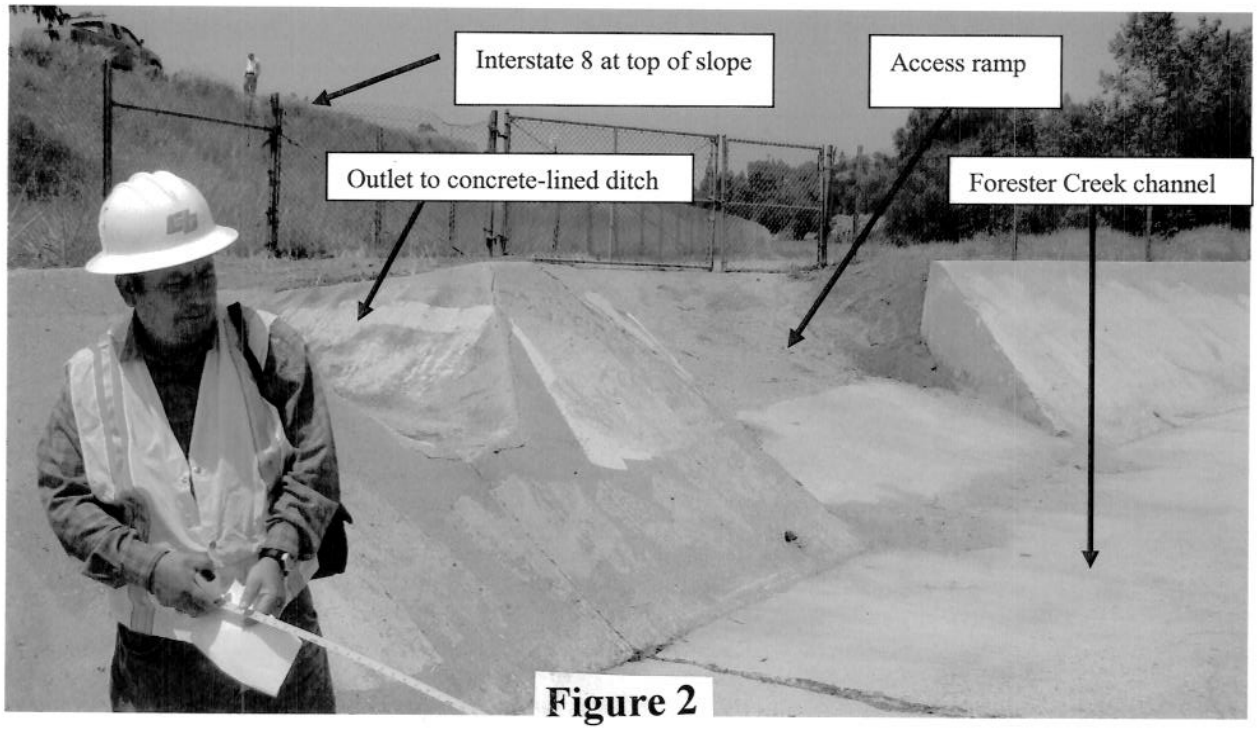

Figure 2

Above: The maintenance access ramp to concrete-lined Forrester Creek channel will be shifted to the east.

Below: The concrete-lined ditch at the toe of the slope to Interstate 8 will also be shifted.

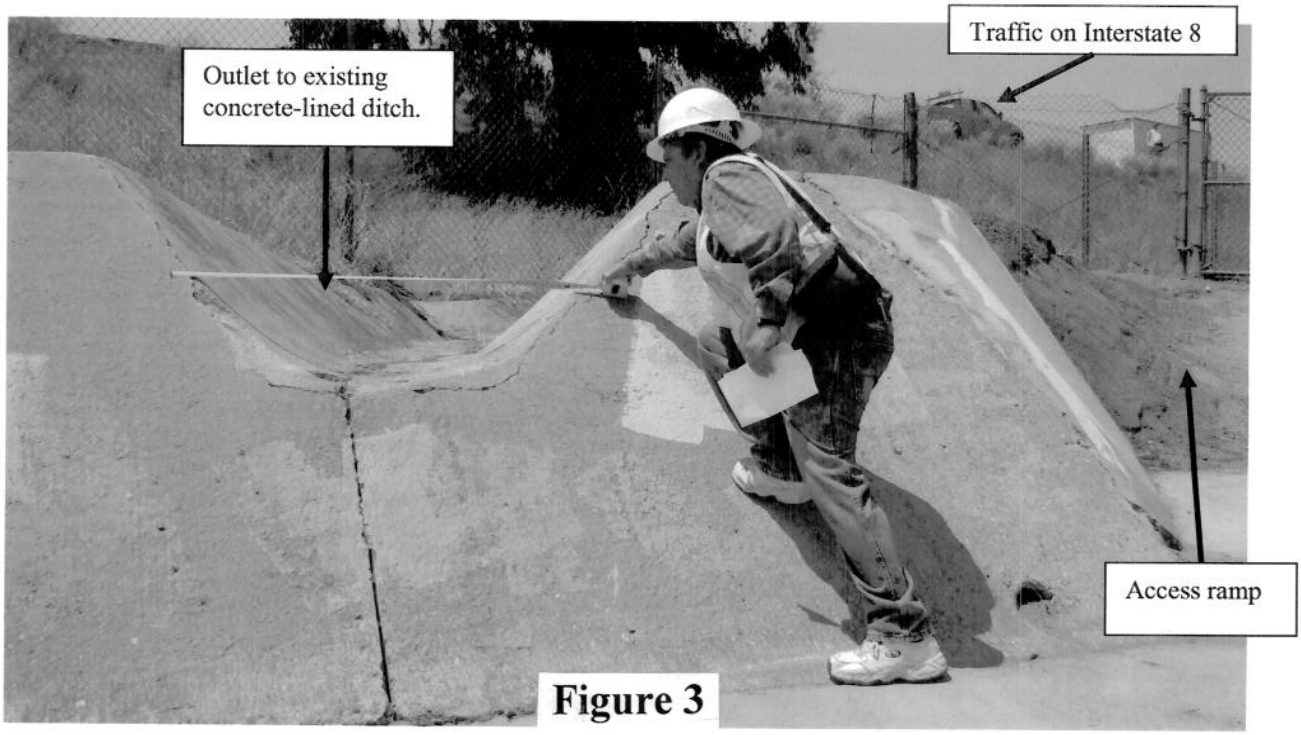

Figure 3

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	8	28.0/R30.1		

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 ELECTRONIC COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER CHADWICK K. LAU No. C33223 Exp. 06-30-10 CIVIL STATE OF CALIFORNIA

Caltrans Metric

NOTES:

1. FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE 1:500

LAYOUT

L-2

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

FUNCTIONAL SUPERVISOR: MICHAEL J. WEBSTER

CALCULATED-DESIGNED BY: WAYNE NGUYEN

CHECKED BY

REVISED BY

DATE REVISED

LAST REVISION 00-00-00

DATE PLOTTED => 16-OCT-2008

TIME PLOTTED => 19:43

BORDER LAST REVISED 3/1/2007

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbwayne

DGN FILE => Layout_2.dgn

CU 11272

EA 063801

Figure 4