FOR CONTRACT NO.: 12-0M5504

INFORMATION HANDOUT

MATERIALS INFORMATION

PILE WALL FOUNDATION DESIGN REPORT
ADDENDUM FOR WALL FOUNDATION DESIGN REPORT
RETAINING WALL R488M AS-BUILTS

ROUTE: 12-Ora-73-10.7/11.6

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

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To: MR. RAMIN RASHEDI, Branch Chief
Office of Structure Design

Date: May 1, 2012

File: 12-ORA-73-PM 10.0/11.4
EA 12-0M5501
Shear Pile Wall for
Embankment Distress

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
Geotechnical Services
Office of Geotechnical Design South-1 Branch B

Subject: Pile Wall Foundation Design Report for Toll Road Route 73 Embankment Slope Investigation.

The Office of Geotechnical Design-South 1 has prepared this Pile Wall Foundation Report for the Toll Road Route 73 embankment from Postmiles 10.0 to 11.4. The intent of this Report is to provide a summary of our geotechnical investigation and foundation recommendations for the subject project area. The analysis and recommendations are based on soil borings, Cone Penetration Tests (CPT's), lab test results, Slope Inclinometer (SI) readings and survey points conducted during the investigation for this project. A summary of the entire investigation is briefly discussed in this report with summary tables of the borings, CPT's and SI data. The details of the first phase of the investigation are covered in full in the Initial Assessment Report, dated December 1st 2011. A second phase of the field investigation, performed for this report is summarized in full herein. The Project Site Location Map is shown on Figure 1.

1.0 SCOPE OF WORK

The following tasks were performed for the preparation of this design report:

- Geotechnical drilling.
- Laboratory testing.
- Geotechnical analysis.
- Preparing Design Details of Pile Wall.
- Preparation of this FR.

2.0 PROJECT DESCRIPTION

2.1 Existing Site Conditions

Complete details of the site features are discussed in the December 1st report. However, for a brief summary the main geometric details of the MSE Wall and the existing Kleinfelder Wall are discussed in this section with updates on the latest SI and wall survey readings.

2.1.1 Mechanically Stabilized Earth Wall

As discussed in the December 1st initial Assessment Report, an MSE Wall is located on the northbound side of the SR-73 between Postmiles 10.72 and 10.97.The wall varies in height from 33 to 47 feet, along a length of 1,320 feet. On available grading plans the MSE Wall spans from approximately Station 481+00 to 493+71.03 along the SR73 Centerline. According to the As-Builts, the length of the steel reinforcement mesh varies from 27 to 33 feet. The MSE Wall is also founded on a 6" by 12" concrete leveling pad. The latest wall movement taken on January 24, 2012 from survey point measurements show 1.5 inches of horizontal movement at point 905 and 1 inch of vertical movement located at Station 491+40. The resultant movement at this location is 1.6 inches (see Section 3.2 and Appendix B).

2.1.2 Existing Kleinfelder Pile Wall

The existing Kleinfelder Cast-in-Drilled-Hole (CIDH) pile wall is located just east of the right of way between the Costco and Caltrans properties. The approximately 400 foot long pile wall consists of 4 to 4.5 foot diameter CIDH piles with rebar reinforcement. The piles are spaced 8-feet on centers and vary in length from 60 to 68 feet deep. The shear capacity of the piles is about 406 kips (Kleinfelder, Interim Landslide Repair, Updated May 13, 2011). The piles were constructed within the first 3 weeks of July 2011. The latest slope inclinometer readings for these piles show ½-inch movement at RC-11-010 in the last 4 months with the latest reading taken in January 10, 2012. North of the Costco Building, the SI at B-14 was about to be sheared off as of January 17th and the nearby SI at RC-11-011 showed ongoing movement (roughly parallel to the MSE Wall).

2.1.3 Roadway Distress - Updated

The SR-73 median is covered with impermeable plastic, which is keeping water from percolating into the subsurface. However, shearing appeared on the left shoulder near station 492+00 in late July 2011 but has not progressed since that time.

Within the Costco property side, the driveway and sidewalk have been repaved after construction of the pile wall during July 2011. Since that time, uplift of the sidewalk about 3/8-1/3-inch relative to the curb was observed in March 2012. The sidewalk covers the Pile Wall installed by Kleinfelder in July 2011.

In addition, fluid, appearing to be drill mud had been observed coming out of Piezometer P-1 adjacent to the Costco Building during the week of February 27th. It is apparent that drilling mud from drilling operations conducted near the SR 73 median has found a pathway to the piezometer adjacent to the Costco Building. Drill mud was also observed flowing out of an outlet drain located at base of the MSE Wall within the Caltrans right of way. It is possible that the pathway could be a shear/fracture zone which would probably be part of the landslide slide plane.

The parking area north of Costco has cracking which coincides with the steady slope movement in this area.

2.2 PROPOSED STRUCTURE

The proposed structure consists of a Cast-in-drilled-Hole (CIDH) pile wall with a layout as shown on plan layout sheets 1 through 4. The pile wall is intended to prevent further movement of the freeway embankment. The pile wall will be composed of 48-inch CIDH piles at 6-foot spacing on centers. There will one row of piles from Station 484+00 to 491+15 and two rows of piles between Station 491+15 to 493+59 as shown on the layout sheets. The spacing between the two rows will be 8 feet. The piles will be topped with a pile cap which will be set adjacent to the face of the MSE Wall. The pile cap will be placed adjacent to the MSE Wall face. The bottom of the pile cap elevation will vary along the length of the MSE Wall but should be no deeper than the elevation of the MSE Wall leveling pad. The pile wall will also have one row of anchors at 30 degrees from the horizontal starting in the south end of the project. The anchors will increase to two rows starting at about 305 feet from the south limit for about 435 feet. From this point to the north end of the project the anchors will increase to three rows. The unbonded lengths will extend 5 feet past the slide plane. The unbonded lengths of the anchors and soil parameters used will be discussed in Section 7.0 of this report.

3.0 EXPLORATION AND INSTRUMENTATION

The investigation for this project was performed between February 7, 2012 and March 8, 2012 which consisted of nine soil borings. Six (6) of the boreholes were converted into Piezometer wells to monitor ground water levels. Four of the borings (RC-12-015 through RC-12-018) were drilled to the south side of the Costco building within Caltrans right of way. These four borings were drilled in the south area to help properly characterize the subsurface conditions in this area. Three borings were added adjacent to proposed horizontal drain locations near stations 487+50, 489+90, and 491+70. These were drilled to monitor groundwater levels through the newly installed horizontal drains. Borings RC-11-022 and RC-11-023 were drilled north of the Costco Building and converted to SI's to help monitor slope movement.

A summary of the Borings is included in the summary Table below and are shown on the plot plan, Figure 2. The borings from this and the previous investigation will be included in Log of Test Borings which will be provided at a later date.

Table No. 1 – Summary of Boring Locations

Boring/sounding	Station	Offset	Alignment	Surface Elevation, ft	Drilled/Sounded Depth, ft	Sl/Piezometer Installation
RC-12-015	483+50	93R	SR73	270	70	N/A
RC-12-016	484+60	29R	SR73	305	120	Piezometer
RC-12-017	485+60	100R	SR73	273	70	Piezometer
RC-12-018	487+10	40L	SR73	311	120	Piezometer
RC-12-019	487+70	36R	SR73	308	100	Piezometer
RC-12-020	489+90	36L	SR73	315	120	Piezometer
RC-12-021	491+70	33R	SR73	323	95	Piezometer
RC-12-022	493+60	29R	SR73	331.5	120	SI
RC-12-023	493+50	165R	SR73	282	70	SI

Note: 1. Elevations are Above Mean Sea Level (MSL) (1988 NAVD Datum).
2. These borings are a continuation of borings RC-11-001 through RC-11-014 and CPT's CPT-11-001 through CPT-11-006 summarized in the Initial Assessment Report, Dated December 1st , 2011.
3. Stations, offsets, and elevations taken from Project Plans.

Survey results for these borings will be done and provided in an addendum memorandum. The borings were logged and sampled using the Standard Penetration Test (SPT) sampler and 2-inch Modified California sampler with 4.25-inch diameter punch coring in between the samples. In some of the borings when Capistrano Formation (Tc) was encountered drilling was switched to 3.8-inch diameter wire-line rock coring to the total depth explored. The SPT samples were driven using a 140-pound hammer falling freely for 30 inches for a total penetration of 18 inches. The Modified California samplers were pushed into the soil to obtain the relatively undisturbed brass-tube samples. Intact formational samples obtained from the borings were sealed in plastic bags to retain moisture and placed in core boxes alongside the remaining core run samples.

3.1 Slope Inclinometer Instrumentation and Update

For this report two additional slope inclinometers, RC-12-022 and RC-12-023, were installed to monitor movement north of the Costco Building. These SI's were installed in mid to late February 2012. Initial readings have been made but have not been processed as of yet. Presently, readings for all the Caltrans SI's are being made on a weekly basis. The results of the readings will be provided as they become available.

During the first phase of the investigation, twelve slope inclinometers (SI) were installed to monitor the movement of the Route 73 Embankment and MSE Wall. Among them, ten SI's were installed behind the MSE Wall within the Caltrans Right of Way. RC-11-010 and RC-11-011 were installed at the base of the MSE Wall within the right of way. The table below shows an update of the readings of these SI's through February 2012 as well as the two recently installed SI's: RC-12-022 and RC-12-023. The readings continue to be taken on a bi-weekly basis.

Table No. 2 – Summary of SI Results

SI No.	Cumulative Displacement (inches)-A direction	Dates	Cumulative Displacement (inches)-B direction	Dates
RC-11-002	0.05 (42 ft)	7/19/11 to 1/11/12	-0.05*	7/19/11 to 1/11/12
RC-11-003(1)	0.65 (39 ft)	5/3/11 to 6/21/11	0.74 (39 ft)	5/3/11 to 6/21/11
RC-11-004	0.3*	5/3//11 to 1/11/12	-0.26*	5/3/11 to 1/11/12
RC-11-005	0.05*	5/5/11 to 1/11/12	-0.04*	5/5/11 to 1/11/12
RC-11-006	0.07*	5/4/11 to 1/11/12	0.02*	5/4/11 to 1/11/12
RC-11-007	0.06*	5/4/11 to 1/11/12	0.03*	5/4/11 to 1/11/12
RC-11-009	-0.22*	5/5/11 to 1/11/12	0.12*	5/5/11 to 1/11/12
RC-11-010	2.0 (24 ft)	5/24/11 to 1/10/12	0.10	5/24/11 to 1/11/12
RC-11-011	0.25	5/25/11 to 1/10/12	-0.52*	5/25/11 to 1/11/12
RC-11-012	0.08	5/24/11 to 1/11/12	0.0	5/24/11 to 1/11/12
RC-11-013	-0.48	5/25/11 to 1/11/12	0.01	5/25/11 to 1/11/12
RC-11-014	0.25	7/26/11 to 1/11/12	-0.02	7/26/11 to 1/11/12
RC-12-022	See Note 2			
RC-12-023	See Note 2			

Notes: A-direction is perpendicular to roadway, B-direction is parallel to roadway.
Depth of movement is in parenthesis.
*Tension Cracking .
1. Sheared off at 40 foot depth prior to the 7/15/11 readings. The SI was replaced by RC-11-014 on July 20th.
2. Data not yet available as of this report date.

The data continues to show slope instability movement at four SI locations, RC-11-010, RC-11-011, RC-11-014, and RC-11-013. RC-11-010 and RC-11-014 are located in front and behind the MSE Wall near Station 490+50 to 491+00. These show 0.2-inches movement since December 2011. RC-11-011, located north of Costco at the base of the MSE Wall shows 0.03-inch movement in the northeast direction (about parallel to the roadway) since December 2011. RC-11-013 located north of the Costco Building behind the MSE Wall shows 0.15-inch movement away from the MSE Wall. The data shows continued movement despite the lack of rainfall these past few months. It may be assumed that with normal rainfall amounts the movement especially north and in front of the Costco building and pile wall would have been greater. The latest SI readings are included in Appendix A of this report.

3.2 Survey Points

Survey points were set on the MSE Wall in June 2011 to monitor movement of the wall face. The points consisted of three rows of points. One row was set along the top of the wall, the second at approximately mid-height and the third just above the base. Readings, taken on a weekly basis showed movement of the MSE Wall vertically and horizontally by 0.8 and 1.6 inches, respectively on August 29, 2011 (Survey point 10905 at Station 491+40). The resultant of this movement, about 1.7 inches, were summarized in the December 1st Initial Assessment Report.

Since that time, readings have been taken on a bi-weekly basis. The latest readings for point 10905 show a vertical reading of 1.0 inch and horizontal reading of 1.53 inches. The resultant from these readings is 1.8-inches. This movement shows the wall with a tenth of an inch of movement since August 2011. This relatively small movement may be due to the lack of rainfall and the existing pile wall on the Costco property line side. Again, with normal rainfall amounts it would be expected that the survey results would show greater movement. The results of the survey points are shown in Appendix B.

4.0 LABORATORY TESTING

Laboratory testing was performed on selected soil and formational samples from the investigation program. The materials tested are representative of the backfill material used for the embankment and the underlying native soil and formational material at depth. Laboratory testing included Grading analysis, Atterberg limits, Direct Shear, Unconfined Compression, Triaxial CU Tests, Consolidation, and Corrosivity Tests. Geotechnical testing was performed in accordance with California Test Methods and/or ASTM procedures as indicted by Table 3.

The results of the laboratory tests are not yet available. They will be provided in an addendum memorandum when they are made available.

Table No. 3 – Laboratory Test Methods

Test	Standard
Grading Analysis	ASTM D 422
Atterberg Limits	AASHTO T 90 & 89
Direct shear	ASTM D 3080
Unconfined Compression	ASTM D 2166
Triaxial CU	ASTM D4767
Consolidation	ASTM D 2435
Corrosion	CTM 643, CTM 422, CTM 417

5.0 GEOTECHNICAL CONDITIONS

5.1 Regional Geology

The project is located within the Peninsular Ranges geomorphic province. The Peninsular Ranges Province is characterized by northwest-southeast trending mountain ranges and valleys that are parallel to the San Andreas Fault. The site lies within the San Joaquin Hills, southwest of the Santa Ana Mountains. According to geological maps, the site is underlain by landslide deposits and the Capistrano Formation. The Capistrano Formation is a Pliocene- to Miocene-aged marine deposit, typically composed of siltstone.

5.2 Site Geology

The original ground surface prior to freeway construction was a mantle of Quaternary landslide deposits over a gentle slope composed of the Capistrano Formation. The landslide deposits are roughly 30-50 feet thick and composed of Capistrano Formation material. The landslide deposits are typically very soft to soft, intensely weathered, moderately fractured mudstone. The bedding is convoluted, and the fractures are rust-stained and frequently filled with gypsum. Slope inclinometers show movement generally follows the contact between the landslide deposits and the underlying bedrock.

The underlying Capistrano Formation ranges from very soft to moderately soft. It is generally slightly weathered and unfractured to slightly fractured mudstone. Bedding was very faint and typically ranged from 10 to 15° dipping to the Southeast (M&T AGRA 1995). However, within the upper sliding material the bedding is convoluted.

Possibly prior to and during freeway construction, artificial fill was placed over the landslide deposits. The fill has a maximum thickness of about 50 feet within the MSE wall limits and tapers to nothing where the western edge of the roadway meets the hillside. The fill appears to be locally-derived from the Capistrano Formation as evidenced by rust-staining and gypsum-filled fractures.

5.3 Ground Water Conditions

Piezometers were installed in during the first phase of the investigation at, RC-11-001 and RC-11-008. During the investigation for this project, six additional piezometers, RC-12-016 through RC-12-021 were installed and are continuing to be monitored on a bi-monthly basis. The table below shows the measured water levels of the first phase and current phase of the investigation. The measurements listed below show that ground water levels have been steadily decreasing in RC-11-001 and RC-11-008 except for a slight increase in RC-11-001 from December 2011 to January 2012 due to the winter season. The same increase is seen in RC-11-008 from January to February 2012. The first readings for RC-12-017, RC-12-019, RC-12-020, and RC-12-021 are shown in the same table. The locations of the wells are shown on the Plot Plan, Figure 2.

Table No. 5 – Ground Water Elevations (ft.)

Date	RC-11-001	RC-11-008	RC-12-016	RC-12-017	RC-12-018	RC-12-019	RC-12-020	RC-12-021
4/27/11	284.7	264.5	N/A	N/A	N/A	N/A	N/A	N/A
5/5/11	278.7	264.8	N/A	N/A	N/A	N/A	N/A	N/A
5/11/11	278.4	262.9	N/A	N/A	N/A	N/A	N/A	N/A
5/24/11	277.6	262.4	N/A	N/A	N/A	N/A	N/A	N/A
6/21/11	271.4	262.6	N/A	N/A	N/A	N/A	N/A	N/A
7/11/11	271.9	--	N/A	N/A	N/A	N/A	N/A	N/A
7/26/11	271.2	261.8	N/A	N/A	N/A	N/A	N/A	N/A
8/9/11	269.5	262.0	N/A	N/A	N/A	N/A	N/A	N/A
9/22/11	269.2	262.0	N/A	N/A	N/A	N/A	N/A	N/A
10/12/11	268.3	--	N/A	N/A	N/A	N/A	N/A	N/A
11/3/11	268.7	262.2	N/A	N/A	N/A	N/A	N/A	N/A
11/29/11	267.4	262.3	N/A	N/A	N/A	N/A	N/A	N/A
12/28/11	268.4	262.4	N/A	N/A	N/A	N/A	N/A	N/A
1/27/12	268.8	262.3	N/A	N/A	N/A	N/A	N/A	N/A
2/7/12	269.2	262.7	N/A	N/A	N/A	N/A	N/A	N/A
2/21/12	269.2	262.7	N/A	N/A	N/A	N/A	N/A	N/A
3/6/12	266.5	262.4	N/A	242.4	N/A	270.7	280.7	268.1

6.0 PROJECT SITE SEISMICITY

The site is not located within any Alquist-Priolo Earthquake Fault Zone as established by the California Geological Survey; therefore, the risk of surface rupture is low. Based on the Caltrans ARS Online site, the controlling faults are the San Joaquin Hills Blind Thrust, the Offshore or Dana Point section of the Newport-Inglewood Fault Zone. The average shear wave velocity of the upper 30 meters (Vs30) is approximately 270 m/sec based on correlations with SPT and CPT data collected during our geotechnical investigation. The Peak Ground Acceleration (PGA) calculated for this site is 0.5g. A summary of the contributing fault parameters as given by ARS Online is shown below. The ARS curve is shown in Appendix C: ARS Curve. The ARS curve data has been modified for near source effects per the Caltrans Seismic Design Criteria.

Table No. 6 – Fault and Design Ground Motion Parameters

Fault	Fault ID	Type	Dip°	Dip Direction	M_{max}	R_{rup} (km)	R_{JB} (km)	R_x (km)
San Joaquin Hills	7	Reverse	23	SW	6.6	4.3	2.7	3.8
Newport-Inglewood	222	RLSS	90	V	7.5	12.0	12.0	12.0

6.1 Liquefaction

Liquefaction is a phenomenon in which loose, saturated fine-grained, granular soils behave like a liquid while being subjected to high-intensity ground shaking. Liquefaction occurs when shallow ground water, low-density, fine, sandy soils and high-intensity ground motion exist in a site.

Saturated, loose to medium dense, near-surface, cohesionless soils exhibit the highest liquefaction potential, while dense, cohesionless and cohesive soils exhibit low to negligible liquefaction potential. Using the seismic parameters discussed in Section 6.0 of this memo and the soil borings produced for this and the previous report, liquefaction is unlikely to occur due to the high fines content of the embankment fill and native soils below the ground water elevation, see Section 5.3.

7.0 SOIL AND ROCK PARAMETERS

Soil and formational parameters selected for foundation analysis were based on in-situ data and/or laboratory test results. Soil Units are broken down into (1) MSE Wall fill (2) Silty Sand/Sandy Clay Undetermined Origin (3) Landslide Material (4) Slide zone material, and (5) Capistrano Formational Material. The soil parameters for these Units were derived mainly from in-situ test results and data from previous investigations (M&T AGRA, 1994-1995 and Kleinfelder, 2011).

A summary of the results are presented in Table 7 below. These parameters were used in axial and lateral pile analysis and design, anchor design, and slope stability analysis.

Table No. 7 – Summary of Soil Strength Parameters

Unit	Soil Description	Elevation, ft	Unit Weight, pcf	Friction Angle, degrees	Cohesion, Su, psf
1	MSE Wall Fill	315-275	120	32	200
2	Silty Sand/Sandy Clay Undetermined Origin	315-275	120	32	200
3	Landslide Material/Debris, (Qls)	320-265	123	27	600
4	Slide Zone Material	259-256	123	14-24	0
5	Capistrano Formation (Tc)	Below 270	122	0	4,000

Note: Friction angle for the slide zone material ranges from 14 to 24 degrees depending on Segment location.

8.0 FOUNDATION RECOMMENDATIONS

The CIDH Piles were analyzed for axial capacity and vertical settlement using SHAFT Version 5 computer program by Ensoft. Soil and rock parameters were provided to Structure Design in order to analyze the pile for lateral capacity. Unbonded tiebacks lengths and design capacities were developed by slope stability analysis. That analysis is summarized in the initial assessment report (Department of Transportation December 1st 2011). The analysis was determined using the computer program Slope/W. Details of the design recommendations are provided in the following sections.

8.1 Cast-In-Drilled-Hole Piles

4-foot diameter CIDH piles are proposed for the shear pile wall. The configuration of the piles is based on three sections along the length of the project (Stations 484+00 to 493+59). One row of piles will span between station 484+00 and 491+15. Two rows of piles will span between station 491+15 and 493+59. The spacing of the piles is 6 foot parallel to the MSE Wall and 8 foot perpendicular to the MSE Wall between Stations 491+50 and 493+59. Foundation design load information for the Service I Limit State and Extreme Event Limit State are summarized in Table No. 8. Table 9 summarizes finish grade/Cutoff Elevations and the permissible settlement for each Section of piles.

Table No. 8 – Design Load Table

Foundation Design Loads											
Support No.	**Service – I Limit State**			**Strength Limit state**				**Extreme Event Limit state**			
	Total Load		**Permanent Load**	**Compression**		**Tension**		**Compression**		**Tension**	
	Per Support	**Max Per Pile**	**Per Support**	**Per Support**	**Max Per Pile**	**Per Support**	**Max Per Pile**	**Per Support**	**Max Per Pile**	**Per Support**	**Max Per Pile**
Segment A, Station 10+00 to 13+05	N/A	150 kips	N/A	N/A	N/A	N/A	N/A	N/A	200 kips	N/A	N/A
Segment B, Station 13+05 to 17+41	N/A	400 kips	N/A	N/A	N/A	N/A	N/A	N/A	450 kips	N/A	N/A
Segment C, Station 17+41 to 19+96	N/A	480 kips	N/A	N/A	N/A	N/A	N/A	N/A	500 kips	N/A	N/A

Table No. 9 – General Foundation Information

Foundation Design Data Sheet								
Support No.	**Design Method**	**Pile Type**	**Finished Grade Elevation (ft)**	**Cutoff Elevation (ft)**	**Pile Cap Size (ft)**		**Permissible Settlement under Service Load (in)**	**Number of Piles per Support**
					B	**L**		
Segment A, Station 10+00 to 13+05	LRFD	48-inch CIDH	Varies, (270.3 to 279.8)	Varies, (267.3 to 269.8)	N/A	N/A	1	N/A
Segment B, Station 13+05 to 17+41	LRFD	48-inch CIDH	Varies, (274.8 to 294.8)	Varies, (269.8 to 286.6)	N/A	N/A	1	N/A
Segment C, Station 17+41 to 19+96	LRFD	48-inch CIDH	Varies (294.8 to 316.3)	Varies (286.6 to 306.6)	N/A	N/A	1	N/A

Based on CALTRANS current practice, the total permissible settlement is one inch for multi-span structures with continuous spans or multi-column bents, one inch for single span structures with diaphragm abutments, and two inches for single span structures with seat abutments. Different permissible settlement under service loads may be allowed if a structural analysis verifies that required level of serviceability is met.

Table Number 10 provides a summary of the foundation recommendations for the piles, separated by Sections A, B and C. The table includes the required factored nominal resistance under the Strength and Extreme limit events. Design tips of the piles for each section were analyzed for compression loads and settlement. Lateral loads were determined by Structure Design.

Table No. 10 – Foundation Recommendations for Pile Wall

Support Location	Pile Type	Cutoff Elevation (ft)	Service I Limit St Load (kips) per support	Total Permissible Support Settlement (inches)	Required Factored Nominal Resistance (kips)				Design Tip Elevations (ft)	Specified Tip Elevations (ft)
					Service I Limit		Extreme Limit			
					Comp. (f=0.7)	Tens. (f=0.7)	Comp. (f=1)	Tens. (f=1)		
Segment A, Station 10+00 to 13+05	48" CIDH	Varies, (267.3 to 269.8)	150	1	220	N/A	200	N/A	244 (a) 264 (b) 219 (c)	219
Segment B, Station 13+05 to 17+41	48" CIDH	Varies, (269.8 to 286.6)	400	1	580	N/A	450	N/A	231.5 (a) 251.5 (b) 219 (c)	219
Segment C, Station 17+41 to 19+96	48" CIDH	Varies (286.6 to 306.6)	480	1	690	N/A	500	N/A	224 (a) 229 (b) 219 (c)	219

Notes:

1. *Design tip elevations are controlled by: (a) Compression, (b) Settlement, (c) Lateral Load.*
2. *The specified tip elevation shall not be raised above the design tip elevations for tension, lateral, and tolerable settlement.*
3. *Design tip elevation for lateral load is typically provided by SD.*
4. *Cutoff Elevation Varies along the length of the pile cap. As such the pile tip will vary also with a constant pile length indicated next to the Specified Tip Elevation in parenthesis.*

Table No. 11 – Pile Data Table

Location	Pile Type	Nominal Resistance, (Kips)		Design Tip Elevation, (ft)	Specified Tip Elevation (ft)
		Compression	Tension		
Segment A, Station 10+00 to 13+05	48" CIDH	220	N/A	244 (a) 264 (b) 219 (c)	219
Segment B, Station 13+05 to 17+41	48" CIDH	580	N/A	231.5 (a) 251.5 (b) 219 (c)	219
Segment C, Station 17+41 to 19+96	48" CIDH	690	N/A	224 (a) 229 (b) 219 (c)	219

Notes:

1. *Design tip elevations piles are controlled by (a) Compression, (b) Settlement, (c) Lateral Load*
2. *Cutoff Elevation Varies along the length of the pile cap. As such the pile tip will vary also with a constant pile length indicated next to the Specified Tip Elevation in parenthesis.*

The pile tip elevations for CIDH piles are based on the skin friction of axial compressive loads only. Based on observations of the drilled soil boring, borehole conditions after completion of drilling may experience caving or squeezing within the upper 20 feet. Therefore, the drilling contractor should be prepared for borehole caving or squeezing in the upper 20 feet. A method to stabilize the hole, such as using temporary casing should be utilized, (See Section 9, Construction Considerations).

8.2 Anchor Design

The shear pile wall is designed with a minimum one row of anchors connected in between the piles and 6.5 feet from the top of the pile cap for Section A. For Section B there would be two rows of anchors, located starting at about 2.6 feet from the top of the pilecap and spaced 4 feet vertically. For Section C, the number of anchors would be increased to three rows, again located starting two feet from the top of the pile cap and spaced vertically 2.5 feet. The anchors should extend past the slide plane, which was developed in slope stability analysis in the initial assessment report. A minimum five feet past the slide plane the anchors should be embedded into the Capistrano formation. The anchors should have an angle of 30 to 45 degrees from the horizontal. The anchor unbonded lengths, angles, spacing and capacities are summarized in the table below.

The capacity of the anchors was developed using the Slope/W slope stability analysis program by taking a sum of the driving force area of the slide plane acting on location of the proposed pile wall location. The driving force in kips/ft was divided by the height of the pile wall above the slide plane to provide the landslide pressure acting on the pile wall. Static and seismic driving forces were determined for the three sections A-A', B-B' and C-C'. These driving forces are also summarized in the table below. The unbonded portion of the anchor length was made to extend past the projected fill-bedrock contact line, thus having the bonded length entirely embedded in Capistrano Bedrock.

Table 12 – Summary of Anchor Design Details

Location	Driving Force, kips/ft		Ave Pile Top to sliding plane, ft	Unbonded Anchor Length, ft	No. of Anchors	Angle of Anchors	Anchor Spacing, ft	Design Anchor Capacity, kips
	Static	Seismic						
Segment A, Station 10+00 to 13+05	115	131	10	40	1	30	6	223
Segment B, Station 13+05 to 17+41	138	148	15	60	2	45 (1st row) 30 (2nd row)	6	300
Segment C, Station 17+41 to 19+96	261 (1st Row) 176 (2nd Row)	266 (1st Row) 182 (2nd Row)	34 (first row) 36 (second row)	95 (Station 17+41 to 19+30), 110 (Station 19+30 to 19+96)	3	30 (1st row) 35 (2nd row) 40 (3rd row)	6	300

Notes: (1) Stationing is the SR 73 Centerline.
(2) Landslide Pressure is the driving force divided by the pile depth to slide surface.
(3) Anchor capacity is the minimum required capacity.
(4) Angle of Anchors to horizontal plane.

For the bonded length embedded in Capistrano Formation material a material unit weight of 122 pcf and shear strength of 4,000 psf may be used. Based on the material type and shear strength of the Capistrano formation, a suggested bond stress is 2,600 psf. The bond length should be determined during construction. The amount of deflection allowed at the pile top is 4-inches under seismic conditions. A post grout pipe may be installed for post grouting to help achieve anchor design strength.

8.3 Horizontal Drains

Three test horizontal drains are recommended to be installed through the base of the MSE Wall extending underneath the existing groundwater table. The purpose of the drains is to determine how much discharge can occur. It is recommended that at least 5 feet of drawdown, as measured by the piezometers located within the SR 73 Travel way, can be achieved. If the three test drains create this amount of discharge or more we will recommend additional drains be added.

The location of the three test drains should be located at Stations 487+50, 489+75 and 493+50. The third drain, located at Station 493+50 should be set at an angle of about 40 degrees from a plane perpendicular to the SR73 alignment. The length of the drains should be about 250 feet with the third test drain 325 feet long. The drains should be set at an angle of 5 degrees up from the horizontal plane. The additional drains should be set at 30 foot spacing, placed at the joints of the MSE Wall panels. The length of the additional drains should not exceed 170 feet.

9.0 CONSTRUCTION CONSIDERATIONS

General

- Fill may be brought in, on an as needed basis to construct a working platform for CIDH pile installation. No excavation in front of the MSE Wall is allowed until after the CIDH piles are installed.

- Plans for construction of a working platform must be submitted to the RE for review and approval.

- Based on the latest SI readings and distress observed in the field, it is recommended that Segment C be constructed first, followed by Segment B and then Segment A.

CIDH Piles

- Temporary Casings may be used to construct the CIDH Piles. The casings should extend 5 feet below the top of pile to the top of existing grade, see Figure 3. Once the CIDH piles achieve the design compressive strength of the concrete, excavation may be made to the top of pile elevation (leveling pad elevation). Contractor must insure that the rebar extending above the top of the CIDH pile shall be properly protected during the excavation process.

- Excavations around the piles to the pilecap elevation should be done in maximum 200 foot lengths at a time. After excavating a maximum 200 ft section, the pilecap and anchors should be constructed before proceeding to excavate the adjacent section. The construction sequence should start from the north end of the project and proceed south.

- CIDH Piles should be constructed in stages, see Figure 4 for single row of piles at Segments A and B and Figure 4A for two rows of piles at Segment C.

- CIDH Piles should be constructed using the wet method as it is anticipated that groundwater will be encountered during drilling.

- During the Geotechnical investigation caving was experienced in the upper 20 feet of drilling at the base of the MSE Wall. A method such as the use of temporary casings should be employed to prevent caving or hole "squeezing" in the top 20 feet, below top of pile.

- Borehole-caving potential is likely wherever landslide material is encountered. Special care should be taken where loose soil is anticipated in the upper 20 feet at the proposed shear pile wall location. All drilled CIDH holes should still be inspected for caving after completion of drilling.

Anchors

- All permanent anchors should be corrosion protected along the length of the anchor and the anchor head. The Corrosion Technology Branch must be contacted regarding corrosion applications of the anchor system.

- Proof testing or performance testing must be done on all permanent anchors to verify design capacity. Specifications should indicate that the contractor is responsible for the design to meet the test load requirements.

- After successful testing the anchors should be stressed to the specified design force and locked off against the structure wall. The lock off force should equal 2/3 times the design force "T".

- A sequence of back filling, placing the anchors, and stressing should be specified in detail to prevent overstressing any members during construction.

- After drilling anchor holes is complete, each hole should be probed to verify that no collapse has occurred before installation of pre-stressing elements. Installation of pre-stressing elements and grouting should be done on the same day to avoid hole deterioration or complete collapse (FHWA, April 1999).

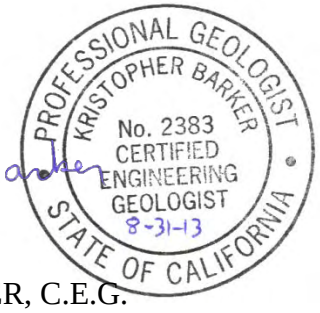
- Post or pressure grouting may be used to achieve the desired design force.

- Claystone bedrock with unconfined compression strength test results of up to 160 psi should be expected to be encountered during drilling for the anchor installation. Therefore, the drilling contractor should have the correct drilling equipment to effectively penetrate these materials.

- Perched water may be encountered during drilling, thus, the contractor should be prepared to handle perched water conditions.

If you have any questions or comments, please call Sam Sukiasian at (213) 620-2135 or Christopher Harris at (213) 620-2147.

Prepared by: Date:



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cc: Massoud Tajik-D12 Maintenance
Jason Yeung-D12 Maintenance
Ahmed-Abou-Abdou, District Project Engineer
Lisa Ramsey, Toll Road Corridor Project Manager
John Ehsan, OGDS1
Shira Rejendra, GS Corporate,
District Construction R.E. Pending File,

FIGURE 1

VICINITY MAP


Exit 2
Crown Valley Pkwy
Arlington
Bedford
Hamden
Weston
Greenfield
Del Norte
Project Location
Costco Building
73
Parking Lot
Cabot Rd
Portofino
Mariposa
Villamira
Image © 2005 USGS
© Caltrans
Capistrano
Forbes
Exit 86
5
Caltrans
Imagery Date: Dec 20, 2010
33°33'16.19" N 117°40'38.08" W elev 295 ft
Eye alt 3351 ft

FIGURE 2

PLOT PLAN

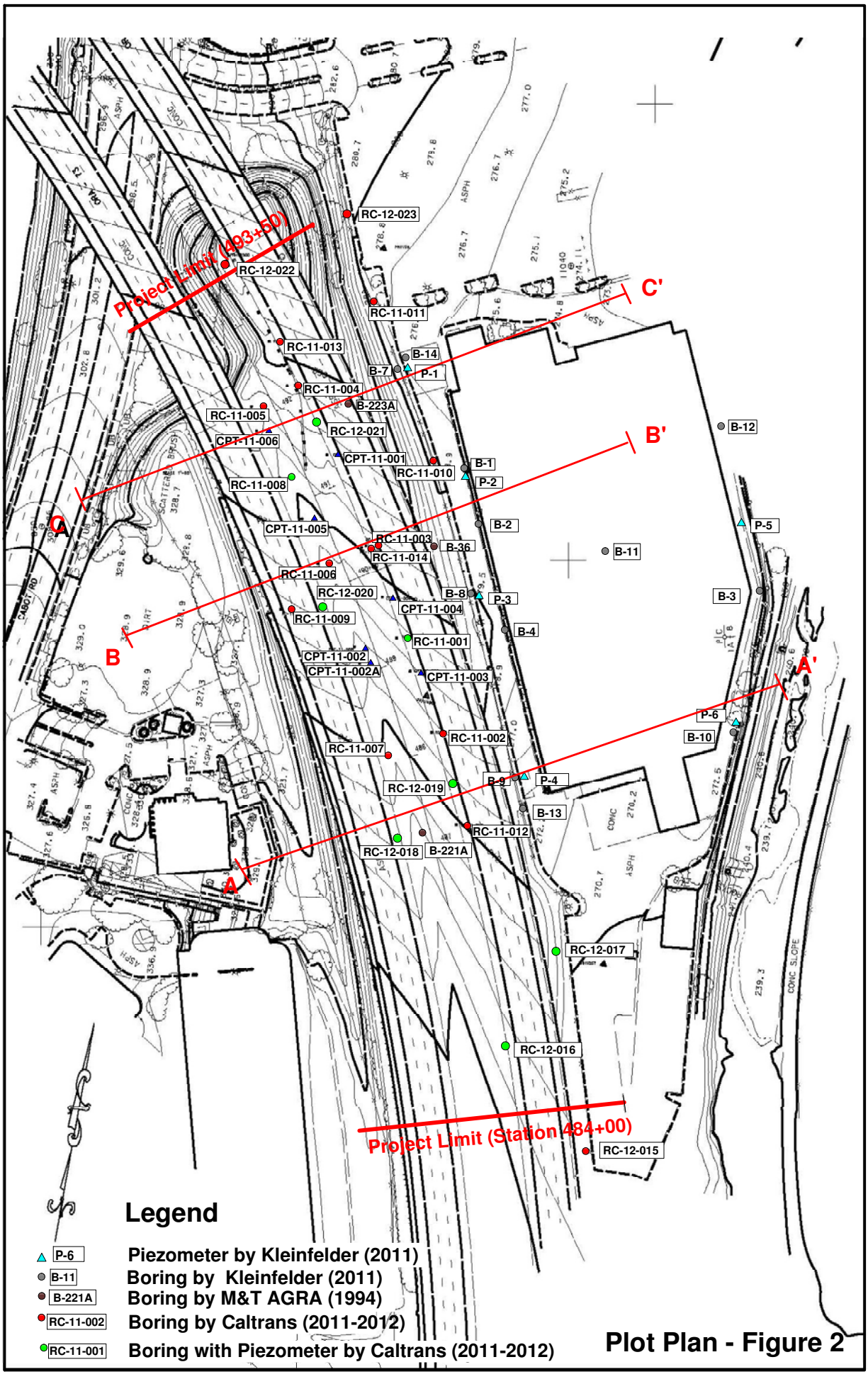
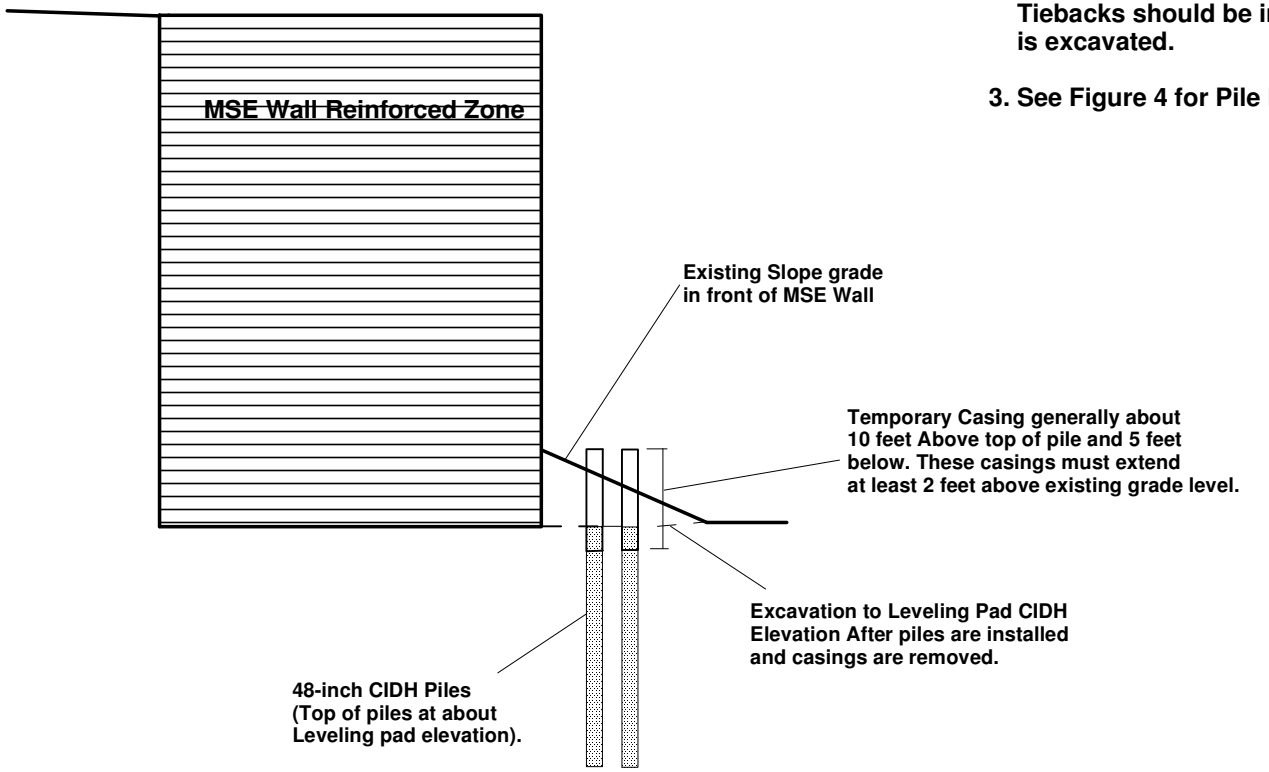

Project Limit (493+50)
Project Limit (Station 484+00)
A
A'
B
B'
C
C'
RC-12-023
RC-12-022
RC-11-011
RC-11-013
B-14
B-7
P-1
RC-11-004
B-223A
RC-11-005
RC-12-021
CPT-11-006
CPT-11-001
B-1
RC-11-010
P-2
RC-11-008
B-12
B-2
P-5
CPT-11-005
RC-11-003
B-36
B-11
RC-11-014
RC-11-006
RC-12-020
B-8
P-3
B-3
CPT-11-004
RC-11-009
B-4
RC-11-001
CPT-11-002
CPT-11-002A
CPT-11-003
P-6
B-10
RC-11-002
RC-11-007
B-9
P-4
RC-12-019
B-13
RC-11-012
RC-12-018
B-221A
RC-12-017
RC-12-016
RC-12-015
Legend
P-6 Piezometer by Kleinfelder (2011)
B-11 Boring by Kleinfelder (2011)
B-221A Boring by M&T AGRA (1994)
RC-11-002 Boring by Caltrans (2011-2012)
RC-11-001 Boring with Piezometer by Caltrans (2011-2012)
Plot Plan - Figure 2

FIGURE 3

PILE INSTALLATION PLAN

Typical Section
NTS

SR 73



Notes:

1. Caving is anticipated within the top 20 feet from leveling pad elevation. A method to control the caving such as temporary casing should be considered.
2. Excavations should be conducted in 50 foot lengths. Tiebacks should be installed after each 50 foot length is excavated.
3. See Figure 4 for Pile Installation Sequence

Legend:

48-inch CIDH Shear Piles

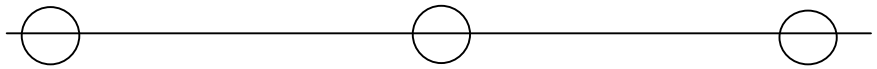
Figure 3

FIGURE 4

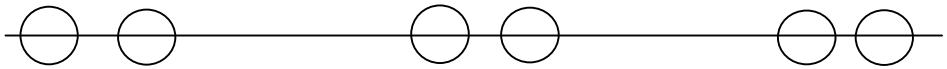
PILE INSTALLATION SEQUENCE PLAN

Typical Sequence in Construction of Shear Piles

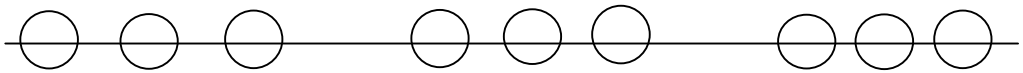
No Scale



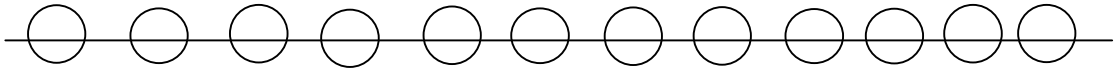
Step 1 - Install Piles Spaced at 24 feet on Centers



Step 2 - Install Piles Adjacent to Piles in Step 1 at 6 foot Spacing



Step 3 - Continue Installation of Piles at 6 foot Spacing

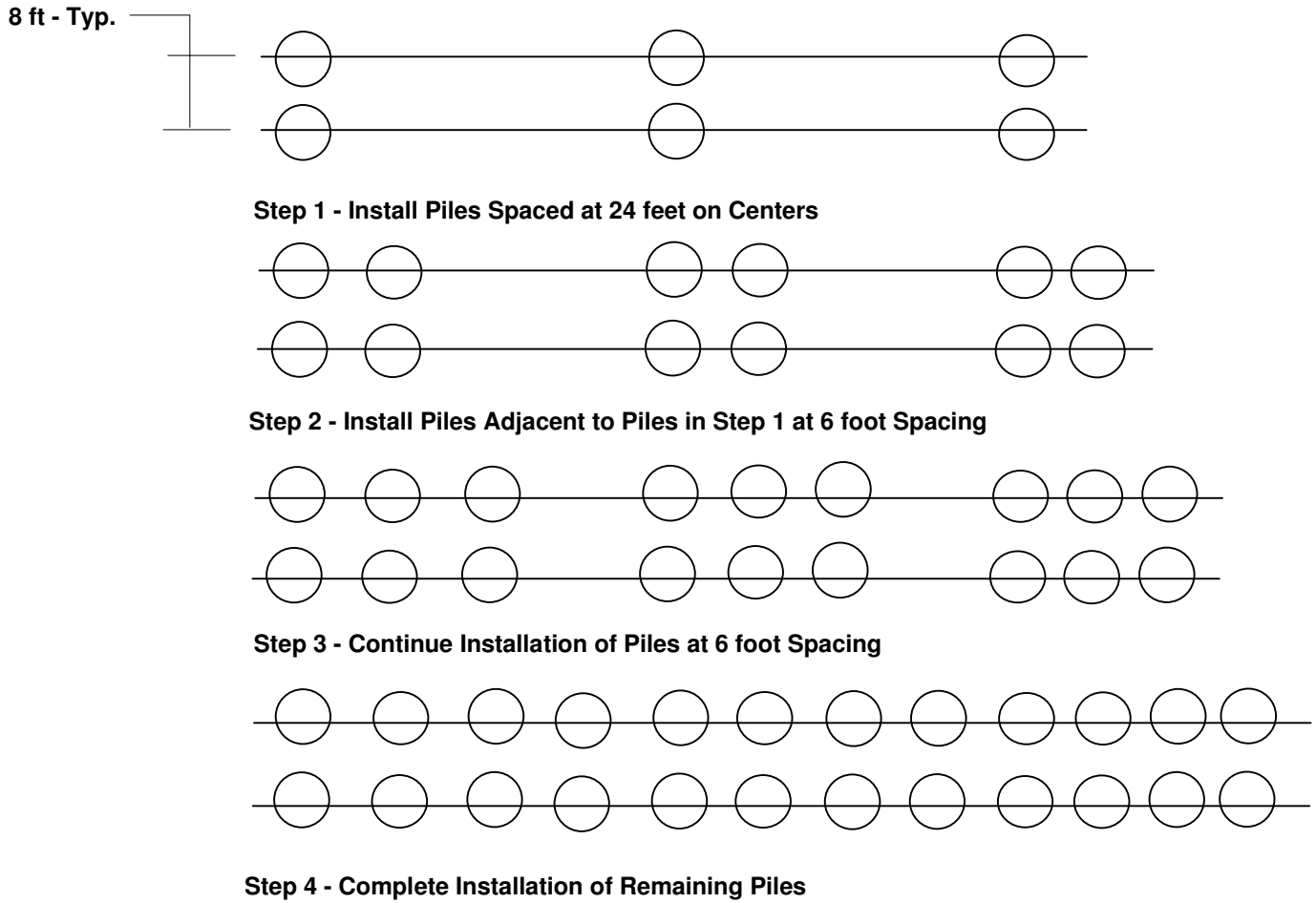


Step 4 - Complete Installation of Remaining Piles

Figure 4

Typical Sequence in Construction of Shear Piles - Two Pile System for Segment C

No Scale

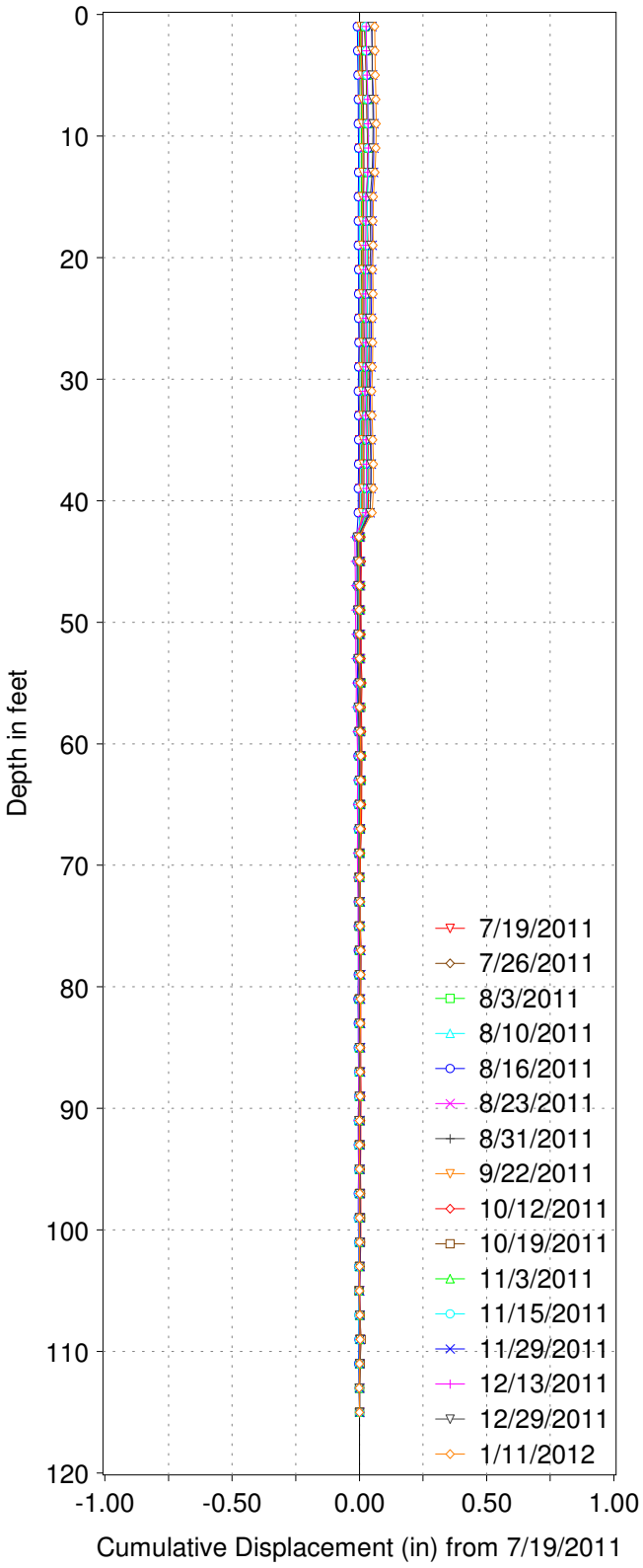


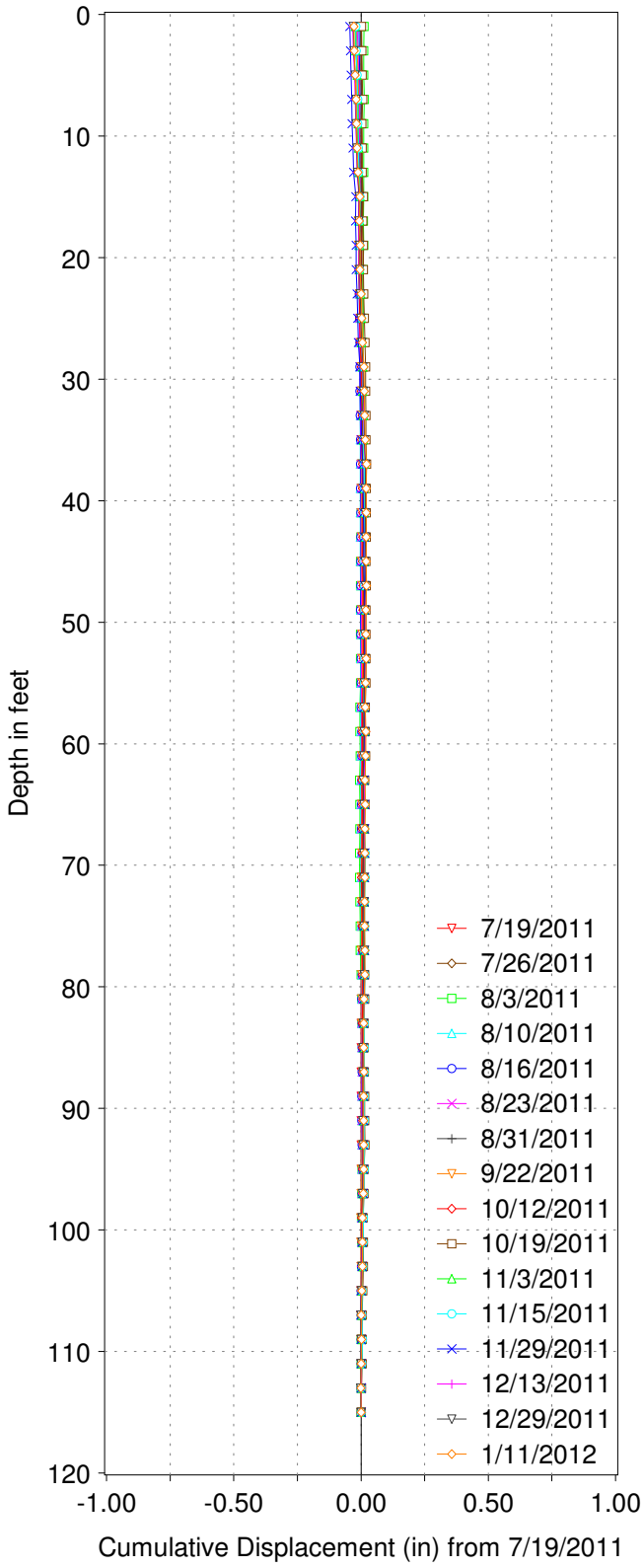
Note: Two pile system consists of two rows of piles spaced 8 feet apart perpendicular to the MSE Wall alignment - per R488M (Shear Pile Wall Retrofit Plans).

Figure 4a

APPENDIX A

SLOPE INCLINOMETER READINGS



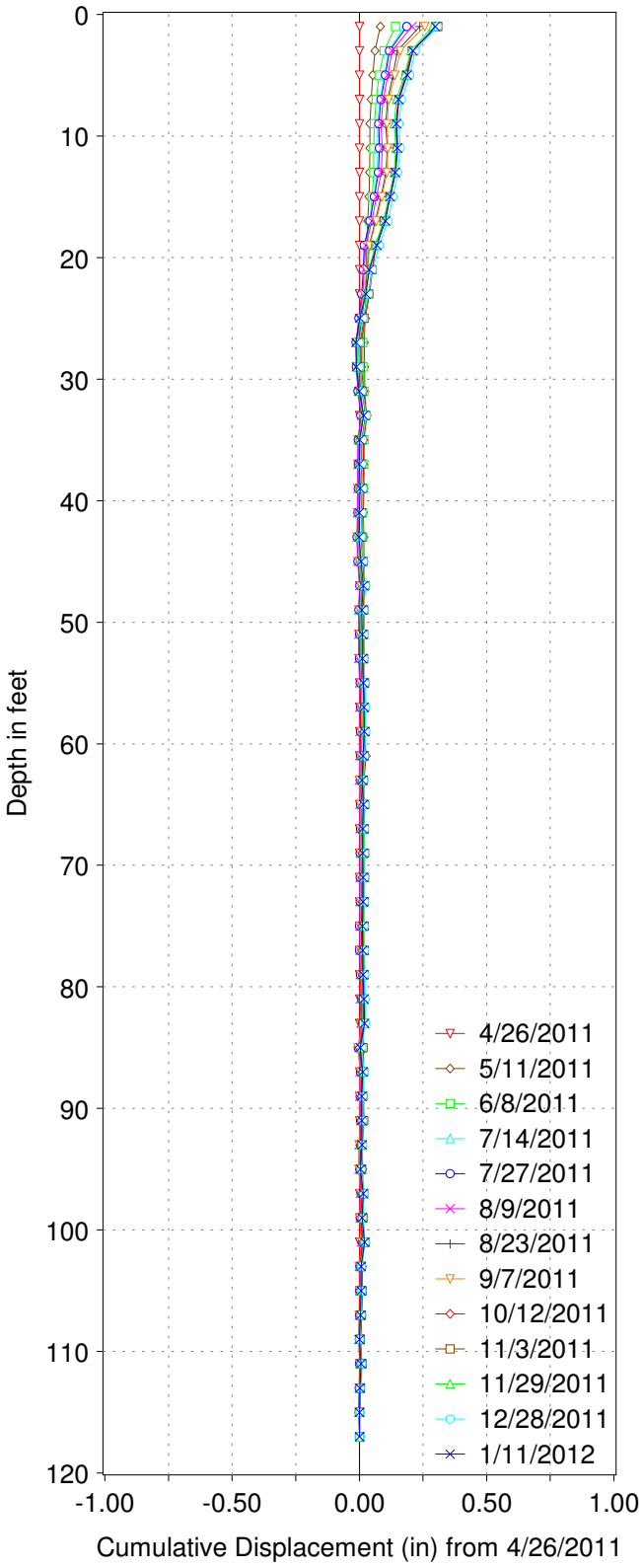


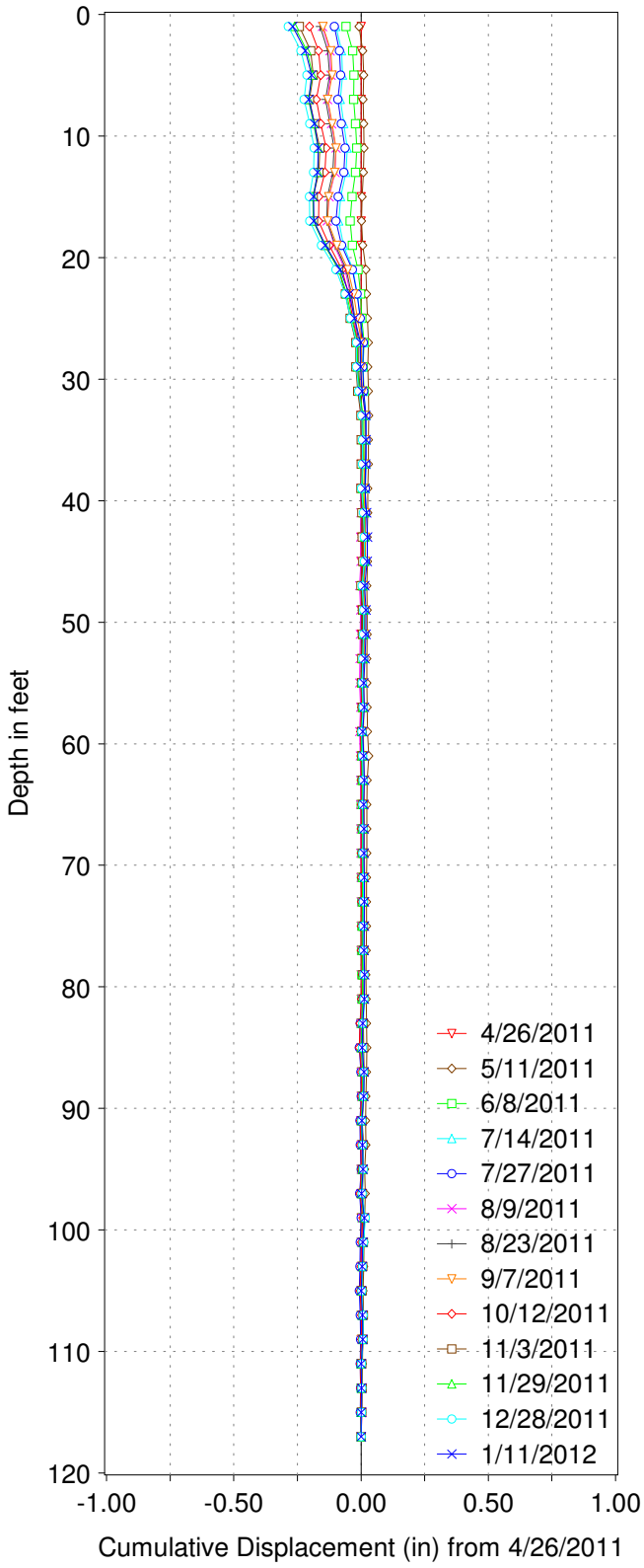
Caltrans

INCLINOMETER MONITORING RESULT

12/ORA/73/PM 10-11
Site: Rte 73 ED, RC-11-002
E.A.: 0000000998

Depth of Casing: 120 ft
A0 Direction: 54 deg
Location (WGS):





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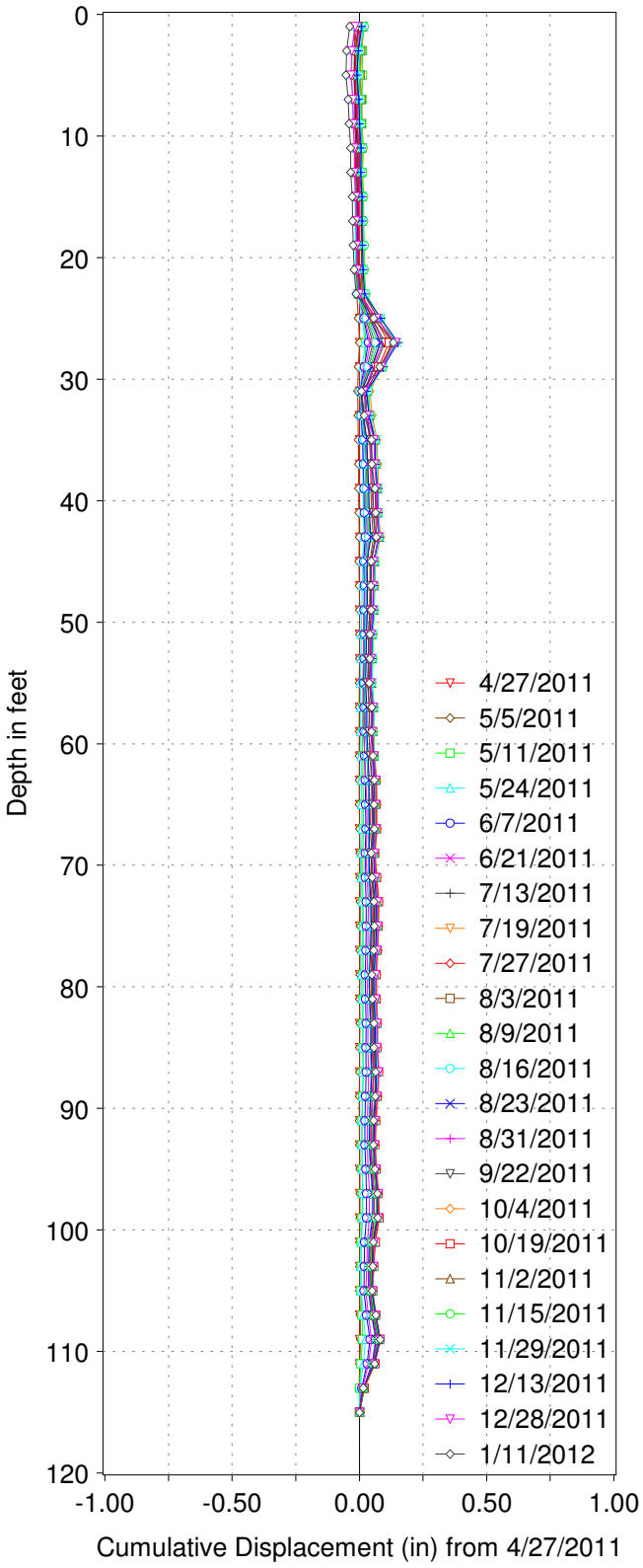
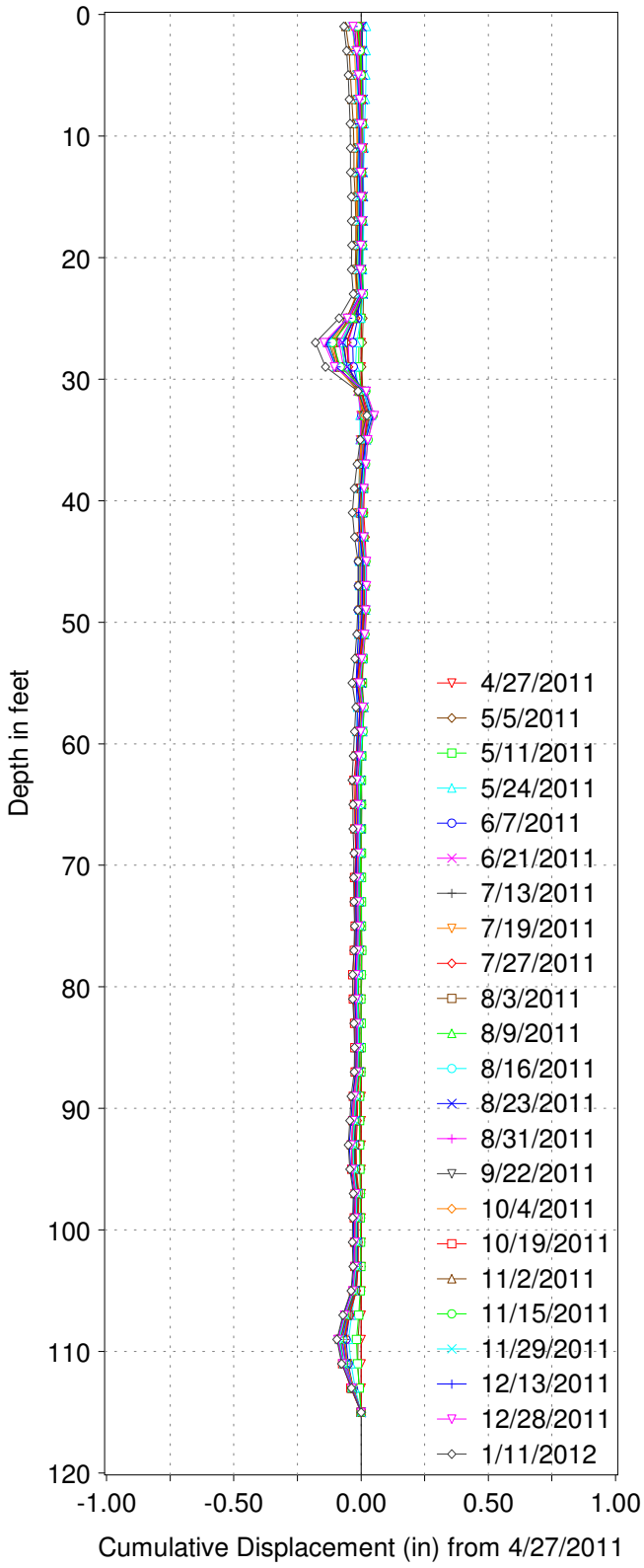
INCLINOMETER MONITORING RESULT

12/ORA/73/PM 10-11
Site: Rte 73 ED, RC-11-004
E.A.: 0000000998

Depth of Casing: 119.3 ft
A0 Direction: 74 deg (magnetic north)
Location (WGS):





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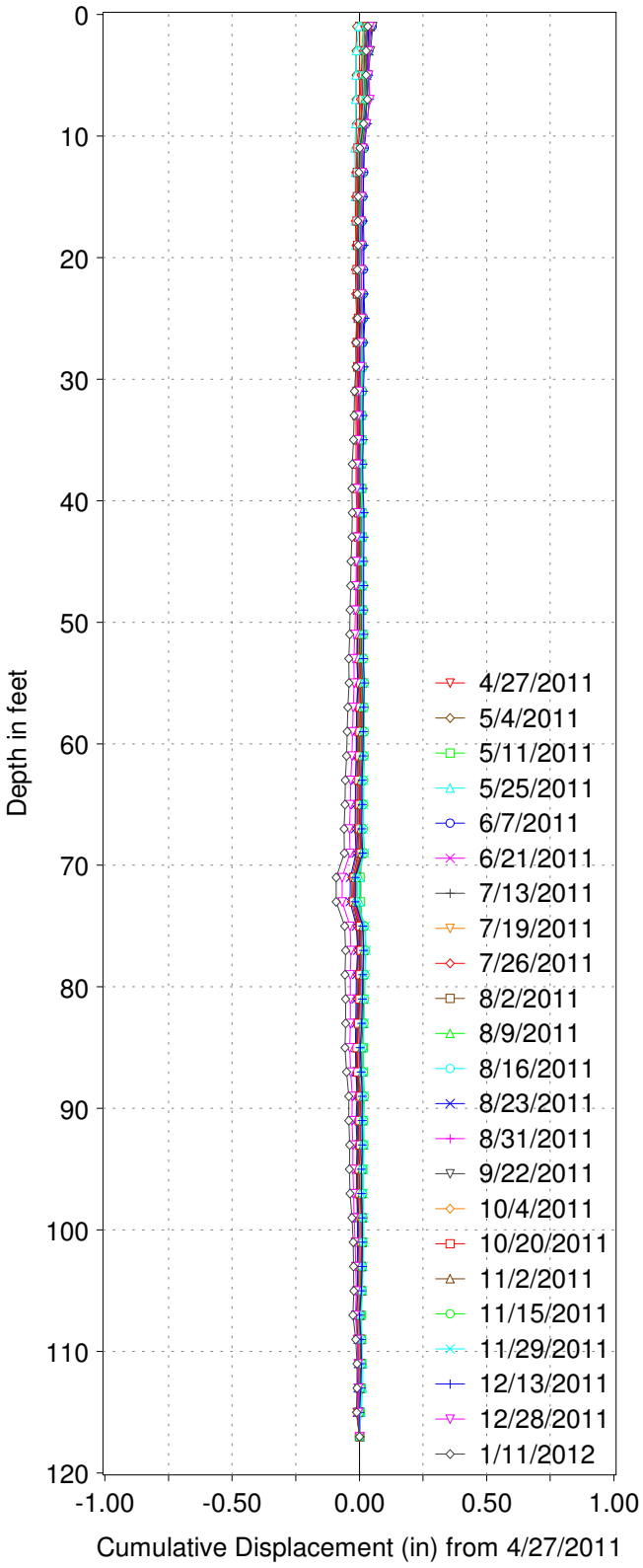
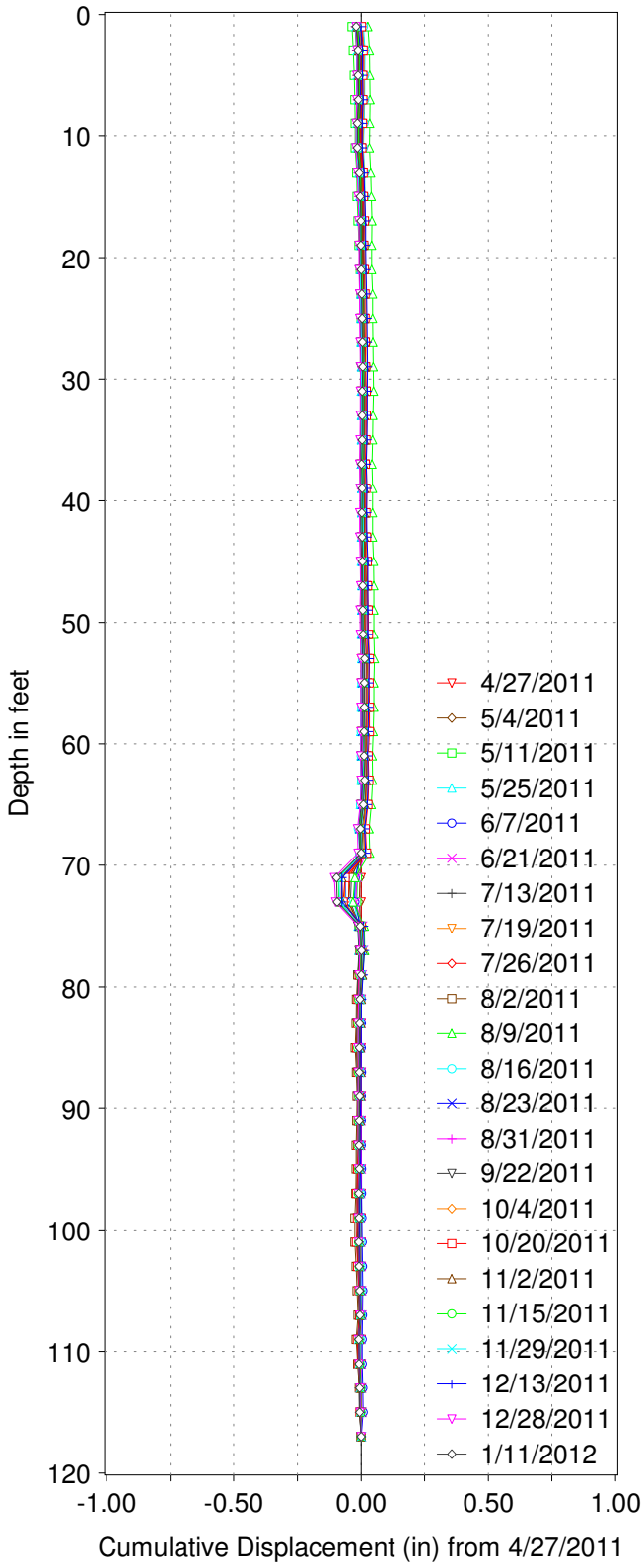
INCLINOMETER MONITORING RESULT

12/ORA/73/PM 10-11
Site: Rte 73 ED, RC-11-005
E.A.: 0000000998

Depth of Casing: 117.11 ft
A0 Direction: 74 deg (magnetic north)
Location (WGS):





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INCLINOMETER MONITORING RESULT

12/ORA/73/PM 10-11

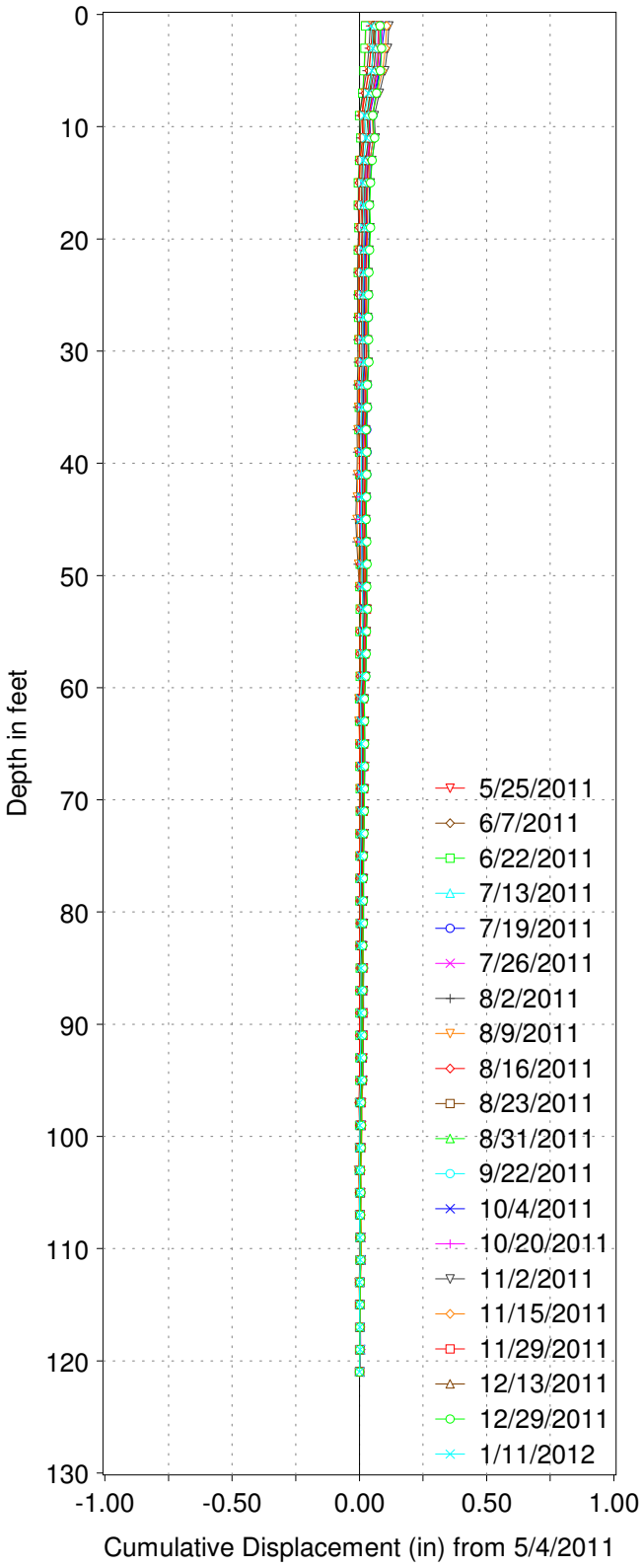
Site: Rte 73, RC-11-006

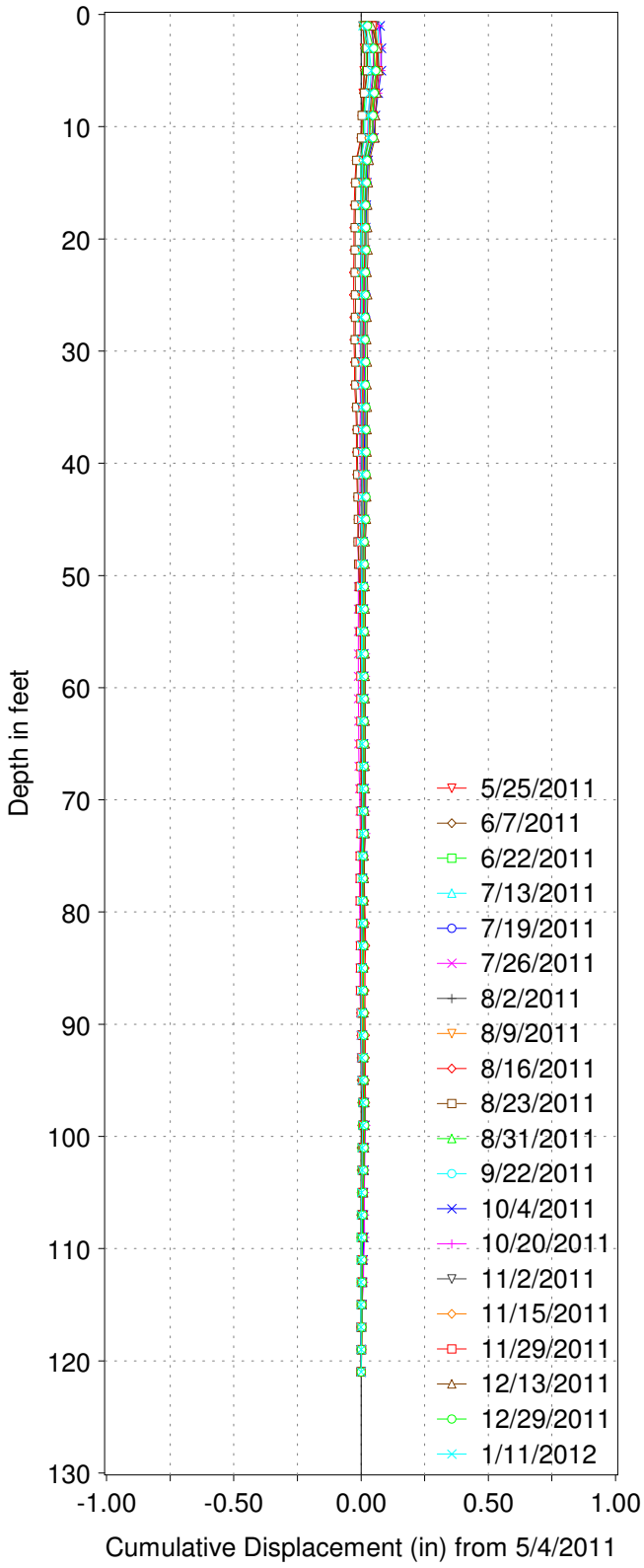
E.A.: 0000000998

Depth of Casing: 119 ft

A0 Direction: 40 deg (magnetic north)

Location (WGS):





INCLINOMETER MONITORING RESULT

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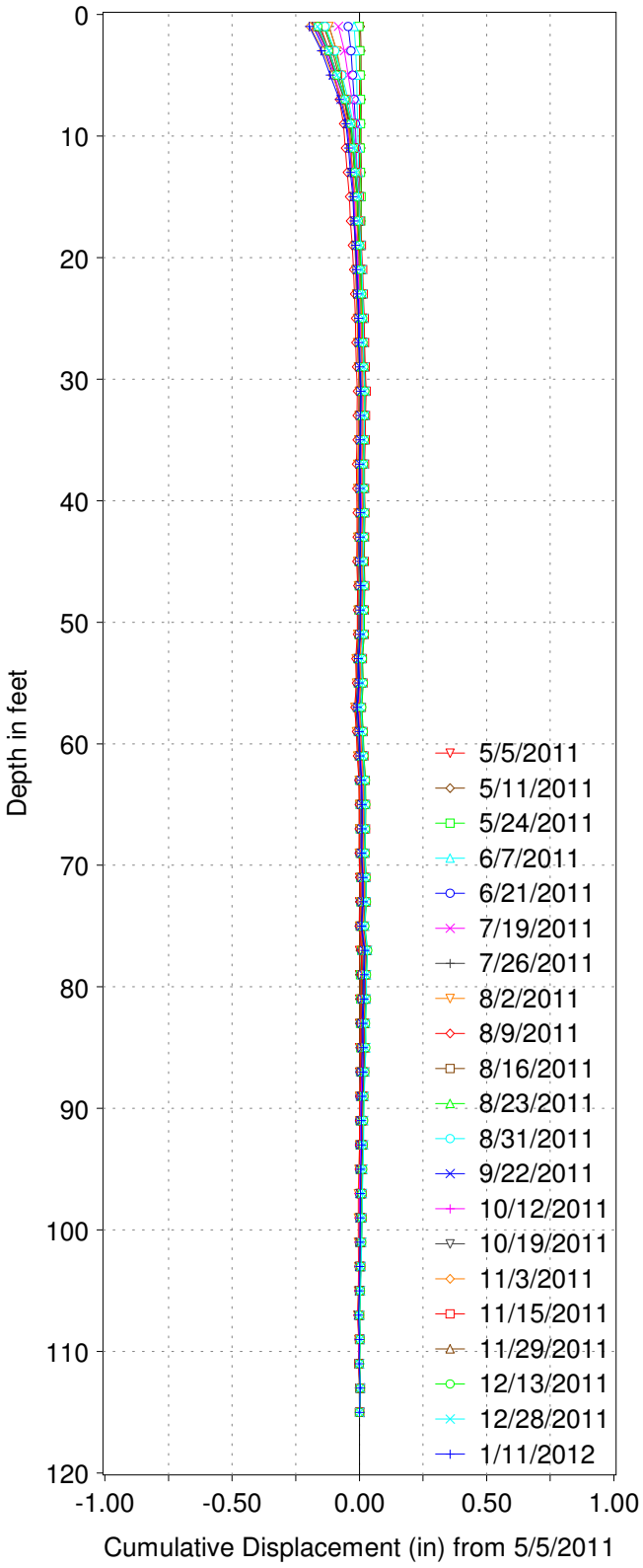
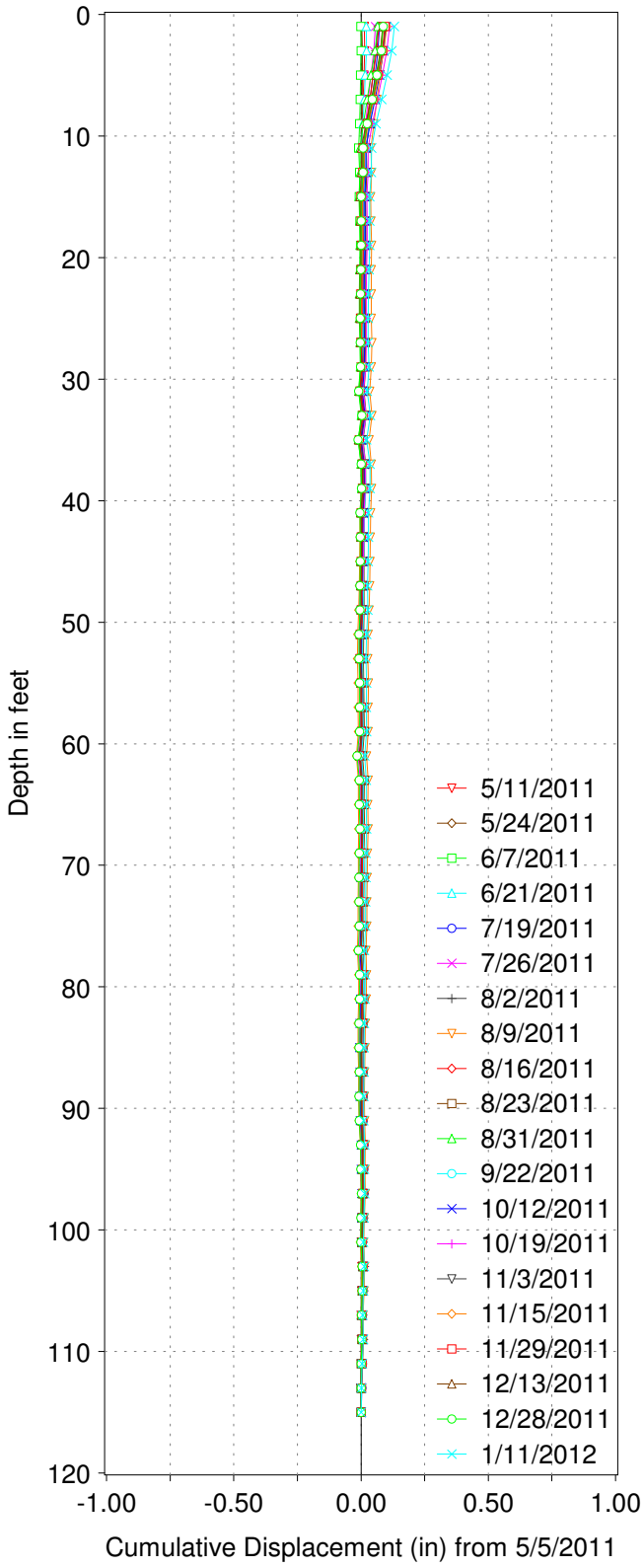
E.A.: 0000000998

Depth of Casing: 123.3 ft
A0 Direction: 20 deg (magnetic north)
Location (WGS):





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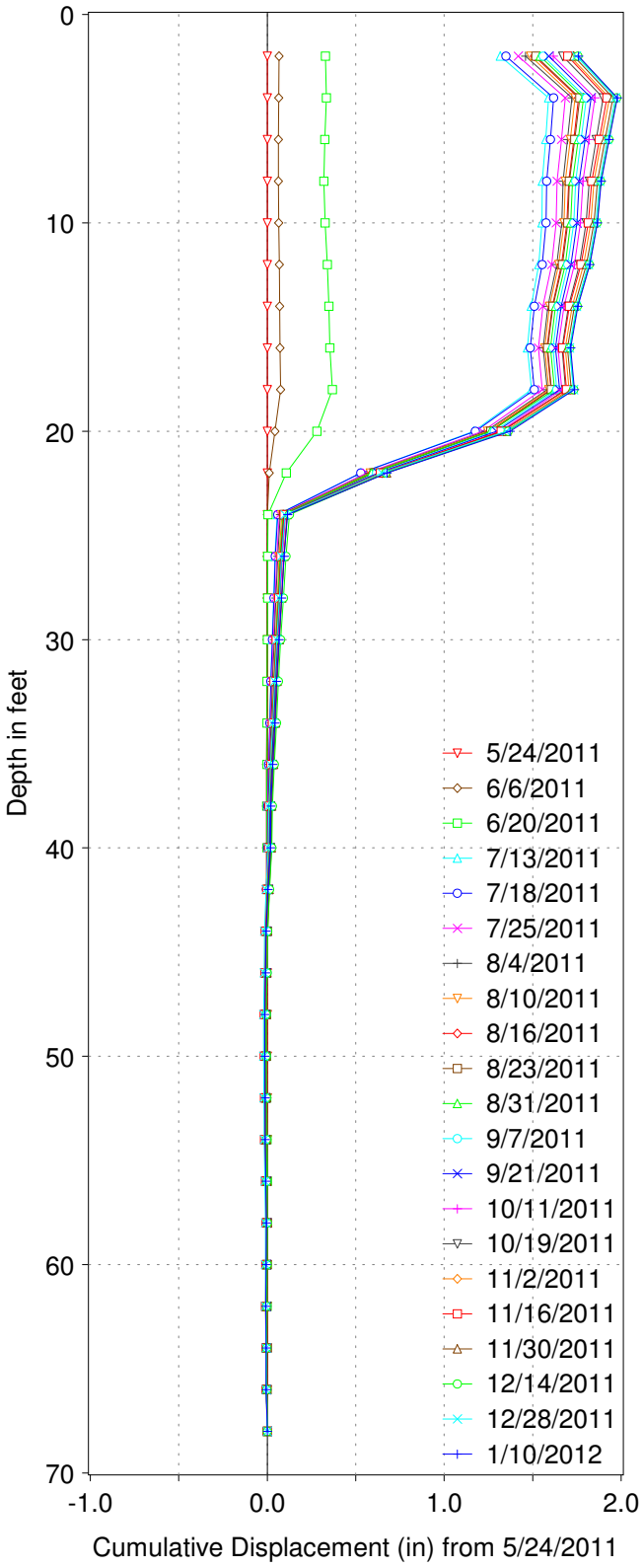
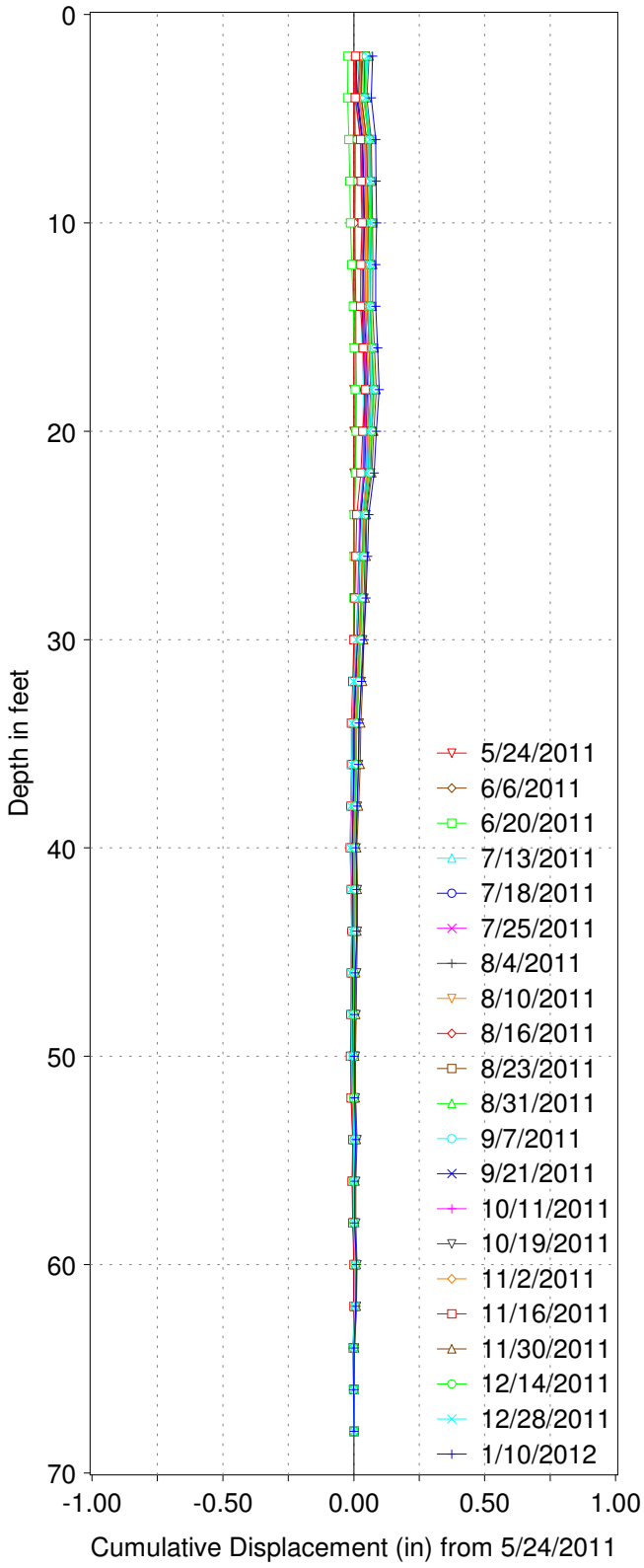
INCLINOMETER MONITORING RESULT

12/ORA/73/PM 10-11
Site: Rte 73 ED, RC-11-009
E.A.: 0000000998

Depth of Casing: 117.5 ft
A0 Direction: 78 deg (magnetic north)
Location (WGS):





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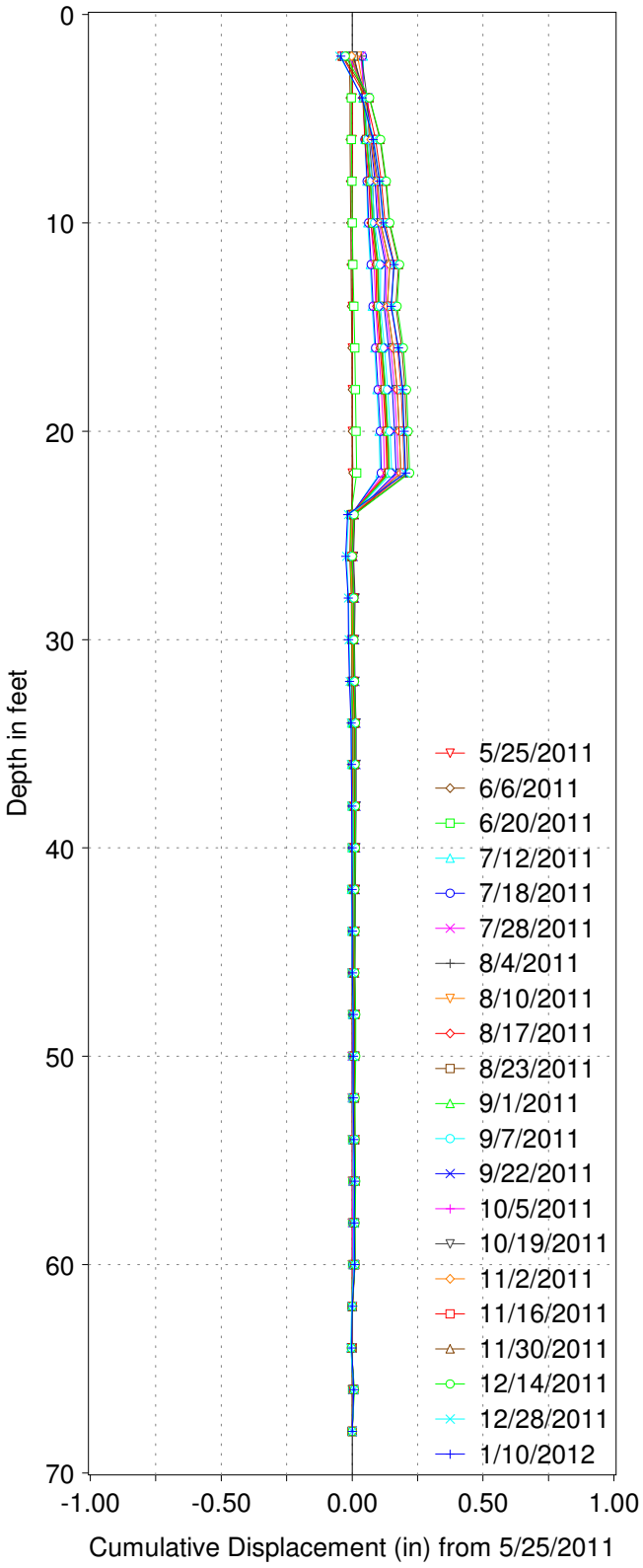
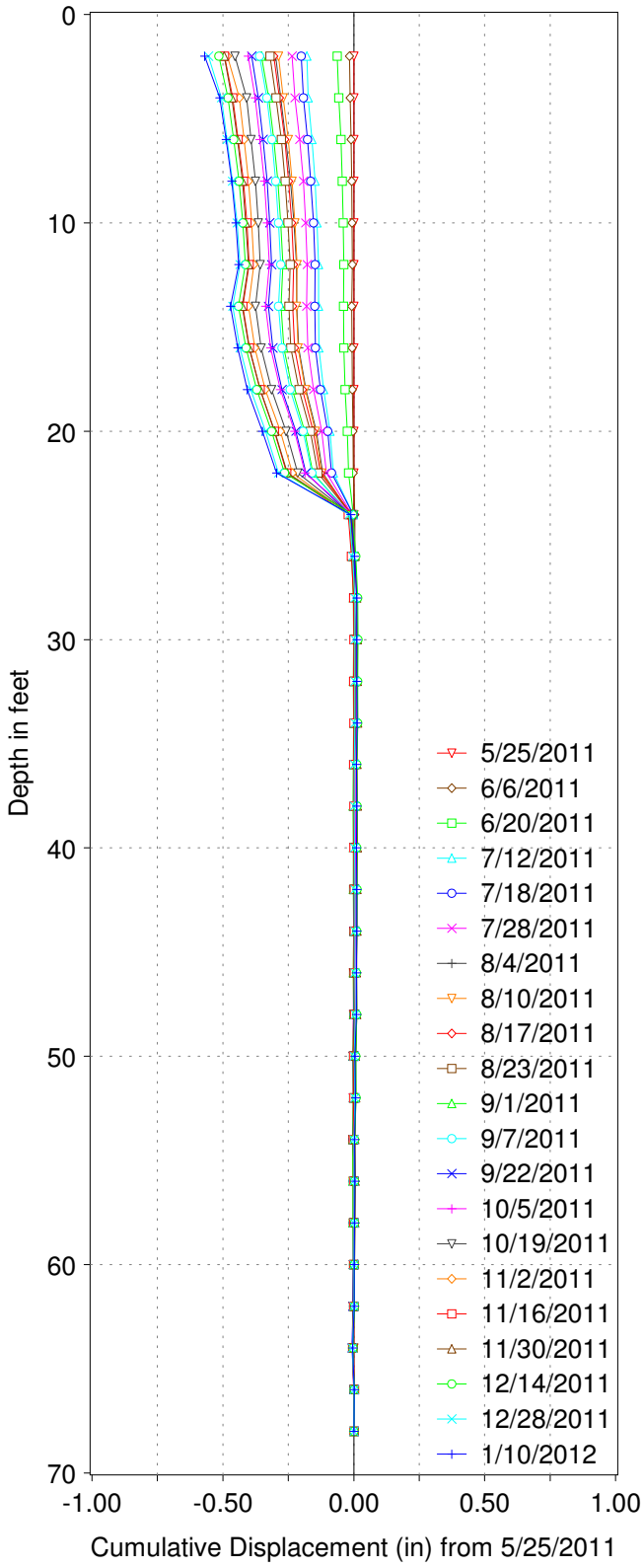
INCLINOMETER MONITORING RESULT

12/ORA/73/PM10-11
Site: Rte 73 ED RC-11-010
E.A.: 000000998

Depth of Casing: 69.5 ft
A0 Direction: 40 deg (magnetic north)
Location (WGS):





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INCLINOMETER MONITORING RESULT

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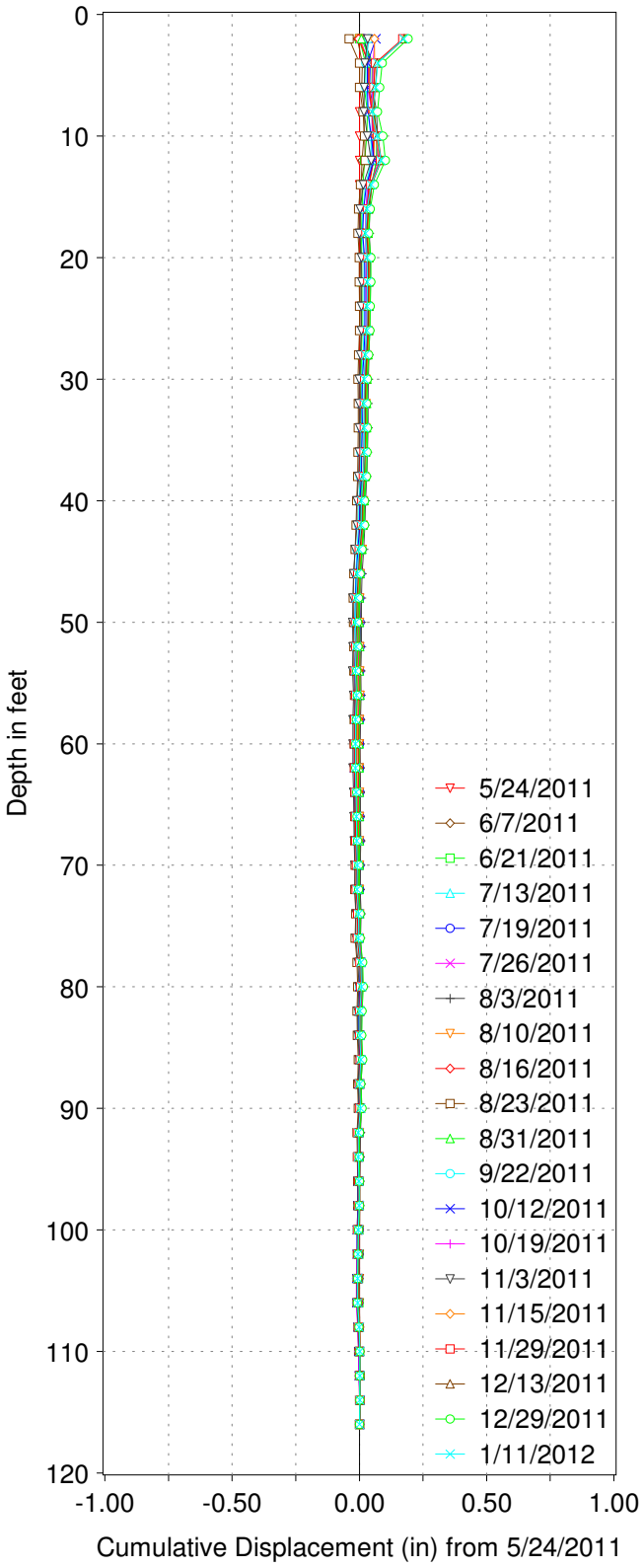
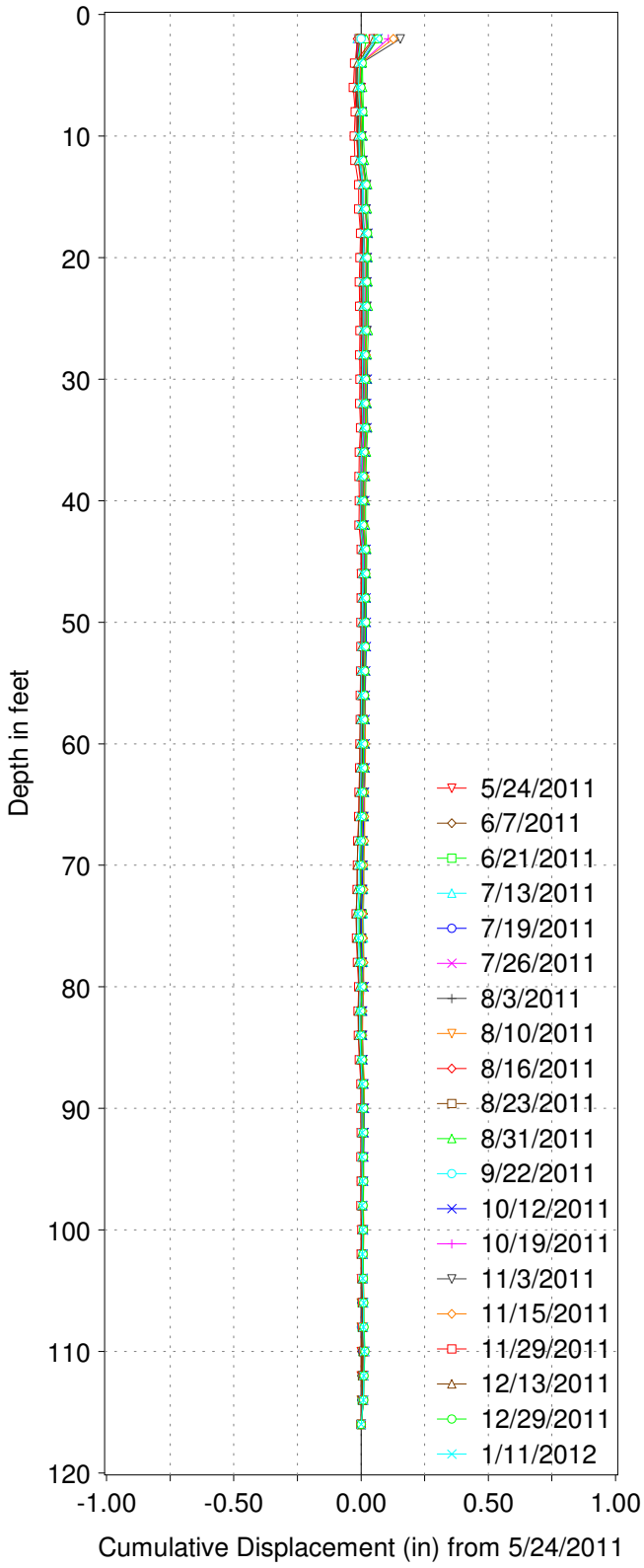
E.A.: 0000000998

Depth of Casing: 69 ft
A0 Direction: 60 deg (magnetic north)
Location (WGS):





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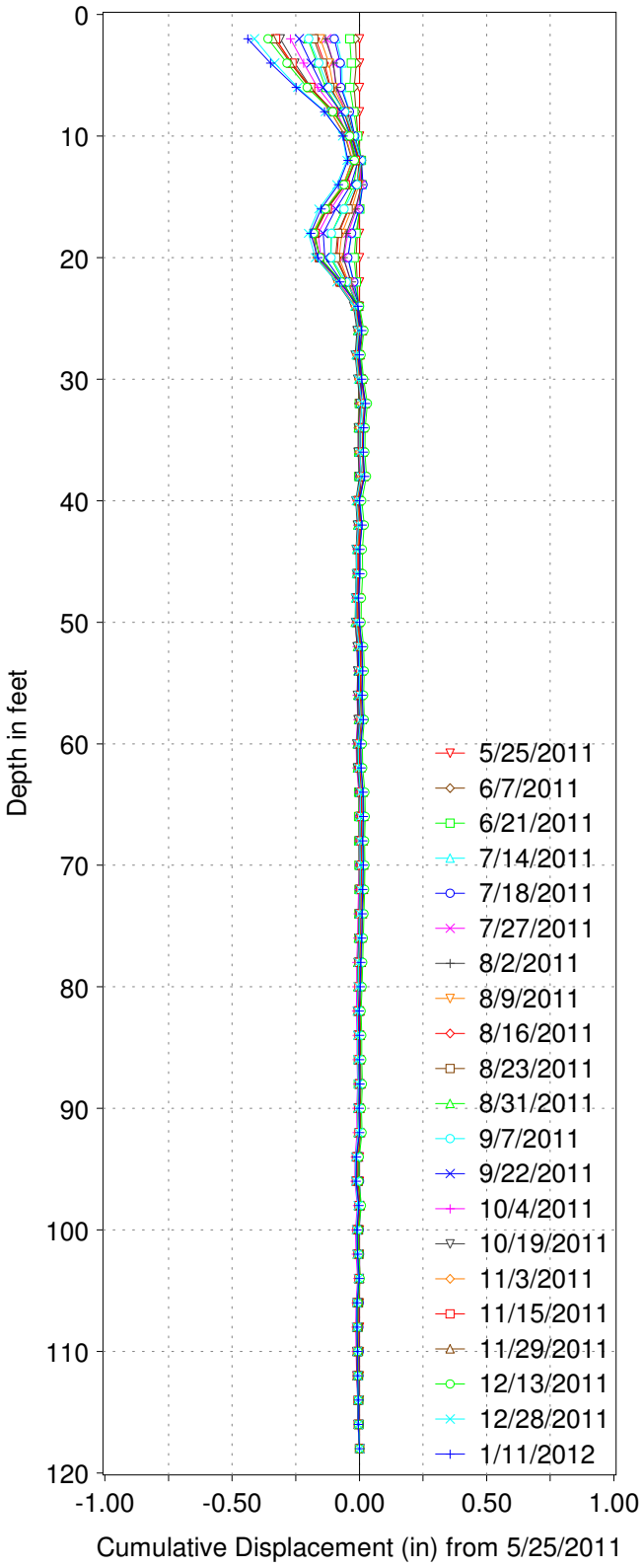
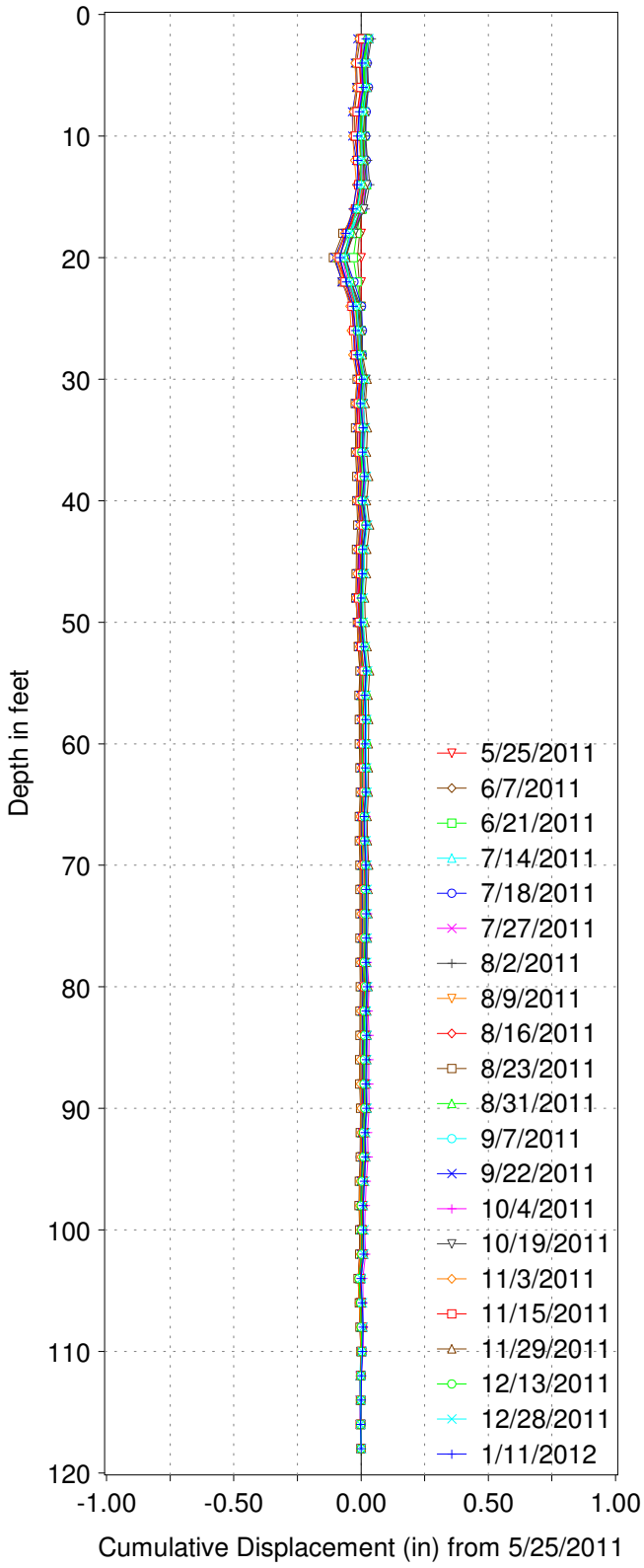
INCLINOMETER MONITORING RESULT

12/ORA/73/PM10-11
Site: Rte 73, RC-11-012
E.A.: 0000000998

Depth of Casing: 117.4 ft
A0 Direction: 40 deg (magnetic north)
Location (WGS):

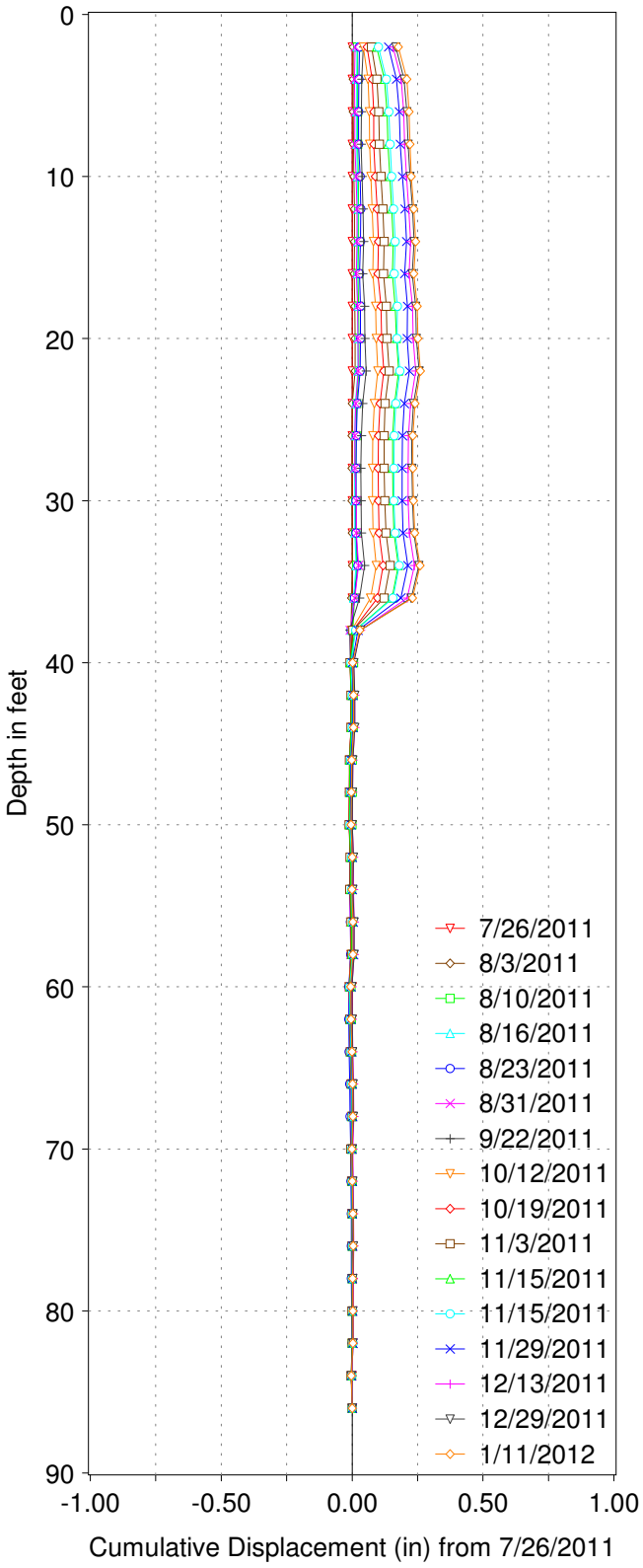


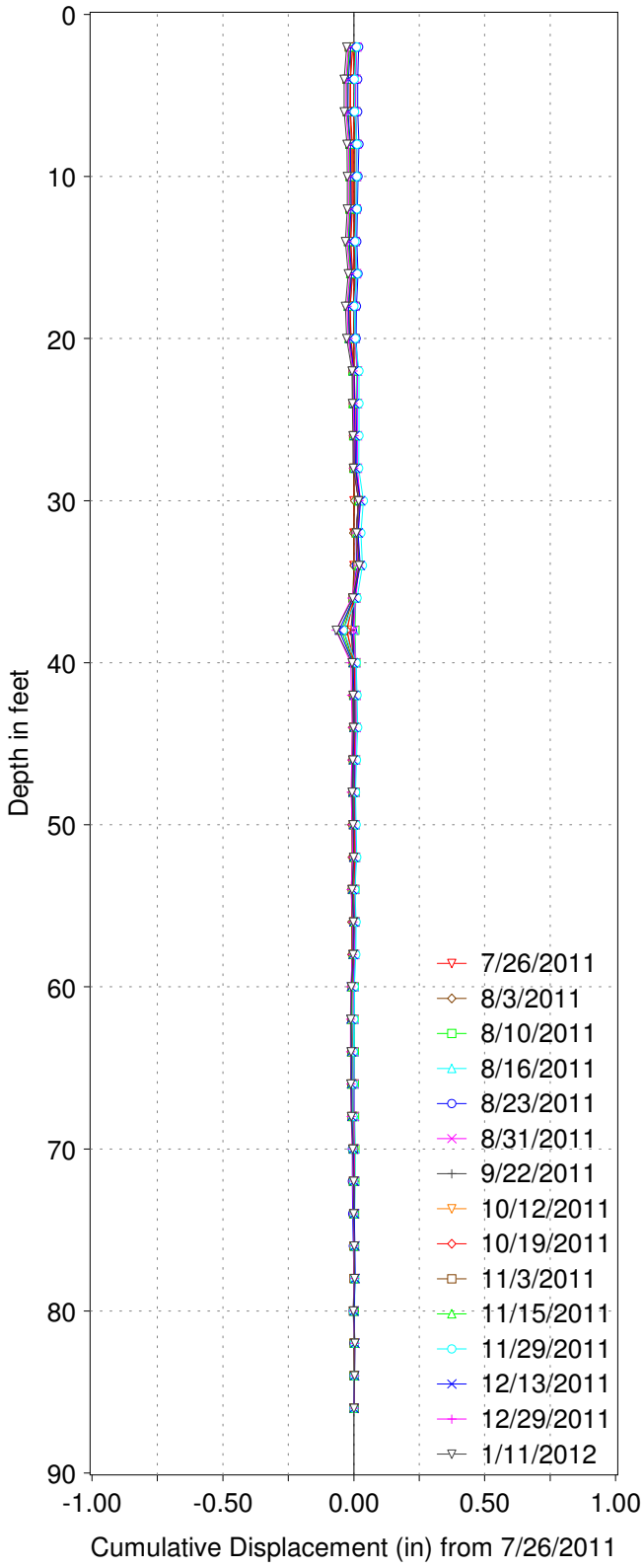


INCLINOMETER MONITORING RESULT

12/ORA/73/PM 10-11
Site: Rte 73, RC-11-013
E.A.: 0000000998

Depth of Casing: 118.4 ft
A0 Direction: 60 deg (magnetic north)
Location (WGS):





INCLINOMETER MONITORING RESULT

12/ORA/73/PM 10-11
Site: Rte 73, RC-11-014
E.A.: 0000000998

Depth of Casing: 87.3 ft
A0 Direction: 40 deg (magnetic north)
Location (WGS):

APPENDIX B

SURVEY POINT RESULTS

		Date : June 23 2011			
Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets
900	2148162.50	6127016.92	313.04	486+49.96	91.61
901	2148255.69	6126971.77	316.28	487+49.86	91.67
902	2148347.28	6126923.05	320.07	488+49.93	91.97
903	2148436.96	6126871.05	324.00	489+49.91	92.63
904	2148524.14	6126814.82	327.71	490+49.95	92.53
905	2148600.93	6126761.11	330.54	491+40.32	92.48
906	2148691.42	6126692.02	334.82	492+50.12	92.23
907	2148770.85	6126625.62	339.38	493+49.98	91.78

		Date : June 27 2011					Date : June 27 2011			
Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets	North. Diff	East. Diff	Elev. Diff	Station Diff	Offset Diff
1900	2148162.53	6127016.93	313.03	486+49.99	91.64	0.03	0.01	-0.01	0.03	0.03
1901	2148255.72	6126971.77	316.28	487+49.89	91.69	0.03	0.00	-0.01	0.04	0.02
1902	2148347.31	6126923.05	320.06	488+49.96	91.99	0.03	0.00	-0.01	0.04	0.02
1903	2148436.98	6126871.05	323.99	489+49.94	92.65	0.03	0.00	-0.01	0.03	0.02
1904	2148524.16	6126814.85	327.70	490+49.96	92.57	0.01	0.03	-0.01	0.00	0.04
1905	2148600.96	6126761.11	330.51	491+40.35	92.51	0.03	0.00	-0.03	0.03	0.03
1906	2148691.42	6126691.99	334.81	492+50.15	92.23	0.00	-0.02	-0.01	0.03	0.00
1907	2148770.85	6126625.59	339.38	493+50.01	91.77	0.00	-0.03	0.00	0.02	-0.01

		Date : July 05 2011					Date : July 05 2011			
Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets	North. Diff	East. Diff	Elev. Diff	Station Diff	Offset Diff
2900	2148162.50	6127016.93	313.04	486+49.96	91.62	0.00	0.01	0.00	0.00	0.01
2901	2148255.69	6126971.78	316.28	487+49.86	91.68	0.01	0.01	0.00	0.00	0.01
2902	2148347.29	6126923.06	320.07	488+49.93	91.99	0.01	0.01	0.00	0.00	0.02
2903	2148436.97	6126871.07	323.99	489+49.91	92.65	0.01	0.02	0.00	0.01	0.02
2904	2148524.15	6126814.87	327.70	490+49.93	92.58	0.01	0.05	-0.01	-0.02	0.05
2905	2148600.96	6126761.17	330.49	491+40.31	92.55	0.03	0.06	-0.05	-0.01	0.07
2906	2148691.42	6126692.04	334.80	492+50.12	92.25	0.01	0.02	-0.02	0.00	0.02
2907	2148770.85	6126625.62	339.38	493+49.98	91.78	0.00	0.00	0.00	0.00	0.00

		Date : July 11 2011					Date : July 11 2011			
Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets	North. Diff	East. Diff	Elev. Diff	Station Diff	Offset Diff
3900	2148162.49	6127016.94	313.04	486+49.95	91.62	-0.01	0.02	0.00	-0.01	0.01
3901	2148255.69	6126971.78	316.28	487+49.85	91.68	0.00	0.01	0.00	-0.01	0.01
3902	2148347.31	6126923.07	320.06	488+49.94	92.00	0.03	0.02	-0.01	0.01	0.03
3903	2148436.99	6126871.07	323.99	489+49.92	92.66	0.03	0.02	-0.01	0.01	0.03
3904	2148524.17	6126814.87	327.69	490+49.94	92.56	0.02	0.05	-0.02	-0.01	0.03
3905	2148600.97	6126761.16	330.49	491+40.32	92.55	0.04	0.05	-0.05	0.00	0.07
3906	2148691.43	6126692.02	334.79	492+50.13	92.24	0.01	0.01	-0.02	0.01	0.01
3907	2148770.85	6126625.62	339.38	493+49.99	91.77	0.00	-0.01	0.00	0.01	-0.01

		Date : July 18 2011					Date : July 18 2011			
Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets	North. Diff	East. Diff	Elev. Diff	Station Diff	Offset Diff
4900	2148162.48	6127016.93	313.05	486+49.93	91.60	-0.02	0.00	0.00	-0.03	-0.01
4901	2148255.69	6126971.78	316.29	487+49.85	91.68	0.00	0.01	0.00	-0.01	0.01
4902	2148347.29	6126923.06	320.07	488+49.93	92.00	0.01	0.01	0.00	0.00	0.03
4903	2148436.97	6126871.08	324.00	489+49.9	92.66	0.01	0.03	0.00	0.00	0.03
4904	2148524.15	6126814.88	327.70	490+49.93	92.58	0.01	0.06	-0.01	-0.02	0.05
4905	2148600.96	6126761.19	330.49	491+40.3	92.56	0.04	0.08	-0.06	-0.02	0.08
4906	2148691.43	6126692.07	334.80	492+50.1	92.28	0.01	0.06	-0.02	-0.02	0.05
4907	2148770.86	6126625.66	339.37	493+49.96	91.81	0.01	0.04	-0.01	-0.02	0.03

Date : July 25 2011						Date : July 25 2011				
Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets	North. Diff	East. Diff	Elev. Diff	Station Diff	Offset Diff
5900	2148162.52	6127016.94	313.04	486+49.97	91.63	0.02	0.02	0.00	0.01	0.02
5901	2148255.71	6126971.78	316.28	487+49.87	91.69	0.02	0.01	0.00	0.01	0.02
5902	2148347.30	6126923.06	320.07	488+49.94	92.00	0.02	0.01	0.00	0.01	0.03
5903	2148436.99	6126871.07	324.00	489+49.92	92.67	0.03	0.03	0.00	0.01	0.04
5904	2148524.17	6126814.86	327.69	490+49.95	92.58	0.03	0.04	-0.02	0.00	0.05
5905	2148600.98	6126761.16	330.48	491+40.33	92.55	0.05	0.05	-0.06	0.01	0.07
5906	2148691.44	6126692.02	334.79	492+50.14	92.24	0.02	0.00	-0.03	0.02	0.01
5907	2148770.86	6126625.63	339.38	493+49.99	91.79	0.01	0.00	0.00	0.01	0.01

Date : August 03, 2011						Date : August 03, 2011				
Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets	North. Diff	East. Diff	Elev. Diff	Station Diff	Offset Diff
6900	2148162.485	6127016.928	313.036	486+49.95	91.6118	-0.01	0.01	0.00	-0.01	0.00
6901	2148255.674	6126971.78	316.277	487+49.85	91.6795	-0.01	0.01	-0.01	-0.01	0.01
6902	2148347.277	6126923.073	320.064	488+49.92	92.0013	0.00	0.02	0.00	0.00	0.03
6903	2148436.979	6126871.079	323.993	489+49.92	92.6761	0.02	0.03	0.00	0.01	0.05
6904	2148524.156	6126814.896	327.697	490+49.93	92.6074	0.01	0.08	-0.01	-0.02	0.08
6905	2148600.966	6126761.195	330.485	491+40.31	92.5835	0.04	0.09	-0.06	-0.01	0.10
6906	2148691.431	6126692.07	334.785	492+50.11	92.2944	0.01	0.06	-0.03	-0.01	0.07
6907	2148770.856	6126625.658	339.378	493+49.97	91.824	0.01	0.04	0.00	-0.01	0.05

			DATE: AUGUST 08, 2011							
Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets	North. Diff	East. Diff	Elev. Diff	Station Diff	Offset Diff
7900	2148162.491	6127016.933	313.037	486+49.955	91.618	0.01	-0.01	0.00	0.00	-0.01
7901	2148255.687	6126971.781	316.278	487+49.858	91.685	0.00	-0.02	0.01	0.00	-0.02
7902	2148347.296	6126923.071	320.064	488+49.942	92.007	-0.02	-0.02	0.00	0.01	-0.04
7903	2148436.977	6126871.086	323.994	489+49.912	92.679	-0.02	-0.04	0.00	0.00	-0.05
7904	2148524.157	6126814.898	327.697	490+49.930	92.608	-0.01	-0.08	0.01	-0.02	-0.08
7905	2148600.973	6126761.199	330.484	491+40.312	92.589	-0.05	-0.09	0.06	-0.01	-0.11
7906	2148691.437	6126692.061	334.781	492+50.119	92.29	-0.02	-0.05	0.04	-0.01	-0.06
7907	2148770.864	6126625.659	339.377	493+49.975	91.829	-0.01	-0.04	0.00	0.00	-0.05

DATE: AUGUST 15, 2011

Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets	North. Diff	East. Diff	Elev. Diff	Station Diff	Offset Diff
8900	2148162.494	6127016.933	313.03	486+49.958	91.618	0.00	-0.01	0.01	0.01	-0.01
8901	2148255.691	6126971.783	316.273	487+49.860	91.689	0.00	-0.02	0.01	0.00	-0.02
8902	2148347.291	6126923.074	320.059	488+49.935	92.008	-0.01	-0.02	0.01	0.01	-0.04
8903	2148436.983	6126871.082	323.988	489+49.919	92.679	-0.03	-0.04	0.01	0.01	-0.05
8904	2148524.16	6126814.894	327.693	490+49.935	92.606	-0.02	-0.08	0.02	-0.01	-0.08
8905	2148600.972	6126761.206	330.481	491+40.308	92.594	-0.04	-0.10	0.06	0.01	-0.11
8906	2148691.449	6126692.065	334.779	492+50.126	92.3	-0.03	-0.05	0.04	0.01	-0.07
8907	2148770.866	6126625.661	339.377	493+49.975	91.831	-0.02	-0.04	0.00	0.00	-0.05

DATE: AUGUST 15, 2011

Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets	North. Diff	East. Diff	Elev. Diff	Station Diff	Offset Diff
9900	2148162.469	6127016.924	313.032	486+49.940	91.6	0.03	0.00	0.01	-0.02	0.01
9901	2148255.681	6126971.782	316.273	487+49.852	91.683	0.01	-0.02	0.01	-0.01	-0.01
9902	2148347.286	6126923.092	320.059	488+49.923	92.021	-0.01	-0.04	0.01	-0.01	-0.05
9903	2148436.977	6126871.09	323.989	489+49.910	92.683	-0.02	-0.04	0.01	0.00	-0.06
9904	2148524.188	6126814.862	327.693	490+49.974	92.596	-0.04	-0.04	0.02	0.02	-0.07
9905	2148600.984	6126761.169	330.491	491+40.338	92.571	-0.06	-0.06	0.05	0.02	-0.09
9906	2148691.442	6126692.011	334.774	492+50.153	92.254	-0.02	0.00	0.04	0.03	-0.03
9907	2148770.857	6126625.595	339.374	493+50.010	91.775	-0.01	0.03	0.01	0.03	0.00

DATE: AUGUST 29, 2011

Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets	North. Diff	East. Diff	Elev. Diff	Station Diff	Offset Diff
10900	2148162.454	6127016.917	313.029	486+49.929	91.587	0.04	0.00	0.01	0.03	0.02
10901	2148255.661	6126971.777	316.271	487+49.837	91.67	0.03	-0.01	0.01	-0.02	0.00
10902	2148347.268	6126923.078	320.058	488+49.914	92	0.01	-0.03	0.01	-0.02	-0.03
10903	2148436.957	6126871.1	323.987	489+49.889	92.681	0.00	-0.05	0.01	-0.02	-0.05
10904	2148524.145	6126814.92	327.692	490+49.909	92.619	0.00	-0.10	0.02	-0.04	-0.09
10905	2148600.965	6126761.23	330.478	491+40.289	92.609	-0.04	-0.12	0.07	-0.03	-0.13
10906	2148691.439	6126692.101	334.772	492+50.097	92.322	-0.02	-0.09	0.05	-0.02	-0.09
10907	2148770.864	6126625.687	339.372	493+49.958	91.849	-0.01	-0.06	0.01	-0.02	-0.07

DATE: SEPTEMBER 06 2011

Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets	North. Diff	East. Diff	Elev. Diff	Station Diff	Offset Diff
11900	2148162.495	6127016.93	313.033	486+49.96	91.62	0.00	-0.01	0.01	0.00	-0.01
11901	2148255.689	6126971.779	316.274	487+49.86	91.68	0.00	-0.01	0.01	0.00	-0.02
11902	2148347.272	6126923.07	320.059	488+49.92	92.00	0.00	-0.02	0.01	0.00	-0.02
11903	2148436.981	6126871.084	323.987	489+49.92	92.68	-0.03	-0.04	0.01	-0.01	-0.05
11904	2148524.159	6126814.898	327.691	490+49.93	92.61	-0.02	-0.08	0.02	0.02	-0.08
11905	2148600.968	6126761.212	330.476	491+40.3	92.60	-0.04	-0.10	0.07	0.02	-0.12
11906	2148691.433	6126692.092	334.768	492+50.1	92.31	-0.02	-0.08	0.05	0.03	-0.08
11907	2148770.86	6126625.681	339.37	493+49.96	91.84	-0.01	-0.06	0.01	0.02	-0.06

DATE: SEPTEMBER 12, 2011

Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets	North. Diff	East. Diff	Elev. Diff	Station Diff	Offset Diff
12900	2148162.489	6127016.926	313.031	486+49.957	91.61	0.01	-0.01	0.01	-0.01	0.00
12901	2148255.673	6126971.777	316.276	487+49.8479999999	91.675	0.02	-0.01	0.01	-0.02	-0.01
12902	2148347.266	6126923.077	320.063	488+49.913	91.998	0.01	-0.03	0.00	-0.02	-0.03
12903	2148436.956	6126871.101	323.991	489+49.887	92.682	0.00	-0.05	0.01	-0.03	-0.06
12904	2148524.137	6126814.931	327.696	490+49.897	92.624	0.01	-0.11	0.01	-0.06	-0.10
12905	2148600.973	6126761.218	330.478	491+40.301	92.605	-0.05	-0.11	0.07	-0.02	-0.13
12906	2148691.44	6126692.087	334.768	492+50.106	92.311	-0.02	-0.07	0.05	-0.02	-0.08
12907	2148770.867	6126625.694	339.371	493+49.956	91.857	-0.02	-0.07	0.01	-0.03	-0.08

DATE: SEPTEMBER 19, 2011

Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets	North. Diff	East. Diff	Elev. Diff	Station Diff	Offset Diff
13900	2148162.49	6127016.926	313.026	486+49.96	91.611	0.01	-0.01	0.01	0.00	0.00
13901	2148255.685	6126971.782	316.268	487+49.86	91.684	0.00	-0.02	0.02	0.00	-0.02
13902	2148347.262	6126923.08	320.054	488+49.91	91.999	0.01	-0.03	0.01	0.02	-0.03
13903	2148436.954	6126871.102	323.985	489+49.89	92.681	0.00	-0.06	0.01	0.02	-0.05
13904	2148524.171	6126814.886	327.691	490+49.95	92.606	-0.03	-0.07	0.02	0.01	-0.08
13905	2148600.98	6126761.202	330.474	491+40.32	92.596	-0.05	-0.09	0.07	0.00	-0.12
13906	2148691.441	6126692.066	334.76	492+50.12	92.296	-0.02	-0.05	0.06	0.00	-0.07
13907	2148770.862	6126625.655	339.366	493+49.98	91.824	-0.01	-0.03	0.02	0.01	-0.05

DATE: OCTOBER 03 2011

Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets	North. Diff	East. Diff	Elev. Diff	Station Diff	Offset Diff
14900	2148162.477	6127016.919	313.02	486+49.95	91.599	0.02	0.00	0.02	0.01	0.01
14901	2148255.678	6126971.778	316.26	487+49.85	91.678	0.01	-0.01	0.02	0.00	-0.01
14902	2148347.27	6126923.078	320.047	488+49.92	92	0.01	-0.03	0.02	0.01	-0.03
14903	2148436.963	6126871.094	323.976	489+49.9	92.679	-0.01	-0.05	0.02	0.01	-0.05
14904	2148524.138	6126814.922	327.684	490+49.9	92.618	0.01	-0.10	0.02	0.05	-0.09
14905	2148600.97	6126761.216	330.465	491+40.3	92.601	-0.04	-0.11	0.08	0.02	-0.12
14906	2148691.436	6126692.088	334.756	492+50.1	92.31	-0.02	-0.07	0.06	0.02	-0.08
14907	2148770.864	6126625.687	339.361	493+49.96	91.85	-0.01	-0.06	0.02	0.03	-0.07

DATE: OCTOBER 18 2011

Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets	North. Diff	East. Diff	Elev. Diff	Station Diff	Offset Diff
15900	2148162.486	6127016.928	313.030	48649.953	91.611	0.012	-0.008	0.011	0.004	-0.004
15901	2148255.672	6126971.782	316.272	48749.844	91.678	0.016	-0.016	0.012	0.012	-0.009
15902	2148347.271	6126923.078	320.059	48849.917	92.001	0.006	-0.028	0.009	0.009	-0.030
15903	2148436.973	6126871.094	323.988	48949.904	92.684	-0.017	-0.048	0.009	0.001	-0.057
15904	2148524.159	6126814.905	327.690	49049.929	92.615	-0.016	-0.087	0.019	0.024	-0.090
15905	2148600.975	6126761.212	330.470	49140.306	92.600	-0.048	-0.103	0.074	0.012	-0.121
15906	2148691.440	6126692.092	334.755	49250.103	92.315	-0.022	-0.077	0.062	0.021	-0.086
15907	2148770.867	6126625.692	339.361	49349.957	91.855	-0.016	-0.070	0.021	0.025	-0.077

Date : November 07 2011										
Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets	North. Diff	East. Diff	Elev. Diff	Station Diff	Offset Diff
16900	2148162.486	6127016.932	313.017	48649.952	91.615	0.012	-0.012	0.024	0.005	-0.008
16901	2148255.687	6126971.784	316.260	48749.857	91.688	0.001	-0.018	0.024	-0.001	-0.019
16902	2148347.278	6126923.080	320.048	48849.921	92.007	-0.001	-0.030	0.020	0.005	-0.036
16903	2148436.974	6126871.095	323.978	48949.905	92.685	-0.018	-0.049	0.019	0.000	-0.058
16904	2148524.157	6126814.907	327.683	49049.926	92.615	-0.014	-0.089	0.026	0.027	-0.090
16905	2148600.979	6126761.217	330.462	49140.307	92.607	-0.052	-0.108	0.082	0.011	-0.128
16906	2148691.438	6126692.085	334.751	49250.106	92.309	-0.020	-0.070	0.066	0.018	-0.080
16907	2148770.868	6126625.696	339.362	49349.955	91.850	-0.017	-0.074	0.020	0.027	-0.072

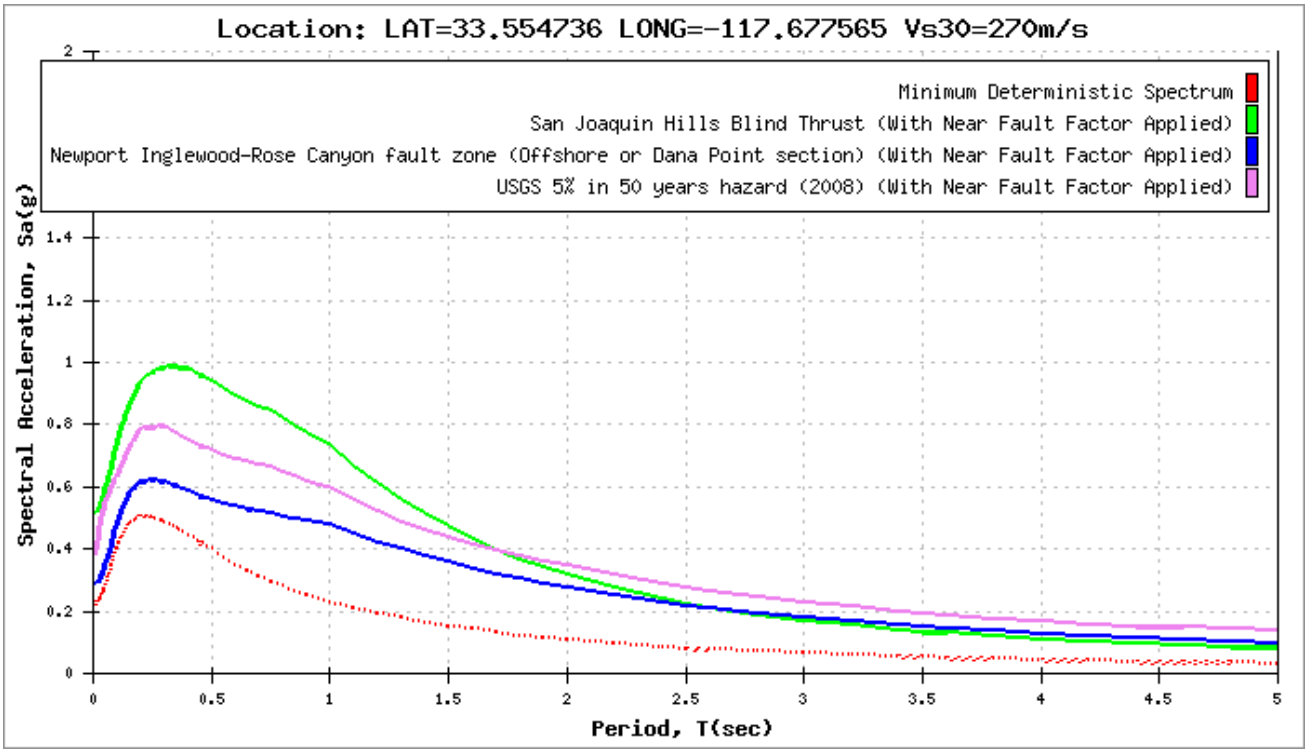
			Date : November 22 2011							
Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets	North. Diff	East. Diff	Elev. Diff	Station Diff	Offset Diff
18900	2148162.496	6127016.930	313.028	48649.961	91.616	0.002	-0.010	0.013	-0.004	-0.009
18901	2148255.689	6126971.780	316.270	48749.860	91.685	-0.001	-0.014	0.014	-0.004	-0.016
18902	2148347.287	6126923.071	320.057	48849.933	92.003	-0.010	-0.021	0.011	-0.007	-0.032
18903	2148436.977	6126871.088	323.986	48949.911	92.682	-0.021	-0.042	0.011	-0.006	-0.055
18904	2148524.173	6126814.884	327.689	49049.951	92.605	-0.030	-0.066	0.020	0.002	-0.080
18905	2148600.985	6126761.188	330.466	49140.328	92.588	-0.058	-0.079	0.078	-0.010	-0.109
18906	2148691.433	6126692.063	334.750	49250.115	92.289	-0.015	-0.048	0.067	0.009	-0.060
18907	2148770.859	6126625.653	339.363	49349.976	91.820	-0.008	-0.031	0.019	0.006	-0.042

		December 20 2011					December 20 2011			
Pnt. Nr.	Northing	Easting	Elevation	Station Route 73	Offsets	North. Diff	East. Diff	Elev. Diff	Station Diff	Offset Diff
20900	2148162.503	6127016.929	313.03	48649.968	91.619	-0.005	-0.009	0.011	-0.011	-0.012
20901	2148255.694	6126971.782	316.27	48749.863	91.689	-0.006	-0.016	0.014	-0.007	-0.020
20902	2148347.28	6126923.078	320.06	48849.924	92.006	-0.003	-0.028	0.008	0.002	-0.035
20903	2148436.977	6126871.085	323.99	48949.913	92.679	-0.021	-0.039	0.007	-0.008	-0.052
20904	2148524.155	6126814.901	327.69	49049.927	92.610	-0.012	-0.083	0.019	0.026	-0.085
20905	2148600.979	6126761.211	330.47	49140.310	92.602	-0.052	-0.102	0.074	0.008	-0.123
20906	2148691.431	6126692.09	334.75	49250.098	92.308	-0.013	-0.075	0.067	0.026	-0.079
20907	2148770.862	6126625.692	339.36	49349.953	91.852	-0.011	-0.070	0.022	0.029	-0.074

APPENDIX C

ARS CURVE

CALCULATED SPECTRA



View Tabular Data | Show Envelope Only | Hide Near Fault Adjustment | Axis Scale | Printer Friendly View | Show Basin Factor

Apply Near Fault Adjustment To:

NOTE: Caltrans SDC requires application of a Near Fault Adjustment factor for sites less than 25 km (Rrup) from the causative fault.

☑ Deterministic Spectrum Using

4.30 Km San Joaquin Hills Blind Thrust

11.96 Km Newport Inglewood-Rose Canyon fault zone (Offshore or Dana Point section)

☑ Probabilistic Spectrum Using

4.30 Km (Recommend Performing Deaggregation To Verify)

◉ Show Spectrum with Adjustment Only

○ Show Spectrum with and without near fault Adjustment

OK

SITE DATA

Shear Wave Velocity, Vs_{30}:	270 m/s
Latitude:	33.554736
Longitude:	-117.677565
Depth to Vs = 1.0 km/s:	327 m
Depth to Vs = 2.5 km/s:	2.00 km

DETERMINISTIC

San Joaquin Hills Blind Thrust

Fault ID:	7
Maximum Magnitude (MMax):	6.6
Fault Type:	R
Fault Dip:	23 Deg
Dip Direction:	SW
Bottom of Rupture Plane:	8.00 km
Top of Rupture Plane(Ztor):	2.00 km
Rrup	4.30 km
Rjb:	2.65 km
Rx:	3.81 km
Fnorm:	0
Frev:	1

Period	SA (Base Spectrum)	Basin Factor	Near Fault Factor (Applied)	SA (Final Spectrum)
0.01	0.512	1.000	1.000	0.512
0.02	0.520	1.000	1.000	0.520
0.022	0.524	1.000	1.000	0.524
0.025	0.530	1.000	1.000	0.530
0.029	0.538	1.000	1.000	0.538
0.03	0.540	1.000	1.000	0.540
0.032	0.545	1.000	1.000	0.545
0.035	0.553	1.000	1.000	0.553
0.036	0.555	1.000	1.000	0.555
0.04	0.565	1.000	1.000	0.565
0.042	0.570	1.000	1.000	0.570
0.044	0.575	1.000	1.000	0.575
0.045	0.577	1.000	1.000	0.577
0.046	0.580	1.000	1.000	0.580
0.048	0.585	1.000	1.000	0.585
0.05	0.590	1.000	1.000	0.590
0.055	0.604	1.000	1.000	0.604
0.06	0.618	1.000	1.000	0.618
0.065	0.633	1.000	1.000	0.633

0.067	0.638	1.000	1.000	0.638
0.07	0.647	1.000	1.000	0.647
0.075	0.662	1.000	1.000	0.662
0.08	0.678	1.000	1.000	0.678
0.085	0.694	1.000	1.000	0.694
0.09	0.709	1.000	1.000	0.709
0.095	0.725	1.000	1.000	0.725
0.1	0.740	1.000	1.000	0.740
0.11	0.768	1.000	1.000	0.768
0.12	0.794	1.000	1.000	0.794
0.13	0.817	1.000	1.000	0.817
0.133	0.824	1.000	1.000	0.824
0.14	0.837	1.000	1.000	0.837
0.15	0.855	1.000	1.000	0.855
0.16	0.874	1.000	1.000	0.874
0.17	0.891	1.000	1.000	0.891
0.18	0.906	1.000	1.000	0.906
0.19	0.921	1.000	1.000	0.921
0.2	0.934	1.000	1.000	0.934
0.22	0.950	1.000	1.000	0.950
0.24	0.964	1.000	1.000	0.964
0.25	0.969	1.000	1.000	0.969
0.26	0.973	1.000	1.000	0.973
0.28	0.979	1.000	1.000	0.979
0.29	0.981	1.000	1.000	0.981
0.3	0.983	1.000	1.000	0.983
0.32	0.985	1.000	1.000	0.985
0.34	0.986	1.000	1.000	0.986
0.35	0.985	1.000	1.000	0.985
0.36	0.985	1.000	1.000	0.985
0.38	0.982	1.000	1.000	0.982
0.4	0.980	1.000	1.000	0.980
0.42	0.972	1.000	1.000	0.972
0.44	0.964	1.000	1.000	0.964
0.45	0.960	1.000	1.000	0.960
0.46	0.956	1.000	1.000	0.956
0.48	0.948	1.000	1.000	0.948
0.5	0.940	1.000	1.000	0.940
0.55	0.898	1.000	1.020	0.916
0.6	0.861	1.000	1.040	0.895
0.65	0.827	1.000	1.060	0.876
0.667	0.816	1.000	1.067	0.870
0.7	0.795	1.000	1.080	0.859
0.75	0.766	1.000	1.100	0.843
0.8	0.730	1.000	1.120	0.818
0.85	0.698	1.000	1.140	0.795
0.9	0.667	1.000	1.160	0.774
0.95	0.639	1.000	1.180	0.754
1	0.612	1.000	1.200	0.734

1.1	0.556	1.000	1.200	0.667
1.2	0.508	1.000	1.200	0.609
1.3	0.465	1.000	1.200	0.558
1.4	0.427	1.000	1.200	0.512
1.5	0.393	1.000	1.200	0.472
1.6	0.360	1.000	1.200	0.432
1.7	0.331	1.000	1.200	0.397
1.8	0.306	1.000	1.200	0.367
1.9	0.283	1.000	1.200	0.340
2	0.264	1.000	1.200	0.317
2.2	0.228	1.000	1.200	0.274
2.4	0.199	1.000	1.200	0.239
2.5	0.187	1.000	1.200	0.224
2.6	0.176	1.000	1.200	0.211
2.8	0.156	1.000	1.200	0.188
3	0.140	1.000	1.200	0.168
3.2	0.128	1.000	1.200	0.153
3.4	0.117	1.000	1.200	0.140
3.5	0.112	1.000	1.200	0.134
3.6	0.107	1.000	1.200	0.129
3.8	0.099	1.000	1.200	0.119
4	0.092	1.000	1.200	0.110
4.2	0.086	1.000	1.200	0.104
4.4	0.081	1.000	1.200	0.097
4.6	0.077	1.000	1.200	0.092
4.8	0.072	1.000	1.200	0.087
5	0.068	1.000	1.200	0.082

To use above data in Excel, copy/paste:

```
0.01    0.512    1.000    1.000    0.512
0.02    0.520    1.000    1.000    0.520
```

Newport Inglewood-Rose Canyon fault zone (Offshore or Dana Point section)

Fault ID:	222
Maximum Magnitude (MMax):	7.5
Fault Type:	RLSS
Fault Dip:	90 Deg
Dip Direction:	V
Bottom of Rupture Plane:	13.00 km
Top of Rupture Plane(Ztor):	0.00 km
Rrup	11.96 km
Rjb:	11.96 km
Rx:	11.96 km
Fnorm:	0
Frev:	0

Period	**SA (Base Spectrum)**	**Basin Factor**	**Near Fault Factor (Applied)**	**SA (Final Spectrum)**
0.01	0.289	1.000	1.000	0.289
0.02	0.293	1.000	1.000	0.293
0.022	0.296	1.000	1.000	0.296

0.025	0.300	1.000	1.000	0.300
0.029	0.304	1.000	1.000	0.304
0.03	0.306	1.000	1.000	0.306
0.032	0.310	1.000	1.000	0.310
0.035	0.315	1.000	1.000	0.315
0.036	0.317	1.000	1.000	0.317
0.04	0.325	1.000	1.000	0.325
0.042	0.329	1.000	1.000	0.329
0.044	0.333	1.000	1.000	0.333
0.045	0.335	1.000	1.000	0.335
0.046	0.337	1.000	1.000	0.337
0.048	0.341	1.000	1.000	0.341
0.05	0.345	1.000	1.000	0.345
0.055	0.358	1.000	1.000	0.358
0.06	0.371	1.000	1.000	0.371
0.065	0.385	1.000	1.000	0.385
0.067	0.390	1.000	1.000	0.390
0.07	0.398	1.000	1.000	0.398
0.075	0.411	1.000	1.000	0.411
0.08	0.425	1.000	1.000	0.425
0.085	0.439	1.000	1.000	0.439
0.09	0.453	1.000	1.000	0.453
0.095	0.466	1.000	1.000	0.466
0.1	0.480	1.000	1.000	0.480
0.11	0.503	1.000	1.000	0.503
0.12	0.524	1.000	1.000	0.524
0.13	0.543	1.000	1.000	0.543
0.133	0.548	1.000	1.000	0.548
0.14	0.559	1.000	1.000	0.559
0.15	0.574	1.000	1.000	0.574
0.16	0.585	1.000	1.000	0.585
0.17	0.594	1.000	1.000	0.594
0.18	0.602	1.000	1.000	0.602
0.19	0.609	1.000	1.000	0.609
0.2	0.615	1.000	1.000	0.615
0.22	0.619	1.000	1.000	0.619
0.24	0.621	1.000	1.000	0.621
0.25	0.621	1.000	1.000	0.621
0.26	0.621	1.000	1.000	0.621
0.28	0.620	1.000	1.000	0.620
0.29	0.618	1.000	1.000	0.618
0.3	0.617	1.000	1.000	0.617
0.32	0.612	1.000	1.000	0.612
0.34	0.606	1.000	1.000	0.606
0.35	0.602	1.000	1.000	0.602
0.36	0.599	1.000	1.000	0.599
0.38	0.592	1.000	1.000	0.592
0.4	0.585	1.000	1.000	0.585
0.42	0.580	1.000	1.000	0.580

0.44	0.574	1.000	1.000	0.574
0.45	0.571	1.000	1.000	0.571
0.46	0.569	1.000	1.000	0.569
0.48	0.563	1.000	1.000	0.563
0.5	0.558	1.000	1.000	0.558
0.55	0.535	1.000	1.020	0.546
0.6	0.515	1.000	1.040	0.536
0.65	0.497	1.000	1.060	0.527
0.667	0.492	1.000	1.067	0.524
0.7	0.481	1.000	1.080	0.519
0.75	0.466	1.000	1.100	0.512
0.8	0.450	1.000	1.120	0.504
0.85	0.435	1.000	1.140	0.496
0.9	0.422	1.000	1.160	0.489
0.95	0.409	1.000	1.180	0.483
1	0.397	1.000	1.200	0.476
1.1	0.373	1.000	1.200	0.447
1.2	0.351	1.000	1.200	0.422
1.3	0.332	1.000	1.200	0.398
1.4	0.314	1.000	1.200	0.377
1.5	0.298	1.000	1.200	0.358
1.6	0.282	1.000	1.200	0.338
1.7	0.267	1.000	1.200	0.320
1.8	0.253	1.000	1.200	0.304
1.9	0.241	1.000	1.200	0.289
2	0.230	1.000	1.200	0.276
2.2	0.208	1.000	1.200	0.249
2.4	0.189	1.000	1.200	0.227
2.5	0.181	1.000	1.200	0.217
2.6	0.174	1.000	1.200	0.208
2.8	0.160	1.000	1.200	0.192
3	0.148	1.000	1.200	0.178
3.2	0.138	1.000	1.200	0.165
3.4	0.128	1.000	1.200	0.154
3.5	0.124	1.000	1.200	0.149
3.6	0.120	1.000	1.200	0.144
3.8	0.113	1.000	1.200	0.135
4	0.106	1.000	1.200	0.127
4.2	0.100	1.000	1.200	0.121
4.4	0.095	1.000	1.200	0.114
4.6	0.091	1.000	1.200	0.109
4.8	0.086	1.000	1.200	0.103
5	0.082	1.000	1.200	0.099

To use above data in Excel, copy/paste:

```
0.01    0.289    1.000    1.000    0.289
0.02    0.293    1.000    1.000    0.293
```

PROBABILISTIC

Probabilistic Model

USGS Seismic Hazard Map(2008) 975 Year Return Period

Period	SA (Base Spectrum)	Basin Factor	Near Fault Factor (Applied)	SA (Final Spectrum)
0.01	0.381	1.000	1.000	0.381
0.02	0.445	1.000	1.000	0.445
0.022	0.454	1.000	1.000	0.454
0.025	0.467	1.000	1.000	0.467
0.029	0.483	1.000	1.000	0.483
0.03	0.486	1.000	1.000	0.486
0.032	0.493	1.000	1.000	0.493
0.035	0.503	1.000	1.000	0.503
0.036	0.507	1.000	1.000	0.507
0.04	0.519	1.000	1.000	0.519
0.042	0.524	1.000	1.000	0.524
0.044	0.530	1.000	1.000	0.530
0.045	0.532	1.000	1.000	0.532
0.046	0.535	1.000	1.000	0.535
0.048	0.540	1.000	1.000	0.540
0.05	0.545	1.000	1.000	0.545
0.055	0.557	1.000	1.000	0.557
0.06	0.567	1.000	1.000	0.567
0.065	0.578	1.000	1.000	0.578
0.067	0.581	1.000	1.000	0.581
0.07	0.587	1.000	1.000	0.587
0.075	0.596	1.000	1.000	0.596
0.08	0.605	1.000	1.000	0.605
0.085	0.613	1.000	1.000	0.613
0.09	0.621	1.000	1.000	0.621
0.095	0.628	1.000	1.000	0.628
0.1	0.635	1.000	1.000	0.635
0.11	0.654	1.000	1.000	0.654
0.12	0.672	1.000	1.000	0.672
0.13	0.689	1.000	1.000	0.689
0.133	0.694	1.000	1.000	0.694
0.14	0.705	1.000	1.000	0.705
0.15	0.720	1.000	1.000	0.720
0.16	0.734	1.000	1.000	0.734
0.17	0.748	1.000	1.000	0.748
0.18	0.761	1.000	1.000	0.761
0.19	0.774	1.000	1.000	0.774
0.2	0.786	1.000	1.000	0.786
0.22	0.789	1.000	1.000	0.789
0.24	0.791	1.000	1.000	0.791
0.25	0.792	1.000	1.000	0.792
0.26	0.793	1.000	1.000	0.793
0.28	0.795	1.000	1.000	0.795
0.29	0.796	1.000	1.000	0.796
0.3	0.797	1.000	1.000	0.797

0.32	0.786	1.000	1.000	0.786
0.34	0.776	1.000	1.000	0.776
0.35	0.772	1.000	1.000	0.772
0.36	0.767	1.000	1.000	0.767
0.38	0.759	1.000	1.000	0.759
0.4	0.751	1.000	1.000	0.751
0.42	0.744	1.000	1.000	0.744
0.44	0.736	1.000	1.000	0.736
0.45	0.733	1.000	1.000	0.733
0.46	0.730	1.000	1.000	0.730
0.48	0.723	1.000	1.000	0.723
0.5	0.717	1.000	1.000	0.717
0.55	0.689	1.000	1.020	0.703
0.6	0.664	1.000	1.040	0.690
0.65	0.642	1.000	1.060	0.680
0.667	0.635	1.000	1.067	0.677
0.7	0.622	1.000	1.080	0.671
0.75	0.604	1.000	1.100	0.664
0.8	0.578	1.000	1.120	0.647
0.85	0.555	1.000	1.140	0.633
0.9	0.534	1.000	1.160	0.620
0.95	0.515	1.000	1.180	0.608
1	0.498	1.000	1.200	0.597
1.1	0.462	1.000	1.200	0.554
1.2	0.432	1.000	1.200	0.518
1.3	0.406	1.000	1.200	0.487
1.4	0.383	1.000	1.200	0.459
1.5	0.363	1.000	1.200	0.435
1.6	0.345	1.000	1.200	0.414
1.7	0.329	1.000	1.200	0.395
1.8	0.315	1.000	1.200	0.378
1.9	0.302	1.000	1.200	0.362
2	0.290	1.000	1.200	0.348
2.2	0.263	1.000	1.200	0.315
2.4	0.240	1.000	1.200	0.288
2.5	0.230	1.000	1.200	0.277
2.6	0.221	1.000	1.200	0.266
2.8	0.205	1.000	1.200	0.246
3	0.191	1.000	1.200	0.229
3.2	0.177	1.000	1.200	0.213
3.4	0.166	1.000	1.200	0.199
3.5	0.160	1.000	1.200	0.192
3.6	0.155	1.000	1.200	0.186
3.8	0.146	1.000	1.200	0.175
4	0.137	1.000	1.200	0.165
4.2	0.132	1.000	1.200	0.158
4.4	0.127	1.000	1.200	0.152
4.6	0.122	1.000	1.200	0.147
4.8	0.118	1.000	1.200	0.142

5	0.114	1.000	1.200	0.137	

To use above data in Excel, copy/paste:

```
0.01    0.381    1.000    1.000    0.381
0.02    0.445    1.000    1.000    0.445
```

MINIMUM DETERMINISTIC SPECTRUM

Period	SA
0.01	0.226
0.02	0.229
0.022	0.231
0.025	0.235
0.029	0.239
0.03	0.240
0.032	0.243
0.035	0.248
0.036	0.250
0.04	0.257
0.042	0.260
0.044	0.264
0.045	0.266
0.046	0.268
0.048	0.271
0.05	0.275
0.055	0.287
0.06	0.300
0.065	0.312
0.067	0.317
0.07	0.325
0.075	0.337
0.08	0.350
0.085	0.363
0.09	0.375
0.095	0.388
0.1	0.400
0.11	0.419
0.12	0.437
0.13	0.454
0.133	0.458
0.14	0.468
0.15	0.481
0.16	0.488
0.17	0.493
0.18	0.498
0.19	0.502
0.2	0.505
0.22	0.504
0.24	0.501
0.25	0.499
0.26	0.497

0.28	0.492
0.29	0.489
0.3	0.486
0.32	0.478
0.34	0.470
0.35	0.466
0.36	0.462
0.38	0.454
0.4	0.446
0.42	0.436
0.44	0.426
0.45	0.422
0.46	0.417
0.48	0.408
0.5	0.400
0.55	0.373
0.6	0.350
0.65	0.329
0.667	0.323
0.7	0.311
0.75	0.295
0.8	0.280
0.85	0.265
0.9	0.252
0.95	0.241
1	0.230
1.1	0.209
1.2	0.192
1.3	0.177
1.4	0.164
1.5	0.152
1.6	0.141
1.7	0.131
1.8	0.122
1.9	0.114
2	0.107
2.2	0.095
2.4	0.085
2.5	0.081
2.6	0.077
2.8	0.070
3	0.064
3.2	0.058
3.4	0.054
3.5	0.052
3.6	0.050
3.8	0.046
4	0.043
4.2	0.041

4.4	0.038
4.6	0.036
4.8	0.034
5	0.032

To use above data in Excel, copy/paste:

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0.01    0.226
0.02    0.229
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Envelope Data

Period	SA
0.01	0.512
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0.022	0.524
0.025	0.530
0.029	0.538
0.03	0.540
0.032	0.545
0.035	0.553
0.036	0.555
0.04	0.565
0.042	0.570
0.044	0.575
0.045	0.577
0.046	0.580
0.048	0.585
0.05	0.590
0.055	0.604
0.06	0.618
0.065	0.633
0.067	0.638
0.07	0.647
0.075	0.662
0.08	0.678
0.085	0.694
0.09	0.709
0.095	0.725
0.1	0.740
0.11	0.768
0.12	0.794
0.13	0.817
0.133	0.824
0.14	0.837
0.15	0.855
0.16	0.874
0.17	0.891
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0.19	0.921
0.2	0.934
0.22	0.950
0.24	0.964
0.25	0.969

0.26	0.973
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0.29	0.981
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0.32	0.985
0.34	0.986
0.35	0.985
0.36	0.985
0.38	0.982
0.4	0.980
0.42	0.972
0.44	0.964
0.45	0.960
0.46	0.956
0.48	0.948
0.5	0.940
0.55	0.916
0.6	0.895
0.65	0.876
0.667	0.870
0.7	0.859
0.75	0.843
0.8	0.818
0.85	0.795
0.9	0.774
0.95	0.754
1	0.734
1.1	0.667
1.2	0.609
1.3	0.558
1.4	0.512
1.5	0.472
1.6	0.432
1.7	0.397
1.8	0.378
1.9	0.362
2	0.348
2.2	0.315
2.4	0.288
2.5	0.277
2.6	0.266
2.8	0.246
3	0.229
3.2	0.213
3.4	0.199
3.5	0.192
3.6	0.186
3.8	0.175
4	0.165

4.2	0.158
4.4	0.152
4.6	0.147
4.8	0.142
5	0.137

To use above data in Excel, copy/paste:

```
0.01	0.512
0.02	0.520
```

State of California

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: MR. RAMIN RASHEDI, Branch Chief
Office of Structure Design

Date: May 29, 2012

File: 12-ORA-73-PM 10.0/11.4
EA 12-0M5501
Shear Pile Wall for Embankment Distress

Attn: Yeo Yoon

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
Geotechnical Services
Office of Geotechnical Design South-1 Branch B

Subject: Addendum for Wall Foundation Design Report for Toll Road Route 73 Embankment Slope Investigation

The Office of Geotechnical Design-South 1 has prepared this Addendum for the Pile Wall Foundation Report for the Toll Road Route 73 embankment from Postmiles 10.72 to 10.97 originally submitted May 1, 2012. This addendum provides an additional construction consideration note, for CIDH Piles (see Section 9.0, page 15 of the May 1st Report). The following changes are provided below:

- Two sections of 200 feet length or less may be excavated at the same time provided that 400 feet of unexcavated slope is left in between the two concurrent excavations.

If you have any questions or comments, please call Sam Sukiasian at (213) 620-2135 or Christopher Harris at (213) 620-2147.

Prepared by: Date:

Christopher R. Harris

PROFESSIONAL GEOLOGIST
CHRISTOPHER R. HARRIS
2196
CERTIFIED ENGINEERING GEOLOGIST
exp 4-30-13
STATE OF CALIFORNIA

CHRISTOPHER HARRIS, C.E.G.
Engineering Geologist
Geotechnical Design South - 1

REGISTERED PROFESSIONAL ENGINEER
SAMUEL G. SUKIASIAN
No. GE2631
exp 6-30-12
GEOTECHNICAL
STATE OF CALIFORNIA

SAM SUKIASIAN, G.E.
Senior Transportation Engineer
Geotechnical Design South - 1

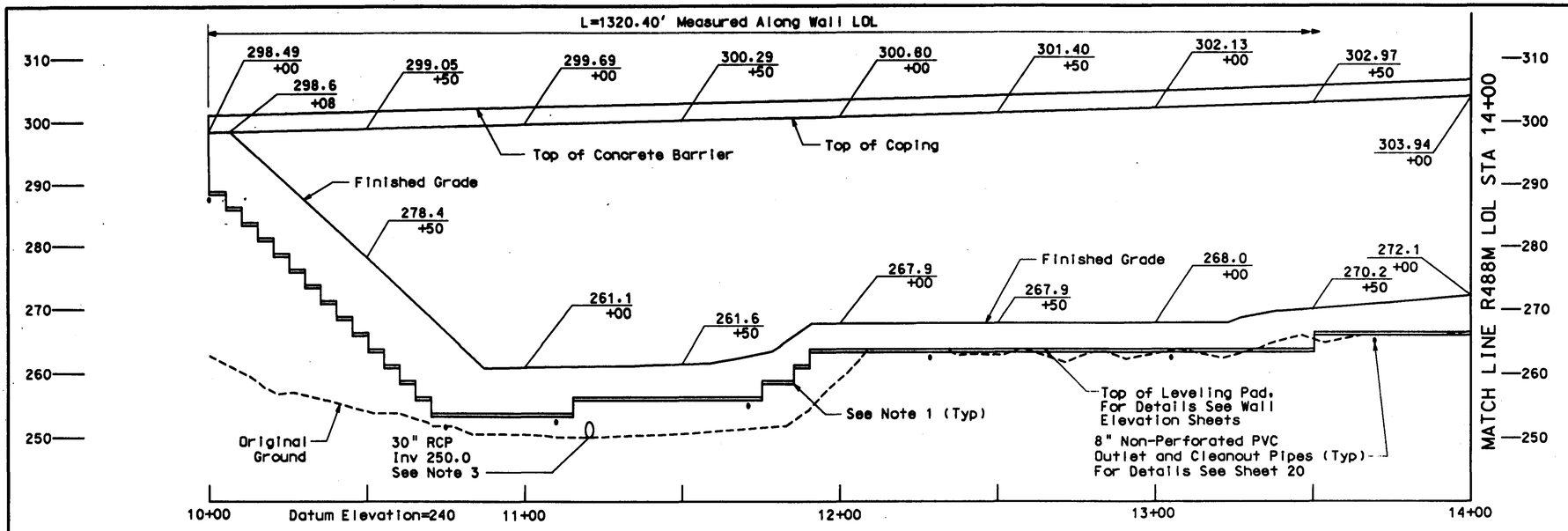
cc: Massoud Tajik-D12 Maintenance
Jason Yeung-D12 Maintenance
Ahmed-Abou-Abdou, District Project Engineer
Lisa Ramsey, Toll Road Corridor Project Manager
John Ehsan, OGDS1
Shira Rajendra, GS Corporate,
Kristopher Barker, OGDS1
District Construction R.E. Pending File,

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	Ora	5,73	9.6-12.9/10.2-11.6		

REGISTERED CIVIL ENGINEER — PLANS APPROVAL — DATE

REGISTERED PROFESSIONAL ENGINEER — T. J. DANIEL — No. C48957 — Exp. 9/30/96 — CIVIL — STATE OF CALIFORNIA

PARSONS DE LEUW, INC.
Two Venture, Suite 550
Irvine, California 92718



CURVE DATA

No	RADIUS	DELTA	TANGENT	LENGTH	CURVE CENTER NORTHING	CURVE CENTER EASTING
(19A)	2591.00'	29°11'55"	674.87'	1320.40'	2147077.559	6124663.124

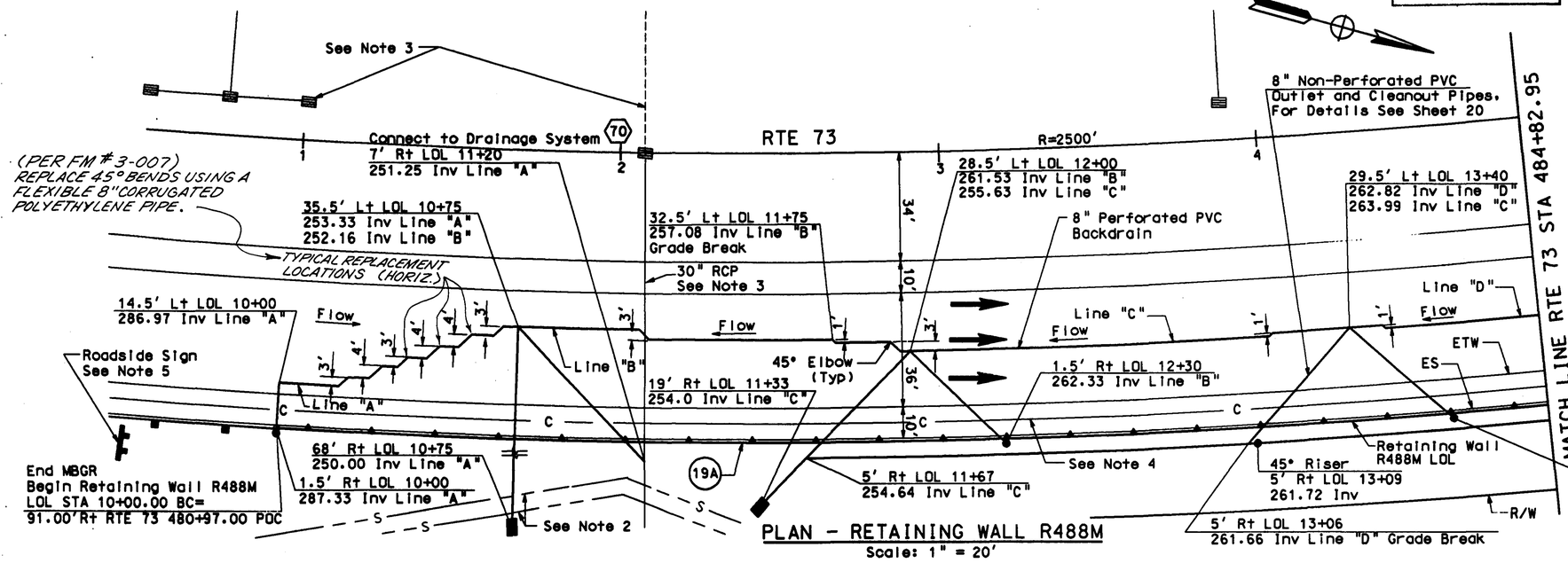
ELEVATION - RETAINING WALL R488M

(Front View Shown)

Scale: Horiz 1" = 20'
Vert 1" = 10'

AS BUILT
- ❑ No Changes
- ■ Changed as Marked

As-Built Date: _____



PLAN - RETAINING WALL R488M

Scale: 1" = 20'

Notes:

1. For Footing Step Details and Elevations See Standard Detail Sheet and Wall Elevation Sheets
2. For Utility Details See Road Plans
3. For Drainage Details See Road Plans
4. For Electrical Details See Road Plans
5. For Sign Details See Road Plans
6. For Typical Section See General Plan No 2

INDEX TO PLANS R488M

STANDARD PLANS DATED JULY 1992

B11-53	Concrete Barrier (Type 25A)
D87C	Cleanout Pipe Terminal and 45° Riser
D93	Riser Safety Cage

QUANTITIES

Description	Wall No R488M CY	LF	SQFT
Panel Area (MSE Wall)			51283
Minor Concrete (Coping)	436		
Minor Concrete (Leveling Pad)	24		
Concrete Barrier (Type 25A Mod)		1320	

QCM RELEASE
JAN 25 1995
FOR CONSTRUCTION

Released for Construction
Section: H
PROJECT ENGINEER — DATE

J.H. Boulter
CALTRANS DESIGN OVERSIGHT
9/20/94
SIGNOFF DATE

	BY	CHECKED
DESIGN	M. Blomquist	J. Ling
DETAILS	M. Blomquist	J. Ling
QUANTITIES	J. Ling	M. Blomquist

TRANSPORTATION CORRIDOR AGENCIES

GENE FOSTER
TCA CORRIDOR MANAGER

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 12332
EA 102540

BRIDGE NO. 55-873M
POST MILE 11.10

RETAINING WALL NO R488M
GENERAL PLAN NO 1 R-105

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 1 OF 20

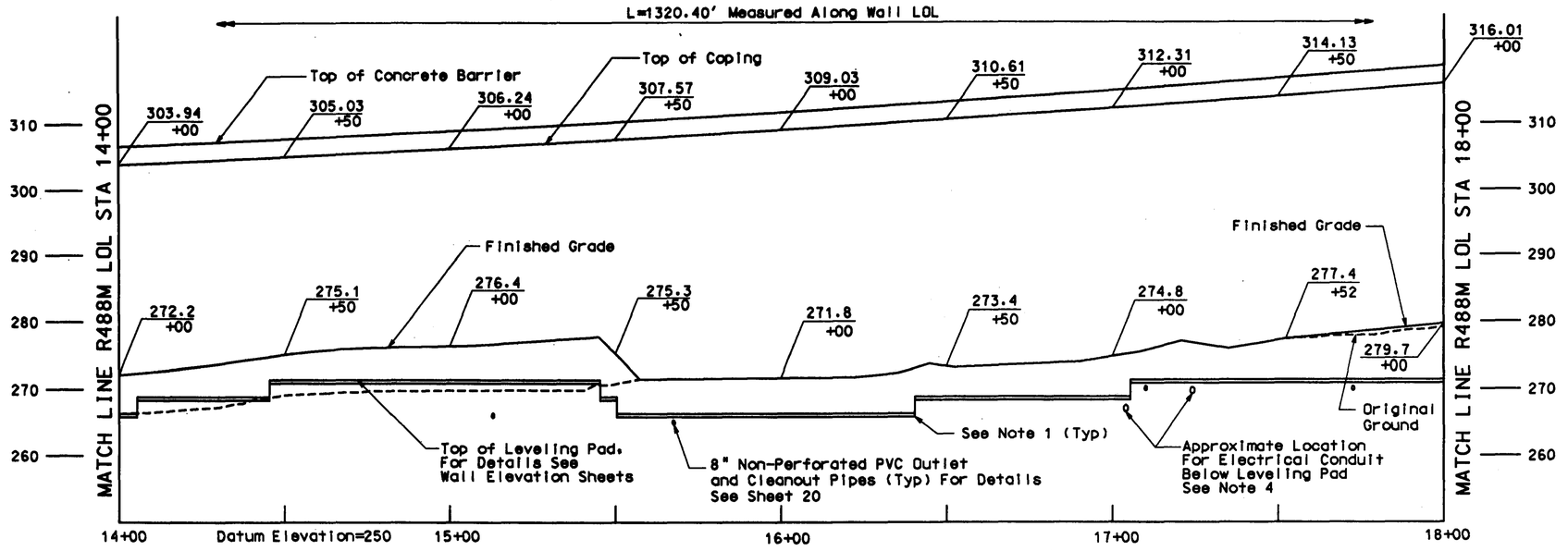
FILE ID: /usr3/le3/ejh/110/drawings/110r90.eht
PLOT DATE: 31-AUG-1994 16:24 PEN TABLE: 20scale.pen

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	Ora	5,73	9.6-12.9/10.2-11.6		

REGISTERED CIVIL ENGINEER — PLANS APPROVAL — DATE

REGISTERED PROFESSIONAL ENGINEER — T. J. DANIEL — No. C48957 — Exp. 9/30/96 — CIVIL — STATE OF CALIFORNIA

PARSONS DE LEUW, INC.
Two Venture, Suite 550
Irvine, California 92718



ELEVATION - RETAINING WALL R488M

(Front View Shown)

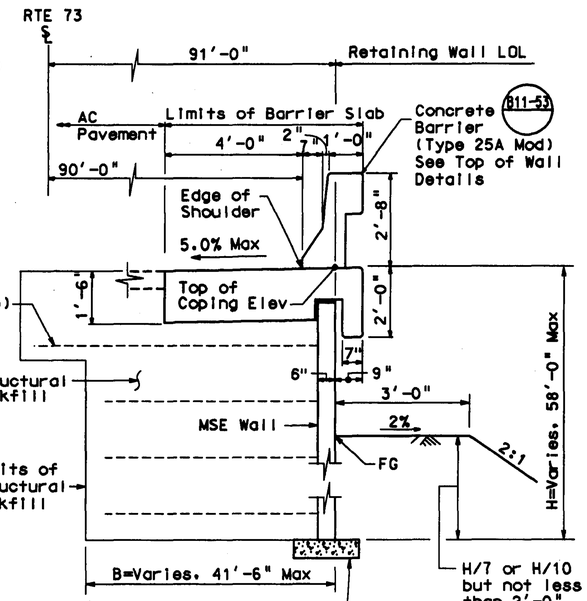
Scale: Horiz 1" = 20'
Vert 1" = 10'

CURVE DATA

No	RADIUS	DELTA	TANGENT	LENGTH	CURVE CENTER	
					NORTHING	EASTING
(19A)	2591.00'	29°11'55"	674.87'	1320.40'	2147077.559	6124663.124

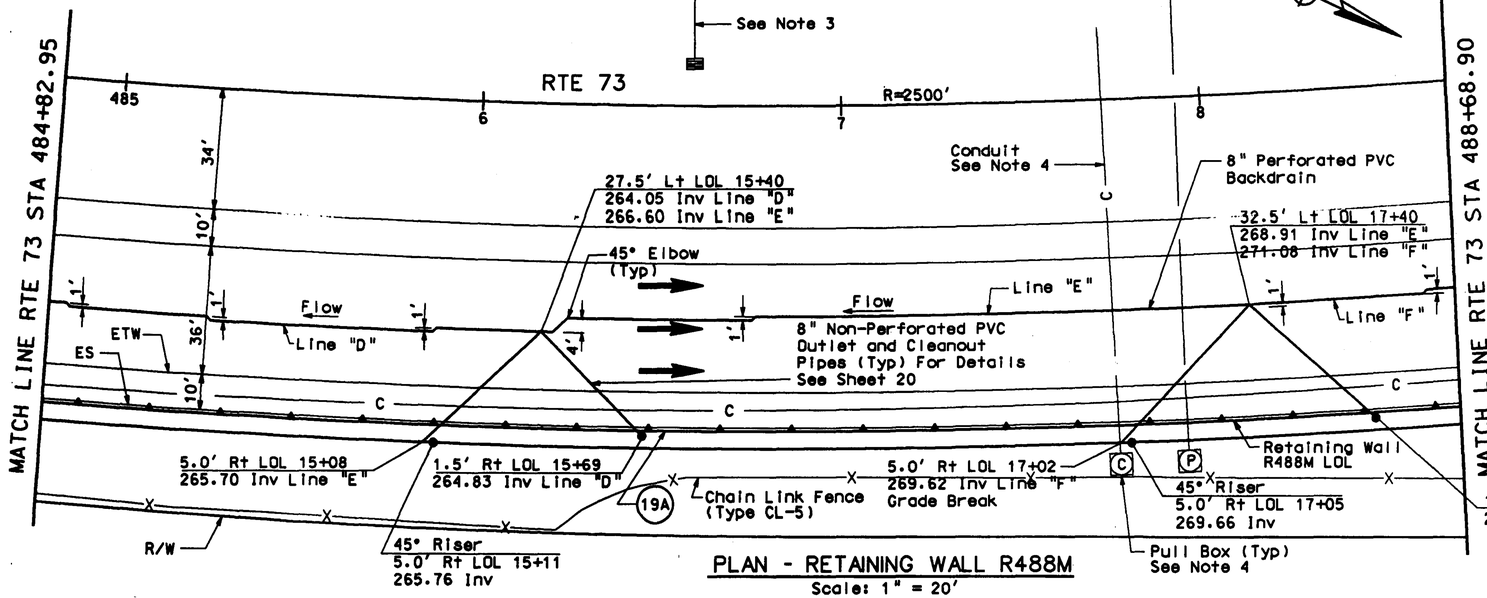
Notes:

1. For Footing Step Details and Elevations See Standard Detail Sheet and Wall Elevation Sheets
2. For Utility Details See Road Plans
3. For Drainage Details See Road Plans
4. For Electrical Details See Road Plans



TYPICAL SECTION

Wall No R488M
No Scale



PLAN - RETAINING WALL R488M

Scale: 1" = 20'

AS BUILT
☒ No Changes
☐ Changed as Marked
As-Built Date: _____

Standard Plan Number
Detail Number

QCM RELEASE
JAN 25 1995
FOR CONSTRUCTION

Released for Construction
Section: //
PROJECT ENGINEER — DATE 01/26/96

H. H. Boulter
CALTRANS DESIGN SUPERVISOR
01/20/94
SIGNOFF DATE

	BY	CHECKED
DESIGN	M. Blomquist	J. Ling
DETAILS	M. Blomquist	J. Ling
QUANTITIES	J. Ling	M. Blomquist

TRANSPORTATION CORRIDOR AGENCIES

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DENE FOSTER
TCA CORRIDOR MANAGER

CU 12332
EA 102540

BRIDGE NO. 55-873M
POST MILE 11.10

RETAINING WALL NO R488M
GENERAL PLAN NO 2 R-106

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 2 OF 20

FILE ID: /usr3/le3/ejh/110/drawings/110r91.sht
PLOT DATE: 31-AUG-1994 16:21 PEN TABLE: 20scale.pen

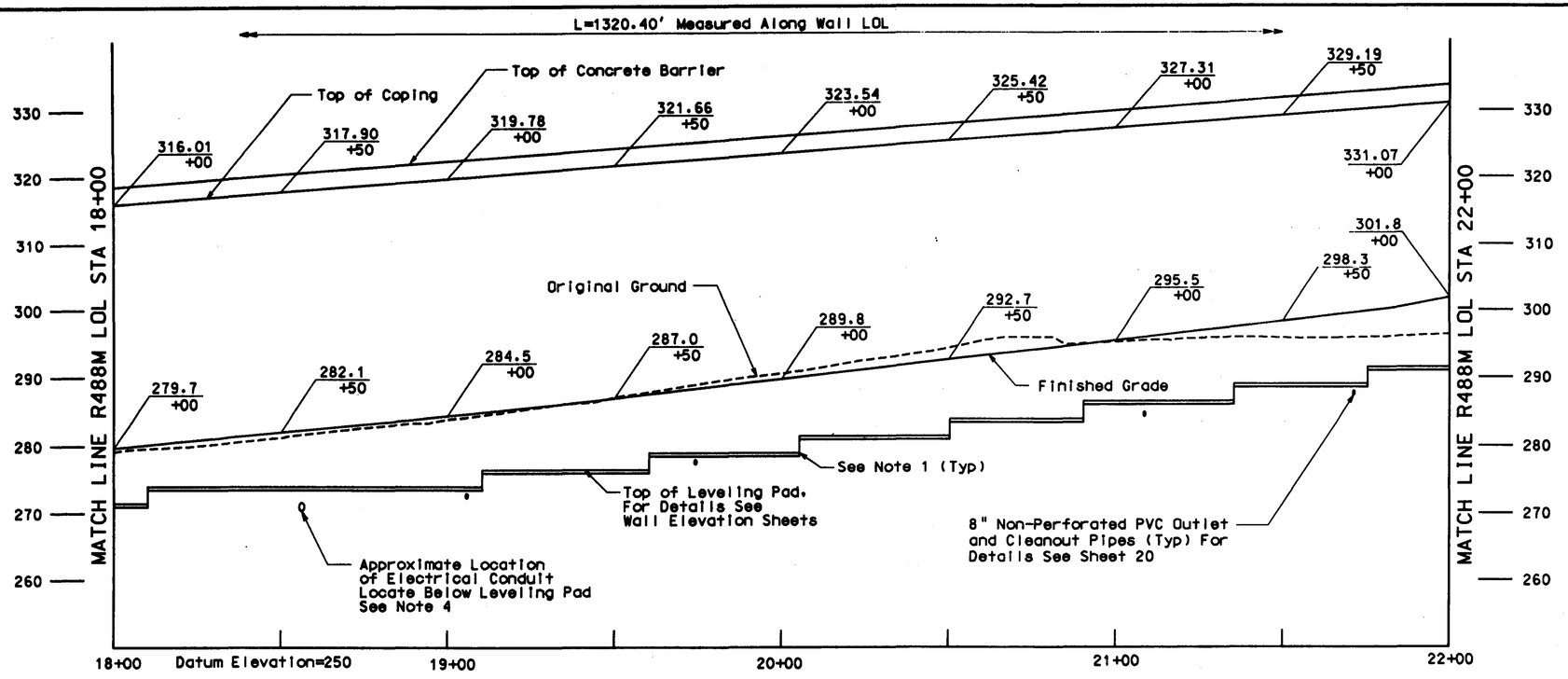
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	Ora	5,73	9.6-12.9/10.2-11.6		

Thomas Daniel
REGISTERED CIVIL ENGINEER

REGISTERED PROFESSIONAL ENGINEER T.J.DANIEL No. C48957 Exp. 9/30/96 CIVIL STATE OF CALIFORNIA

PLANS APPROVAL DATE

PARSONS DE LEUW, INC.
Two Venture. Suite 550
Irvine. California 92718



ELEVATION - RETAINING WALL R488M

(Front View Shown)

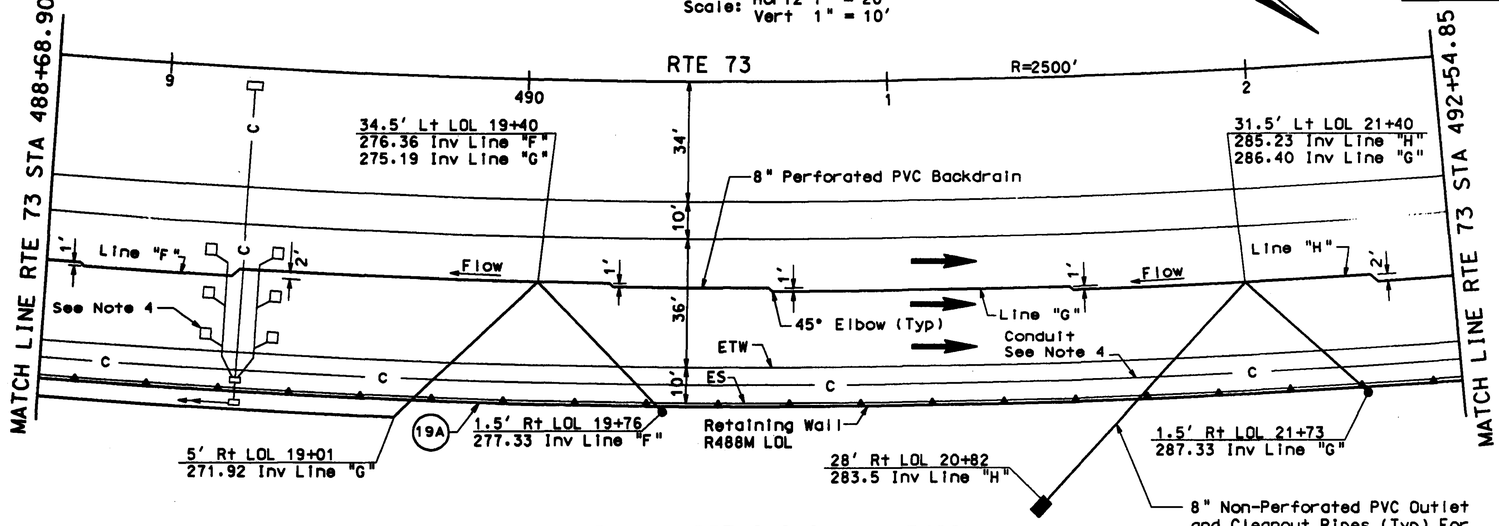
Scale: Horiz 1" = 20'
Vert 1" = 10'

Notes:

1. For Footing Step Details and Elevations See Standard Detail Sheet and Wall Elevation Sheets
2. For Utility Details See Road Plans
3. For Drainage Details See Road Plans
4. For Electrical Details See Road Plans

CURVE DATA

No	RADIUS	DELTA	TANGENT	LENGTH	CURVE CENTER NORTHING	CURVE CENTER EASTING
19A	2591.00'	29°11'55"	674.87'	1320.40'	2147077.559	6124663.124



PLAN - RETAINING WALL R488M

Scale: 1" = 20'

AS BUILT
■ No Changes
□ Changed as Marked
As-Built Date

QCM RELEASE
JAN 25 1995
FOR CONSTRUCTION

Released for Construction
Section: 11
PROJECT ENGINEER 01/26/96 DATE

L.A.H. Bautista
CALTRANS DESIGN OVERSIGHT
01/20/94
SIGNOFF DATE

	BY		CHECKED
DESIGN	M. Blomquist		J. Ling
DETAILS	M. Blomquist		J. Ling
QUANTITIES	J. Ling		M. Blomquist

TRANSPORTATION CORRIDOR AGENCIES

GENE FOSTER
TCA CORRIDOR MANAGER

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 12332
EA 102540

BRIDGE NO. 55-873M
POST MILE 11.10

RETAINING WALL NO R488M
GENERAL PLAN NO 3 R-107

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 3 OF 20

FILE ID: /usr3/le3/sjh/110/drawings/110r92.eht
PLOT DATE: 31-AUG-1994 16:20 PEN TABLE: 20scale.pen

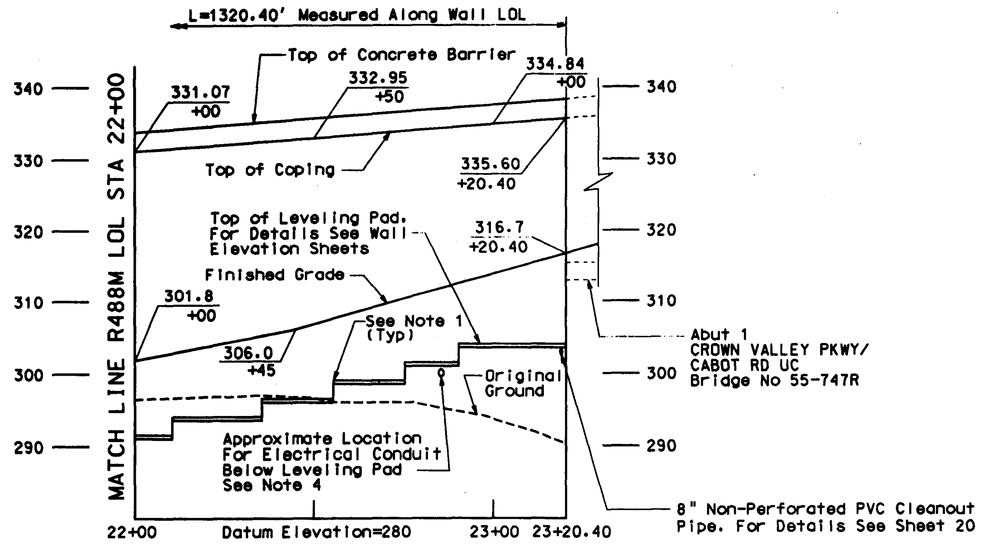
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	Ora	5,73	9.6-12.9/10.2-11.6		

Thomas Daniel
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER * T.J. DANIEL * No. C48957 Exp. 9/30/96 CIVIL * STATE OF CALIFORNIA *

PARSONS DE LEUW, INC.
Two Venture. Suite 550
Irvine. California 92718

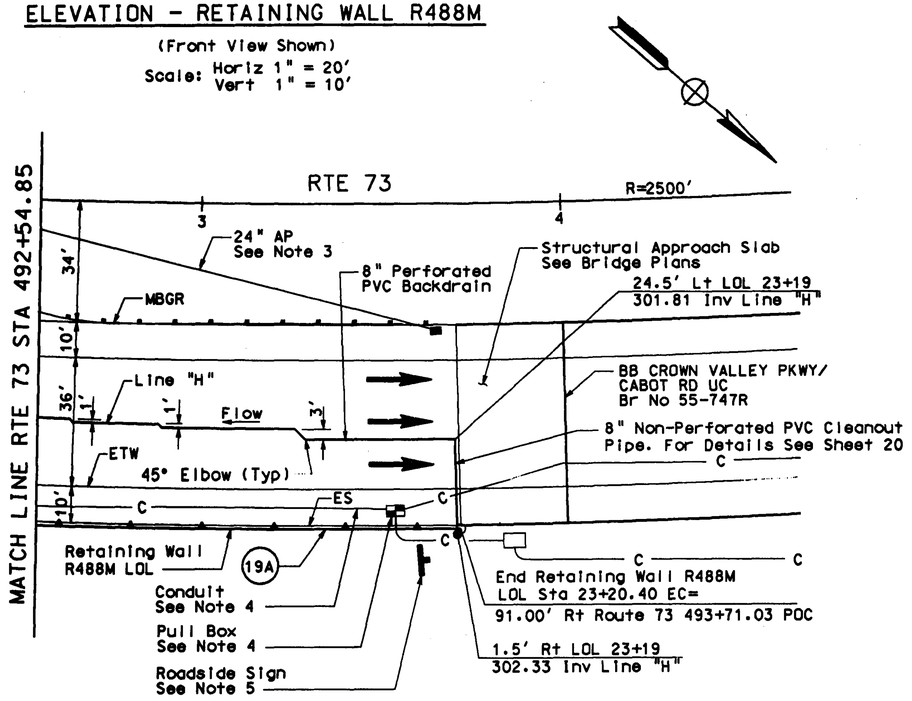


ELEVATION - RETAINING WALL R488M

(Front View Shown)
Scale: Horiz 1" = 20'
Vert 1" = 10'

CURVE DATA

No	RADIUS	DELTA	TANGENT	LENGTH	CURVE CENTER	
					NORTHING	EASTING
(19A)	2591.00'	29°11'55"	674.87'	1320.40'	2147077.559	6124663.124



PLAN - RETAINING WALL R488M
Scale: 1" = 20'

Notes:

1. For Footing Step Details and Elevations See Standard Detail Sheet and Wall Elevation Sheets
2. For Utility Details See Road Plans
3. For Drainage Details See Road Plans
4. For Electrical Details See Road Plans
5. For Sign Details See Road Plans

AS BUILT
- No Changes
- Changed as Marked

As-Built Date: _____

QCM RELEASE
JAN 25 1995
FOR CONSTRUCTION

Released for Construction
Section: 11
Thomas Daniel 01/26/96
PROJECT ENGINEER DATE

H.H. Boulton
CALTRANS DESIGN OVERSIGHT
01/20/94
SIGNOFF DATE

DESIGN	BY M. Blomquist	CHECKED J. Ling	
DETAILS	BY M. Blomquist	CHECKED J. Ling	
QUANTITIES	BY J. Ling	CHECKED M. Blomquist	

TRANSPORTATION CORRIDOR AGENCIES

GENE FOSTER
TCA CORRIDOR MANAGER

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 12332
EA 102540

BRIDGE NO. 55-873M
POST MILE 11.10

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

RETAINING WALL NO R488M
GENERAL PLAN NO 4 R-108

SHEET 4 OF 20

FILE ID: /usr3/le3/sjh/110/drawings/110r93.eht
PLOT DATE: 31-AUG-1994 15:46 PEN TABLE: 20scale.pen

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	ORA	73	9.6-12.9/10.2-11.6		

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

DAVID T. SWANSON No. 1183 Exp. 12/31/96 CIVIL STATE OF CALIFORNIA

MACIAS A JOINT VENTURE 1077 Dell Avenue Campbell, California 95008 Telephone: (408) 866-5000

RETAINED EARTH™ WALLS

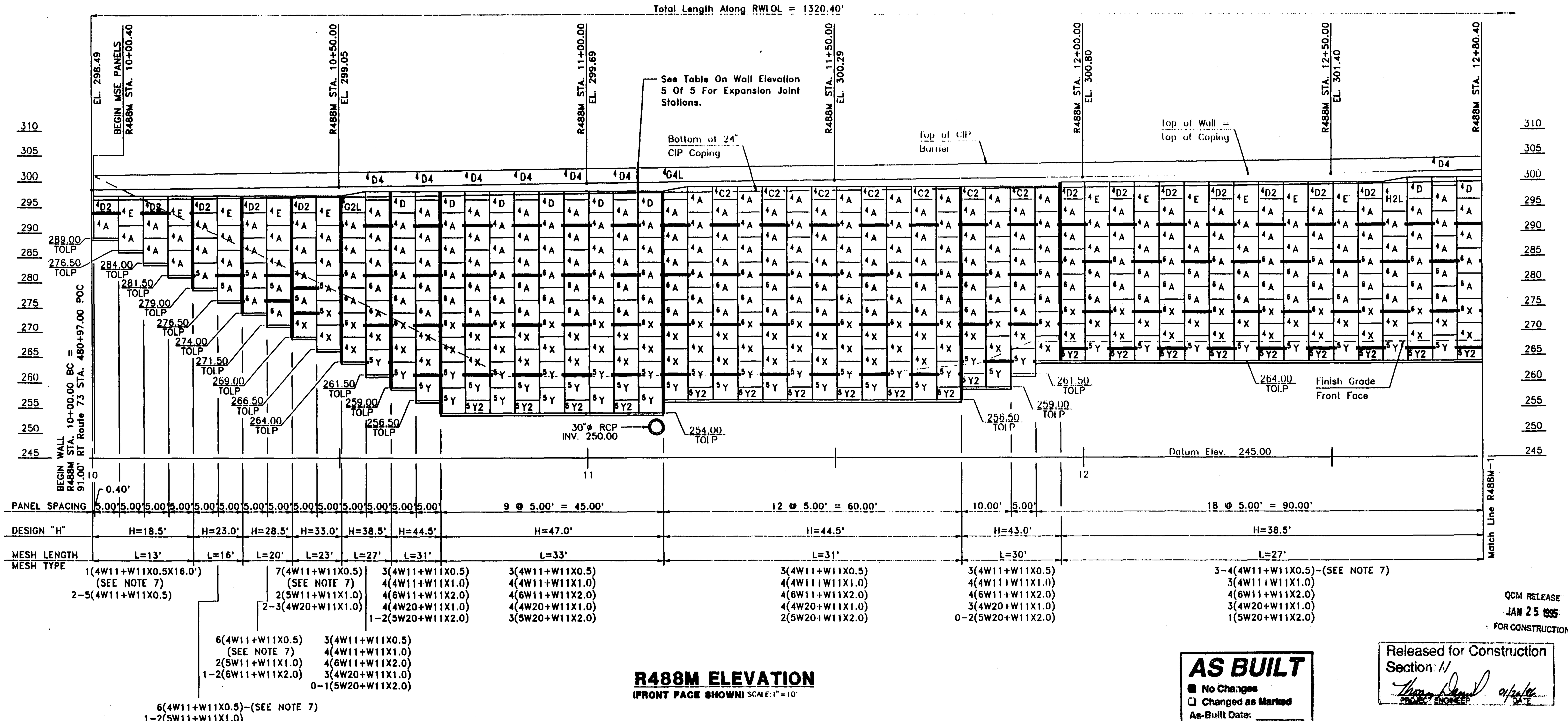
SOIL REINFORCEMENT NOTES:

1. Mesh Lengths Shown Above Mesh Length Line.
2. Heavy Horizontal Lines Separate Zones Of Different Mesh Types.
3. Heavy Vertical Lines Separate Zones Of Different Mesh Lengths / Design Heights.
4. Mesh Types Shown Below Mesh Length Line. (See STANDARD DETAIL SHEET For Mesh Key)
5. The Number Preceding The Mesh Type Indicates The No. Of Layers Of That Type Req'd.
6. Min. Length For Top Layer Of Mesh = 16 FT.
7. Type "D2" Panels Require 2 Layers Of Soil Reinforcement

GENERAL NOTES:

1. Elevations Shown Above Wall Are To Top Of Cast-In-Place Coping.
2. Elevations Shown Below Wall Are To Top Of Cast-In-Place Leveling Pad.
3. Panels Have Fractured Fin Finish.
4. Adjust Location Of Drainage Structures And Luminaires To ℄ Of Panel Joints. (See Drainage Inlet Detail Sheet For Details)
5. Panels To Accommodate Inspection Wires Are Designated With An "I" Subscript. (See Panel Finish Detail Sheet For Details)
6. See The SJHTC General Special Provisions For Earth Retaining Structures For Material And Construction Specifications.

PANEL "H"	MAXIMUM BEARING PRESSURE
10.0'	2050 psf.
22.5'	4000 psf.
27.5'	4675 psf.
37.5'	6150 psf.
40.0'	6625 psf.
42.5'	6950 psf.
45.0'	7300 psf.
47.5'	7650 psf.



R488M ELEVATION

(FRONT FACE SHOWN) SCALE: 1" = 10'

QCM RELEASE JAN 25 1995 FOR CONSTRUCTION

AS BUILT
- ■ No Changes
- ☐ Changed as Marked

As-Built Date: ______

Released for Construction Section: 11
PROJECT ENGINEER DATE 01/20/96

THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF RETAINED EARTH STRUCTURES ONLY.

DESIGN OVERSIGHT 9/20/94 SIGNOFF DATE

	BY		CHECKED	
DESIGN		J. S. TILMANT		M. MAGARELLI
DETAILS		J. S. TILMANT		M. MAGARELLI
QUANTITIES				

LOAD FACTOR DESIGN — LIVE LOADING: HS20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD

LAYOUT BY — CHECKED

SPECIFICATIONS BY — PLANS AND SPECS COMPARED

TRANSPORTATION CORRIDOR AGENCIES

GENE FOSTER TCA CORRIDOR MANAGER

BRIDGE NO. 55-813M

POST MILE 11.0

RETAINING WALL R488M R-109

WALL ELEVATION 1 OF 5

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 12332
EA 102540

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 5 OF 20

FILE ID: R488-1$$$$$$$$$$$$dgnspec$$$$$$$$$$$$$$$$$$
PLOT DATE: 8-30-94sytime$$$$$$ PEN TABLE: $$pentable$$

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	ORA	7.5	9.6-12.9/10.2-11.6		

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — DAVID T. SWANSON — No. 1883 — Exp. 12/31/96 — CIVIL — STATE OF CALIFORNIA

MACIAS A JOINT VENTURE — 1077 Dell Avenue, Campbell, California 95008, Telephone: (408) 866-5000

RETAINED EARTH™ WALLS

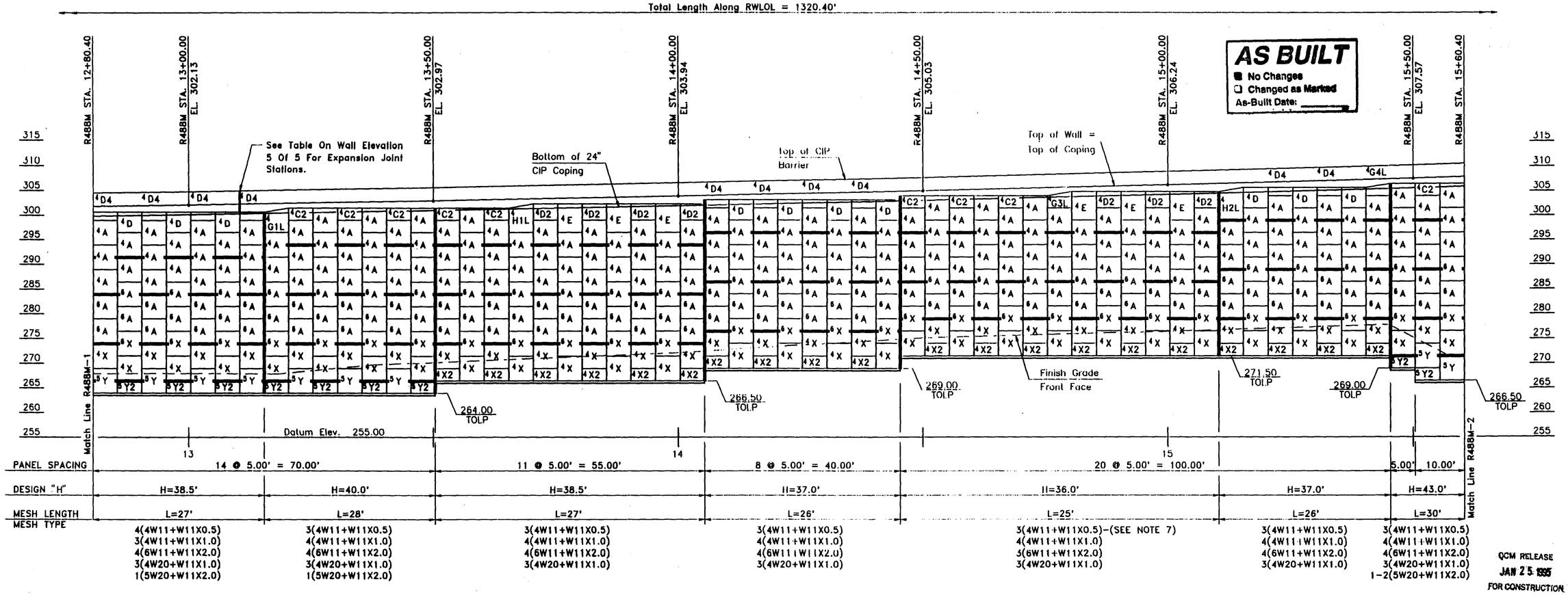
SOIL REINFORCEMENT NOTES:

1. Mesh Lengths Shown Above Mesh Length Line.
2. Heavy Horizontal Lines Separate Zones Of Different Mesh Types.
3. Heavy Vertical Lines Separate Zones Of Different Mesh Lengths / Design Heights.
4. Mesh Types Shown Below Mesh Length Line. (See STANDARD DETAIL SHEET For Mesh Key)
5. The Number Preceding The Mesh Type Indicates The No. Of Layers Of That Type Req'd.
6. Min. Length For Top Layer Of Mesh = 16 FT.
7. Type "D2" Panels Require 2 Layers Of Soil Reinforcement

GENERAL NOTES:

1. Elevations Shown Above Wall Are To Top Of Cast-in-Place Coping.
2. Elevations Shown Below Wall Are To Top Of Cast-in-Place Leveling Pad.
3. Panels Have Fractured Fin Finish.
4. Adjust Location Of Drainage Structures And Luminaires To ℄ Of Panel Joints. (See Drainage Inlet Detail Sheet For Details)
5. Panels To Accommodate Inspection Wires Are Designated With An "I" Subscript. (See Panel Finish Detail Sheet For Details)
6. See The SJHTC General Special Provisions For Earth Retaining Structures For Material And Construction Specifications.

Total Length Along RWLOL = 1320.40'



PANEL SPACING	14 @ 5.00' = 70.00'	11 @ 5.00' = 55.00'	8 @ 5.00' = 40.00'	20 @ 5.00' = 100.00'		5.00'	10.00'
DESIGN "H"	H=38.5'	H=40.0'	H=38.5'	H=37.0'	H=36.0'	H=37.0'	H=43.0'
MESH LENGTH	L=27'	L=28'	L=27'	L=26'	L=25'	L=26'	L=30'
MESH TYPE	4(4W11+W11X0.5) 3(4W11+W11X1.0) 4(6W11+W11X2.0) 3(4W20+W11X1.0) 1(5W20+W11X2.0)	3(4W11+W11X0.5) 4(4W11+W11X1.0) 4(6W11+W11X2.0) 3(4W20+W11X1.0) 1(5W20+W11X2.0)	3(4W11+W11X0.5) 4(4W11+W11X1.0) 4(6W11+W11X2.0) 3(4W20+W11X1.0)	3(4W11+W11X0.5) 4(4W11+W11X1.0) 4(6W11+W11X2.0) 3(4W20+W11X1.0)	3(4W11+W11X0.5)-(SEE NOTE 7) 4(4W11+W11X1.0) 5(6W11+W11X2.0) 3(4W20+W11X1.0)	3(4W11+W11X0.5) 4(4W11+W11X1.0) 4(6W11+W11X2.0) 3(4W20+W11X1.0)	3(4W11+W11X0.5) 4(4W11+W11X1.0) 4(6W11+W11X2.0) 3(4W20+W11X1.0) 1-2(5W20+W11X2.0)

QCM RELEASE JAN 25 1995 FOR CONSTRUCTION

Released for Construction
Section: 11
PROJECT ENGINEER 01/26/96 DATE

R488M ELEVATION

(FRONT FACE SHOWN) SCALE: 1" = 10'

PANEL "H"	MAXIMUM BEARING PRESSURE
37.5'	6150 psf.
40.0'	6625 psf.
42.5'	6950 psf.
45.0'	7300 psf.

THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF RETAINED EARTH STRUCTURES ONLY.

DESIGN OVERSIGHT 9/20/94 SIGNOFF DATE	DESIGN	BY J. S. TILMANT	CHECKED M. MAGARELLI	LOAD FACTOR DESIGN	LIVE LOADING: HS20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD		
	DETAILS	BY J. S. TILMANT	CHECKED M. MAGARELLI	LAYOUT	BY	CHECKED	
	QUANTITIES	BY	CHECKED	SPECIFICATIONS	BY	PLANS AND SPECS COMPARED	

TRANSPORTATION CORRIDOR AGENCIES

GENE FOSTER, TCA CORRIDOR MANAGER

BRIDGE NO. 55-813M

POST MILE 11.0

RETAINING WALL R488M R-110

WALL ELEVATION 2 OF 5

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 5

CU 12332
EA 102540

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 6 OF 20

FILE ID: R488-2$$$$$$$$$$$$dgnspec$$$$$$$$$$$$$$$$$$$$
PLOT DATE: 8-30-94 sylima$$$$$$ PEN TABLE: $$pentable$$

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	ORA	73	9.6-12.9/10.2-11.6		

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — DAVID T. SWANSON — No. 5183 — Exp. 12/31/96 — CIVIL — STATE OF CALIFORNIA

MACIAS — A JOINT VENTURE — 1077 Dell Avenue Campbell, California 95008 Telephone (408) 866-5000

RETAINED EARTH™ WALLS

AS BUILT
- ■ No Changes
- ☐ Changed as Marked

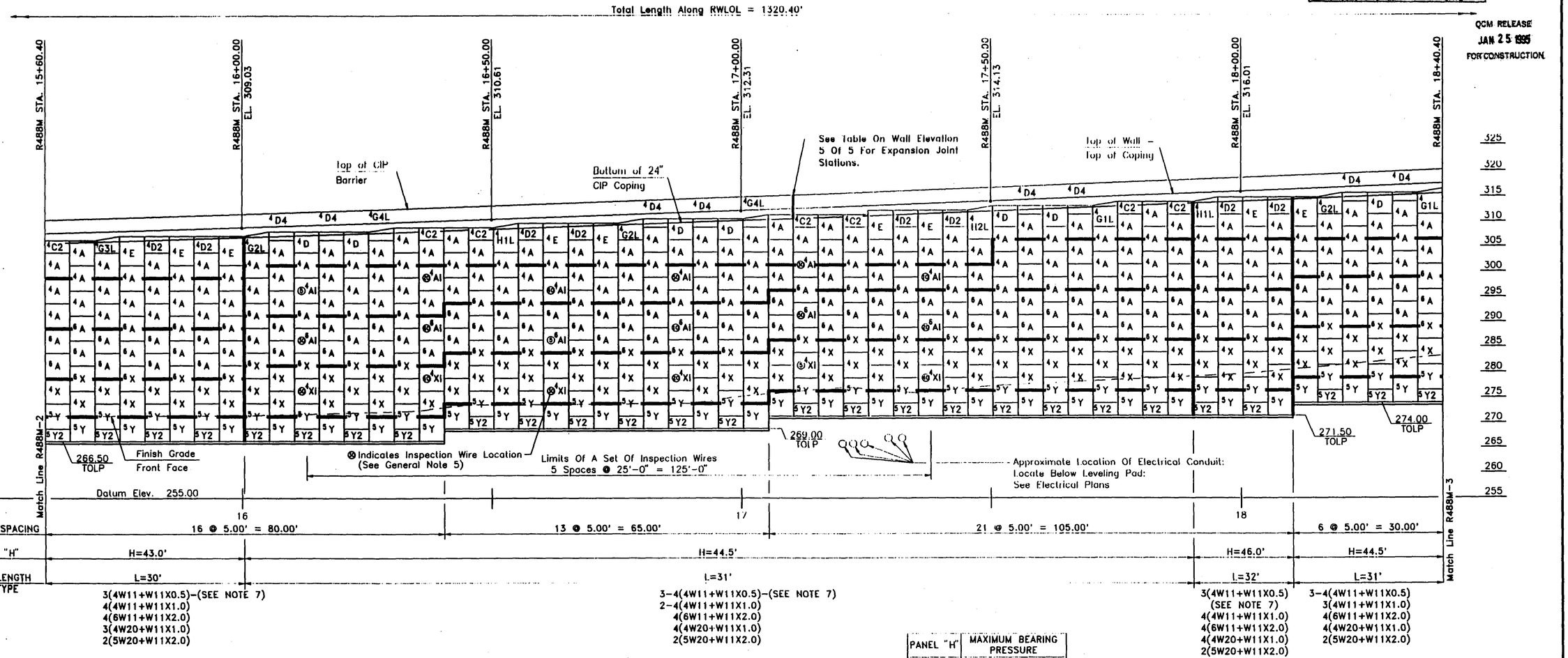
As-Built Date: _____

Released for Construction
Section: 11
PROJECT ENGINEER 01/26/96 DATE

QCM RELEASE
JAN 25 1995
FOR CONSTRUCTION

SOIL REINFORCEMENT NOTES:
1. Mesh Lengths Shown Above Mesh Length Line.
2. Heavy Horizontal Lines Separate Zones Of Different Mesh Types.
3. Heavy Vertical Lines Separate Zones Of Different Mesh Lengths / Design Heights.
4. Mesh Types Shown Below Mesh Length Line. (See STANDARD DETAIL SHEET For Mesh Key)
5. The Number Preceding The Mesh Type Indicates The No. Of Layers Of That Type Req'd.
6. Min. Length For Top Layer Of Mesh = 16 FT.
7. Type "D2" Panels Require 2 Layers Of Soil Reinforcement

GENERAL NOTES:
1. Elevations Shown Above Wall Are To Top Of Cast-In-Place Coping.
2. Elevations Shown Below Wall Are To Top Of Cast-In-Place Leveling Pad.
3. Panels Have Fractured Fin Finish.
4. Adjust Location Of Drainage Structures And Luminaires To ℄ Of Panel Joints. (See Drainage Inlet Detail Sheet For Details)
5. Panels To Accommodate Inspection Wires Are Designated With An "I" Subscript. (See Panel Finish Detail Sheet For Details)
6. See The SJHTC General Special Provisions For Earth Retaining Structures For Material And Construction Specifications.



PANEL SPACING	16 @ 5.00' = 80.00'	13 @ 5.00' = 65.00'	21 @ 5.00' = 105.00'	6 @ 5.00' = 30.00'
DESIGN "H"	H=43.0'	H=44.5'	H=46.0'	H=44.5'
MESH LENGTH	L=30'	L=31'	L=32'	L=31'
MESH TYPE	3(4W11+W11X0.5)-(SEE NOTE 7) 4(4W11+W11X1.0) 4(6W11+W11X2.0) 3(4W20+W11X1.0) 2(5W20+W11X2.0)	3-4(4W11+W11X0.5)-(SEE NOTE 7) 2-4(4W11+W11X1.0) 4(6W11+W11X2.0) 4(4W20+W11X1.0) 2(5W20+W11X2.0)	3(4W11+W11X0.5) (SEE NOTE 7) 4(4W11+W11X1.0) 4(6W11+W11X2.0) 4(4W20+W11X1.0) 2(5W20+W11X2.0)	3-4(4W11+W11X0.5) 3(4W11+W11X1.0) 4(6W11+W11X2.0) 4(4W20+W11X1.0) 2(5W20+W11X2.0)

PANEL "H"	MAXIMUM BEARING PRESSURE
37.5'	6150 psf.
40.0'	6625 psf.
42.5'	6950 psf.
45.0'	7300 psf.

R488M ELEVATION
(FRONT FACE SHOWN) SCALE:1"=10'

THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF RETAINED EARTH STRUCTURES ONLY.

L.H. Bourtous
DESIGN OVERSIGHT
SIGNOFF DATE 9/20/94

	BY	CHECKED
DESIGN	J. S. TILMANT	M. MAGARELLI
DETAILS	J. S. TILMANT	M. MAGARELLI
QUANTITIES		

LOAD FACTOR DESIGN — LIVE LOADING: HS20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD
LAYOUT — BY — CHECKED
SPECIFICATIONS — BY — PLANS AND SPECS COMPARED

TRANSPORTATION CORRIDOR AGENCIES

GENE FOSTER
TCA CORRIDOR MANAGER

BRIDGE NO. 55-873M
POST MILE 11.0

RETAINING WALL R488M R-111
WALL ELEVATION 3 OF 5

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 12332
EA 102540

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 7 OF 20

FILE ID: R488-3$$$$$$$$$$$$$$dgnspec$$$$$$$$$$$$$$$$$$$$
PLOT DATE: 8-30-94eytime$$$$$$$ PEN TABLE: $$pentable$$

SOIL REINFORCEMENT NOTES:

1. Mesh Lengths Shown Above Mesh Length Line.
2. Heavy Horizontal Lines Separate Zones Of Different Mesh Types.
3. Heavy Vertical Lines Separate Zones Of Different Mesh Lengths / Design Heights.
4. Mesh Types Shown Below Mesh Length Line. (See STANDARD DETAIL SHEET For Mesh Key)
5. The Number Preceding The Mesh Type Indicates The No. Of Layers Of That Type Req'd.
6. Min. Length For Top Layer Of Mesh = 16 FT.
7. Type "D2" Panels Require 2 Layers Of Soil Reinforcement

GENERAL NOTES:

1. Elevations Shown Above Wall Are To Top Of Cast-in-Place Coping.
2. Elevations Shown Below Wall Are To Top Of Cast-in-Place Leveling Pad.
3. Panels Have Fractured Fin Finish.
4. Adjust Location Of Drainage Structures And Luminaires To ℄ Of Panel Joints. (See Drainage Inlet Detail Sheet For Details)
5. Panels To Accommodate Inspection Wires Are Designated With An "I" Subscript. (See Panel Finish Detail Sheet For Details)
6. See The SJHTC General Special Provisions For Earth Retaining Structures For Material And Construction Specifications.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	ORA	73	9.6-12.9/10.2-11.6		

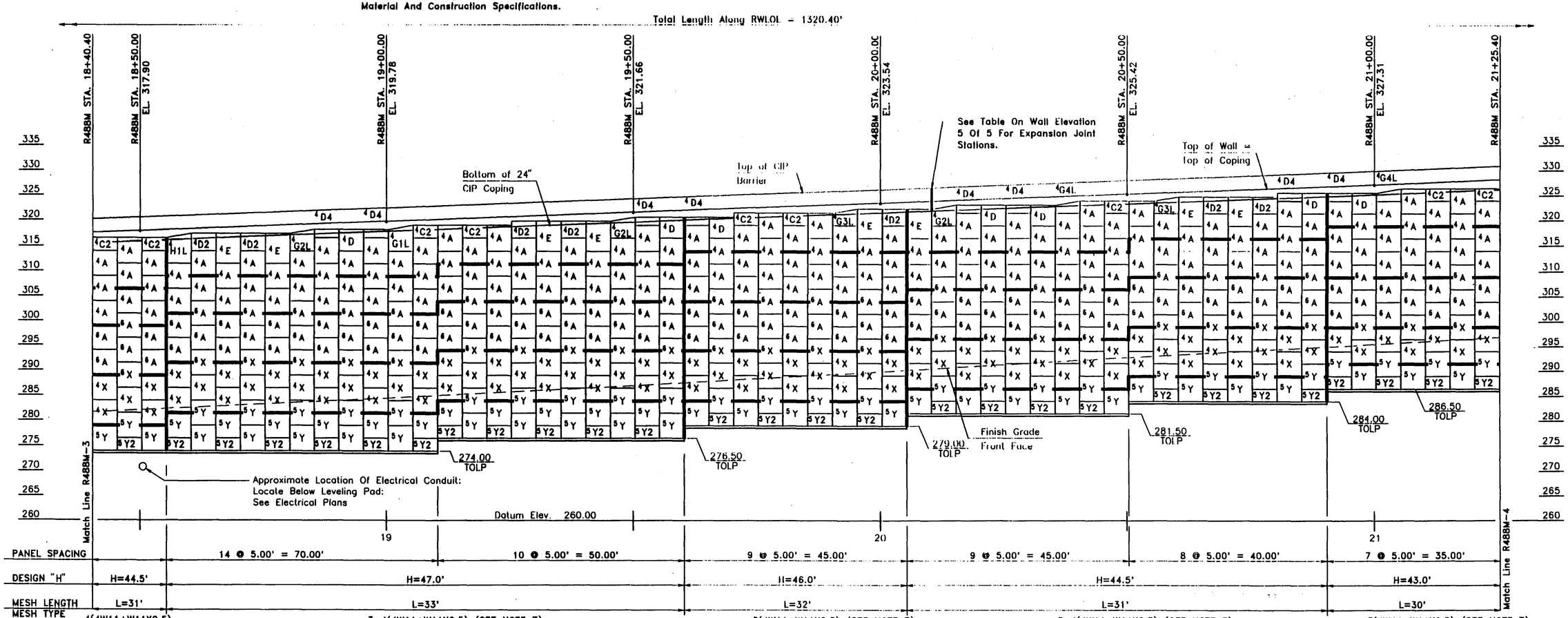
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — DAVID T. SWANSON — No. — Exp. 12/31/96 — CIVIL — STATE OF CALIFORNIA

MACIAS — A JOINT VENTURE — 1077 Dell Avenue, Campbell, California 95008, Telephone: (408) 866-5000

RETAINED EARTH® WALLS



PANEL SPACING	14 @ 5.00' = 70.00'	10 @ 5.00' = 50.00'	9 @ 5.00' = 45.00'	9 @ 5.00' = 45.00'	8 @ 5.00' = 40.00'	7 @ 5.00' = 35.00'
DESIGN "H"	H=44.5'	H=47.0'	H=46.0'	H=44.5'		H=43.0'
MESH LENGTH	L=31'	L=33'	L=32'	L=31'		L=30'
MESH TYPE	4(4W11+W11X0.5) 3(4W11+W11X1.0) 4(6W11+W11X2.0) 4(4W20+W11X1.0) 2(5W20+W11X2.0)	3-4(4W11+W11X0.5)-(SEE NOTE 7) 3(4W11+W11X1.0) 4(6W11+W11X2.0) 4(4W20+W11X1.0) 3(5W20+W11X2.0)	3(4W11+W11X0.5)-(SEE NOTE 7) 4(4W11+W11X1.0) 4(6W11+W11X2.0) 4(4W20+W11X1.0) 2(5W20+W11X2.0)	3-4(4W11+W11X0.5)-(SEE NOTE 7) 3(4W11+W11X1.0) 4(6W11+W11X2.0) 4(4W20+W11X1.0) 2(5W20+W11X2.0)		3(4W11+W11X0.5)-(SEE NOTE 7) 4(4W11+W11X1.0) 4(6W11+W11X2.0) 3(4W20+W11X1.0) 2(5W20+W11X2.0)

AS BUILT
■ No Changes
❑ Changed as Marked
As-Built Date: _____

PANEL "H"	MAXIMUM BEARING PRESSURE
37.5'	6150 psf.
40.0'	6625 psf.
42.5'	6950 psf.
45.0'	7300 psf.

QCM RELEASE JAN 25 1995 FOR CONSTRUCTION

Released for Construction
Section: 11
PROJECT ENGINEER 01/26/96 DATE

THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF RETAINED EARTH STRUCTURES ONLY.

R488M ELEVATION

(FRONT FACE SHOWN) SCALE: 1" = 10'

DESIGN OVERSIGHT 01/20/04 SIGNOFF DATE	DESIGN	BY J. S. TILMANT	CHECKED M. MAGARELLI	LOAD FACTOR DESIGN	LIVE LOADING: HS20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD		
	DETAILS	BY J. S. TILMANT	CHECKED M. MAGARELLI	LAYOUT	BY	CHECKED	
	QUANTITIES	BY	CHECKED	SPECIFICATIONS	BY	PLANS AND SPECS COMPARED	

TRANSPORTATION CORRIDOR AGENCIES

GENE FOSTER
TCA CORRIDOR MANAGER

BRIDGE NO. 55-813M
POST MILE 11.0

RETAINING WALL R488M R-112

WALL ELEVATION 4 OF 5

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 12332
EA 102540

DISREGARD PRINTS BEARING EARLIER REVISION DATES ---►

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 8 OF 20

FILE ID: R488-4$$$$$$$$$$$$$$dgnspec$$$$$$$$$$$$$$$$$$$$
PLOT DATE: 8-20-96$$ytime$$$$$$ PEN TABLE: $$pentable$$

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	ORA	73	9.6-12.9/10.2-11.6		

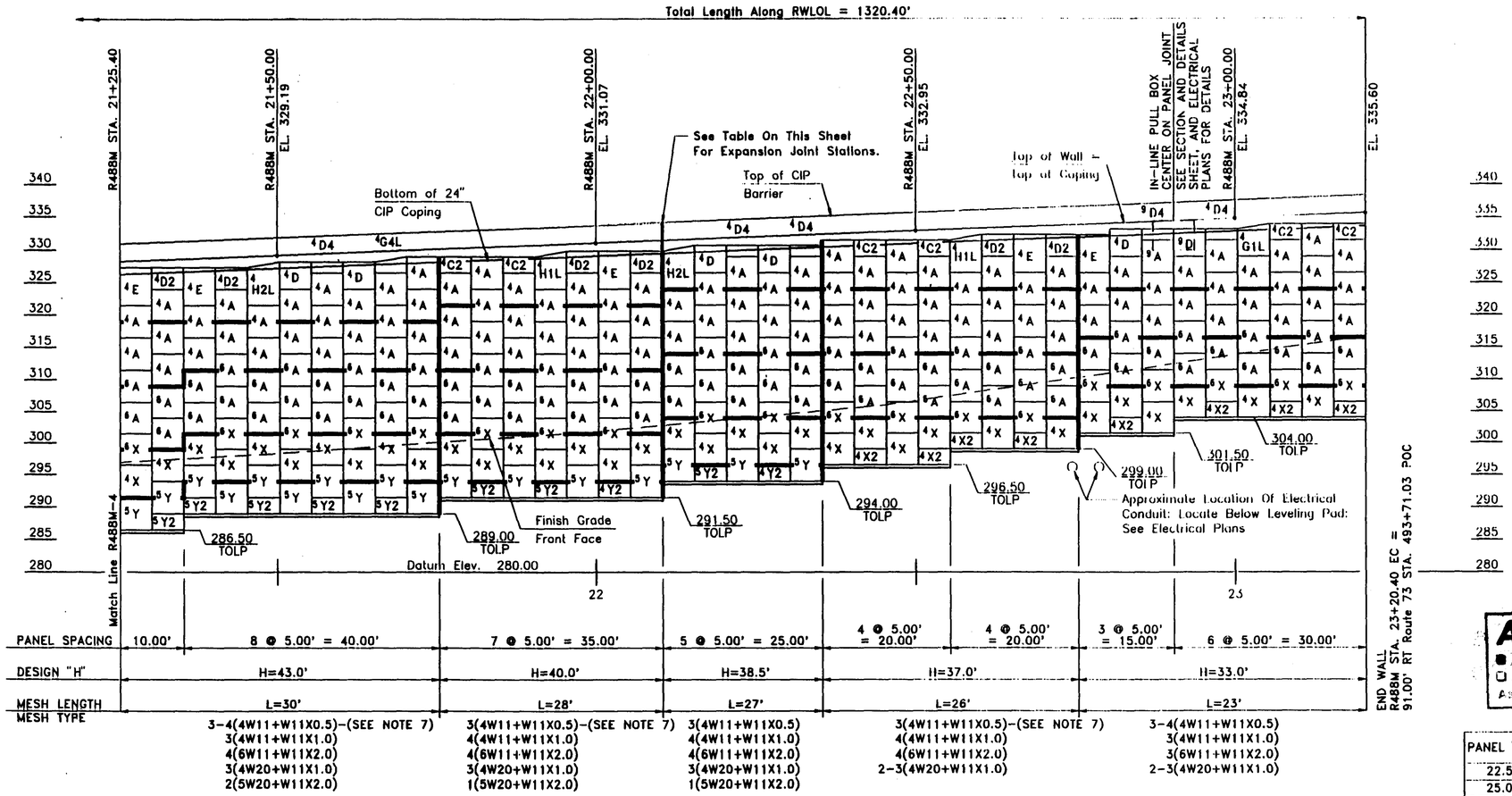
REGISTERED CIVIL ENGINEER

REGISTERED PROFESSIONAL ENGINEER — DAVID T. SHANNON — No. 1183 — Exp. 12/31/96 — CIVIL — STATE OF CALIFORNIA

PLANS APPROVAL DATE

MACIAS A JOINT VENTURE — 1077 Dell Avenue, Campbell, California 95008, Telephone: (408) 866-5000

RETAINED EARTH™ WALLS



R488M ELEVATION

FRONT FACE SHOWN SCALE: 1" = 10'

SOIL REINFORCEMENT NOTES:

1. Mesh Lengths Shown Above Mesh Length Line.
2. Heavy Horizontal Lines Separate Zones Of Different Mesh Types.
3. Heavy Vertical Lines Separate Zones Of Different Mesh Lengths / Design Heights.
4. Mesh Types Shown Below Mesh Length Line. (See STANDARD DETAIL SHEET For Mesh Key)
5. The Number Preceding The Mesh Type Indicates The No. Of Layers Of That Type Req'd.
6. Min. Length For Top Layer Of Mesh = 16 FT.
7. Type "D2" Panels Require 2 Layers Of Soil Reinforcement

GENERAL NOTES:

1. Elevations Shown Above Wall Are To Top Of Cast-in-Place Coping.
2. Elevations Shown Below Wall Are To Top Of Cast-in-Place Leveling Pad.
3. Panels Have Fractured Fin Finish.
4. Adjust Location Of Drainage Structures And Luminaires To ℄ Of Panel Joints. (See Drainage Inlet Detail Sheet For Details)
5. Panels To Accommodate Inspection Wires Are Designated With An "I" Subscript. (See Panel Finish Detail Sheet For Details)
6. See The SJHTC General Special Provisions For Earth Retaining Structures For Material And Construction Specifications.

EXPANSION JOINT STATIONS
STA. 11+10.40
STA. 12+10.40
STA. 13+10.40
STA. 14+10.40
STA. 15+10.40
STA. 16+10.40
STA. 17+10.40
STA. 18+10.40
STA. 19+10.40
STA. 20+10.40
STA. 21+10.40
STA. 22+10.40

CONTRACTOR MAY ADJUST JOINT STATIONING WHILE KEEPING 90' MIN. AND 135' MAX. SPACING.

AS BUILT
■ No Changes
□ Changes As Marked
As-Built Date: _____

QCM RELEASE
JAN 25 1995
FOR CONSTRUCTION

PANEL "H"	MAXIMUM BEARING PRESSURE
22.5'	4000 psf.
25.0'	4350 psf.
27.5'	4675 psf.
30.0'	5150 psf.
32.5'	5475 psf.
35.0'	5825 psf.

Released for Construction
Section: 1/
PROJECT ENGINEER — 01/26/95 DATE

THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF RETAINED EARTH STRUCTURES ONLY.

DESIGN OVERSIGHT 9/20/94 SIGNOFF DATE

	BY	CHECKED
DESIGN	J. S. TILMANT	M. MAGARELLI
DETAILS	J. S. TILMANT	M. MAGARELLI
QUANTITIES		

LOAD FACTOR DESIGN — LIVE LOADING: HS20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD
LAYOUT — CHECKED
SPECIFICATIONS — PLANS AND BASIS COMPARED

TRANSPORTATION CORRIDOR AGENCIES

GENE FOSTER
TCA CORRIDOR MANAGER

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 12332
EA 102540

BRIDGE NO. 55-813M
POST MILE 11.10

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

RETAINING WALL R488M R-113
WALL ELEVATION 5 OF 5

SHEET 9 OF 20

FILE ID: R488-5$$$$$$$$$$$$$dgnspec$$$$$$$$$$$$$$$$$$$
PLOT DATE: 8-30-94sylime$$$$$$ PEN TABLE: $$pentable$$

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	ORA	73	9.6-12.9/10.2-11.6		

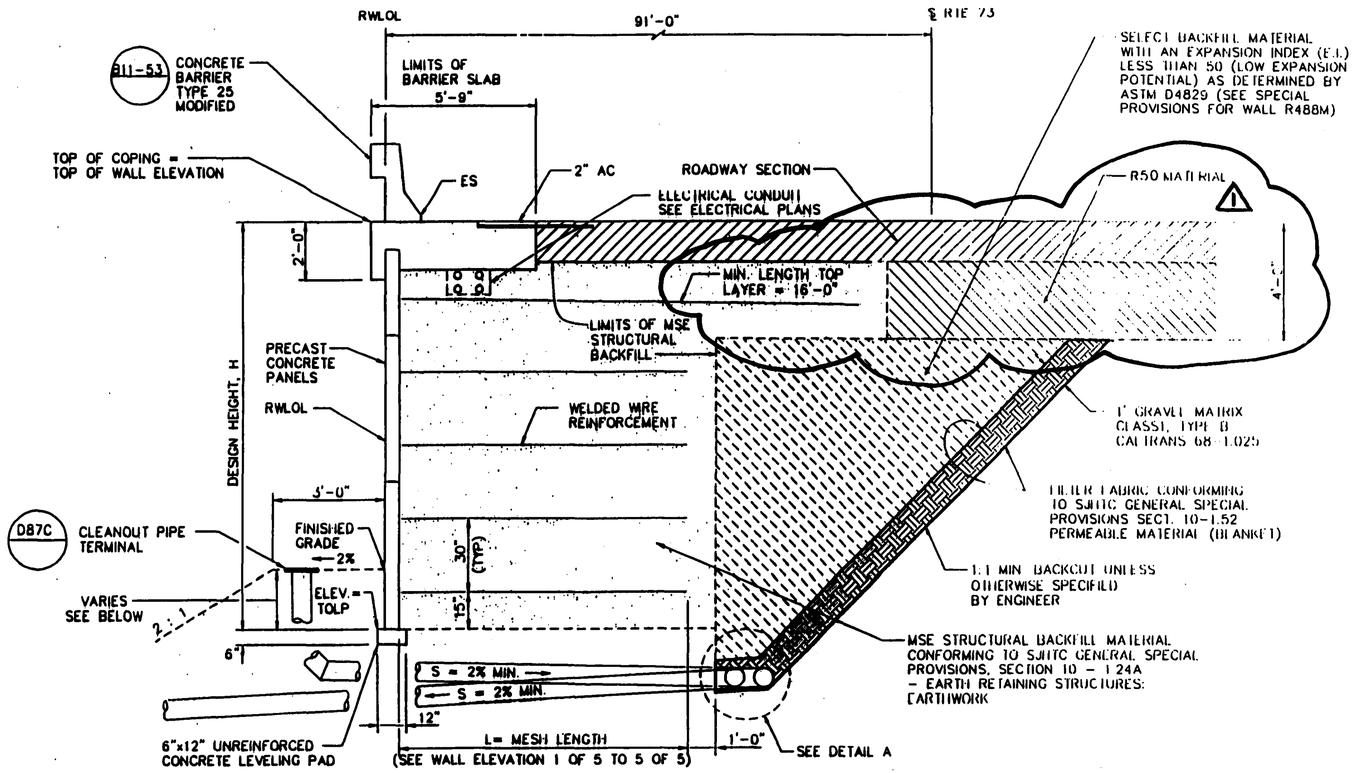
REGISTERED CIVIL ENGINEER

REGISTERED PROFESSIONAL ENGINEER — DAVID T. SWANSON — No. 1083 — Exp. 12/31/96 — CIVIL — STATE OF CALIFORNIA

PLANS APPROVAL DATE

MACIAS A JOINT VENTURE 1077 Oak Avenue Campbell, California 95008 Telephone: (408) 866-5000

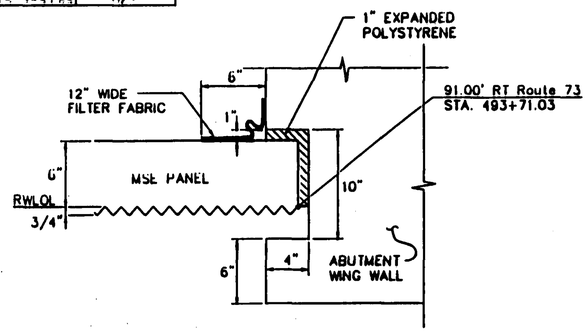
RETAINED EARTH™ WALLS



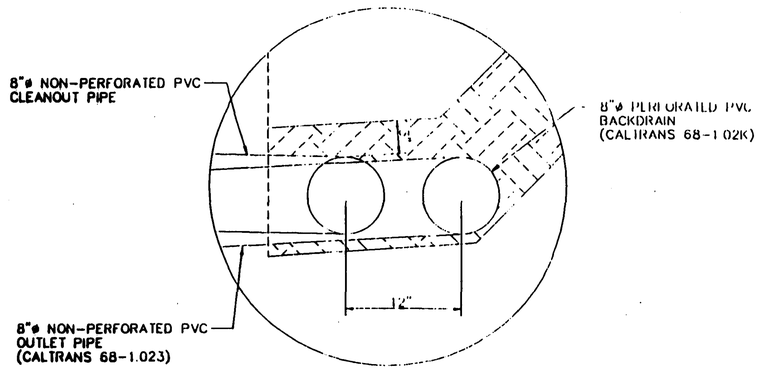
TYPICAL SECTION

SCALE: N.T.S.

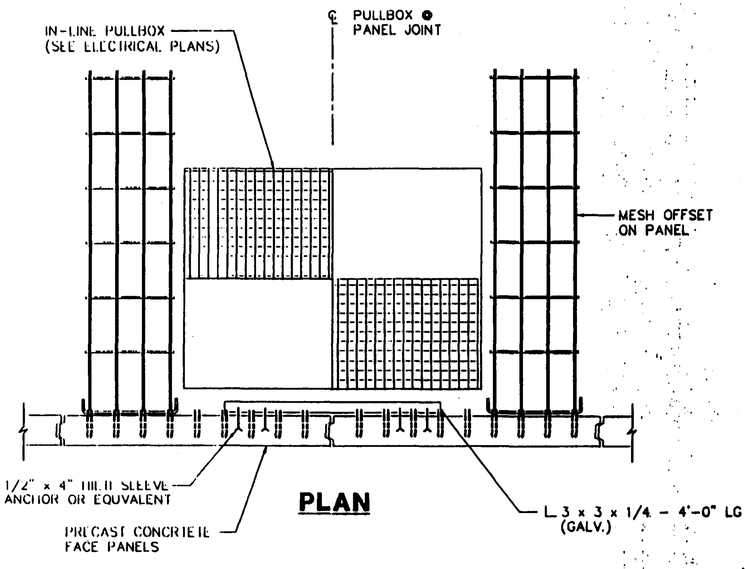
ROUTE 73 STATION	MINIMUM EMBEDMENT
480+97 TO 482+00	H/7
482+00 TO 488+50	H/10
488+50 TO 493+69	H/7



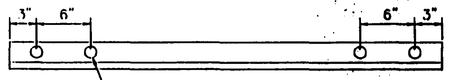
BRIDGE No. 55-873M ABUTMENT JOINT DETAIL



DETAIL A



PLAN



NOTE: 1 REQ'D AT EACH LAYER OF MESH OFFSET DUE TO PULLBOX

DETAIL AT IN-LINE PULLBOX

AS BUILT
- ■ No Changes
- ❑ Changed as Marked
- As-Built Date: _____

QCM RELEASE JAN 25 1995 FOR CONSTRUCTION

REVISION NO	DESCRIPTION	ISSUE DATE
1	MODIFIED BACKFILL LIMITS	12/21/94
	ORIGINAL ISSUE	9/20/94

RELEASED FOR CONSTRUCTION Section 1.1

Thomas Daniel 12/21/94
PROJECT ENGINEER DATE

THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF RETAINED EARTH STRUCTURES ONLY.

H.H. Poynter
CALTRANS DESIGN ENGINEER
9/20/94
SIGNOFF DATE

	BY	CHECKED
DESIGN	J. S. TILMANT	M. MAGARELLI
DETAILS	J. S. TILMANT	M. MAGARELLI
QUANTITIES		

TRANSPORTATION CORRIDOR AGENCIES

GENE FOSTER TCA CORRIDOR MANAGER

BRIDGE NO. 55-873M
POST MILE 11.0

RETAINING WALL R488M
SECTIONS AND DETAILS R-114

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

CU 12 2

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 10 OF 20

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	ORA	73	9.6-12.9/10.2-11.6		

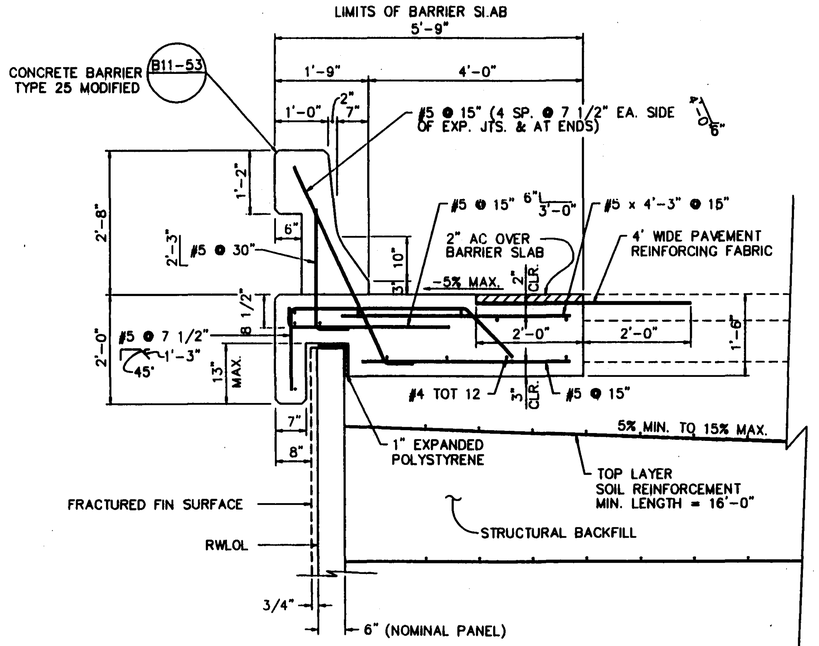
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

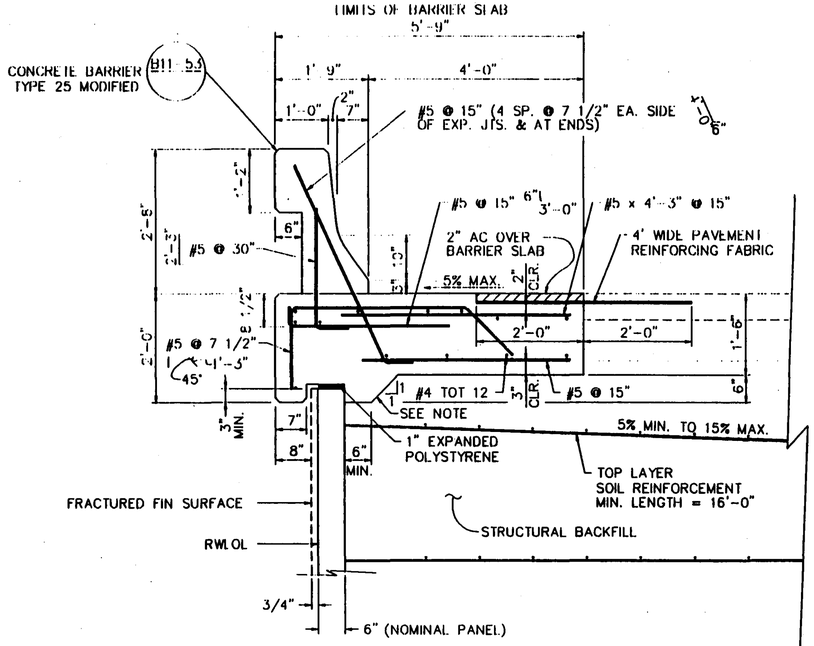
REGISTERED PROFESSIONAL ENGINEER — DAVID T. GIBANSON — No. 1183 — Exp. 12/31/96 — CIVIL — STATE OF CALIFORNIA

MACIAS A JOINT VENTURE 1077 Dell Avenue Campbell, California 95008 Telephone: (408) 866-5000

RETAINED EARTH™ WALLS



A CAST IN PLACE BARRIER MAXIMUM PANEL EMBEDMENT
SCALE: 3/4" = 1'



NOTE: PROVIDE HAUNCH @ LOCATIONS WHERE WHERE PANEL IS NOT EMBEDDED A MINIMUM OF 3" INTO THE 18" MOMENT SLAB

B CAST IN PLACE BARRIER MINIMUM PANEL EMBEDMENT
SCALE: 3/4" = 1'

AS BUILT
- No Changes
- Changed as Marked

As-Built Date: _____

QCM RELEASE
JAN 25 1995
FOR CONSTRUCTION

Released for Construction
Section: N
PROJECT ENGINEER 01/24/95 DATE

NOTES:

NOT ALL TRAFFIC BARRIER REINFORCEMENT SHOWN.

PROVIDE 1/2" EXPANSION JOINT IN BARRIER/BARRIER SLAB AT 90' MIN. TO 135' MAX. SPACING.

THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF RETAINED EARTH STRUCTURES ONLY.

CALTRANS DESIGN OVERSIGHT
SIGNOFF DATE 9/20/94

	BY	CHECKED
DESIGN	J. S. TILMANT	M. MAGARELLI
DETAILS	J. S. TILMANT	M. MAGARELLI
QUANTITIES		

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

TRANSPORTATION CORRIDOR AGENCIES

GENE FOSTER
TCA CORRIDOR MANAGER

CU 12332
EA 102540

BRIDGE NO. 55-813M
POST MILE 11.0

RETAINING WALL R488M

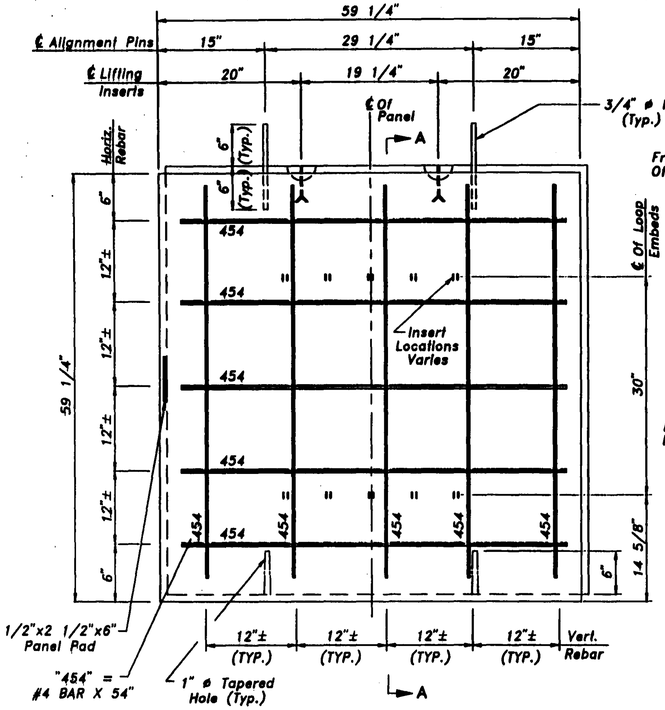
TOP OF WALL DETAILS R-115

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

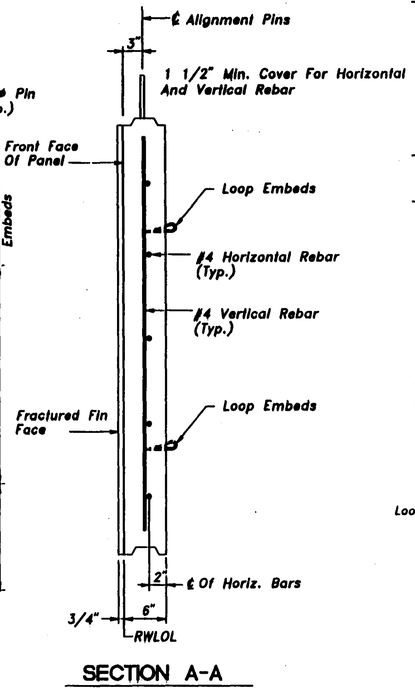
SHEET 11 OF 20

FILE ID: R488-7$$$$$$$$$$$$$$dgnspec$$$$$$$$$$$$$$$$$$$$
PLOT DATE: 8-26-94$yltime$$$$$$ PEN TABLE: $$pentable$$



STANDARD "5A" PANEL

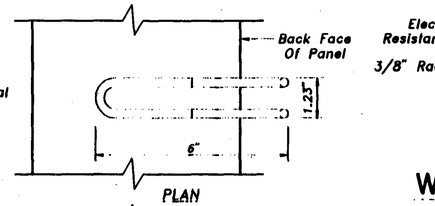
Back Face View



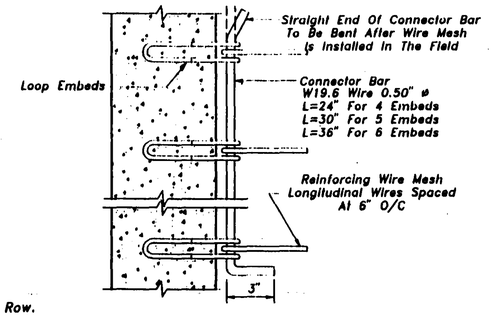
SECTION A-A

NOTE :

Minimum Panel Connectors Is 4 Loop Embeds Per Row. The Number Of Loop Embeds Per Row May Increase As Required By The Design Condition. These Panels Will Be Designated By The Number Of Loop Embeds Per Row Preceeding The Panel Type.

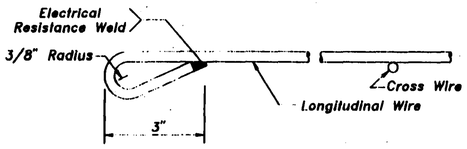


LOOP EMBED DETAIL

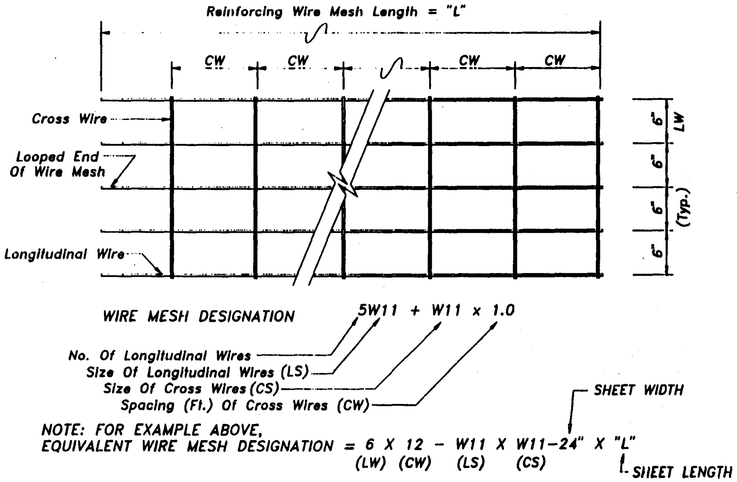


PLAN VIEW

REINFORCING MESH CONNECTION DETAIL



WIRE MESH LOOP DETAIL



NOTE: FOR EXAMPLE ABOVE,
EQUIVALENT WIRE MESH DESIGNATION = 6 X 12 – W11 X W11–24" X "L"
(LW) (CW) (LS) (CS)

REINFORCING MESH DETAIL

Soil Reinforcement Key

Mesh Types Are Designated Below Mesh Length Line. Heavy Horizontal Lines On Wall Elev. Separate Zones Of Different Mesh Types. (See Reinforcing Mesh Detail For Mesh Type Details).

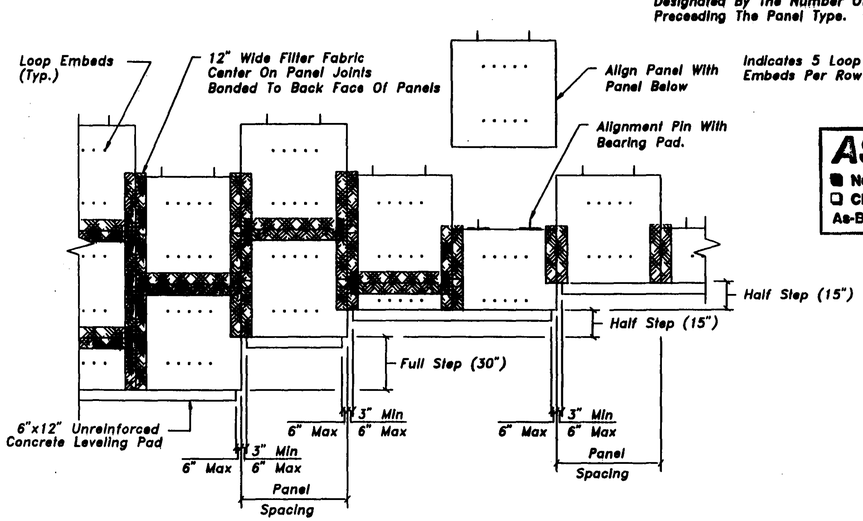
Example:

5A	5C2	5W11+W11X1.0' (2 LAYERS)
5A		
4A	4B2	4W11+W11X1.0' (2 LAYERS)

MESH LENGTH L=12'

MESH TYPE (2) 5W11+W11X1.0' (2) 4W11+W11X1.0'

Contact VSL Corp. For Questions Concerning Placement Of Soil Reinforcement.



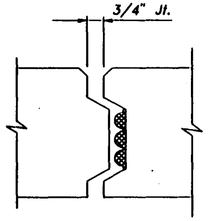
FILTER FABRIC DETAIL AND PANEL PLACEMENT

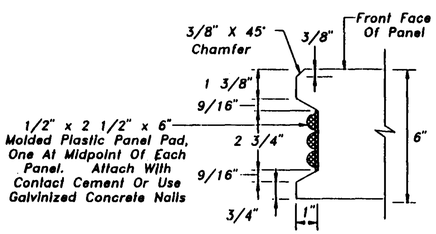
Back Face View

AS BUILT
- No Changes
- Changed as Marked

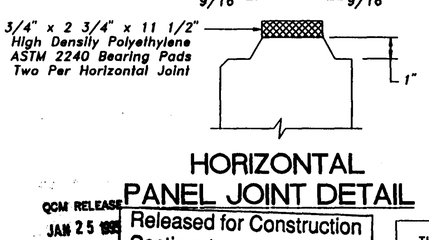
As-Built Date: _____

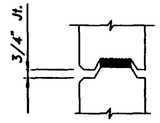
5A = Indicates 5 Loop Embeds Per Row; Panel Type

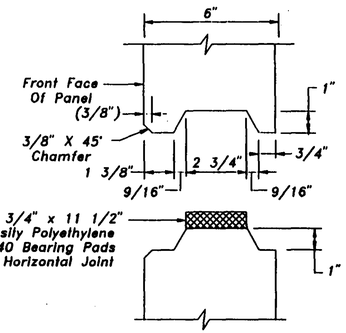




VERTICAL PANEL JOINT DETAIL







HORIZONTAL PANEL JOINT DETAIL

NOTES :

1. *Panel Reinforcement Bars Shall Be Deformed Billet–Steel Bars For Concrete Reinforcement Conforming To The Specifications Of ASTM Designation A615, Grade 60, Including Supplementary Requirement S1 Or Low Alloy Steel Deformed Bars Conforming To The Specifications Of ASTM Designation A706.*
2. *W11 And W20 Steel Wire Shall Conform To The ASTM Designation A82. The Welded Wire Mat, Loop Embed, And Mesh Loop Shall Be Welded In Accordance With ASTM Designation A185.*
3. *Alignment Pins Shall Be 3/4"ø Rigid PVC.*
4. *Reinforcing Mesh, Loop Embeds Connector Bars, And Alignment Pins Shall Be Galvanized In Accordance With ASTM Designation A123.*
5. *Concrete Panels To Have 28 Day Compressive Strength of 4000 PSI.*

QCM RELEASE
JAN 25 19[illegible]
FOR CONSTRUCTION

Released for Construction
Section: //
Thomas Daniel 01/26/96
BRIDGE ENGINEER DATE

THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF RETAINED EARTH STRUCTURES ONLY.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	ORA	73	9.6-12.9/10.2-11.6		

REGISTERED CIVIL ENGINEER

REGISTERED PROFESSIONAL ENGINEER — DAVID T. SHANNON — No. 1383 — Exp. 12/31/96 — CIVIL — STATE OF CALIFORNIA

PLANS APPROVAL DATE

MACIAS A JOINT VENTURE — 1077 Dell Avenue Campbell, California 95008 Telephone: (408) 864-5000

RETAINED EARTH™ WALLS

CALTRANS DESIGN OVERSIGHT — SIGNOFF DATE 01/20/96

	BY		CHECKED	
DESIGN	BY	J. S. TILMANT	CHECKED	M. MAGARELLI
DETAILS	BY	J. S. TILMANT	CHECKED	M. MAGARELLI
QUANTITIES	BY		CHECKED	

TRANSPORTATION CORRIDOR AGENCIES

GENE FOSTER
TCA CORRIDOR MANAGER

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 12332
EA 102540

BRIDGE NO. 55-813M
POST MILE 11.10

RETAINING WALL R488M
STANDARD DETAIL SHEET R-116

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 12 OF 20

FILE ID: R488-0$$$$$$$$$$$$$$donspec$$$$$$$$$$$$$$$$$$
PLOT DATE: 8-2-94aytime$$$$$$ PEN TABLE: $$pentable$$

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	ORA	73	9.6-12.9/10.2-11.6		

REGISTERED CIVIL ENGINEER

REGISTERED PROFESSIONAL ENGINEER — DAVID T. SHANNON — No. 1183 — Exp. 12/31/96 — CIVIL — STATE OF CALIFORNIA

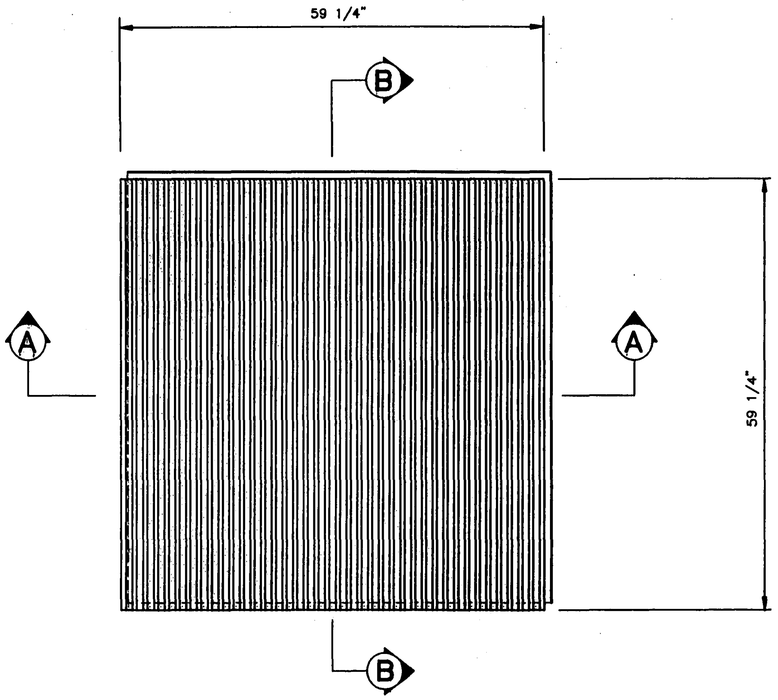
PLANS APPROVAL DATE

MACIAS A JOINT VENTURE — 1077 Dell Avenue, Campbell, California 95008, Telephone: (408) 866-5000

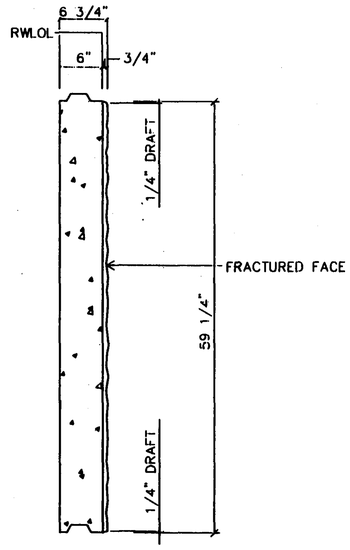
RETAINED EARTH™ WALLS

AS BUILT
- ■ No Changes
- ❑ Changed as Marked

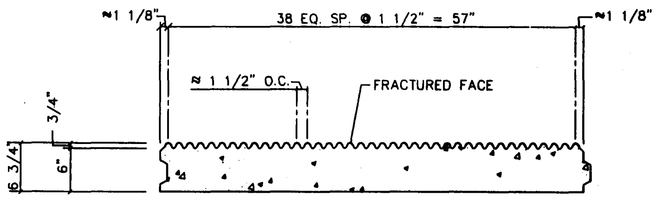
As-Built Date: _____



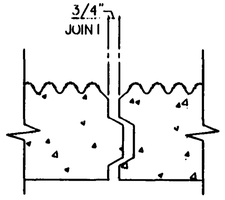
ARCHITECTURAL PANEL DETAIL
(FRONT FACE SHOWN)
SCALE: 1"=1'-0"



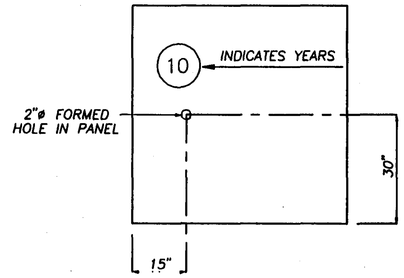
SECTION B-B
SCALE: 1"=1'-0"

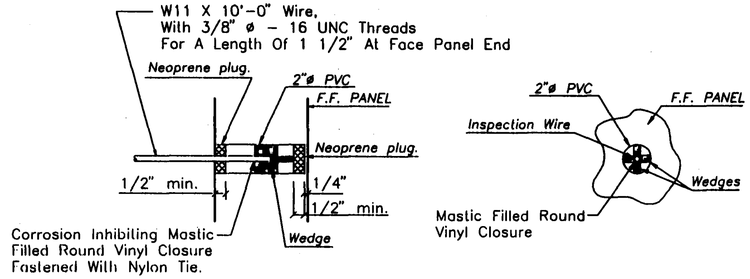


SECTION A-A
SCALE: 1"=1'-0"



JOINT DETAIL
SCALE: 1/2"=1'-0"





INSPECTION WIRE DETAIL

QCM RELEASE
JAN 25 1995
FOR CONSTRUCTION

Released for Construction
Section: //
PROJECT ENGINEER 01/26/96 DATE

THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF RETAINED EARTH STRUCTURES ONLY.

CALTRANS DESIGN OVERSIGHT 01/20/94
SIGNOFF DATE

	BY		CHECKED	
DESIGN	BY	J. S. TILMANT	CHECKED	M. MAGARELLI
DETAILS	BY	J. S. TILMANT	CHECKED	M. MAGARELLI
QUANTITIES	BY		CHECKED	

TRANSPORTATION CORRIDOR AGENCIES

GENE FOSTER
TCA CORRIDOR MANAGER

BRIDGE NO. 55-813M
POST MILE 11.0

RETAINING WALL R488M
PANEL FINISH DETAIL R-117

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 12332
EA 102540

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 13 OF 20

FILE ID: R488-10$$$$$$$$$$$$$$dgnspec$$$$$$$$$$$$$$$$
PLOT DATE: 8-2-94eylima$$$$$$$ PEN TABLE: $$pentable$$

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	ORA	73	9.6-12.9/10.2-11.6		

REGISTERED CIVIL ENGINEER

REGISTERED PROFESSIONAL ENGINEER — DAVID T. SWANSON — No. 11813 — Exp. 12/31/96 — CIVIL — STATE OF CALIFORNIA

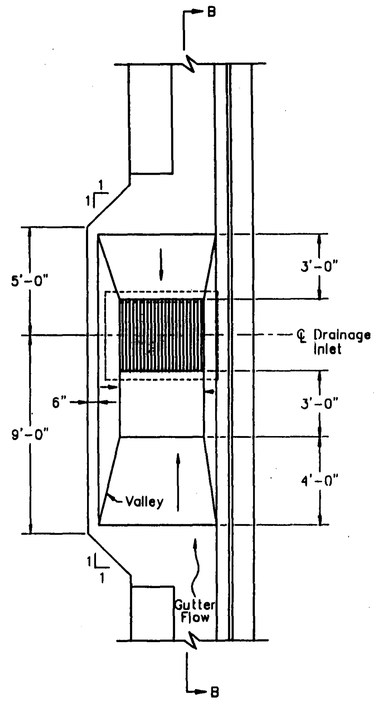
PLANS APPROVAL DATE

MACIAS A JOINT VENTURE — 1077 Dell Avenue, Campbell, California 95008, Telephone: (408) 866-5000

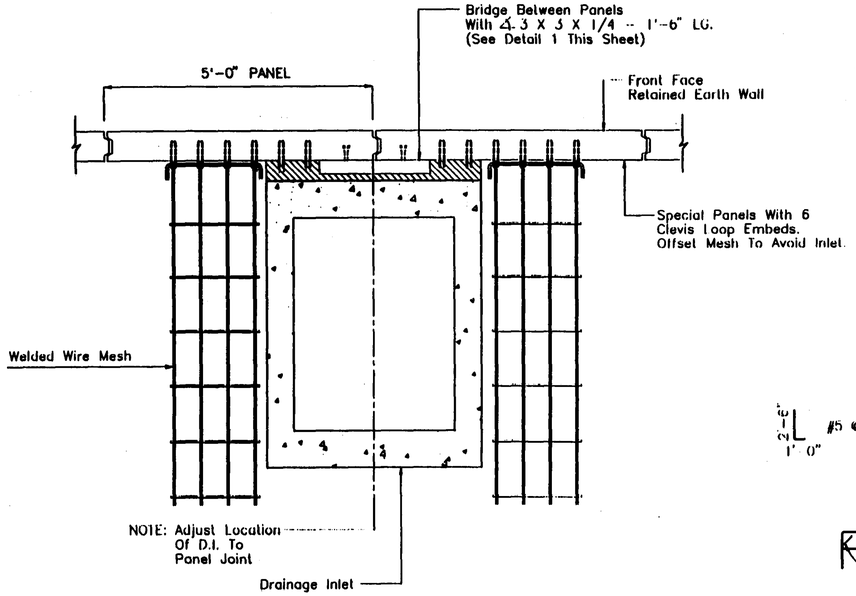
RETAINED EARTH™ WALLS

AS BUILT
- No Change
- Changed as Marked

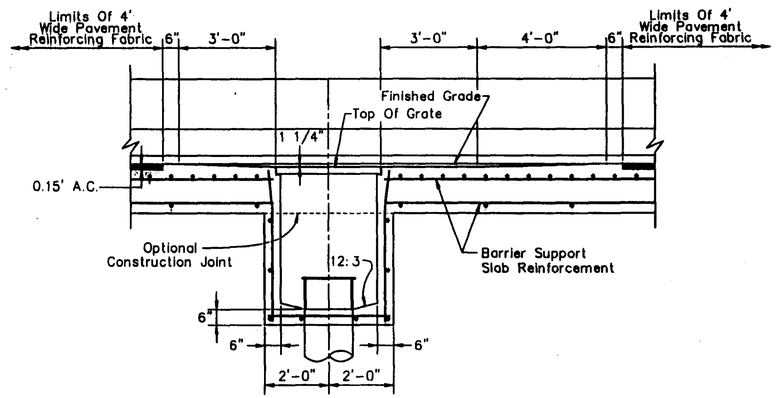
As-Built Date: _____



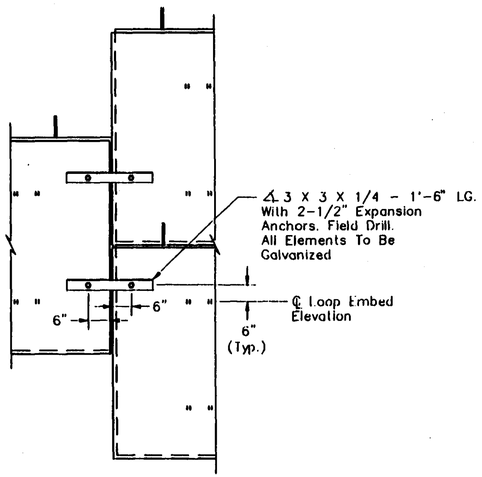
PLAN



SECTION A-A

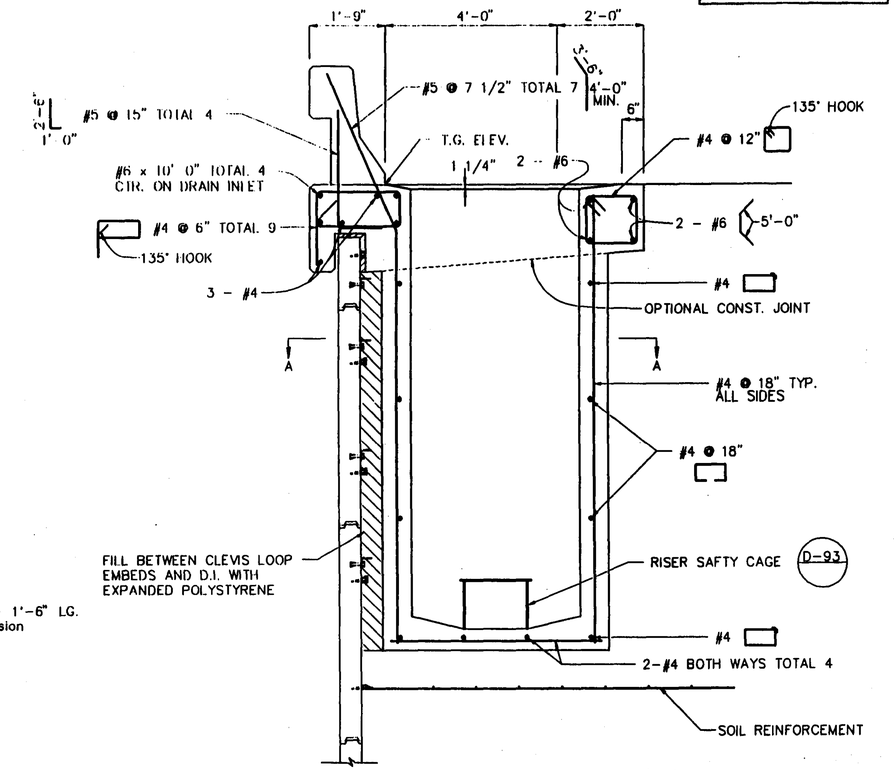


SECTION B-B



DETAIL 1

N.T.S.



TYPICAL SECTION OF DRAINAGE INLET BEHIND WALL

QEM RELEASE
JAN 25 1996
FOR CONSTRUCTION

Released for Construction
Section: 11
PROJECT ENGINEER 01/24/96 DATE

THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF RETAINED EARTH STRUCTURES ONLY.

H.H. Bowles
CALTRANS DESIGN OVERSIGHT
SIGNOFF DATE 9/20/94

DESIGN	BY J. S. TILMANT	CHECKED	M. MAGARELLI
DETAILS	BY J. S. TILMANT	CHECKED	M. MAGARELLI
QUANTITIES	BY	CHECKED	

TRANSPORTATION CORRIDOR AGENCIES

GENE FOSTER
TCA CORRIDOR MANAGER

BRIDGE NO. 55-813M
POST MILE 11.10

RETAINING WALL R488M
PANEL FINISH DETAIL R-118

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 12332
EA 102540

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 14 OF 20

FILE ID: R488-8$$$$$$$$$$$$$$dgnspec$$$$$$$$$$$$$$$$
PLOT DATE: 8-26-94dytime$$$$$$$ PEN TABLE: $$pentable$$

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	ORA	73	9.6-12.9/10.2-11.6		

REGISTERED CIVIL ENGINEER

REGISTERED PROFESSIONAL ENGINEER — DAVID T. SWANSON — No. 1883 — Exp. 12/31/96 — CIVIL — STATE OF CALIFORNIA

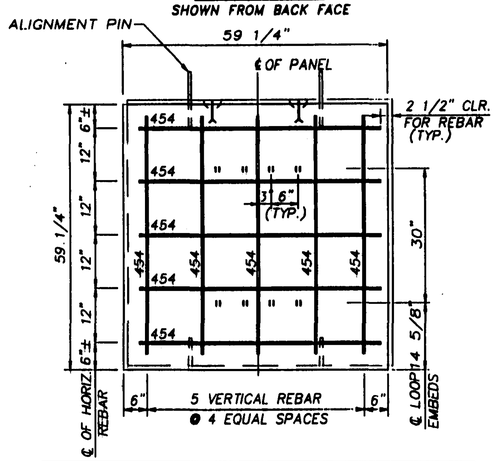
PLANS APPROVAL DATE

MACIAS A JOINT VENTURE 1077 Dell Avenue Campbell, California 95008 Telephone: (408) 866-5000

RETAINED EARTH" WALLS

TYPE-4A

SHOWN FROM BACK FACE

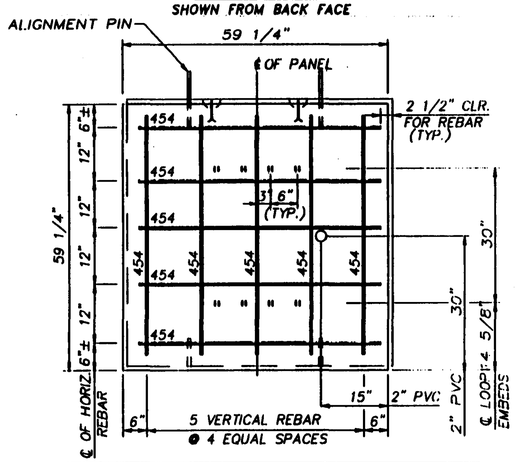


Qt.	Item	Description
5	Vertical Bar	#4 Bar - 54" Long
5	Horizontal Bar	#4 Bar - 54" Long
8	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke
2	Alignment Pin	3/4"ø 12" Long Rigid PVC

Note:
Type 5A Similar With 5 Loop Embeds Per Row.
Type 6A Similar With 6 Loop Embeds Per Row.

TYPE-4Ai

SHOWN FROM BACK FACE

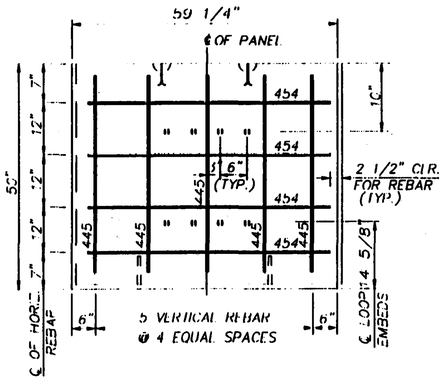


Qt.	Item	Description
5	Vertical Bar	#4 Bar - 54" Long
5	Horizontal Bar	#4 Bar - 54" Long
8	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke
2	Alignment Pin	3/4"ø 12" Long Rigid PVC
1	Insp. Wire Sleeve	2"ø x 6" Long Rigid PVC

Note:
Type 6Ai Similar With 6 Loop Embeds Per Row.

TYPE-4D

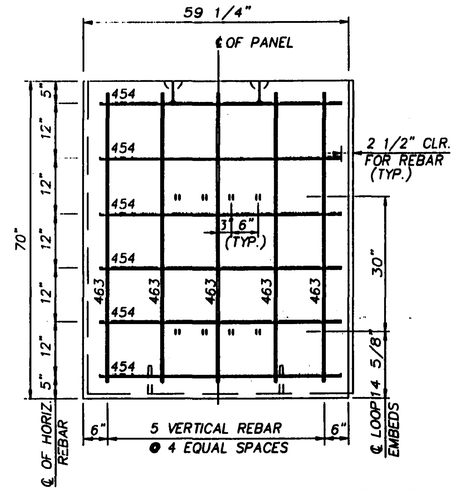
SHOWN FROM BACK FACE



Qt.	Item	Description
5	Vertical Bar	#4 Bar - 45" Long
4	Horizontal Bar	#4 Bar - 54" Long
8	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke

TYPE-4E

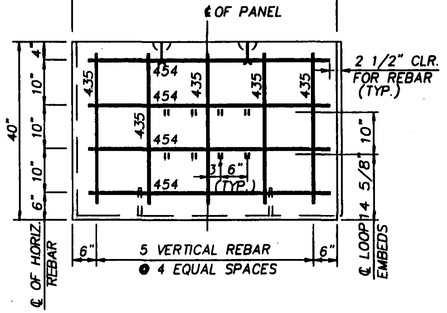
SHOWN FROM BACK FACE



Qt.	Item	Description
5	Vertical Bar	#4 Bar - 63" Long
6	Horizontal Bar	#4 Bar - 54" Long
8	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke

TYPE-4D2

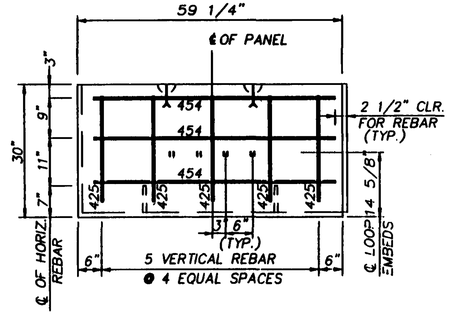
SHOWN FROM BACK FACE



Qt.	Item	Description
5	Vertical Bar	#4 Bar - 35" Long
3	Horizontal Bar	#4 Bar - 54" Long
8	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke

TYPE-4C2

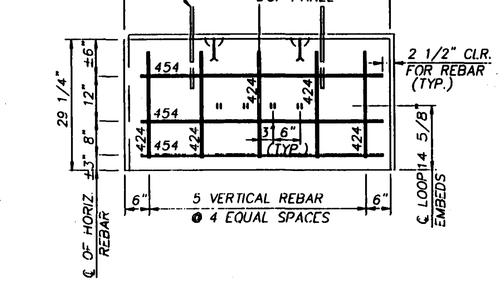
SHOWN FROM BACK FACE



Qt.	Item	Description
5	Vertical Bar	#4 Bar - 25" Long
3	Horizontal Bar	#4 Bar - 54" Long
4	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke

TYPE-4B2

SHOWN FROM BACK FACE



Qt.	Item	Description
5	Vertical Bar	#4 Bar - 24" Long
3	Horizontal Bar	#4 Bar - 54" Long
4	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke
2	Alignment Pin	3/4"ø 12" Long Rigid PVC

AS BUILT
- ■ No Changes
- ❑ Changed as Marked

As-Built Date: _____

QCM RELEASE
JAN 25 1995
FOR CONSTRUCTION

Released for Construction
Section: //
PROJECT ENGINEER 01/26/95 DATE

THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF RETAINED EARTH STRUCTURES ONLY.

CALTRANS DESIGN OVERSIGHT
SIGNOFF DATE 01/20/94

	BY		CHECKED
DESIGN	J. S. TILMANT		M. MAGARELLI
DETAILS	J. S. TILMANT		M. MAGARELLI
QUANTITIES			

TRANSPORTATION CORRIDOR AGENCIES

GENE FOSTER
TCA CORRIDOR MANAGER

CU 12332
EA 102540

BRIDGE NO. 55-813M
POST MILE 11.0

RETAINING WALL R488M R-119

PANEL REBAR DETAIL 1 OF 3

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 15 OF 20

FILE ID: R488P-1$$$$$$$$$$dgnspec$$$$$$$$$$$$$$$$$$
PLOT DATE: 8-2-94$ytime$$$$$$ PEN TABLE: $$pentable$$

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	ORA	73	9.6-12.9/10.2-11.6		

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

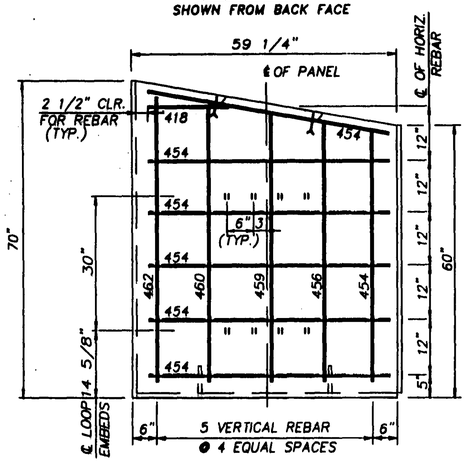
REGISTERED PROFESSIONAL ENGINEER — DAVID T. SWANSON — No. 1183 — Exp. 12/31/96 — CIVIL — STATE OF CALIFORNIA

MACIAS A JOINT VENTURE 1077 Dell Avenue Campbell, California 95008 Telephone: (408) 866-5000

RETAINED EARTH™ WALLS

TYPE-4H1L

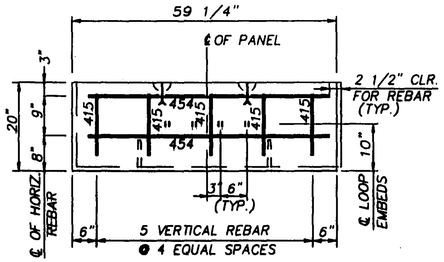
SHOWN FROM BACK FACE



Qt.	Item	Description
1	Vertical Bar	#4 Bar - 54" Long
1	Vertical Bar	#4 Bar - 56" Long
1	Vertical Bar	#4 Bar - 59" Long
1	Vertical Bar	#4 Bar - 60" Long
1	Vertical Bar	#4 Bar - 62" Long
1	Horizontal Bar	#4 Bar - 18" Long
6	Horizontal Bar	#4 Bar - 54" Long
8	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke

TYPE-4D4

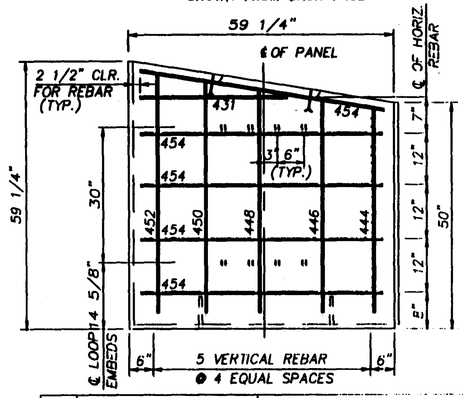
SHOWN FROM BACK FACE



Qt.	Item	Description
5	Vertical Bar	#4 Bar - 15" Long
2	Horizontal Bar	#4 Bar - 54" Long
5	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke

TYPE-4G1L

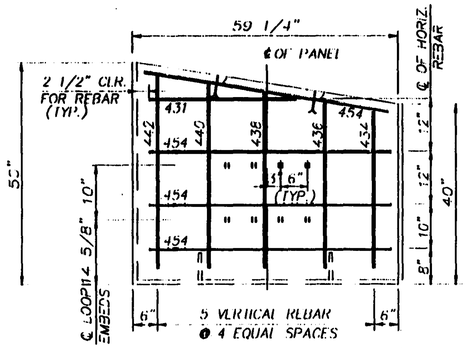
SHOWN FROM BACK FACE



Qt.	Item	Description
1	Vertical Bar	#4 Bar - 44" Long
1	Vertical Bar	#4 Bar - 46" Long
1	Vertical Bar	#4 Bar - 48" Long
1	Vertical Bar	#4 Bar - 50" Long
1	Vertical Bar	#4 Bar - 52" Long
1	Horizontal Bar	#4 Bar - 31" Long
5	Horizontal Bar	#4 Bar - 54" Long
8	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke

TYPE-4G2L

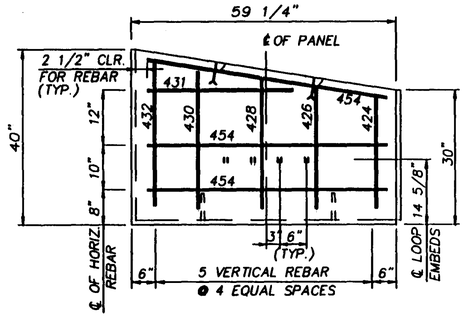
SHOWN FROM BACK FACE



Qt.	Item	Description
1	Vertical Bar	#4 Bar - 34" Long
1	Vertical Bar	#4 Bar - 36" Long
1	Vertical Bar	#4 Bar - 38" Long
1	Vertical Bar	#4 Bar - 40" Long
1	Vertical Bar	#4 Bar - 42" Long
1	Horizontal Bar	#4 Bar - 31" Long
4	Horizontal Bar	#4 Bar - 54" Long
8	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke

TYPE-4G3L

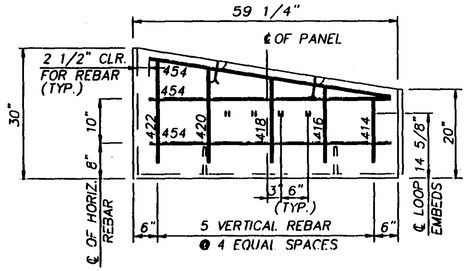
SHOWN FROM BACK FACE



Qt.	Item	Description
1	Vertical Bar	#4 Bar - 24" Long
1	Vertical Bar	#4 Bar - 26" Long
1	Vertical Bar	#4 Bar - 28" Long
1	Vertical Bar	#4 Bar - 30" Long
1	Vertical Bar	#4 Bar - 32" Long
1	Horizontal Bar	#4 Bar - 31" Long
3	Horizontal Bar	#4 Bar - 54" Long
4	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke

TYPE-4G4L

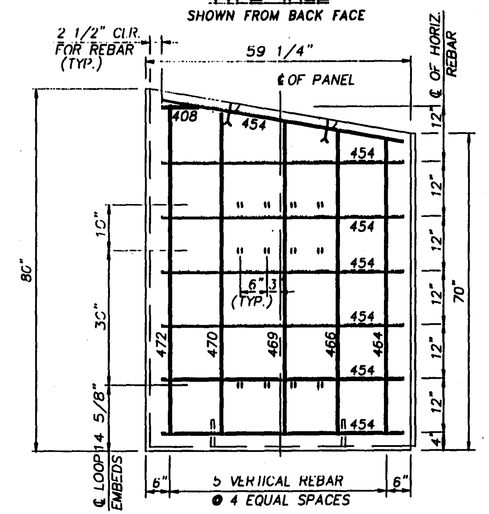
SHOWN FROM BACK FACE



Qt.	Item	Description
1	Vertical Bar	#4 Bar - 14" Long
1	Vertical Bar	#4 Bar - 16" Long
1	Vertical Bar	#4 Bar - 18" Long
1	Vertical Bar	#4 Bar - 20" Long
1	Vertical Bar	#4 Bar - 22" Long
3	Horizontal Bar	#4 Bar - 54" Long
4	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke

TYPE-4H2L

SHOWN FROM BACK FACE



Qt.	Item	Description
1	Vertical Bar	#4 Bar - 64" Long
1	Vertical Bar	#4 Bar - 66" Long
1	Vertical Bar	#4 Bar - 69" Long
1	Vertical Bar	#4 Bar - 70" Long
1	Vertical Bar	#4 Bar - 72" Long
1	Horizontal Bar	#4 Bar - 08" Long
7	Horizontal Bar	#4 Bar - 54" Long
12	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke

AS BUILT

■ No Changes
❑ Changed as Marked
As-Built Date: _____

QCM RELEASE
JAN 25 1996
FOR CONSTRUCTION

Released for Construction
Section: //
PROJECT ENGINEER DATE

THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF RETAINED EARTH STRUCTURES ONLY.

CALTRANS DESIGN OVERSIGHT
SIGNOFF DATE 9/20/96

DESIGN	BY J. S. TILMANT	CHECKED M. MAGARELLI		
DETAILS	BY J. S. TILMANT	CHECKED M. MAGARELLI		
QUANTITIES	BY	CHECKED		

TRANSPORTATION CORRIDOR AGENCIES

GENE FOSTER
TCA CORRIDOR MANAGER

BRIDGE NO.	RETAINING WALL R488M R-120
55-873M	
POST MILE 11.10	PANEL REBAR DETAIL 2 OF 3

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 12332
EA 102540

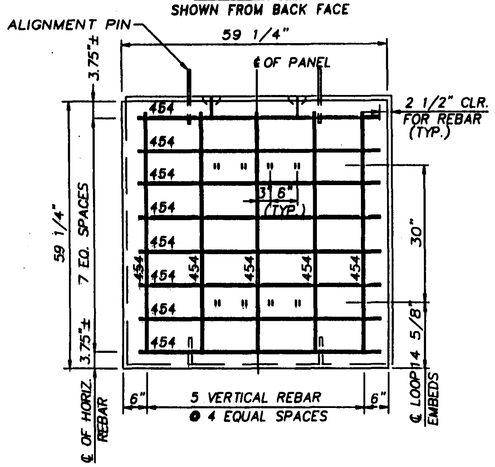
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 16 OF 20

FILE ID: R488P-2$$$$$$$$$$dgnspec$$$$$$$$$$$$$$$$$$
PLOT DATE: 8-2-96 sylim$$$$$$$ PEN TABLE: $$pentable$$

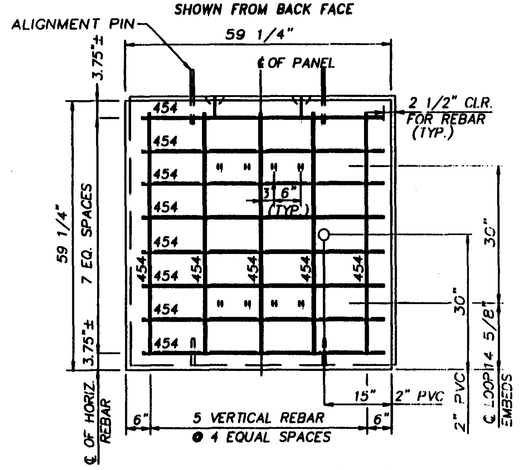
TYPE-4X
SHOWN FROM BACK FACE



Qt.	Item	Description
5	Vertical Bar	#4 Bar – 54" Long
8	Horizontal Bar	#4 Bar – 54" Long
8	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke
2	Alignment Pin	3/4"ø 12" Long Rigid PVC

Note:
Type 5X Similar With 5 Loop Embeds Per Row.
Type 6X Similar With 6 Loop Embeds Per Row.

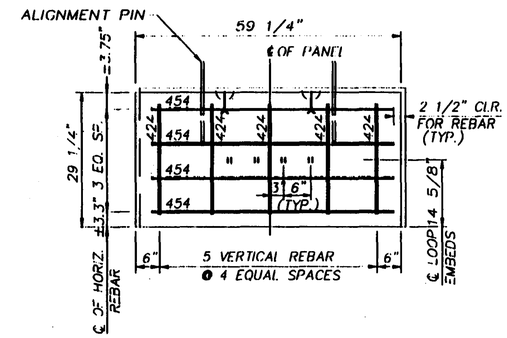
TYPE-4Xi
SHOWN FROM BACK FACE



Qt.	Item	Description
5	Vertical Bar	#4 Bar – 54" Long
8	Horizontal Bar	#4 Bar – 54" Long
8	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke
2	Alignment Pin	3/4"ø 12" Long Rigid PVC
1	Insp. Wire Sleeve	2"ø x 6" Long Rigid PVC

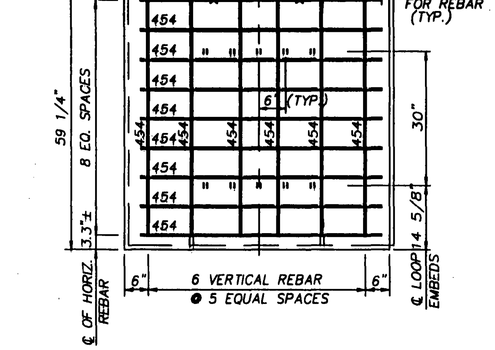
Note:
Type 5Xi Similar With 5 Loop Embeds Per Row.

TYPE-4X2
SHOWN FROM BACK FACE



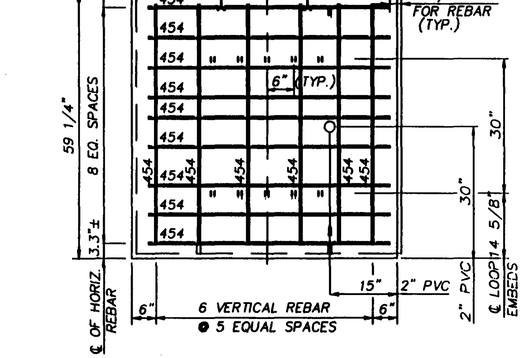
Qt.	Item	Description
5	Vertical Bar	#4 Bar – 24" Long
4	Horizontal Bar	#4 Bar – 54" Long
4	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke
2	Alignment Pin	3/4"ø 12" Long Rigid PVC

TYPE-5Y
SHOWN FROM BACK FACE



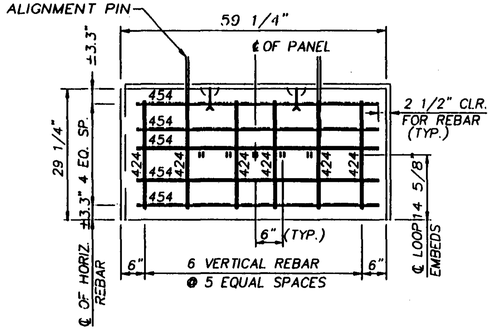
Qt.	Item	Description
6	Vertical Bar	#4 Bar – 54" Long
9	Horizontal Bar	#4 Bar – 54" Long
10	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke
2	Alignment Pin	3/4"ø 12" Long Rigid PVC

TYPE-5Yi
SHOWN FROM BACK FACE



Qt.	Item	Description
6	Vertical Bar	#4 Bar – 54" Long
9	Horizontal Bar	#4 Bar – 54" Long
10	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke
2	Alignment Pin	3/4"ø 12" Long Rigid PVC
1	Insp. Wire Sleeve	2"ø x 6" Long Rigid PVC

TYPE-5Y2
SHOWN FROM BACK FACE



Qt.	Item	Description
6	Vertical Bar	#4 Bar – 24" Long
5	Horizontal Bar	#4 Bar – 54" Long
5	Loop Embeds	0.375" ø
2	Lifting Insert	1 Ton Burke
2	Alignment Pin	3/4"ø 12" Long Rigid PVC

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	ORA	73	9.6-12.9/10.2-11.6		

REGISTERED CIVIL ENGINEER

REGISTERED PROFESSIONAL ENGINEER — DAVID T. SWANSON — No. 1693 — Exp. 12/31/96 — CIVIL — STATE OF CALIFORNIA

PLANS APPROVAL DATE

MACIAS A JOINT VENTURE — 1077 Dell Avenue Campbell, California 95008 Telephone: (408) 866-5000

RETAINED EARTH™ WALLS

AS BUILT
- ■ No Changes
- ❑ Changed as Marked

As-Built Date: _____

NOTES :

1. All Panel Reinforcing Steel To Be #4 Bars Grade 60, Unless Otherwise Noted.
2. All Dimensions Shown Are To Front Face Of Panel, Unless Otherwise Noted.
3. Reinforcement For Partial Panels To Be Proportional To Full Panels.
4. All Reinforcing Bars Are To Be 1 1/2" Minimum Clear To The Sides Of The Panel.
5. Left And Right Cut Panels Are So Named By The Side of The Panel To Have The Vertical Cut As Viewed Front Face.
6. Spaces Between Reinforcing Bars May Vary 3" ± To Avoid Loop Embeds Or Maintain Proper Clearances.
7. All Panels Are To Be Properly Marked On The Back Face As Shown.
8. Proper Care Shall Be Taken During The Pouring Of Concrete, To Clear All Looped Ends Of The Loop Embeds Of Any Excess Concrete.
9. Equally Space The Two 1 Ton Burke Lifting Inserts To Balance Cut Panels.
10. Reinforcement Labels Indicate Bar Size And Length. Ex: 454 Designates A #4 Bar 54 Inches Long.

QCM RELEASE
JAN 25 1995
FOR CONSTRUCTION

Released for Construction
Section: //
PROJECT ENGINEER 01/26/96 DATE

THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF RETAINED EARTH STRUCTURES ONLY.

CALTRANS DESIGN OVERSIGHT
9/20/94
BIDHOFF DATE

	BY		CHECKED
DESIGN	J. S. TILMANT		M. MAGARELLI
DETAILS	J. S. TILMANT		M. MAGARELLI
QUANTITIES			

TRANSPORTATION CORRIDOR AGENCIES

GENE FOSTER
TCA CORRIDOR MANAGER

BRIDGE NO. 55-813M
POST MILE 11.0

RETAINING WALL R488M R-121
PANEL REBAR DETAIL 3 OF 3

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 12332
EA 102540

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 17 OF 20

FILE ID: R488P-3$$$$$$$$$dgnspec$$$$$$$$$$$$$$$$$$
PLOT DATE: 8-2-94$ytime$$$$$$$ PEN TABLE: $$pentable$$

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	ORA	5, 73	9.6-12.9/10.2-11.6		

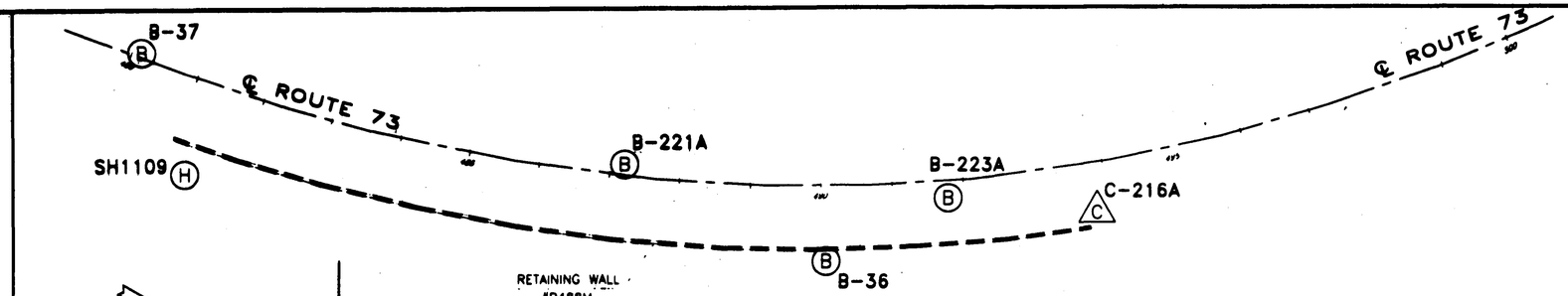
REGISTERED PROFESSIONAL ENGINEER

PLANS APPROVAL DATE

No. C048827 Exp. 9-30-97 CIVIL STATE OF CALIFORNIA

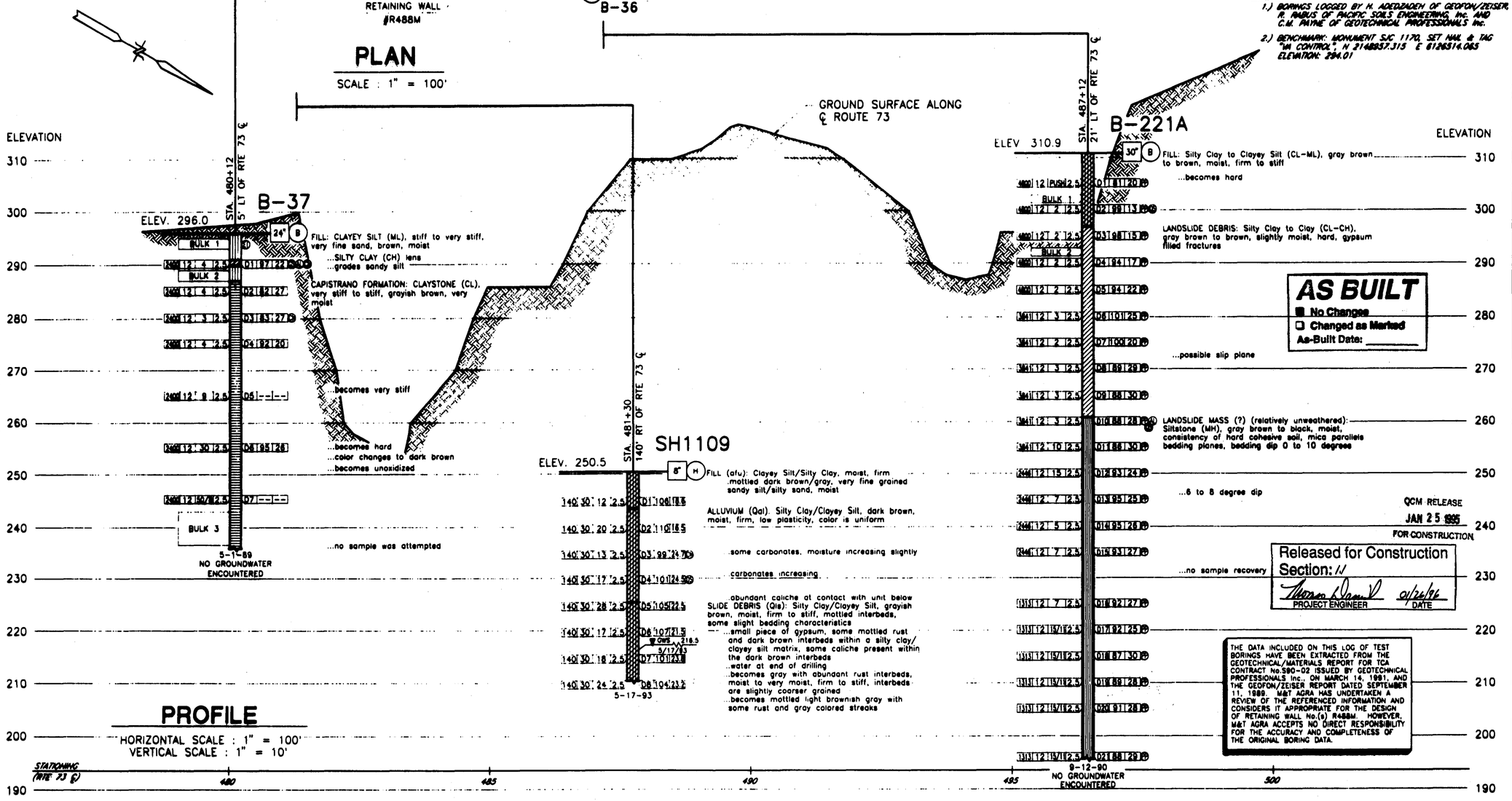
M&T AGRA
Geotechnical and Environmental Services
16760 W. Bernardo Drive San Diego, Ca

NOTE:
1.) BORINGS LOGGED BY H. ADEDZADEH OF GEOFON/ZEISER, R. RABUS OF PACIFIC SOILS ENGINEERING, Inc. AND C.M. PAYNE OF GEOTECHNICAL PROFESSIONALS Inc.
2.) BENCHMARK: MONUMENT S.C. 1170, SET NAIL & TAG "HI CONTROL" N 2148937.315 E 812651.4.085 ELEVATION: 294.01



RETAINING WALL #R488M

PLAN
SCALE : 1" = 100'



AS BUILT
■ No Changes
□ Changed as Marked
As-Built Date: _____

QCM RELEASE
JAN 25 1995
FOR CONSTRUCTION

Released for Construction
Section: //
PROJECT ENGINEER 01/26/96 DATE

THE DATA INCLUDED ON THIS LOG OF TEST BORINGS HAVE BEEN EXTRACTED FROM THE GEOTECHNICAL/MATERIALS REPORT FOR TCA CONTRACT No.580-02 ISSUED BY GEOTECHNICAL PROFESSIONALS Inc., ON MARCH 14, 1991, AND THE GEOFON/ZEISER REPORT DATED SEPTEMBER 11, 1989. M&T AGRA HAS UNDERTAKEN A REVIEW OF THE REFERENCED INFORMATION AND CONSIDERS IT APPROPRIATE FOR THE DESIGN OF RETAINING WALL No.(s) R488M. HOWEVER, M&T AGRA ACCEPTS NO DIRECT RESPONSIBILITY FOR THE ACCURACY AND COMPLETENESS OF THE ORIGINAL BORING DATA.

PROFILE
HORIZONTAL SCALE : 1" = 100'
VERTICAL SCALE : 1" = 10'

STATIONING (RTE 73 ℄): 480, 485, 490, 495, 500

JOB No. 693-140 PLATE ☒R-122

Caltrans Design Oversight 3/20/96 DATE	DRAWN BY J.B. DEPOORTER	H. ADEDZADEH R.A. RABUS/C.M. PAYNE FIELD INVESTIGATOR	TRANSPORTATION CORRIDOR AGENCIES	GENE FOSTER TCA CORRIDOR MANAGER	BRIDGE NO. 55-873M
	CHECKED BY J. VETTEL	DATE MAY 17, 1993			POST MILE 11.10

RETAINING WALL R488M
LOG OF TEST BORINGS NO 1

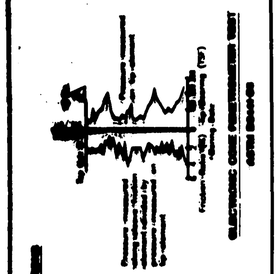
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 12332 EA 182540

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 18 OF 20



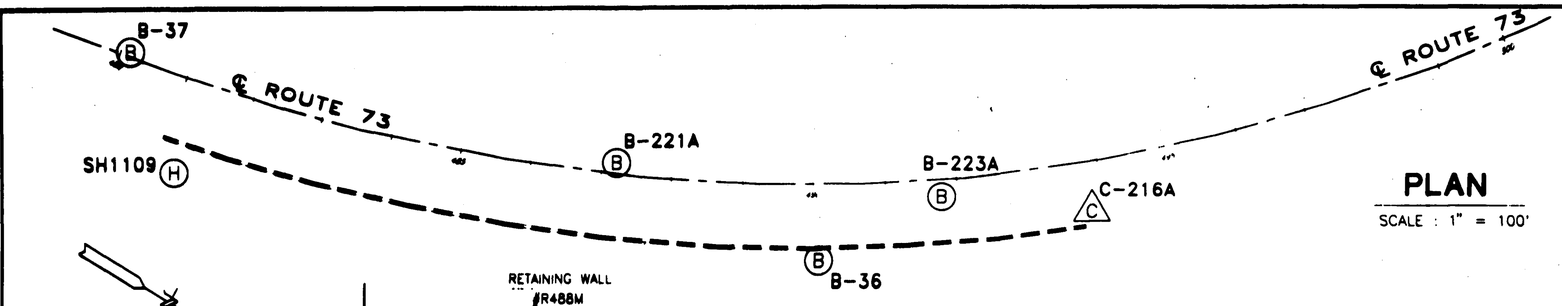
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	ORA	5, 73	9.6-12.9/10.2-11.6		

REGISTERED PROFESSIONAL ENGINEER

No. C048827
Exp. 9-30-92
CIVIL
STATE OF CALIFORNIA

PLANS APPROVAL DATE

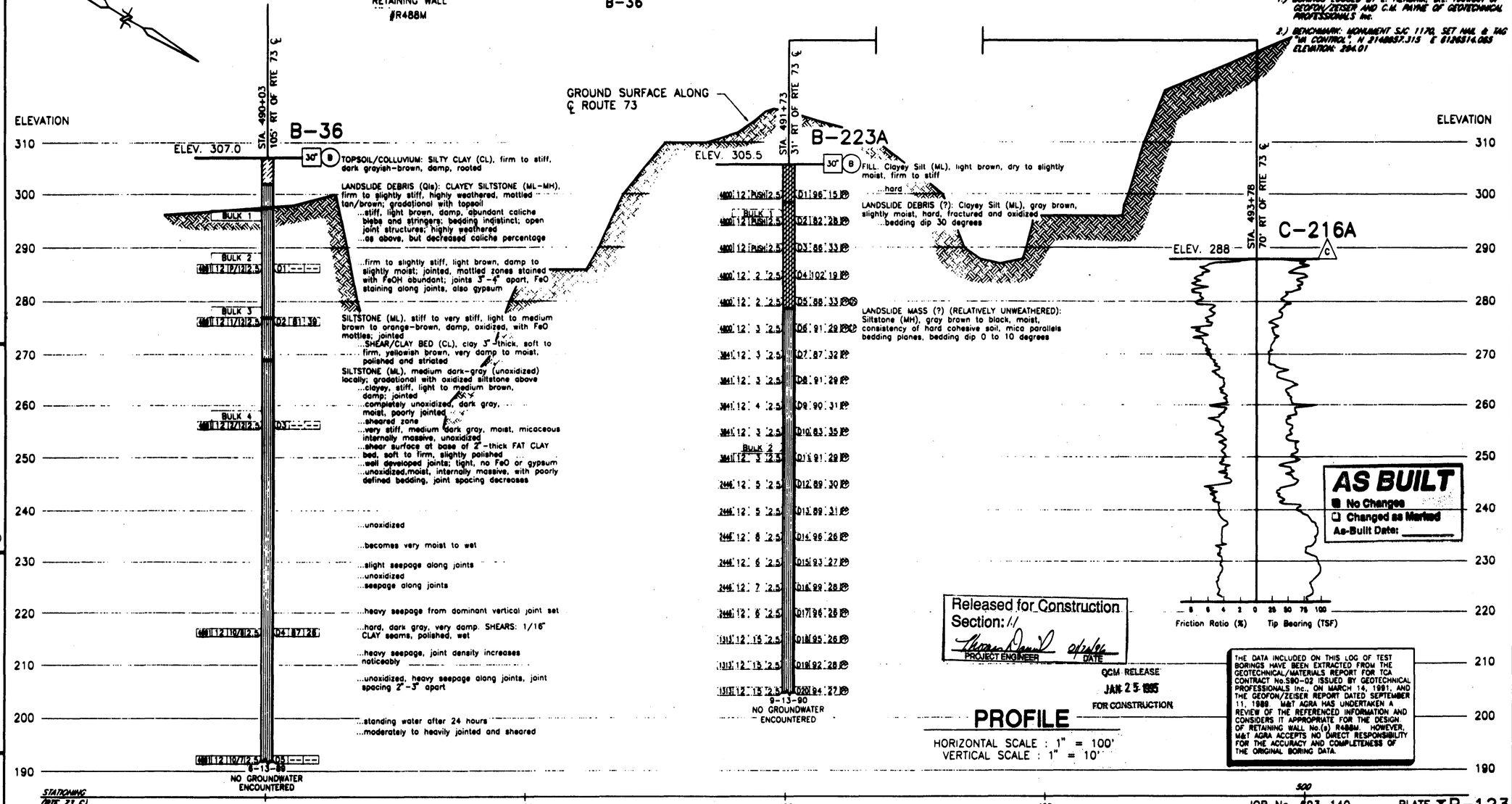
M&T AGRA
Geotechnical and Environmental Services
16760 W. Bernardo Drive San Diego, Ca



PLAN
SCALE : 1" = 100'

NOTE:
1.) BORINGS LOGGED BY E. HENDRIX, D.L. HANNAN OF GEOFON/ZEISER AND C.M. PAYNE OF GEOTECHNICAL PROFESSIONALS Inc.

2.) BENCHMARK: MONUMENT S.C. 11-70, SET NAIL & TAG "M&T CONTROL" N 2148537.315 E 6136514.085 ELEVATION: 304.01



AS BUILT
■ No Changes
❑ Changed as Marked
As-Built Date: _____

Released for Construction
Section: 11
PROJECT ENGINEER
DATE

QCM RELEASE
JAN 25 1995
FOR CONSTRUCTION

THE DATA INCLUDED ON THIS LOG OF TEST BORINGS HAVE BEEN EXTRACTED FROM THE GEOTECHNICAL/MATERIALS REPORT FOR TCA CONTRACT No.580-02 ISSUED BY GEOTECHNICAL PROFESSIONALS Inc., ON MARCH 14, 1991, AND THE GEOFON/ZEISER REPORT DATED SEPTEMBER 11, 1989. M&T AGRA HAS UNDERTAKEN A REVIEW OF THE REFERENCED INFORMATION AND CONSIDERS IT APPROPRIATE FOR THE DESIGN OF RETAINING WALL No.(s) R488M. HOWEVER, M&T AGRA ACCEPTS NO DIRECT RESPONSIBILITY FOR THE ACCURACY AND COMPLETENESS OF THE ORIGINAL BORING DATA.

PROFILE
HORIZONTAL SCALE : 1" = 100'
VERTICAL SCALE : 1" = 10'

JOB No. 693-140 PLATE R-123

CALTRANS DESIGN OVERSIGHT 2/20/94 DATE	DRAWN BY J.B. DEPOORTER	E. HENDRIX D.L. HANNAN/C.M. PAYNE FIELD INVESTIGATOR	TRANSPORTATION CORRIDOR AGENCIES	GENE FOSTER TCA CORRIDOR MANAGER	BRIDGE NO. 55-873M
	CHECKED BY J. VETTEL	DATE SEPTEMBER 13, 1990			POST MILE 11.10

RETAINING WALL R488M
LOG OF TEST BORINGS NO 2

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 12332
EA 182540

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 19 OF 20

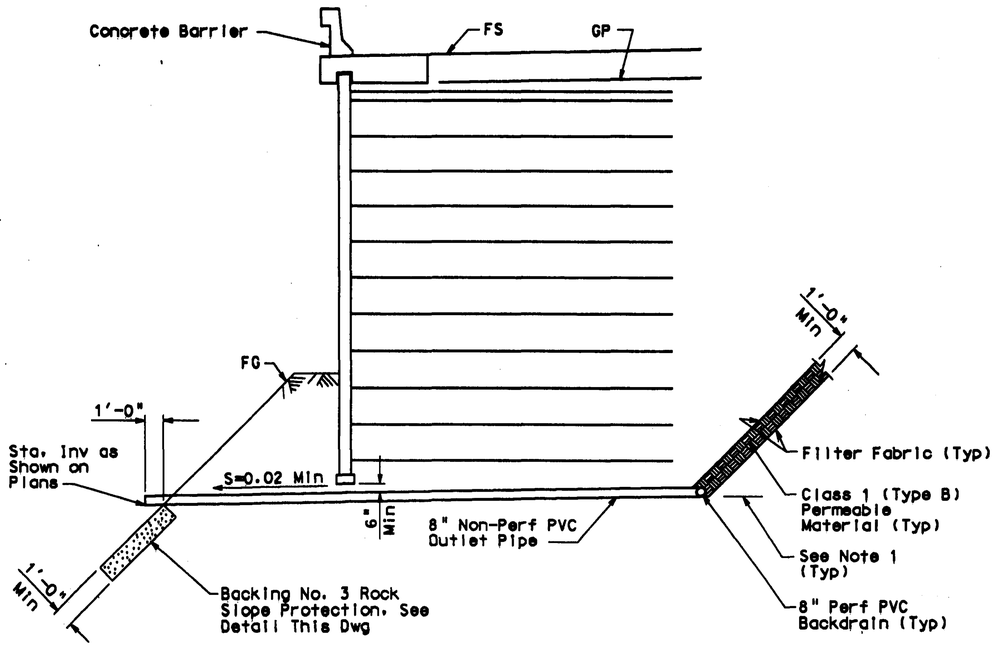
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	Ora	5,73	9.6-12.9/10.2-11.6		

Thomas Daniel
REGISTERED CIVIL ENGINEER

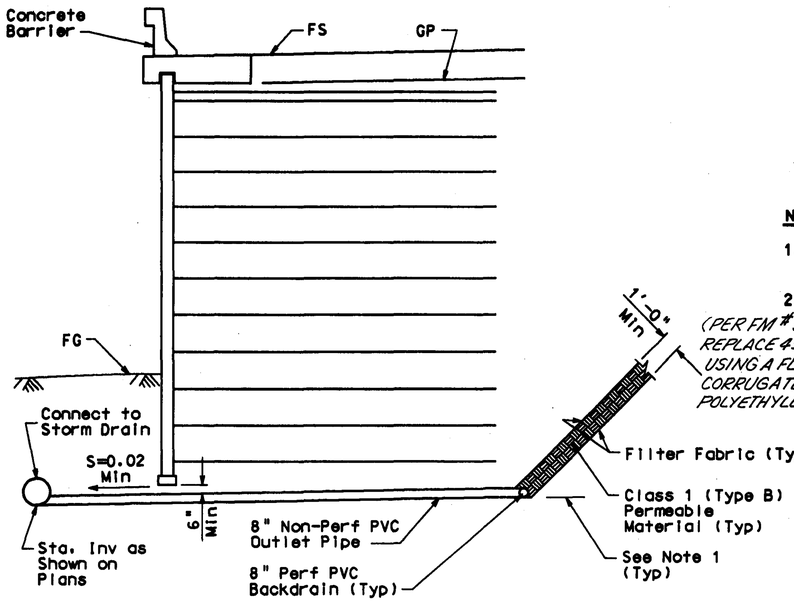
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
T. J. DANIEL
No. C48957
Exp. 9/30/96
CIVIL
STATE OF CALIFORNIA

PARSONS DE LEUW, INC.
Two Venture, Suite 550
Irvine, California 92718

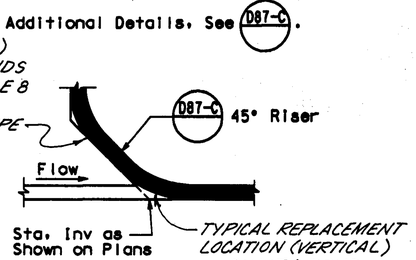


OUTLET PIPE DETAIL
No Scale



NOTES:

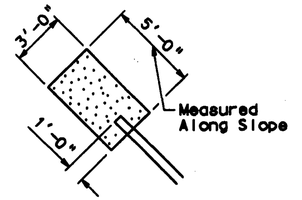
1. Profile Elevations of Bottom of Underdrain Pipe are Shown on General Plan Drawings.
2. For Additional Details, See D87-C.



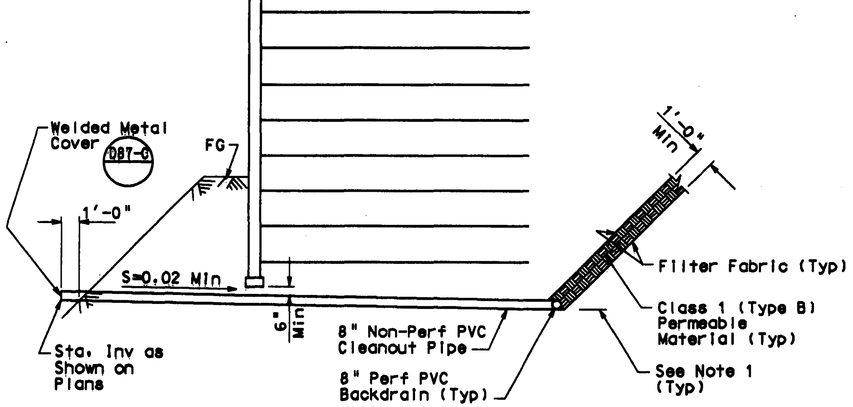
45° RISER
No Scale

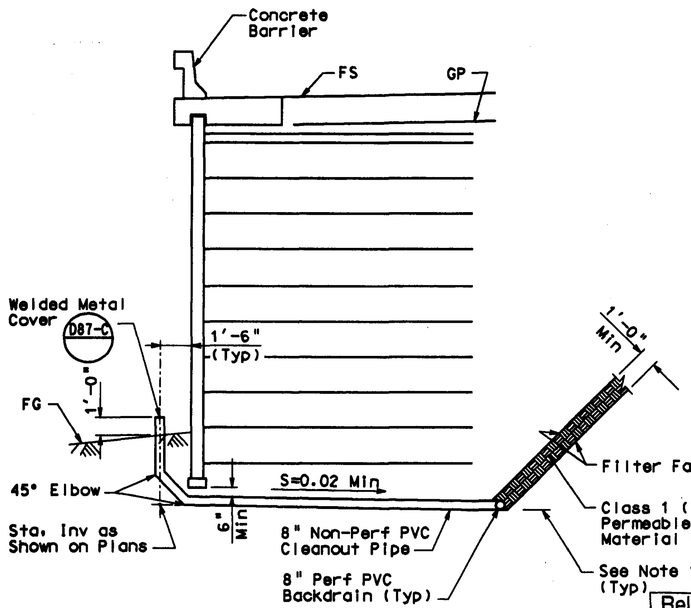
AS BUILT
- ☐ No Changes
- ■ Changed as Marked

As-Built Date: _____



OUTLET PIPE ROCK SLOPE PROTECTION DETAIL
No Scale

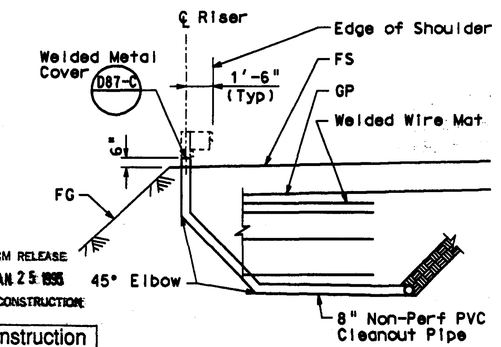




CLEANOUT PIPE WITHIN LENGTH OF WALL DETAIL
No Scale

Released for Construction
Section: I.I.
PROJECT ENGINEER 01/26/96 DATE

QCM RELEASE
JAN 25 1996
FOR CONSTRUCTION



CLEANOUT PIPE AT END OF WALL DETAIL
No Scale

R-124

D.H. Baxter
CALTRANS DESIGN OVERSIGHT
SIGNOFF DATE 9/20/94

DESIGN	BY C. CUSHNIE	CHECKED T. DANIEL	
DETAILS	BY K. MONTGOMERY	CHECKED T. DANIEL	
QUANTITIES	BY	CHECKED	

TRANSPORTATION CORRIDOR AGENCIES

GENE FOSTER
TCA CORRIDOR MANAGER

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 12332
EA 102540

BRIDGE NO.	55-873M
POST MILE	11.10

MECHANICALLY STABILIZED EMBANKMENT
OUTLET AND CLEANOUT PIPE DETAILS

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET	OF
20	20

FILE ID: /usr3/le3/ejh/110/drawings/110r128.sht
PLOT DATE: 31-AUG-1994 14:38 PEN TABLE: ejh.pen