FOUNDATION REPORT
MEEKLAND AVENUE CORRIDOR IMPROVEMENTS
SAN LORENZO CREEK CROSSING
ALAMEDA COUNTY, CALIFORNIA

Prepared for:



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WRECO Project No. P20101
August 2023

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Attention: Chris Hodge, PE
Principal Engineer

Subject: Foundation Report
San Lorenzo Creek Crossing
Meekland Avenue Corridor Improvements
Cherryland, Alameda County, California
WRECO Project No. P20101

Dear Mr. Hodge:

WRECO is pleased to submit our *Foundation Report* for the San Lorenzo Creek Crossing, part of the proposed Meekland Avenue Corridor Improvements. This report was conducted and prepared in general conformance with the scope of work prepared by WRECO for the subject Project.

We would like to thank Wood Rodgers, Inc. and the Alameda County Public Works Agency for the opportunity to prepare this report.

If you have any questions or wish to discuss this report in greater detail, please contact us at (916) 513-7428.

Sincerely,
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TABLE OF CONTENTS

1. Introduction 1
2. Project Description 1
2.1 Existing Facilities 1
2.2 Proposed Improvements 2
2.3 Right of Way 2
2.4 Utilities 3
2.5 Assumptions 3
2.6 Scope of Work 3
3. Exceptions to Policies and Procedures 4
4. Geotechnical Investigations 4
4.1 Preliminary Field Investigation 4
4.2 Geotechnical Investigation 4
5. Laboratory Testing 5
6. Geotechnical Conditions 6
6.1 Geology 6
6.1.1 Regional Geology 6
6.1.2 Local Geology 6
6.2 Surface Conditions 7
6.3 Subsurface Conditions 8
6.3.1 Geotechnical Investigation 8
6.3.2 Previous Geotechnical Investigations by Others 8
7. Groundwater 9
7.1 2021 Geotechnical Investigation 9
7.2 Previous Groundwater Observations 9
8. As-Built Foundation Data 10
8.1 As-Built Meekland Avenue Bridge 10
8.2 Subsurface Full Trash Capture Devices Structure, 2018 10
9. Scour Evaluation 11
10. Corrosion Evaluation 11
11. Seismic Information 12
11.1 Ground Motion Hazard 12
11.2 Other Seismic Hazards 12
11.2.1 Surface Fault Rupture Potential 12
11.2.2 Liquefaction Potential 13
11.2.3 Seismic Slope Stability 13
11.2.4 Tsunami Risk 13

12. Foundation Recommendations 13
12.1 Deep Foundations – Cast-In-Drilled-Hole (CIDH) Piles 14
13. Integral Curb 16
14. Retaining Walls 17
15. Abutment Recommendations 20
15.1 Abutment Drainage 20
15.2 Approach Fills 20
15.3 Slope Stability 20
16. Notes for Specifications 20
16.1.1 Structural Backfill 20
16.1.2 Controlled Low Strength Material 21
17. Notes for Construction 21
17.1 Timber Piles 21
17.2 CIDH Pile Construction 22
17.3 Abutments Construction 22
17.4 Approach Fills 22
17.4.1 Site Preparation and Grading 22
17.4.2 Structure Fill Placement 23
17.4.3 Excavations and Shoring 23
17.5 New Structural Pavement Sections 24
18. Limitations 25
19. References 27
20. Report Copy List 29

LIST OF APPENDICES

Appendix I. Figures
Appendix II. Log of Test Borings and As-built Logs
Appendix III. As-built Plans
Appendix IV. Laboratory Test Reports
Appendix V. Plans
Appendix VI. Analysis and Calculations
Appendix VII. Cellular Concrete Light Weight Embankment Material

FOUNDATION REPORT
SAN LORENZO CREEK CROSSING
MEEKLAND AVENUE CORRIDOR IMPROVEMENTS
COUNTY OF ALAMEDA, CALIFORNIA

1. INTRODUCTION

Alameda County Public Works Agency is proposing to provide a multimodal crossing of San Lorenzo Creek and improve multimodal connectivity along the Meekland Avenue corridor between East Lewelling Boulevard as the north terminus and Blossom Way as the south terminus. The multimodal improvements provide sidewalks and other complete streets and safety improvements to accommodate the collector road serving schools, residences, and commercial businesses. The project improves Americans with Disabilities Act (ADA) access through the addition of ADA compliant curb ramps and driveway aprons.

The project includes replacement of the existing San Lorenzo Creek Bridge (33C0206) with a new bridge that meets current applicable County, American Association of State Highway and Transportation Officials (AASHTO), and Caltrans design criteria and standards. The project is funded by a mix of federal funds from the Congestion Mitigation and Air Quality (CMAQ) Program and Surface Transportation Program (STP), as well as sales tax and other local funding sources.

This *Foundation Report* was prepared by WRECO and is intended for use by the engineers and planners involved in the Meekland Avenue Corridor Improvements Project. WRECO staff reviewed existing geotechnical data at and around the subject Project and have conducted a geotechnical investigation for the purpose of providing geotechnical recommendations for the planned bridge foundations. Recommendations for the planned corridor roadway improvements are provided in the companion WRECO *Geotechnical Design Report*.

2. PROJECT DESCRIPTION

The proposed bridge replacement will include sidewalks, Class II bike facilities, and pavement construction and rehabilitation on the north and south approaches. The bridge replacement approach is to clear span the concrete-lined channel with an independent structure to the east to minimize impacts to the access and the channel, to minimize any loads on the existing structure, and to minimize utility relocations.

2.1 Existing Facilities

The San Lorenzo Creek Bridge is located on Meekland Avenue, south of the intersection with East Lewelling Boulevard. This segment of Meekland Avenue is a generally north-south urban minor arterial comprised of primarily two 12-feet wide lanes of traffic with narrow bike lanes and sidewalks on each side. The terrain is generally flat, and the road is posted with a 25-mph speed limit.

The project location is immediately adjacent to residential neighborhoods and businesses, and the bridge serves as a link across San Lorenzo Creek for bicycle and pedestrian traffic, public transit (bus), and access to San Lorenzo High School.

The project site includes extensive utilities located overhead and underground running parallel to and within Meekland Avenue. At the crossing, the public right of way is approximately 60-feet wide. San

Lorenzo Creek is a USACE concrete-lined flood control waterway with Operation and Maintenance by the Alameda County Flood Control and Water Conservation District (ACFCWCD).

The three-span bridge is comprised of a main 84-feet long span of three steel girders with concrete deck supported on seat bents with pile-columns. End spans are 30-feet long spans of reinforced concrete T-beams frames. All four corners of the project include adjacent points of access for ACFCWCD driveways and gate, residential business driveways and fence gates, and side streets.

On the southwest bank, there is a large underground trash capture structure founded on shallow foundations. The edge of the existing bridge deck lies within one foot of a trash capture structure retaining wall.

2.2 Proposed Improvements

The County proposes to replace the existing bridge with a new single-span bridge that will accommodate two travel lanes plus Class II bike lanes, raised concrete sidewalks, and traffic rated vehicular barriers to meet AASHTO standards, for a total bridge width of approximately 54-feet. The proposed improvements are shown on the 65% plans prepared by Wood Rogers (2022).

The single span replacement bridge is approximately 125-feet long with the abutments placed behind the channel walls and will include fill and retaining walls at the ends of the bridge. The superstructure is a precast prestressed concrete wide flange girder over the channel. The abutments are located at the top of the channel banks outside the limits of the creek and founded on cast-in-drilled-hole piles. The existing trash capture structure on the west side will require modification to accommodate the widened bridge deck. Modifications to the trash capture structure and foundations are detailed in the Geotechnical Design Report produced by WRECO in April 2022.

The roadway profile at the bridge is raised approximately two feet for greater flood clearance and improved drainage. The roadway profile along the general corridor is maintained. The existing horizontal alignment is maintained. The roadway surface along the general corridor is improved by a slurry seal treatment. A full structural section replacement of the roadbed is anticipated at only select locations in the parking and shoulder areas and at the bridge roadway approaches. Sidewalks along the corridor are demolished and reconstructed within the existing right-of-way for accessibility/ADA compliance. Accessibility/ADA compliant curb ramps and driveway aprons are installed where needed. Any drainage modifications will reconnect to the existing storm drainage system.

Rain gardens, landscape tree wells and plantings, and clean water features will be incorporated at some locations as available space allows. Three street light poles will be replaced and reconnected to the existing County electrical system. No existing traffic signals will be modified, except for minor modifications to appurtenances associated with the signal on the northern half of the intersection of Meekland Avenue and Blossom Way.

2.3 Right of Way

Based on preliminary records search, Meekland Avenue is within a varying 60-feet to 64-feet wide recorded Alameda County right of way. The corridor improvements have 102 parcels fronting the project limits. Permission to enter agreements or temporary construction easements will be needed from the parcels fronting the project limits to construct the improvements along the project corridor as well as the

bridge replacement. Temporary easements do not require relocation of residences or businesses. No permanent acquisition of right-of-way is required.

2.4 Utilities

The project site contains multiple underground and overhead utilities and other facilities, including high risk utilities along the western edge of Meekland Avenue and hung from the eastern edge of the existing bridge. The bridge replacement will require modification of the existing services, including de-energizing, temporary re-routing of lines, resetting boxes and poles, and permanent relocations. Along the general corridor, no utility relocations are required.

The proposed project has the following potential impacts:

- Near the bridge, overhead utility lines (electrical and communication) and support poles along the west side will require permanent relocation.
- At the bridge, 6" waterline and 3" gas line attached to the eastern edge of the existing bridge will require permanent relocation.
- Along the corridor, three street light poles will be relocated.

2.5 Assumptions

Based on conversations with the County, the following assumptions have been made:

- The Meekland Avenue-San Lorenzo Creek bridge is confirmed as an intended bridge replacement with the goal of clear spanning and working outside of the concrete-lined canal.
- Right-of-way (R/W) impacts for the bridge replacement affects no more than six parcels. Of the six parcels, Acquisition to Full Width Line (FWL) is possibly on four parcels, and the remaining two affected parcels are Alameda County Flood Control and Water Conservation District (ACFCWCD) channel parcels. Utility relocations will affect current overhead (OH) and underground (UG) utilities. The affected parcels are as follows:
    - 413-0031-048-00 - No adjustment per County.
    - 413-0031-049-00
    - 413-0031-051-00 - ACFCWCD
    - 413-0063-013-00
    - 413-0063-019-00 - ACFCWCD
    - 413-0063-032-00
- The general cross section of the future reconfigured Meekland Avenue-San Lorenzo Creek Crossing bridge will have a 11-foot-wide travel lane, one 7-foot-wide bike lane, and a 8-foot-wide sidewalk on both the southbound (west) and northbound (east) sides (Wood Rodgers, 2020a).

2.6 Scope of Work

Based on the stated goals and assumptions above, WRECO has prepared this *Foundation Report* in accordance with the Caltrans *Foundation Report for Bridges Guidelines* (Caltrans, 2021). The report includes the following:

- A Project summary, including a description of the proposed improvements.
- An overview of the field investigations performed as part of the study.

- A discussion of the regional and site geology as it pertains to the proposed bridge replacement and corridor improvements.
- A summary of identified site soils, a summary of laboratory testing results, and a Log of Test Borings (LOTB) with the boring logs.
- A discussion of the regional seismology and assumed seismic design parameters for the proposed Project site in accordance with the latest Caltrans ARS Online Design Tool and Caltrans Seismic Design Criteria.
- A liquefaction evaluation of the identified site soils.
- A discussion of the foundation recommendations for the proposed bridge and retaining walls taking into consideration the loading demands, site soil conditions, environmental constraints, scour, and cost.
- Approach grading recommendations to aid in the temporary construction staging and any profile correction work.
- Identification of any Contract Standard Special Provision (SSP) language for inclusion in the contract documents to better identify and quantify the foundation construction risk during bidding, and therefore, reduce the occurrence of a Contract Change Order (CCO) resulting from the bridge foundation excavations and construction.

3. EXCEPTIONS TO POLICIES AND PROCEDURES

No exceptions to policy were taken in preparation of this *Foundation Report*.

4. GEOTECHNICAL INVESTIGATIONS

4.1 Preliminary Field Investigation

A preliminary field investigation was made on December 30, 2020, to observe the current bridge and the surrounding grounds, and to mark out in white paint the proposed boring locations for an Underground Service Alert (USA) North 811 survey to identify potential underground conflicts with the future subsurface investigation.

4.2 Geotechnical Investigation

Our subsurface field investigation program was performed between March 3-4, 2021, and consisted of the advancement of two borings using powered drill equipment for the bridge foundation. The field exploration for the bridge foundations involved the completion of two borings, R-21-001 and R-21-002, by Geo-Ex Subsurface Exploration under the supervision of an WRECO geologist. An WRECO field geologist visually classified soil and rock samples and cuttings at the time of drilling using the *Caltrans, Soil and Rock Logging, Classification, and Presentation Manual,* 2010 Edition (and Errata, 2018).

Both borings were completed using a 4.5-inch diameter solid-stem auger and mud rotary drill equipment. Boring R-21-001 was located within the southbound lane of Meekland Avenue immediately north of the north bridge abutment of the Project bridge. Boring R-21-002 was located east of Meekland Avenue within an unpaved area adjacent to the south bridge abutment. Solid stem augers were used in the upper 30 feet to determine potential groundwater conditions; both borings were advanced below 30 feet using mud rotary equipment.

Soil sampling was performed using drive samplers which were advanced using a 140-pound auto-trip hammer, falling 30-inches, in general conformance with conducting the Standard Penetration Test (SPT, ASTM D1586). Soil samples were collected from Borings R-21-001 and R-21-002 at selected intervals using a 1.375 inch inside diameter (ID) split spoon sampler. This sampler is unlined. In addition, soil samples were collected from Boring R-21-001 in the upper 51.5 feet using a 3.0-inch outer diameter (OD) sampler with 2.4-inch ID stainless steel liners for purpose of dry density and moisture and unconfined compression stress analyses. Field blow counts were recorded as the number of hammer blows required to drive the sampler the final 12 inches of an 18-inch drive.

Site topography, detailed visual descriptions of the recovered soil samples, SPT results, and boring information is shown on the boring records as an attachment to this report, Appendix II Logs of Test Borings (LOTB). The site topography and the boring location are shown on Figure 2, Location of Field Tests (LOFT).

Table 1. Summary of Subsurface Investigation

Boring ID	Latitude, Longitude	Surveyed Surface Elevation (feet)	Drilled Depth (feet)	Energy Efficiency
R-21-001	37º 41’ 9.416”; -122º 6’ 0.858”	58.1	81.5	101%
R-21-002	37º 41’ 7.400”; -122º 6’ 0.360”	58.5	71.5	

Upon completion of drilling, each boring was backfilled with neat cement grout consisting of a Type I/II Portland Cement to near existing ground surface. The existing asphalt concrete (AC) roadway surface was patched with quick setting, high-strength concrete approximately 3 inches in depth to match the existing grade.

5. LABORATORY TESTING

Laboratory soil testing for this study included unconfined compression, moisture content and density, determination of grain size distribution; Atterberg Limits; and corrosive potential (i.e. resistivity, pH, sulfate content and chloride content tests), as summarized in Table 2.

Table 2. Laboratory Test Summary

Boring ID	Sample Interval (feet)	Test	Test Standard
R-21-001	0.9 – 5.0	pH and Min. Resistivity	CTM 643
		Sulfate	CTM 417
		Chloride	CTM 422
	15.5 – 16.5	Moisture Content and Density	ASTM D 2216/CTM 226 and ASTM D 2937
	20.5 – 21.5	Unconfined Compression	ASTM D 2166
	25.0 – 26.5	Moisture Content and Density	ASTM D 2216/CTM 226 and ASTM D 2937
	30.5 – 31.5	Unconfined Compression	ASTM D 2166
	35.5 – 36.5	Unconfined Compression	ASTM D 2166
	40.5 – 41.5	Moisture Content and Density	ASTM D 2216/CTM 226 and ASTM D 2937
	45.5 – 46.5	Unconfined Compression	ASTM D 2166
	50.5 – 51.5	Moisture Content and Density	ASTM D 2216/CTM 226 and ASTM D 2937
	55.0 – 56.5	Grain Size Distribution	ASTM D 6913
		Atterberg Limits	ASTM D 4318
	65.0 – 66.5	Atterberg Limits	ASTM D 4318
R-21-002	5.0 – 6.5	Grain Size Distribution	ASTM D 6913
		Atterberg Limits	ASTM D 4318
	10.5 – 11.5	pH and Min. Resistivity	CTM 643
		Sulfate	CTM 417
		Chloride	CTM 422
	20.0 – 21.5	Grain Size Distribution	ASTM D 6913
		Atterberg Limits	ASTM D 4318
	35.5 – 36.5	Grain Size Distribution	ASTM D 6913
		Atterberg Limits	ASTM D 4318
	50.5 – 51.5	Atterberg Limits	ASTM D 4318
	70.5 – 71.5	Atterberg Limits	ASTM D 4318
Notes: ASTM: American Society for Testing and Materials CTM: California Test Method			

Laboratory test reports are provided in Appendix IV, and the results of the corrosive potential to buried steel and concrete are further discussed in Section 7.

6. GEOTECHNICAL CONDITIONS

6.1 Geology

6.1.1 *Regional Geology*

The Project site is located within the Coast Ranges Geomorphic Province of California (California Geologic Survey [CGS], 2002). This province extends along the majority of the California coast and is bounded by the Great Valley to the east, the Pacific Ocean to the west, the Transverse Range Mountains to the south, and the Klamath Mountains to the north. The Coast Ranges are northwest-trending mountain ranges and valleys subparallel to the San Andreas Fault System. The coastline is uplifted, terraced, and wave-cut. The northern and southern ranges are separated by a depression containing the San Francisco Bay.

6.1.2 *Local Geology*

Review of the *Geologic Map of the Hayward Quadrangle, Contra Costa and Alameda Counties, California* (Dibblee and Minch, 2005) shows the majority of the Project site as underlain by Holocene

Surficial Sediments (Qa). Qa sediments are described as alluvial gravel, sand, and clay, including gravel and sand of major stream channels.

On the *Geologic Map and Map Database of the Oakland Metropolitan Area, Alameda, Contra Costa, and San Francisco Counties, California* (U.S. Geological Survey [USGS], 2000), the geologic units correspond to the mapped units in the 2005 Hayward Quadrangle geologic map but the Qa sediments are further subdivided. The Project site is mapped as Holocene natural levee deposits (Qhl). Qhl deposits are described as loose, moderately-sorted to well-sorted sandy or clayey silt grading to sandy or silty clay. These deposits are porous and permeable and provide conduits for transport of ground water. Levee deposits border stream channels, usually both banks, and slope away to flatter floodplains and basins.

The Project site can be seen in relation to the published geology in the Geology Map, as shown on Figure 3 in Appendix I. The Earthquake Fault Zones Map showing the known Alquist-Priolo Fault Hazard Zone (including the Hayward Fault) is provided as Figure 4 in Appendix I.

6.2 Surface Conditions

The Project bridge site is approximately 300 feet south of East Lewelling Boulevard in an unincorporated urban area of the County; located at 37°41'08.3" North, 122°07'00.6" West. This unincorporated area, is bounded by Interstate (I-) 238 to the north, I-880 to the west, the City of Hayward to the south, and Foothill Boulevard to the east. Meekland Avenue is a north-south, two-lane urban road. Development in the area includes single-family homes and apartment buildings, as well as a variety of commercial uses.

The ground to the north and south are relatively flat. The ground to the north ranges from approximately elevation 52 feet near East Lewelling Boulevard and approximate elevation 48-50 feet in southeast of Paseo Grande Drive. The ground from the north and south approaches from Meekland Avenue has been raised to the bridge deck level by embankments. Based on a recent survey, the high point on the roadway deck is elevation 58.83 feet, and the north end of the bridge was measured at elevation 58.48 feet (County of Alameda, 2020).

The bridge deck was found to be in good condition. Cracks were visible in the asphalt concrete and coincide with the bridge side edges of the north and south bridge abutments. The bridge has steel guardrails that separate the roadway and adjacent sidewalks.

The Project site is located within San Lorenzo Creek watershed. The watershed is approximately 48 square miles in area and extends east into the hills above Oakland and San Leandro and north to include the town of Moraga in Contra Costa County. San Lorenzo Creek flows generally west, entering central San Francisco Bay near Roberts Landing, west of San Lorenzo. The lower and middle watershed areas are highly urbanized, and the natural drainage has been greatly altered. Between 1953 and 1962, the lower reach of the creek was converted into a concrete flood control channel approximately 4.6 miles to the creek mouth. The Project bridge location is within the modified lower portion of San Lorenzo Creek. Hydraulic characteristic of the channel, along with channel flow rates for design flooding events, are provided in the *Location Hydraulic Study for Meekland Avenue Corridor Improvements* (WRECO, 2021).

San Lorenzo Creek was flowing from the southeast to the northeast at the Project site with an approximate surface height of over 24 feet from the bridge deck. This channel has 13.5-foot-high vertical concrete walls along the channel sides and a 5-foot wide, 1-foot deep, low-flow fish channel along the

middle of the channel bottom. The ground surface slopes down from the bridge sides to level surfaces adjacent to the channel walls. The channel is closed off to public access via chain link fences.

Access to the channel can be made via a gravel access road on the northeast side and through a paved area over a County-operated subsurface full trash capture facility located to the southwest corner of the bridge.

The Project can be seen in relation to the surrounding natural and manmade features on Figure 1, Project Location Map, which is included in Appendix I of this report. All elevations referenced within this report are based on the North American Vertical Datum of 1988 (NAVD 88), unless otherwise noted. No reference datum is provided on the 1926-27 plan sheets. To convert an elevation at this site from the 1926-27 as-built values to a NAVD 88 value, add 3.48 feet[1] to the 1926-27 elevations.

6.3 Subsurface Conditions

6.3.1 *Geotechnical Investigation*

Materials at the site appear are considered consistent with the published geologic mapping. Observed soils are interbedded lean clays, lean clays with sand, sandy lean clays, silty sands, and silty sands with gravel. In general, the earth materials encountered are summarized in Table 3.

Table 3. Summary of Subsurface Conditions, WRECO Geotechnical Investigation

Boring	R-22-001	R-22-002
Surveyed Top Hole Elevation (ft)	58.1	58.5
Unit 1 – Fill	SANDY SILT (ML), grayish brown, dry to moist	CLAYEY SILT (ML/CL), loose, mottled dark and light brown, moist, with scattered debris (nails)
Bottom of Unit 1 Elevation (ft)	53	54
Unit 2 – Natural Deposits	Interbedded Lean CLAY with SAND (CL), Lean CLAY (CL), SANDY SILT (ML), SANDY Lean CLAY (CL), stiff to very stiff to approximately -13.9 feet then hard to -20 feet then stiff; with very dense SILTY SAND with GRAVEL between -1.9 and -6.9 feet	Interbedded Lean CLAY with SAND (CL), SAND with CLAY (SW-SC), stiff to very stiff and medium dense; with medium dense SILTY SAND between 13.5 and 8.5 feet
Bottom of Boring (ft)	-23.4	-13.0
Observed Groundwater Elevation (ft)	30.1	24.5

6.3.2 *Previous Geotechnical Investigations by Others*

Review of previous subsurface investigations in the form of Alameda County As-built Log of Test Borings (LOTB) (ACPWA, 1927) and design reports for nearby structures are summarized in Table 4. At the Project site, Sheet 9 of the Alameda County As-built drawings depicts four borings completed in May 1926. No reference datum is provided on the 1926 plan sheets, and the National Geodetic Vertical Datum of 1929 (NGVD29) is assumed. Approximately 80 feet to the west of the north abutment a Large

[1] Based on a comparison of the bridge deck elevation reported in the 1927 drawings to the 2020 surveyed bridge deck elevation at the north end of the bridge.

Trash Capture System was designed by Kleinfelder in December 2018 (Kleinfelder, 2018). A copy of the asbuilt LOTB are provided in Appendix II.

Table 4. Summary of Subsurface Conditions By Others

Document	Location	Number of Borings	Approximate Surface Elevation (ft)	Approximate Termination Elevation (ft)	Soil Description	Deviating Conditions
1926 LOTB (33C0206)	Bridge abutments and stream bed	4	Bridge: 40 NGVD29 Stream: 28 NGVD29	(-10 to 17) NGVD29	Silt, fine sand, and small gravel to approximate elev. 23 feet, underlain by clays	Fine gravel found below elev. -5 feet
2018 Kleinfelder Trash Capture System	South stream channel, 50 ft west of the Project bridge	1	43	-18.5	Silty sand to sandy lean clay to fat clay with sand (N =10 to 22)	Fill found above elev. 29 feet, associated with channel wall
Notes: N = Recorded Field Blows per foot						

7. GROUNDWATER

7.1 2021 Geotechnical Investigation

During the February 2021, WRECO geotechnical investigation, groundwater was first encountered in Boring R-21-001 at an elevation of 30.2 feet. In Boring R-21-002, groundwater was noted at an elevation of 24.0 feet. Groundwater observations are summarized in Table 5.

Table 5. Summary of Groundwater Observations

Boring ID	Ground Surface Elevation (feet)	Depth to Groundwater (feet)	Groundwater Elevation (feet)	Date Measured
R-21-001	58.1	28.0	30.1	February 2, 2021
R-21-002	58.5	34.0	24.5	February 3, 2021

7.2 Previous Groundwater Observations

Groundwater was noted in the 1926 borings with reported (adjusted to NAVD88) of approximately elevations 25.5, 22.5, 24.5, and 25.5 feet in Borings 1, 2, 3, and 4, respectively. Note that these readings were made prior to the extensive channel modifications made after 1953 but appear to align with more recent observations.

Kleinfelder's 2018 subsurface investigation observed water levels after well construction at an elevation 26 feet. During the boring advancement, groundwater was first encountered at an elevation 23 feet.

Based on the February 2021 observations and previous groundwater observations made by others, top of the groundwater surface can be expected between elevations 22.5 to 31 feet on the north side of Lorenzo Creek. On the south side of the creek channel, groundwater elevations were recorded or observed to range from 23 to 26 feet. Groundwater elevation will typically vary with changes in irrigation, well pumping, and other factors, which may explain differing range of values between two area locations.

8. AS-BUILT FOUNDATION DATA

8.1 As-Built Meekland Avenue Bridge

Three original bridge plans were provided by the County and are attached for reference in Appendix III. The first plan set is dated August 1926 (ACPWA, 1926a) and the second plan set with as-built notes, likely dating to May 31, 1927 (ACPWA, 1927). The third drawing set are shop drawings from Western Iron Works, dated November 3, 1926 (ACPWA, 1926b).

The Project site bridge was constructed in 1926-27 and replaced an earlier approximately 18-foot-wide bridge with five pile bents. The earlier bridge footprint coincides with the existing bridge in length. The Project bridge has an overall length of approximately 152 feet, with a center steel girder structure, two concrete abutments, and two concrete bents, all on spread footings. Abutments and bents are at 45-degree skew to the southeast.

The steel bridge structure rest on concrete wall abutments and two reinforced concrete bents. Each bent consists of a three-column reinforced concrete structure, with a reinforced concrete cross member, and a rear concrete wall that extends to the roadway elevation. Each bent column is square approximately 4.5-feet-wide, square cross section supported on circular bell-shaped footings. The bottom of footings are approximately 10 feet wide. The reported as-built 1927 of the footing bottoms are elevations 9.0, 10.0, and 9.2 feet (southeast to northwest) for the North Bent and elevations 11.5, 11.8, and 12.5 feet (southeast to northwest) for the South Bent.

The bridge abutments are connected to the bent structures by four, 14-inch-wide concrete beams that have 8-foot spacings between the beam centerlines. The abutments are supported on strip footings of approximately 4-foot width. The as-builts indicate abutment footing base elevations to be 30.0 feet (ACPWA, 1927).

Modification of the bridge sidewalks occurred in 1973-74 and consisted of the removal of the original concrete side parapet structures, the construction of chain link fence to replace the original parapet, and the addition of roadway guard rails separating the sidewalks and adjacent roadway (ACPWA, 1973).

At the time of bridge construction, the surveyed bottom of Lorenzo Creek was at elevation 30 feet. The creek was subsequently modified to a concrete-lined channel with 13.5-foot-high vertical walls with a gently sloped to flat bottom with a surveyed bottom elevation of 35.55 feet at Meekland Avenue (ACPWA, 2018). A trapezoid-shaped, low-flow channel is formed into the center of the concrete bottom.

8.2 Subsurface Full Trash Capture Devices Structure, 2018

A subsurface full Trash Capture Devices Structure was built west of the southwest corner of the bridge but did not modify the existing bridge structure. Based on the 2018 as-built plans (ACPWA, 2018), the Trash Capture Devices Structure is constructed as a buried concrete box. A copy of the asbuilt drawings are provided in Appendix III.

The Trash Capture Devices Structure box roof is reported at an elevation of 48.0 feet. The top elevation of the bottom floor varies to allow the existing stormwater flowline from existing 54-inch diameter, reinforced concrete pipe (RCP) inlet and outlet to be maintained; the inlet and outlet locations are on the southeast and northwest sides of the box structure. The invert inlet and outlet elevations of the RCP are 36.6 feet and 36.51 feet, respectively.

The box sides consist of concrete walls extending to the grade beam below the box roof slab with concrete walls extending above the box roof slab to create maintenance and pedestrian access hatch routes and perimeter retaining walls to the northeast, east, and south. The roof is buried under a geofoam backfill with thicknesses ranging from over 8.5 feet adjacent to the buried south retaining wall to a minimal thickness along the north retaining wall.

When constructed the box side walls were supported by 24-inch diameter CIDH piles along the south (Piles W10-W14), west (Piles W02-W09), northwest (Piles W01 and W15), and a portion of the northeast perimeter (Piles W19-W21). CIDH tip elevations are reported as 25.0 feet for the south and west piles while the CIDH tip elevations for the one south pile (W14) and the northeast piles are 29.0 feet. The east edge and northeast edges of the box side walls are supported by 18-inch diameter CIDH piles (Piles W22-W27 and W16-W18, respectively). The 18-inch diameter CIDH pile tip elevations are reported as 29.0 feet.

9. SCOUR EVALUATION

The bottom and walls of the Lorenzo Creek channel are lined with concrete and the current channel configuration will not be modified. Scour potential within the Project limits is expected to be negligible.

10. CORROSION EVALUATION

Based upon the Caltrans *Corrosion Guidelines Version 3.2* (Caltrans, 2021b), soils are considered corrosive if one or more of the following conditions exists for the representative soil samples taken at the site:

- *Chloride concentration is 500 ppm or greater,*
- *Sulfate Concentration is 1,500 ppm or greater,*
- *pH is 5.5 or less.*

In addition to the conditions listed above, *The California Amendments to the American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Bridge Design Specifications (BDS)*, 8th Edition, Section 10.7.5 (Caltrans, 2019a) considers a site corrosive if the additional condition listed below exists for the representative soil samples taken at the site:

- *Minimum resistivity of 1,100 ohm-cm or less.*

WRECO performed corrosive potential testing on two recovered representative soil samples as part of this study. The results are summarized in Table 6.

Table 6. Soil Corrosion Data

Location	Depth (feet)	Minimum Resistivity (ohm-cm)	Soil pH	Chloride Content (ppm)	Sulfate Content (ppm)
R-21-001	0.7-5.0	1,720	6.97	9.4	65.0
R-21-002	10.5-11.0	510	6.79	99.0	48.3
Methods: California Test Method (CTM) 643 for pH and minimum resistivity; CTM 417 for sulfate; CTM 422 for chloride ppm: parts per million					

Based on the corrosive potential testing results the site soils are not considered corrosive to structure concrete or steel reinforcement. However, the tested soil from Boring R-21-002 is considered corrosive to the planned driven steel casing as defined by Caltrans' *The California Amendments to the AASHTO LRFD BDS,* 8th Edition (Caltrans, 2019a).

11. SEISMIC INFORMATION

The Project is located in a seismically active area of California. Potential geologic and potential seismic hazards for the site include ground surface rupture, seismic shaking (ground motion), liquefaction, and seismically induced settlement.

11.1 Ground Motion Hazard

The SDC *Memos to Designer* (MTD) Section 20, was adopted September 1, 2019. Following Caltrans' Seismic Design Criteria (SDC) Version 2.0 and design tools outlined in Caltrans' *Methodology for Developing Design Response Spectrum for Use in Seismic Design Recommendation* (2019), a preliminary seismic analysis of the Project site was performed using Caltrans ARS Online Design Tool Version 3.0.2, which produces a design spectrum based on the USGS 975-year uniform hazard spectrum. This analysis serves to present the preliminary seismic design parameters and to identify potential seismic hazards such as liquefaction or lateral spreading in accordance with the updated criteria.

Based on SPT correlations during the recent site exploration, the Vs_{30} for the Project site was calculated to be 205 meters per second (about 672 feet per second) in the upper 100 feet of soil. This corresponds to a preliminary Soil Profile Type D ("stiff soil" with $180 < Vs_{30} < 360$ meters per second). Based on this information, the peak ground acceleration (PGA) for the site is estimated to be 0.8*g* with a peak spectral acceleration (PSA) of 2.07*g* at a period of 0.50 seconds. The Seismic Design Data sheet and seismic analysis PGA and PSA calculations are provided in Appendix VI and summarized in Table **7**.

Table 7. Seismic Analysis

Site location:	Latitude: 37.685949
	Longitude: -122.100238
Assumed Site Shear Wave Velocity (V_{S30})	205 meters per second
Soil Profile Classification	S1
Site-Source Distance	6.3 kilometers (3.4 miles)
Peak Ground Acceleration (PGA)	0.8*g*
Peak Spectral Acceleration (PSA)	2.07*g*
Period of PSA	0.50 seconds

11.2 Other Seismic Hazards

11.2.1 *Surface Fault Rupture Potential*

The Project site lies 0.78 miles from an Alquist-Priolo Earthquake Fault Zone (CGS, 2012). The closest active fault is the Hayward Fault, which coincides with the I-580 alignment and located 0.78 miles northeast of the Project bridge site. No other active faults are mapped passing through or directly adjacent to the Project.

Based on the above the potential for ground surface rupture is considered negligible, baring fault rupture of an unknown fault below the Project. The Project site is shown in relation to the Alquist-Priolo Earthquake Fault Zone on Figure 4 in Appendix I.

11.2.2 *Liquefaction Potential*

Liquefaction is a process in which seismic shear waves cause an increase in the pore water pressure in a cohesionless (sand and some non-cohesive silts) soil strata. This increase in pore water pressure reduces the effective stress that confines the soil. The reduction in effective stress causes a reduction in the shear modulus of the soil, which in turn, results in increased soil deformation.

Also associated with liquefaction is a loss in bearing strength. In the case of full liquefaction, when the increase in pore water pressure reduces the confining stress to zero, the soil experiences a full loss of strength and undergoes large viscous deformations. Lateral spreading (large lateral deformation) is possible when liquefaction occurs in ground even with minimal slope. Primary factors that can trigger liquefaction are moderate to strong ground shaking, relative clean and loose granular soils, and saturated soil conditions. Liquefaction is generally limited to the upper saturated 50 feet of ground surface due to the increasing overburden pressure with depth.

Project site soils are documented as having a substantial proportion of cohesive material, for this reason it is expected that liquefaction will not be a significant issue for design. Subsequently, earthquake induced settlement is expected to be minimal for the project site.

11.2.3 *Seismic Slope Stability*

The Project site has no known history of subsidence, rock falls/landslides, or embankment failures due to seismic activity and no features consistent with these types of failures were observed during our site review or reported in available reports for the Project area.

11.2.4 *Tsunami Risk*

The Project is located approximately 2.8 miles from east shore of the San Francisco Bay and the ground surface elevations in the Project area are less than 60 feet in elevation. However, the site is not located within the tsunami inundation zone or hazard area shown on the California Tsunami Map, Alameda County (CGS, 2022c). The tsunami inundation zone is located west of a line defined by Union Pacific railroad line, which is located approximately 2.1 miles southwest of the Project site. Based on the above information, a tsunami hazard does not exist at the Project.

11.2.4.1 Seiche Risk

There are no confined bodies of water within or near the Project corridor. In addition, a potential seiche in the San Francisco Bay likely would be limited to 4 inches or less, based on the observations made during the 1906 San Francisco earthquake event (County of Alameda, 2010). Therefore, seiches are not considered to be a potential hazard for the Project area.

12. FOUNDATION RECOMMENDATIONS

The following recommendations are for the proposed Meekland Avenue-San Lorenzo Creek replacement, as shown on the Plans For The Improvement of Meekland Avenue received via electronic mail on July 28, 2023 (Wood Rogers, 2023) and are provided in Appendix V. The following

recommendations are provided in accordance with the American Association of State Highway and Transportation Officials (AASHTO) *Load and Resistance Factor Design (LRFD) Bridge Design Specification*s (2017) with California Amendments. Copies of calculations are provided in Appendix VI.

12.1 Deep Foundations – Cast-In-Drilled-Hole (CIDH) Piles

As depicted in the plans, both Abutment 1 and Abutment 2 will be supported by four 54-inch diameter CIDH piles. Based on the Foundation Plan (Sheet 67 of 93), the bridge is to be supported by two abutments, south - Abutment 1 (skew clockwise 45°00'00") and north - Abutment 2 (skew clockwise 41°56'00"). Shallow groundwater at the project site will likely need to be addressed through wet construction techniques.

Abutment 1 will have a single pile with 66-inch diameter isolation casing to minimize any potential interactions with the existing Trash Capture Device foundation. It is recommended that the annular space between the pile and casing be filled with a crushable material such as foam. Also, due to the abnormally high loading at this pile location, the required tip depth is below the depth investigated and it is recommended that a confirmation boring or Cone Penetration Test be advanced beyond the planned pile tip.

Information of the general foundation elevations and loading is presented in Table 8, factored design loads are presented in Table 9, foundation design recommendation are presented in Table 10. Copies of calculations including input parameters for lateral pile analysis are provided in Appendix VI.

Table 8. General Foundation Design Information

Support Location	Pile Type	Finished Grade	Cut-off Elevation	Pile Cap Size		Permissible Settlement under Service Load	No. Piles per Support
				B	L		
Abut 1	54" CIDH	60.49 ft	50.25 ft	6.50 ft	76.83 ft	2.00 in	3
Abut 1	54" CIDH in 66" Isolation Casing	60.49 ft					1
Abut 2	54" CIDH	60.42 ft	50.25 ft	6.50 ft	76.83 ft	2.00 in	4

Table 9. Foundation Factored Design Loads

Support No.	Service-I Limit State		Strength / Construction Limit State (Controlling Load Group)			
	Total Load per Support (kips)	Permanent Loads per Support (kips)	Compression		Tension	
			Per Support (kips)	Max. per Pile (kips)	Per Support (kips)	Max. per Pile (kips)
Abut 1	2,332	1,982	3,448	823	0	0
Abut 2	2,291	1,937	2,260	815	0	0

Note:
1) Extreme Event Limit State not applicable to Abutment Design

Table 10. Foundation Design Recommendations

Support Location	Pile Type	Cut-off Elevation (ft)	Service-I Limit State		Permissible Settlement under Service Load (in)	Required Nominal Resistance				Bottom of Casing Elevation (ft)	Design Tip Elevation (ft)	Specified Tip Elevation (ft)
						Strength / Construction		Extreme Event				
			Total Load per Support (kips)	Permanent Load per Support (kips)		Compression (kips) (φ=0.70)	Tension (kips) (φ=0.70)	Compression (kips) (φ=1.0)	Tension (kips) (φ=1.0)			
Abut 1	54" CIDH	50.25	2,332	1,962	2	1180	0	N/A	N/A	--	(a-1) -28 (c) -20 (d) -18	-28
Abut 1	54" CIDH in 66" Isolation Casing									32.00	(a-1) -37 (c) -20 (d) -19	-37
Abut 2	54" CIDH	50.25	2,291	1,937	2	1170	0	N/A	N/A	--	(a-1) -27 (c) -20 (d) -5	-27

Notes:

1. Design tip elevations are controlled by (a-I) Compression (Strength Limit), (c) Settlement, (d) Lateral Load.
2. Extreme Event Limit State not applicable to Abutment Design.
3. The CIDH Specified Tip Elevation shall not be raised.
4. Design Tip Elevation for Lateral Load is typically provided by the SD.

Table 11. Foundation Design Data – Meekland Avenue over San Lorenzo Creek

Support Location	Pile Type	Cut-off Elevation (ft)	Nominal Resistance		Bottom of Casing Elevation (ft)	Design Tip Elevations (elev.)	Specified Tip Elevation (elev.)
			Compression (kip)	Tension (kip)			
Abut 1	54" CIDH	50.25	1180	0	--	(a) -28 (c) -20 (d) -18	-28
Abut 1	54" CIDH in 66" Isolation Casing				32.00	(a) -37 (c) -20 (d) -19	-37
Abut 2	54" CIDH	50.25	1170	0	--	(a) -27 (c) -20 (d) -5	-27

Note:
1) Design Tip Elevations are controlled by (a) Compression (c) Settlement, (d) Lateral Load
2) The CIDH Specified Tip Elevation shall not be raised.
3) Design Tip Elevation for Lateral Load is typically provided by the SD.

13. INTEGRAL CURB

Due to the proximity of the existing Trash Capture Device Structure nearest to the west end of the south abutment an Integral Curb is planned to support the roadway and limit additional loading to the Trash Capture Device. The backfill is expected to consist of Controlled Low Strength Material (CLSM) or cellular concrete. CLSM is recommended to be Class IV with a cast density of 42 to 49 pounds per cubic foot and have a minimum compressive strength of 120 psi at 28 days. Compressive strength can be determined using ASTM C 495. If the CLSM is allowed to properly set up during construction, soil pressures on the back wall will be reduced to a negligible amount. Requirements for cellular concrete are referenced in Appendix VII.

14. RETAINING WALLS

Table 12 provides a summary of the data provided on the proposed retaining walls.

Table 12. Summary of Proposed Retaining Walls

Retaining Wall No.	Caltrans Standard Plan Type	Meekland Avenue Centerline		Range of Design Height (H)
		Begin Station	End Station	
RW 1	Type 5 (Case 1)	"M" line 29.47' LT Sta 50+95.95	"M" line 29.50' LT Sta 51+28,75	4-6'
		RW1 LOL 1+00	RW 1 LOL 1+33.36	
RW 2	Type 5 (Case 1)	"M" line 27.16' RT Sta. 0+56.04	"M" line 27.17' RT Sta. 0+77.04	4'
		RW 2 LOL 2+99	RW 2 LOL 2+21.00	
Notes: RW = Retaining Wall)				

The retaining wall data presented in the Wood Rodgers "Foundation Plan", "Retaining Wall 1 Layout" and "Retaining Wall 2 Layout" (Sheet 71, 97 and 98, Wood Rodgers 2023) were utilized to determine the Factored Gross Nominal Bearing Resistance and Net Permissible Contact Stress. Retaining Wall 1 and Reis planned as a Type 5 Standard Plan Wall with two stepwise wall sections; the southern section will be 6 feet tall and 16 feet long, the northern section will be 4 feet tall and 25.5 feet long. The wall will have a tied-in sidewalk cap and extending guard rail.

Information regarding the extreme limit state, strength limit state, and service limit sate for Retaining Wall 1 and Retaining Wall 2 can be found on Table 13, Table 14, Table 15. Table 16, Table 17 and Table 18

Table 13. Extreme Limit State Foundation for RW 1 Type 5 (Case 1)

Stationing (RW LOL)	Length (feet)	Design Height, H	Bottom of Footing Elevation (feet)	Footing Width, B	Minimum Footing Embedment Depth (feet)	Effective Footing Width for Extreme Limit State, I B' (feet)	Extreme Limit State Gross Uniform Bearing Stress I, $q_{g,u}$ (ksf)	Effective Footing Width for Extreme Limit State, II B' (feet)	Extreme Limit State Gross Uniform Bearing Stress II, $q_{g,u}$ (ksf)	Extreme Limit State Factored Bearing Resistance, q_R (ksf) φ_b (q_N)=1.00
RW 1	16	6’ 0”	52.75	7’ 9”	2.0	4.1	2.2	3.1	3.0	10.1
RW 1	17’ 4¼”	4’ 0”	54.50	7’ 3”	2.0	4.4	1.5	2.5	2.7	10.1

Table 14. Strength Limit State Foundation Data for RW 1 Type 5 (Case 1)

Stationing (RW LOL)	Length (feet)	Design Height, H	Bottom of Footing Elevation (feet)	Footing Width, B	Minimum Footing Embedment Depth (feet)	Effective Footing Width Strength Limit State, B' (feet)	Strength Limit State Gross Uniform Bearing Stress, $q_{g,u}$ (ksf)	Strength Limit State Factored Bearing Resistance, q_R (ksf) φ_b (q_N) φ_b= 0.45
RW 1	16	6’ 0”	52.75	7’ 9”	2.0	6.1	2.9	4.5
RW 1	17’ 4¼”	4’ 0”	54.50	7’ 3”	2.0	6.2	2.4	4.5

Table 15. Service Limit State Foundation Data for RW 1 Type 5 (Case 1)

Stationing (RW LOL)	Length (feet)	Design Height, H	Bottom of Footing Elevation (feet)	Footing Width, B	Minimum Footing Embedment Depth (feet)	Effective Footing Width for Service Limit State, B' (feet)	Service Limit State Net Bearing Stress (ksf)	Calculated Settlement at Net Bearing Pressure (Inches)	Total Permissible Settlement (Inches)
RW 1	16	6’ 0”	52.75	7’ 9”	2.0	6.1	1.8	0.3	1
RW 1	17’ 4¼”	4’ 0”	54.50	7’ 3”	2.0	6.2	1.4	0.3	1

Table 16. Extreme Limit State Foundation for RW 2 Type 5 (Case 1)

Stationing (RW LOL)	Length (feet)	Design Height, H	Bottom of Footing Elevation (feet)	Footing Width, B	Minimum Footing Embedment Depth (feet)	Effective Footing Width for Extreme Limit State, I B' (feet)	Extreme Limit State Gross Uniform Bearing Stress I, $q_{g,u}$ (ksf)	Effective Footing Width for Extreme Limit State, II B' (feet)	Extreme Limit State Gross Uniform Bearing Stress II, $q_{g,u}$ (ksf)	Extreme Limit State Factored Bearing Resistance, q_R (ksf) φ_b (q_N)=1.00
RW 2	9	4’ 0”	55.0	7’ 3”	2.0	4.4	1.5	2.5	2.7	10.1
RW 2	8	4’ 0”	56.0	7’ 3”	2.0	4.4	1.5	2.5	2.7	10.1
RW 2	4	4’ 0”	57.0	7’ 3”	2.0	4.4	1.5	2.5	2.7	10.1

Table 17 . Strength Limit State Foundation Data for RW 2 Type 5 (Case 1)

Stationing (RW LOL)	Length (feet)	Design Height, H	Bottom of Footing Elevation (feet)	Footing Width, B	Minimum Footing Embedment Depth (feet)	Effective Footing Width Strength Limit State, B' (feet)	Strength Limit State Gross Uniform Bearing Stress, $q_{g,u}$ (ksf)	Strength Limit State Factored Bearing Resistance, q_R (ksf) φ_b (q_N) φ_b= 0.45
RW 2	9	4’ 0”	55.0	7’ 3”	2.0	6.2	2.4	4.5
RW 2	9	4’ 0”	56.0	7’ 3”	2.0	6.2	2.4	4.5
RW 2	9	4’ 0”	57.0	7’ 3”	2.0	6.2	2.4	4.5

Table 17. Service Limit State Foundation Data for RW 2 Type 5 (Case 1)

Stationing (RW LOL)	Length (feet)	Design Height, H	Bottom of Footing Elevation (feet)	Footing Width, B	Minimum Footing Embedment Depth (feet)	Effective Footing Width for Service Limit State, B' (feet)	Service Limit State Net Bearing Stress (ksf)	Calculated Settlement at Net Bearing Pressure (Inches)	Total Permissible Settlement (Inches)
RW 2	9	4’ 0”	55.0	7’ 3”	2.0	6.2	1.4	0.3	1
RW 2	9	4’ 0”	56.0	7’ 3”	2.0	6.2	1.4	0.3	1
RW 2	9	4’ 0”	57.0	7’ 3”	2.0	6.2	1.4	0.3	1

15. ABUTMENT RECOMMENDATIONS

Per the Memo to Designers 1-47 (Caltrans, 2010), abutment substructures are also to be designed using he AASHTO LRFD Bridge Design Specifications with the California Amendments. Per Section 11.5.1 of the California Amendments, abutment substructures are to be designed to withstand lateral earth and water pressures, including any live and dead load surcharges, the self-weight of the wall, temperature and shrinkage effects, and earthquake loads.

15.1 Abutment Drainage

Drainage behind the two abutment walls is essential for the stability of the structures. Each abutment wall is recommended to have a geocomposite drainage system providing positive drainage to daylight. The drainage system should be based on Caltrans 2022 Standard Plans B9-6 and B0-3 Detail 3-1 (Caltrans, 2022b). This drainage system must be maintained to ensure it does not clog with debris and prevent a buildup of hydrostatic pressure.

15.2 Approach Fills

Approach fills, defined as fill within 150 feet of each bridge abutment (“M” Line, Stations 48+55 to 51+60), are to be constructed per Section 19 of the *Standard Specifications* (Caltrans, 2022c).

15.3 Slope Stability

If future modifications require steeper fill slopes, these embankments should not be constructed until additional stability analyses are performed to show they are stable. Fill slopes steeper than 2H:1V that are determined to be stable from stability analyses would require additional slope erosion protection to prevent surficial erosion from surface water.

16. NOTES FOR SPECIFICATIONS

16.1.1 *Structural Backfill*

The structural backfilled should conform to the construction techniques described in Section 19-3.03E “Structure Backfill” of the 2022 Caltrans Standard Specifications. Backfill should be compacted to a minimum of 95 percent of the maximum wet density as determined by California Test Method (CTM) 216 or ASTM D1557.

In addition to the minimum requirements stated in Section 19-3.02C "Structure Backfill" of the 2022 Caltrans Standard Specifications (Caltrans, 2022b), the following minimum material requirements should also be met in order to use the provided soils design information for structure backfill material:

- Maximum Plasticity Index (PI) of 6
- Minimum Sand Equivalent of 20
- Minimum R-value of 26

The following soil properties and equivalent fluid pressures may be used to determine the soil loading on the abutments and retaining walls:

- Total Unit Weight of Soil (γtot) = 120 pounds per cubic foot (pcf)
- Internal Angle of Friction (ϕ) = 34°
- Undrained Shear Strength (c) = 0 pounds per square foot (psf)
- Active Equivalent Fluid Pressure = 34 psf
- At-rest Equivalent Fluid Pressure = 53 psf
- Passive Equivalent Fluid Pressure = 350 psf

These abutments and retaining walls are considered yielding structures and will allow the development of active earth pressures, and should be designed using active equivalent fluid pressures to determine the lateral soil loading.

16.1.2 *Controlled Low Strength Material*

Controlled Low Strength Material (CLSM) Fill should conform to the requirements shown in Appendix VII for Cellular Concrete Lightweight Embankment Material. Materials used should at a minimum meet the requirements of Class IV Cellular Concrete with a density between 42-49 pounds per cubic foot, and a minimum compressive strength at 120 days of 100 pounds per square inch.

CLSM should be installed in 2-foot lifts and allowed to properly set between lift placements. CLSM should extended behind the back of wall facing beyond the critical surface angle for the retained soils, or the height of the retaining wall plus 2 feet. Benching will reduce the required volume of CLSM and benches should maintain a minimum width of 2 feet. Cellular concrete placement should extend under the sidewalk at a minimum thickness of 2 feet, to avoid an abrupt change support modulus.

17. NOTES FOR CONSTRUCTION

17.1 Timber Piles

As-built information shows the previous bridge (previous to 1926) was supported on timber piles. Exploratory excavation should be completed during construction to determine the location of the timber piles, and the timber piles should be removed prior to the main pile construction. Timber pile tops may be below elevation 50 feet, and may be offset from the center of new piles. The following steps should be completed prior to main pile construction:

1) Excavate the abutments footing down to elevation 50 feet and look for the top of timber piles within 6 feet diameter of the planned new pile center.
    a. If timber pile tops are found, drill an 18-inch diameter boring on the center of the timber pile to the pile tip elevation or 0 feet elevation. Backfill with 2-sack slurry to elevation 50 feet.

b. If no pile tips are found, got to step 2.

2) At the location of the new pile drill a 6-foot diameter boring on center of the new pile down to elevation 30 feet. Have an engineer or geologist look for the top of timber piles within the boring.
   a. If timber pile tops are found, drill an 18-inch diameter boring on the center of the timber pile to the pile tip elevation or 0 feet elevation. Backfill with 2-sack slurry.
   b. If no pile tops are found, backfill the boring with 2-sack slurry to elevation 50 feet.
3) After completion of steps 1 and 2, construct the new CIDH pile.

17.2 CIDH Pile Construction

Excavations below groundwater would be expected to encounter seepage and infiltration of groundwater into any open excavations. CIDH pile excavation are expected to require slurry drilling methods. CIDH pile drilling appears feasible with conventional drilling equipment.

Shallow, unconfined groundwater was encountered in Boring R-21-001 at an elev. 30 feet and in Boring R-21-002 at an elev. 24 feet. Groundwater would be expected to be close to the San Lorenzo Creek water elevation and to be at higher elevations away from the creek. The groundwater surface elevation would be expected to vary with the amount of precipitation, irrigation, and other factors.

17.3 Abutments Construction

The proposed abutments are below the observed groundwater elevations and foundation excavations below groundwater are expected to encounter seepage. Seepage within lean clay with sand below a depth of 25 feet is likely. Measures such as berms and diversion ditches should be incorporated to prevent stormwater runoff from entering the excavations. For dry season construction, the control of seepage within excavations is expected to require sump pumping, though a seal course may be required.

17.4 Approach Fills

Excavation, backfill, and roadway grading work shall be performed in accordance with Section 19, Earthwork, of the Caltrans 2018 Standard Specifications (Caltrans, 2018c).

17.4.1 *Site Preparation and Grading*

The site preparation and grading operations for the proposed areas to receive new pavements, slope widenings, and other permanent structural improvements should commence with the removal of vegetation and the stripping of the surficial organic soils. Based on the WRECO 2021 field investigation, minor depths of topsoil, consisting of the natural accumulation of native grasses, brush and trees are anticipated along the margins of Meekland Avenue. Removal of the organic matter up to depths of 24 inches will generally be required to prepare the area for receiving fill and structural pavement sections. Organic-laden soils free from debris may be stockpiled for later use in non-structural areas, but such material should not be used for structure fill or areas receiving structural pavement sections.

Any voids left by the removal of existing pavements or other buried objects, including existing site improvements, abandoned buried utilities, and root balls should be cleared of loose soils and properly backfilled as described below. Stripped vegetation and debris should be removed from the areas receiving structural improvements. Clearing and grubbing operations should be performed in accordance with recommendations presented in this report and with the requirements specified in the Section 19, Earthwork, of the Caltrans 2022 Standard Specifications (Caltrans, 2022c).

After clearing and grubbing, any exposed subgrade soils, which will receive new structural pavement sections, should be scarified to a minimum depth of 12 inches, moisture conditioned, and compacted to at least 95% relative compaction. Relative compaction refers to the in-place wet density of a soil and is expressed as a percentage of the maximum wet density of the same material, as determined by the CTM 216, or in-place dry density as determined by ASTM D 1557 test procedures. If unsuitable materials (such as organic, soft, and/or yielding soil) are encountered during grading procedures, these areas should be stabilized prior to fill placement or paving. The depth and extent of required soil removal and remedial repair should be reviewed and approved in the field by the Geotechnical Engineer of Record.

17.4.2 *Structure Fill Placement*

In areas where new fill is to be placed onto existing fill slopes or natural slopes exceeding 5H:1V, a full bond between the two materials will need to be developed by placing the new fill on discrete horizontal benches that are cut fully into the existing slope and below any loose/soft or otherwise unsuitable materials (as per Section 19 of 2022 Caltrans *Standard Specifications* [Caltrans, 2022c]). The horizontal benches shall have a maximum key height dimension of 2 feet vertical.

In areas where existing utilities are present within the limits of the embankment fill, complete removal of the utility trench backfill is recommended, followed by subsequent replacement with backfill compacted to 95% of the maximum dry density in accordance with ASTM D 1557. Placement of embankment fill can then proceed when these areas are brought up to grade.

Structure backfill should be placed and compacted in layers not exceeding 12 inches in un-compacted thickness, moisture-conditioned, processed as necessary, and compacted unless demonstrated by the Contractor that thicker lifts can be compacted to the required in-place density. The optimum moisture content and maximum dry density for each soil type should be determined in accordance with ASTM D 1557. The compacted in-place density should not be less than 95% of the maximum dry density. These criteria should be obtained for structure backfill materials used within the structure areas. Mixing of the soils and water should be performed by reprocessing to the full depth of the lift and compacted to achieve the required in-place density.

If the native soils from the excavation appear to be saturated from either perched or transient groundwater and/or have a water content above the optimum moisture content as determined by ASTM D 1557 methods, and if these excavated soils are to be used for backfill, they must be brought to the optimum moisture content to obtain the minimum required compaction. Typical methods of achieving this include: drying soils in wind rows or blending them with dry import fill to reduce the overall moisture content of the blended fill material.

17.4.3 *Excavations and Shoring*

All excavation and backfill work shall be performed in accordance with Section 19 of 2022 Caltrans *Standard Specifications* (Caltrans, 2022c).

The existing site soils can be classified as the State of California Division of Occupational Safety and Health (Cal/OSHA) Type C (existing fill, disturbed soils, and surficial soils) and may be prone to cave-in during construction activities. Temporary construction backslopes should be reviewed by a competent person during construction in evaluation of stability and for possible supplemental support (e.g., local shoring in areas of soft/weak materials). It is also the contractor's responsibility to assess the actual

conditions in the field at the time of construction and to make its own interpretation of the Cal/OSHA soil/rock type for design of the excavation and trench slopes, or the need for excavation shoring.

Open excavations will possibly need benching and shoring during construction. Temporary erosion control measures, such as a flash coating, may be required for excavations open for extended periods. Temporary construction slopes of 1:1 or flatter are generally considered reasonable for soils above groundwater, though loose sandy soils may require 2:1 or flatter slopes. Excavation below groundwater will likely require shoring.

Surcharge loads such as trench spoils, equipment, etc., should not be placed adjacent to an open excavation (within a distance of 1.5 times the height of the excavation). Where loads are planned adjacent to proposed excavations, the conditions should be evaluated for the necessity of shoring, bracing, or underpinning. In general, any temporary or permanent structure closer to an open excavation than 1.5 times the excavation's height should be evaluated. This distance may be greater if a localized area of less competent material is encountered.

If excavations are shored, then the soil loading applied to the shoring will be dependent on the depth of the excavation, proximity to surcharge loading, groundwater depth, and type of shoring employed. Cantilevered shoring should be limited to a practical height of 8 feet of exposed face. Exposed heights greater than this will generally require a mid-height support (whaler and strut or tie-back anchor) to prevent excessive deflections from vehicular and construction equipment loading.

Shoring made in or within a distance equal to the height of the shoring of the travel way, shall have at a minimum a 250 pound per square foot (pdf) infinite surcharge loading applied to the side(s) adjacent to the loading to account for vehicular traffic. If construction equipment is to pass within the height of the shoring, a minimum of a 500 pound per square foot (psf) infinite surcharge shall be applied to the shoring design as well. Should large point loads also be applied such as crane outriggers, large truck wheels, or large excavator tracks adjacent to the shoring, the loading shall be included in the shoring design and a method, such as Boussineq or other generally accepted method of determining lateral surcharge loading will be used to determine the additional lateral loading from the vertical surcharge. WRECO should be allowed to review the excavation plans for conformance with the design parameters and recommendations contained in this report.

17.5 New Structural Pavement Sections

Currently the profile of the new bridge and roadway approaches is going to be raised and new structural pavement sections will be required as part of this work. R-value testing result south of the bridge area indicates a roadway subgrade soil with an R-value of 9 (WRECO, 2022).

Recommendations for new pavement sections have been provided for the design TI of 8 and design R-value of 9. Flexible structural pavement design alternatives were determined using the web-based program CALFP-Web (University of California, 2021). The pavement sections were determined using the Gravel Equivalency (GE) Methodology for a 20-year design life. Both a conventional flexible pavement section and one incorporating a Subgrade Enhancement Geotextile (SEG) (Class B1 or B2) to reduce the AB required are provided. These values are provided in Table.

Table 19. New Flexible Structural Pavement Sections with Native Subgrade Soils

Section Type	Design TI	Design R-value	Minimum HMA Thickness (feet)	Minimum Class 2 Aggregate Base (feet)
HMA	8.0	9	0.40	1.40
HMA with SEG	8.0	20	0.40	1.15
Notes: TI = Traffic Index; HMA = hot mix asphalt; SEG = subgrade enhancement geotextile				

New flexible structural pavement sections were also determined for the same range of TI values using an R-value of 25, which represents readily available structure fill. These values are provided in Table.

Table 20. New Flexible Structural Pavement Sections with Structure Fill

Design TI	Assumed Design R-value	HMA (Type A) Thickness (feet)	Class 2 Aggregate Base (feet)
9.0	25	0.45	1.20
Notes: TI = Traffic Index; HMA = Hot Mix Asphalt			

Pavement design and construction should conform to the requirements of the Caltrans Standard Specifications, 2018 edition. All native material or import fill used below the new pavement sections should possess an R-value equivalent to or greater than the design R-value (9).

All trench backfill for utilities and pipes underlying paved areas should be properly placed and compacted to at least 95 percent compaction (ASTM D1557) to provide a stable pavement subgrade. The upper 30 inches of all pavement subgrades should be moisture conditioned and compacted to at least 95 percent relative compaction (ASTM D1557), per Caltrans Standard Specifications (2022c).

Copies of the structural pavement calculations are included in Appendix V.

18. LIMITATIONS

This Bridge Foundation Report was developed using the bridge and wall layouts provided in the project plans (Wood Rodgers, Inc., 2023) and changes to these plans will require reevaluation of the conclusions and recommendations contained herein. The report was developed in accordance with generally accepted geotechnical engineering principles and practices. No other warranty, expressed or implied, is made as to the conclusions and professional recommendations made in this report.

This *Bridge Foundation Report* is intended for use with the Meekland Avenue Bridge located in the unincorporated area of Cherryland, Alameda County, California. Any proposed designs or changes to the location of the proposed new improvements, however slight, should be brought to our attention so that we may determine how they may affect our conclusions and recommendations. The conclusions and

recommendations contained in this report are based upon the data relating only to this specific Project and locations discussed herein.

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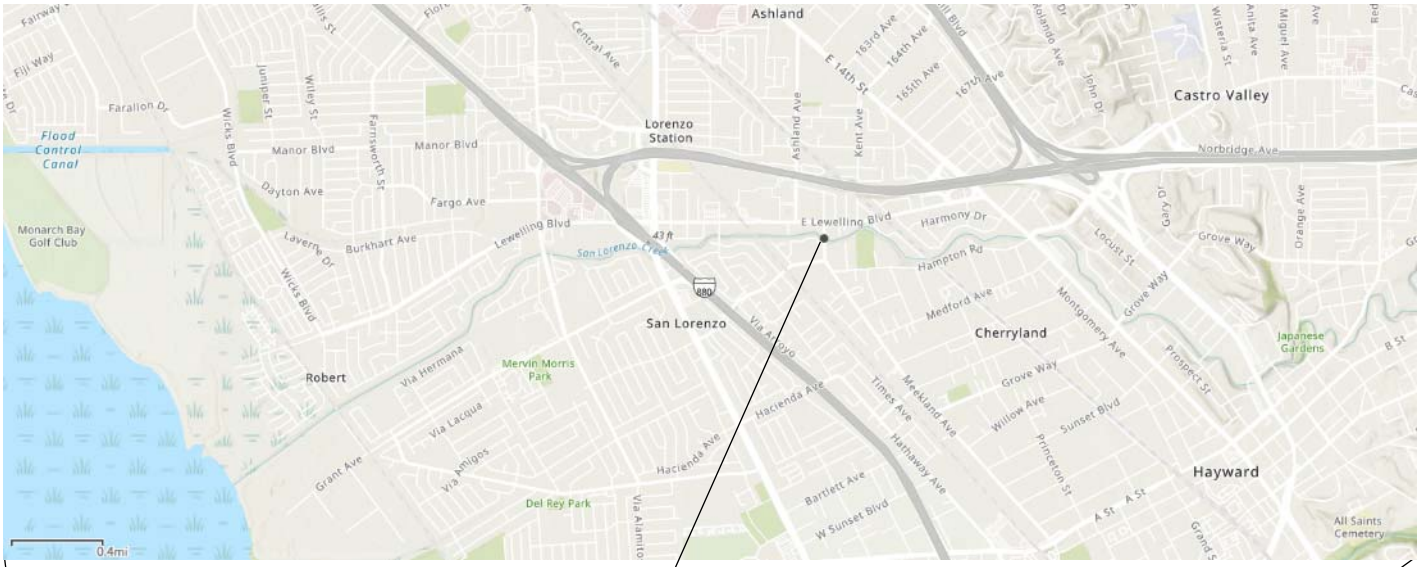
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20. REPORT COPY LIST

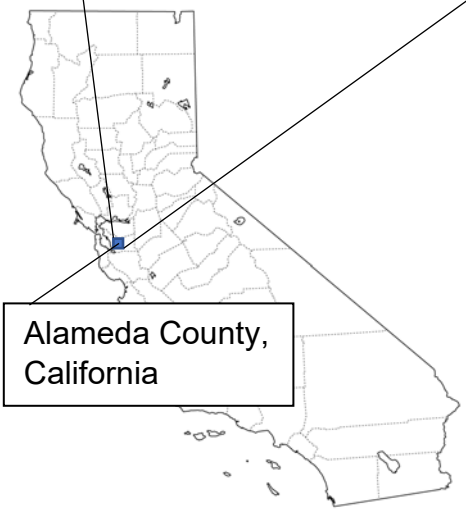
This report was prepared for the Alameda County for the design of the Meekland Avenue Bridge Replacement Project.

Appendix I Figures



PROJECT LOCATION

N



Alameda County, California

Figure 1
Vicinity Map

Meekland Ave. Corridor Improvements-San Lorenzo Creek Crossing

Alameda County, California

WRECO Project No. P20101

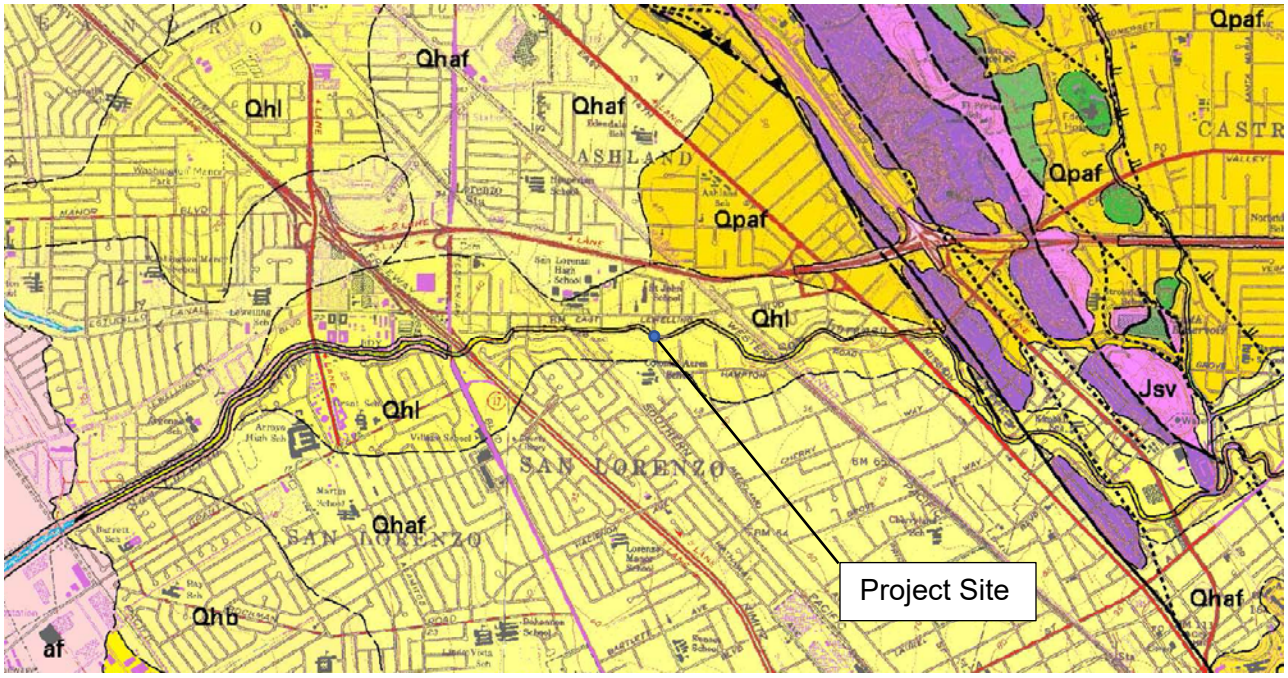


Figure 2
Boring Location Map

Meekland Ave. Corridor Improvements-San Lorenzo Creek Crossing

Alameda County, California

WRECO Project No. P20101



0 1 2 3 4 5 6 7 8 9 10 11 THOUSAND FEET

CONTOUR INTERVAL 50 METERS

Derived from USGS Misc. Field Studies, MF-2342, Ver. 1.0 (R.W. Graymer, 2000)

LIST OF MAP UNITS

Surficial Deposits

af — **Artificial fill (Historic)**

Qhaf — **Alluvial fan and fluvial deposits (Holocene)**

Qhb — **Basin deposits (Holocene)**

Qhl — **Natural levee deposits (Holocene)**

Qpaf — **Alluvial fan and fluvial deposits (Pleistocene)**

KJk — **Knoxville Formation (Early Cretaceous and Late Jurassic**

Jsv — **Keratophyre and quartz keratophyre (Late Jurassic)**

Jgb — **Gabbro**

Contact-- Depositional or intrusive contact, dashed where approximately located, dotted where concealed

Fault-- Dashed where approximately located, small dashes where inferred, dotted where concealed, queried where location is uncertain.

Reverse or thrust fault-- Dashed where approximately located, dotted where concealed

WRECO

N

Figure 3
Geology Map

Meekland Ave. Corridor Improvements-San Lorenzo Creek Crossing
Alameda County, California

WRECO Project No. P20101

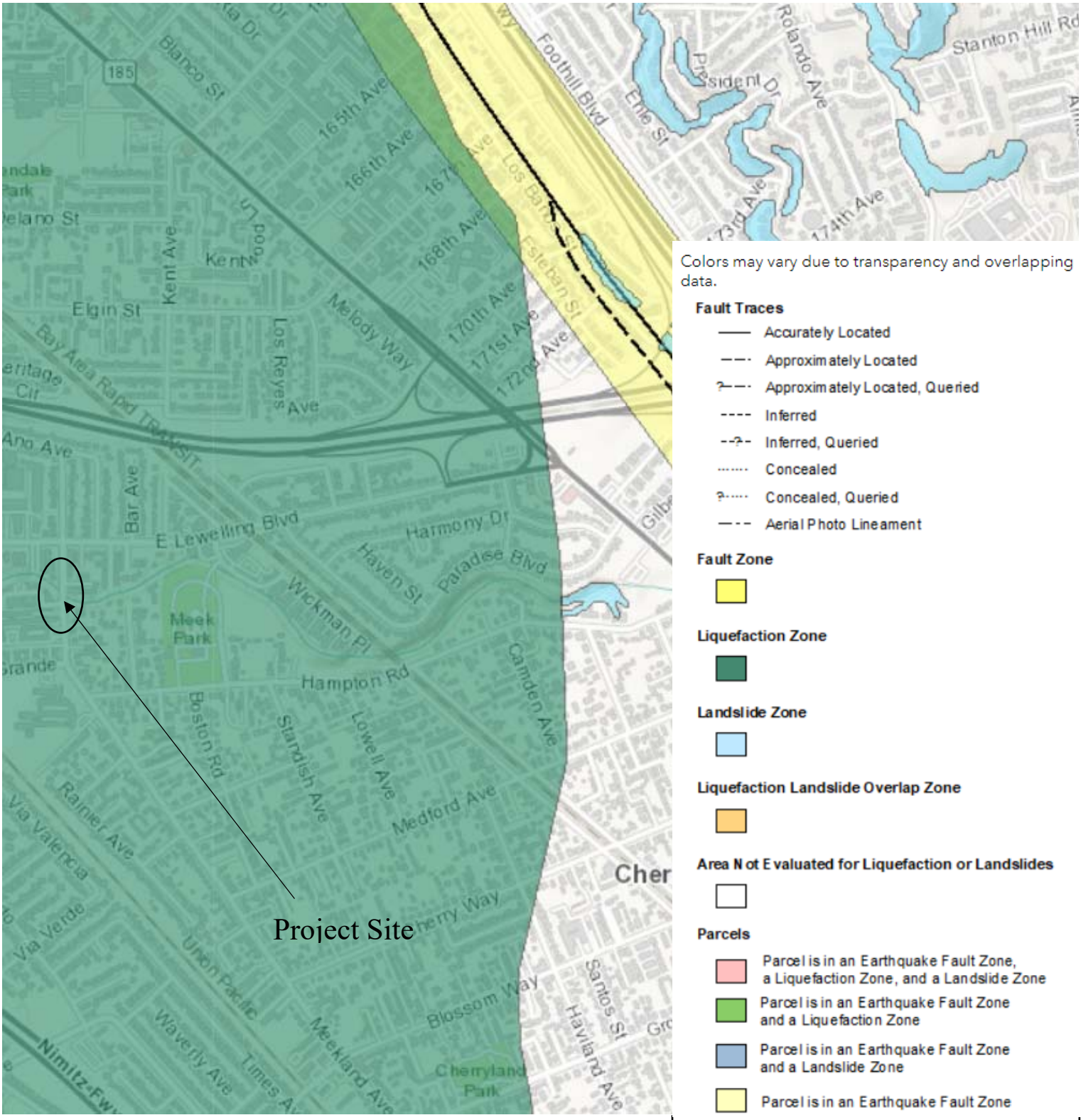


Figure 4
Alquist-Priolo Fault Hazard Zone Map

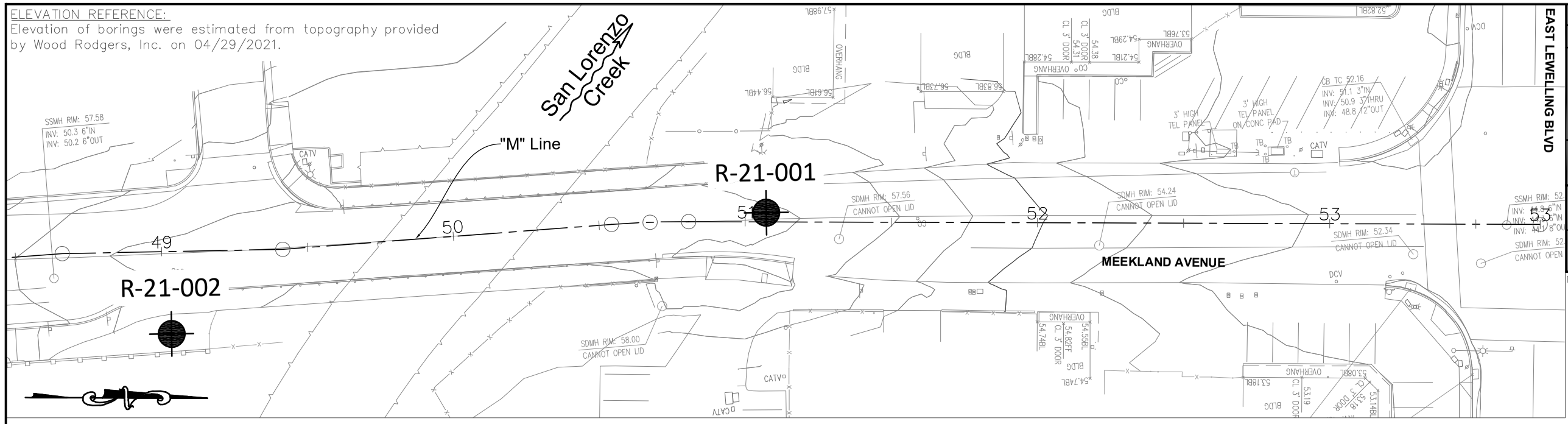
Meekland Ave. Corridor Improvements-San Lorenzo Creek Crossing

Alameda County, California

WRECO Project No. P20101

Appendix II Log of Test Borings

ELEVATION REFERENCE:
Elevation of borings were estimated from topography provided by Wood Rodgers, Inc. on 04/29/2021.



PLAN
1"=20'

PROFILE
HOR. 1"=10'
VERT. 1"=10'

ELEVATION (feet)

R-21-002 (Sta 49+02.9, 28.7 ft Rt)

Ground Elev. 58.5'

Depth	Blows	Recovery	Sample	Lab
5	7	1.4	PA	PI
10	10	1.4		
15	9	1.4		
20	9	1.4	PA	PI
25	5	1.4		
30	17	1.4	4	
35	12	1.4	PA	PI
40	7	1.4		
45	19	1.4		
50	9	1.4	PI	
55	17	1.4		
60	16	1.4		
65				
70	20	1.4	PI	

GWS Elev. 24.5 ft 03/04/2021

- Duff/Topsoil dark brown.
- CLAYEY SILT (ML/CL); mottled dark and light brown; moist.
- Light brown; moist; low plasticity fines.
- Lean CLAY with SAND (CL); stiff; mottled light brown and yellowish brown; dry grading to moist; little fine SAND; mostly fines. PP = 2.0–2.5 tsf.
- Dark olive brown; dry grading to moist; PP = 1.5–1.9 tsf.
- Well-graded SAND with CLAY (SW-SC); medium dense; yellowish brown; wet.
- Lean CLAY with SAND (CL); very stiff; dark olive brown; moist; PP = 2.0–2.25 tsf.
- Well-graded SAND with CLAY (SW-SC); medium dense; light yellowish brown; wet; some fines. PP = 2.0 tsf.
- Lean CLAY with SAND (CL); stiff; mottled medium brown and grayish brown; moist; little fine SAND; mostly fines; PP = 1.25 tsf.
- Light to medium brown; moist to wet; high plasticity fines; PP = 0.75–1.0 tsf.
- Very stiff; grayish brown; moist; high plasticity fines; PP = 2.75 tsf.
- Olive gray; moist; little fine SAND; mostly high plasticity fines; PP=2.75 tsf.
- Stiff; weakly mottled light grayish brown and brown; moist; high plasticity fines; PP = 1.1 tsf.
- SILTY SAND (SM); medium dense; light brown to grayish brown; wet; mostly fine SAND; low plasticity fines; PP = 0.6–1.0 tsf.
- Lean CLAY with SAND (CL); stiff; mottled light grayish brown to brown; moist; high plasticity fines; PP = 1.05 tsf.
- Very stiff; moist; PP = 2.8 tsf.
- Light brown with varigated whitish brown; moist; trace medium SAND; medium plasticity fines; PP = 2.0 tsf.
- Slightly mottled light brown and brownish gray; wet to moist; medium plasticity fines; PP = 2.4 tsf.

03-03/04-21
Terminated at Elev -13.5'
ERi = 101%

R-21-001 (Sta 51+07.3, 3.2 ft Lt)

Ground Elev. 58.1'

Depth	Blows	Recovery	Sample	Lab
5	5	1.4	CR	
10	11	2.5		
15	25	2.5		
20	19	2.5	M	UW UC
25	13	2.5		
30	23	2.5	4	
35	12	2.5	M	UW UC
40	17	2.5	M	UW UC
45	14	2.5	M	UW
50	22	2.5	M	UW UC
55	16	1.4	M	UW
60	55	1.4	PA	PI
65	13	1.4		
70	24	1.4	PI	
75	29	1.4		
80	14	1.4		

GWS Elev. 30.1 ft 03/03/2021

- 5.6 — ASPHALT CONCRETE (8 in).
- AGGREGATE BASE (3 in).
- SANDY SILT (ML); grayish brown; dry to moist.
- Lean CLAY with SAND (CL); stiff; dark olive brown; moist; PP = 1.25 tsf.
- Moist; medium plasticity fines; PP = 1.6 tsf.
- CLAYEY SAND (SC); medium dense; slightly mottled dark brown and gray; moist; low plasticity fines; PP = 3.25 tsf.
- Lean CLAY with SAND (CL); very stiff; dark olive brown; moist; PP = 2.5 tsf. Stiff; slightly mottled dark olive brown; medium to high plasticity fines; PP = 1.5 tsf.
- PP = 1.2 tsf.
- Lean CLAY (CL); very stiff; olive brown; moist; medium to high plasticity fines. PP = 2.0 tsf.
- Medium stiff; mottled dark olive brown and yellow; PP = 0.6 tsf.
- Very stiff; light yellowish brown; PP = 2.0 tsf.
- PP = 2.6 tsf.
- SANDY SILT (ML); stiff; light yellowish brown; moist; PP = 1.0–1.25 tsf.
- SANDY lean CLAY (CL); stiff; light olive brown; moist; some fine SAND; mostly low plasticity fines; PP = 1.3 tsf.
- Very stiff; grayish brown and light brown; few fine SAND ; PP = 2.4–2.5 tsf.
- SILTY SAND with GRAVEL (SM); very dense; light brown; wet; little fine to coarse, subangular to angular GRAVEL ; nonplastic fines.
- Lean CLAY (CL); stiff; mottled grayish brown and light yellowish brown; moist; medium plasticity fines ; PP = 1.0–1.2 tsf.
- SANDY lean CLAY (CL); very stiff; light yellowish brown; moist; few fine SAND ; medium to high plasticity fines ; PP = 3.25–3.75 tsf.
- Hard; mottled brown and gray; PP = 4.0–4.25 tsf.
- Stiff; light yellowish brown; few medium SAND ; PP = 1.4–1.6 tsf.

03-03-21
Terminated at Elev -23.3'
ERi = 101%

49+00 51+00 52+00

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	ALA			99	99

CERTIFIED ENGINEERING GEOLOGIST — DATE 7/25/2023

PLANS APPROVAL DATE

REGISTERED GEOLOGIST — DAVID A. KITZMANN — No. 2412 — Exp. 12/31/2021 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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

WRECO
7807 LAGUNA BLVD., SUITE 400
ELK GROVE, CA 95758
WRECO JOB NO: P20101.010

WOOD RODGERS, INC.
3301 C STREET, BUILDING 100-B
SACRAMENTO, CA 95816

Notes:

1. Field classification of soils was in accordance with the Caltrans Soil & Rock Logging, Classification, and Presentation Manual (2010 Edition and 2018 Errata).
2. 1.4" samples were taken using a 1.375" split barrel sampler per Standard Penetration Test (SPT) performed in accordance with ASTM D 1557–11. 2.4" samples were taken using a 2.49" split barrel sampler per Modified California Split Barrel Test performed in accordance with ASTM D 3550.
3. 1.4" and 2.4" samples were taken with an automated hammer system consisting of a hammer automated of a hammer weight 140 lbs. free falling a distance of 30". Autohammer energy ratio (ERi) measurements indicate an ERi=101%.
4. Whole number blow counts ("N") represent the "standard penetration resistance" interval in accordance with ASTM D1586–11. Where less than 1 foot of penetration is achieved, the blow count shown is for that fraction of the "standard penetration resistance" interval actually penetrated.
5. The blow counts shown on the logs are the raw blow counts which have not ben corrected for hammer energy, sample size, overburden, or any other correction factor. The apparent density of granular soil is on a corrected Standard Penetration Test N60 value.
6. Groundwater surface elevations in the borings indicated on the Log of Test Boring Sheet reflects the fluid level in the borings on the specified date. The groundwater surface elevation is subject to seasonal fluctuations and may occur at higher or lower elevations depending on the conditions at any particular time.
7. Boring locations were measured in the field based on site existing features and topographic survey by LCC Engineering & Surveying, Inc. Electronic media for plan view provided by Wood Rodgers, Inc. on 04/29/2021.

ENGINEERING SERVICES		GEOTECHNICAL SERVICES	
FUNCTIONAL SUPERVISOR: D. KITZMANN	DRAWN BY: M. NICOLETTA CHECKED BY: FPT	FIELD INVESTIGATION BY: J. OLSSON	DATE: 03-03/04-2021

PREPARED FOR ALAMEDA COUNTY

D. KITZMANN, PROJECT ENGINEER

BRIDGE NO. XXX-XXXX
POST MILE XXX

MEEKLAND AVENUE BRIDGE AND CORRIDOR IMPROVEMENTS
LOG OF TEST BORINGS

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU XXXXXX
EA XXXXXX

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 99 OF 99

FILE => $REQUEST
USERNAME => $USER
DATE PLOTTED => $DATE
TIME PLOTTED => $TIME
6/21/2021 2022 0214 P20101 Meekland LOTB v0.3 MN.dwg

Driveway

C.M. Brown

M.S. Faria

San Lorenzo Creek

N

Drainage openings here, see 8½"x13" detail sheet

New Bridge to be constructed

Old Bridge

℄ Meekland Ave.

℄ Bridge

To Hayward

℄ Meekland Ave.

To be graded to meet existing road 200' from bridge

Sta 4+375

55.04 Crown Roadway

Existing 8" W.I. water pipe

Existing 8" W.I. gas pipe

Existing 12" W.I. gas pipe

Expansion joint

Existing 8" W.I. gas pipe

Existing 8" W.I. water pipe

Sta 2+915

55.67 Sidewalk

54.15 Gutter

54.84 Gutter

55.47 Sidewalk

54.75 Gutter

Sidewalk

One Bronze Name Plate on post, See specifications

One Bronze Name Plate on post, See Specifications

To Oakland

To be graded to meet existing road 200' from bridge

℄ Meekland Ave.

Varies

35'0"

32'0"

Drainage openings here, see 8½"x13" detail sheet

All deck grades raised 0.04 ft. because of ½" increase of slab thickness on steel span. For vertical curve grades see sheet 2.

ALL Property this side to H.W. Meek Estate, Inc. Colonial Acres.

16'-0" 16'-0"

6'-0" 10'-0" 10'-0" 6'-0"

6"

4" Compacted gravel

1½:1

1½:1

TYPICAL SECTION OF ROADWAY APPROACH
Scale:- 1"=5' Hor. 1"=2' Vert.

To Hayward

To Oakland

℄ Bridge

For revised parapet see sheet 3A

Exp. Jt.

Parapet and Sidewalk Slab removed

Abutments poured with square ends to El 49.00

El. 44.0

El. 44.0

El. 36.0

Profile Curb Line West Side

Profile Curb Line E.S.

℄ Elev. 30.0

Elev. 30.5

28.0

℄ Elev. 30.0

For foundation materials and final pier data see sheet 6A

11.5 11.8 12.5 9.0 10.0 8.2

ELEVATION

55 50 45 40 35 30 25 20 15 10 5

SIDE ELEVATION OF BRIDGE
Scale: 1"=10'

LOCATION OF WORK

HAYWARD

SAN LORENZO CREEK

SAN LORENZO VILLAGE

LOCATION MAP
SCALE IN MILES

CONTRACT EXECUTED SEPT. 27, 1926
ENTIRE JOB ACCEPTED MAY 31 1927

24A 48Y

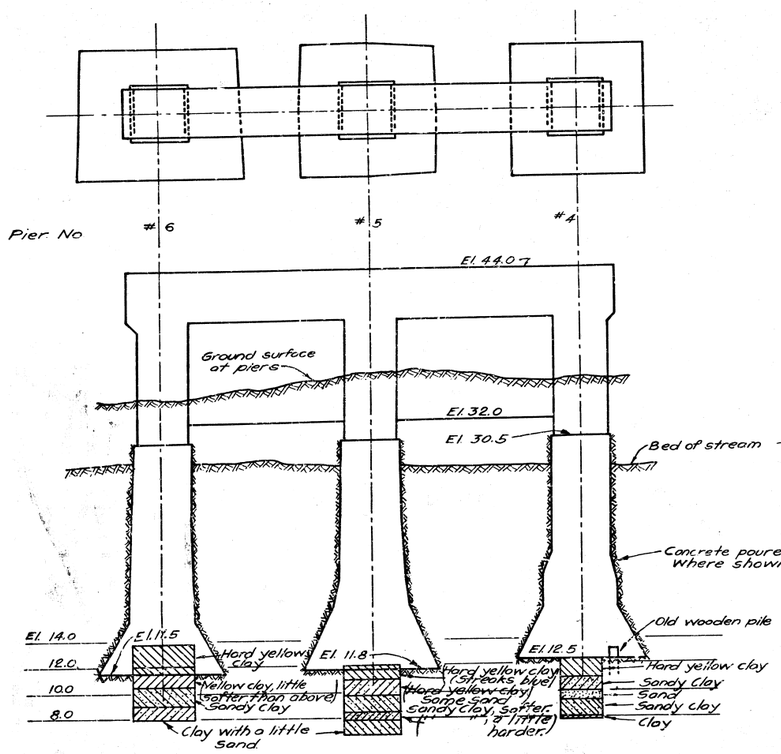
DE 36/6 32

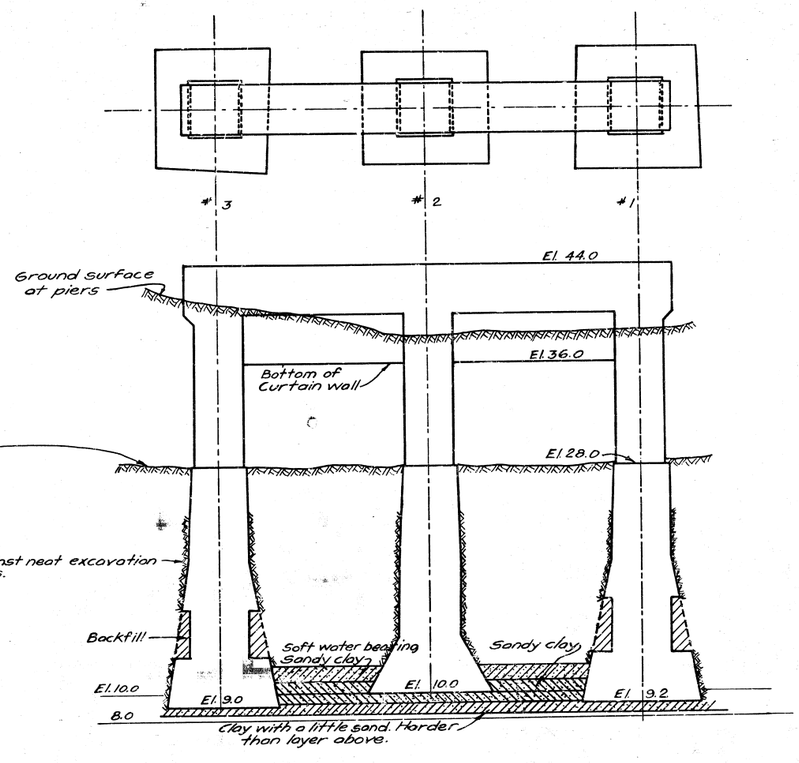
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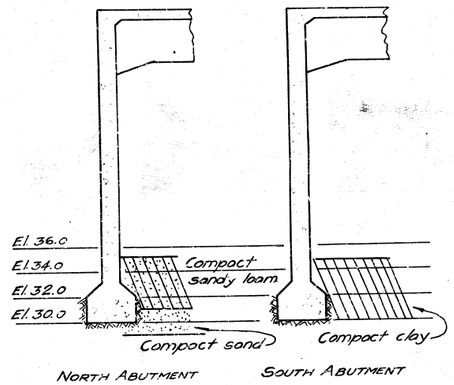
ALAMEDA COUNTY CALIFORNIA	
GEORGE A. POSEY COUNTY SURVEYOR 404 FIFTH STREET OAKLAND	
MEEKLAND AVE. BRIDGE 8-16-5 PLAN AND ELEVATION	
APPROVED [signature]	DATE August 1926
Drawn AAE WRD / Traced AAE WRD / Checked [illegible]	S/E 1" = 10'

Specif # 926 Sheet 1 of 6 Sheets 503-24

456







ABUTMENT CROSS SECTIONS

Notes:

For horizontal cross sections of pier excavations see loose leaf notes on construction by G.T. 1926.

Abutments constructed essentially as shown on contract drawings.

No water was encountered in abutments. Water was present in all pier footings, but was removed and a two inch layer of gravel deposited on the bottom of footing before any concrete was deposited.

Footing Areas 113.4 Sq. Ft. 114.5 Sq. Ft. 110.2 Sq. Ft. 88.2 Sq. Ft. 90.0 Sq. Ft. 93.1 Sq. Ft.

SOUTH PIERS HAYWARD SIDE

NORTH PIERS OAKLAND SIDE

114.5 / 90.1 × 1.68 = 2.14 tons/sq. ft.

FOUNDATION PRESSURES PIER No. 4.

Dead Load	1.39 tons per sq. ft.	1.90
Live Load	.45	.62
Backfill	.62	.85
Total	2.46	2.37
Original earth pressure	1.23	1.65
Abnormal pressure	1.23	1.29
" "	1.68 Center Pier (#5)	

PIER CONSTRUCTION

Total □' of footings · 609.4 □'
Av. □' of footings 101.5 1'

Total Area of deck of center spans plus ½ of both approach spans (Sidewalks weighted ½) 3205 □' — Area supported by 6' main footings

1 □' of footing supports 5.27 □' of deck

24A 48Y
DL 36 Pg 32
7/10

ALAMEDA COUNTY CALIFORNIA	
GEORGE A. POSEY COUNTY SURVEYOR 48 FIFTH STREET OAKLAND	
MEEKLAND AVE. BRIDGE B-16-3	
PIER AND ABUTMENT CONSTRUCTION	
APPROVED	DATE Dec 1926
Drawn G.T. / Traced G.T. / Checked	Scale 1" = 5'-0"

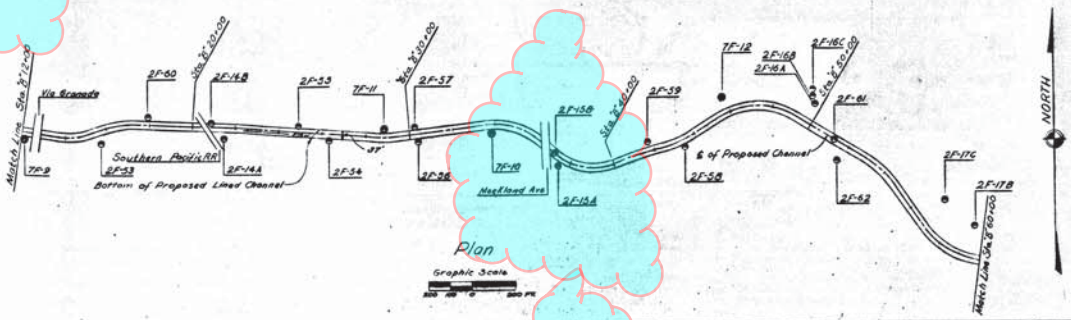
503-24

Sheet 6A

462

CORPS OF ENGINEERS

U. S. ARMY

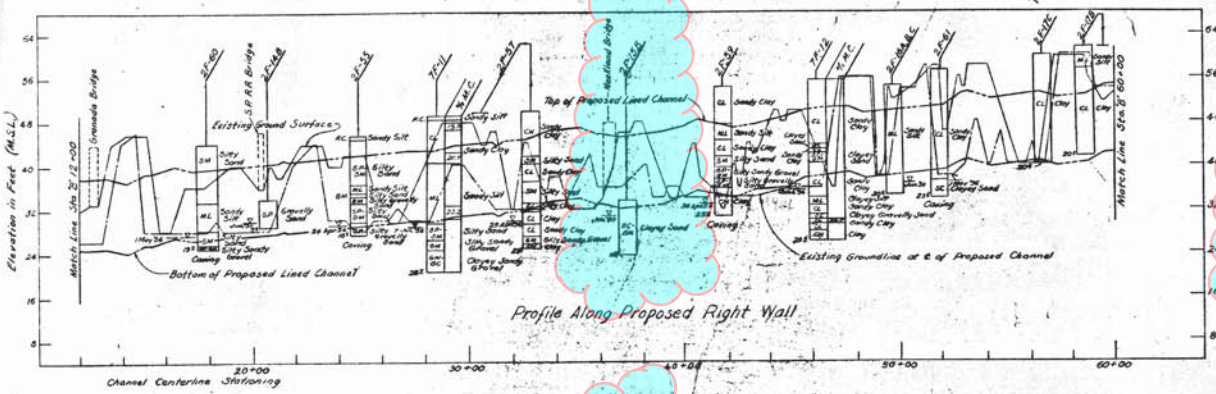


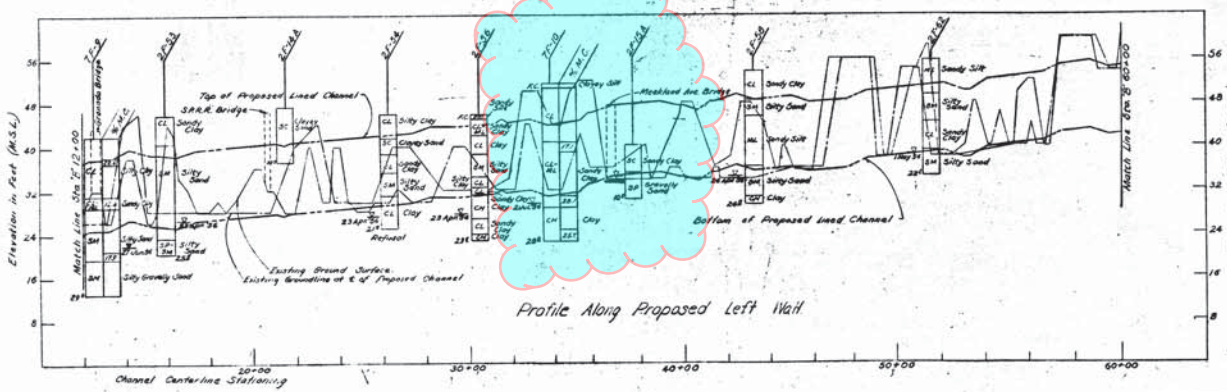
Plan

Graphic Scale

GROUND WATER RECORD

Hole No.	Elev. Top of Hole	Reading Taken Date	Time	Depth Below Top of Hole to Ground Water	to Caved Hole	Remarks
7F-9	28.0	5 Oct '56		20.5		
		6 Oct '56	12:00 P.M.	20.2		Data Omitted
7F-11	48.0	9 Oct '56		28.5	31.7	
		14 and 16 Oct '56	8:45 A.M.	30.7		Data Omitted
		30 Oct '56		18.9		





LEGEND:

- M.C. Natural moisture content.
- Auger holes.
- Undisturbed-sample drill holes.
- Water level at completion of hole as date shown, not necessarily ground water level.
- Water level-stabilized ground water level as date shown. See ground water record hereon.
- F.C. Field classification.

NOTES:

1. All classifications are in accordance with "Corps of Engineers 'Unified Soil Classification System' dated March 1953."
2. Datum is Mean Sea Level.
3. All soil classification is laboratory classification except as noted.
4. All holes drilled to required depth except as noted.

	As Constructed - No changes made	E. Wilcox	N.T.S.
SYMBOL	DESCRIPTION	DATE	APPROVED

REVISIONS

CORPS OF ENGINEERS U. S. ARMY
OFFICE OF THE DISTRICT ENGINEER, SAN FRANCISCO SUBDISTRICT
SAN FRANCISCO, CALIFORNIA

DESIGNED BY S.D.
TRACED BY W.A.
CHECKED BY R.S.
SUBMITTED: Reginald
EXECUTIVE ENGINEER: W.C.H.
PREPARED UNDER THE DIRECTION OF JOHN S. HARNETT, CIVIL, M.E. DISTRICT ENGINEER

ALAMEDA COUNTY CALIFORNIA

SAN LORENZO CREEK FLOOD CONTROL PROJECT

FOUNDATION EXPLORATION

PLAN AND LOGS OF EXPLORATION

STA "B" 12+00 TO STA "B" 60+00

DRAWN: E. Wilcox
CHIEF, ENGINEERING DIVISION: C.D. Allen
APPROVED: for Division Engineer
DATE: As shown
JOB NO.
DRAWING NUMBER: 5 62 36

RECORD DRAWING

SCALE: 1"=10' or 1"=100'

0 10 20 30 40 50 60 70 80 90 100

SAMPLER AND DRILLING METHOD GRAPHICS



BULK / GRAB / BAG SAMPLE

MODIFIED CALIFORNIA SAMPLER
(2 or 2-1/2 in. (50.8 or 63.5 mm.) outer diameter)

CALIFORNIA SAMPLER
(3 in. (76.2 mm.) outer diameter)

STANDARD PENETRATION SPLIT SPOON SAMPLER
(2 in. (50.8 mm.) outer diameter and 1-3/8 in. (34.9 mm.) inner diameter)

SHELBY TUBE SAMPLER

HOLLOW STEM AUGER

SOLID STEM AUGER

WASH BORING

GROUND WATER GRAPHICS

WATER LEVEL (level where first observed)

WATER LEVEL (level after exploration completion)

WATER LEVEL (additional levels after exploration)

OBSERVED SEEPAGE

NOTES

- The report and graphics key are an integral part of these logs. All data and interpretations in this log are subject to the explanations and limitations stated in the report.
- Lines separating strata on the logs represent approximate boundaries only. Actual transitions may be gradual or differ from those shown.
- No warranty is provided as to the continuity of soil or rock conditions between individual sample locations.
- Logs represent general soil or rock conditions observed at the point of exploration on the date indicated.
- In general, Unified Soil Classification System designations presented on the logs were based on visual classification in the field and were modified where appropriate based on gradation and index property testing.
- Fine grained soils that plot within the hatched area on the Plasticity Chart, and coarse grained soils with between 5% and 12% passing the No. 200 sieve require dual USCS symbols, ie., GW-GM, GP-GM, GW-GC, GP-GC, GC-GM, SW-SM, SP-SM, SW-SC, SP-SC, SC-SM.
- If sampler is not able to be driven at least 6 inches then 50/X indicates number of blows required to drive the identified sampler X inches with a 140 pound hammer falling 30 inches.

ABBREVIATIONS
WOH - Weight of Hammer
WOR - Weight of Rod

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)

COARSE GRAINED SOILS (More than half of material is larger than the #200 sieve)	**GRAVELS** (More than half of coarse fraction is larger than the #4 sieve)	CLEAN GRAVEL WITH <5% FINES	Cu ≥4 and 1≤ Cc≤3		**GW**	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
			Cu <4 and/ or 1>Cc >3		**GP**	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		GRAVELS WITH 5% TO 12% FINES	Cu ≥4 and 1≤ Cc≤3		**GW-GM**	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
					GW-GC	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
			Cu <4 and/ or 1>Cc >3		**GP-GM**	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
					GP-GC	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
		GRAVELS WITH > 12% FINES			**GM**	SILTY GRAVELS, GRAVEL-SILT-SAND MIXTURES
					GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
					GC-GM	CLAYEY GRAVELS, GRAVEL-SAND-CLAY-SILT MIXTURES
	SANDS (More than half of coarse fraction is smaller than the #4 sieve)	CLEAN SANDS WITH <5% FINES	Cu ≥6 and 1≤ Cc≤3		**SW**	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
			Cu <6 and/ or 1>Cc >3		**SP**	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
		SANDS WITH 5% TO 12% FINES	Cu ≥6 and 1≤ Cc≤3		**SW-SM**	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES
					SW-SC	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES
			Cu <6 and/ or 1>Cc >3		**SP-SM**	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES
					SP-SC	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES
		SANDS WITH > 12% FINES			**SM**	SILTY SANDS, SAND-GRAVEL-SILT MIXTURES
					SC	CLAYEY SANDS, SAND-GRAVEL-CLAY MIXTURES
					SC-SM	CLAYEY SANDS, SAND-SILT-CLAY MIXTURES

FINE GRAINED SOILS (More than half of material is smaller than the #200 sieve)	SILTS AND CLAYS (Liquid Limit less than 50)	**ML**	INORGANIC SILTS AND VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, SILTS WITH SLIGHT PLASTICITY
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		CL-ML	INORGANIC CLAYS-SILTS OF LOW PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		OL	ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS (Liquid Limit greater than 50)	**MH**	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILT
		CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
		OH	ORGANIC CLAYS & ORGANIC SILTS OF MEDIUM-TO-HIGH PLASTICITY

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	20172563
DRAWN BY:	JDS
CHECKED BY:	CN
DATE:	5/30/2018
REVISED:	-

GRAPHICS KEY

ACFC & WCD LARGE TRASH CAPTURE PROJECT
MEEKLAND AVE. AND LOMA VERDE DR.
SAN LORENZO, CALIFORNIA

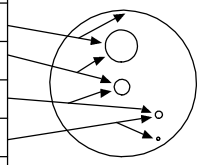
FIGURE

A-1

gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [LEGEND 1 (GRAPHICS KEY) USCS_STANDARD]
PROJECT NUMBER: 20172563.010A
OFFICE FILTER: OAKLAND
PLOTTED: 12/19/2018 01:16 PM BY: JSala

GRAIN SIZE

DESCRIPTION		SIEVE SIZE	GRAIN SIZE	APPROXIMATE SIZE
Boulders		>12 in. (304.8 mm.)	>12 in. (304.8 mm.)	Larger than basketball-sized
Cobbles		3 - 12 in. (76.2 - 304.8 mm.)	3 - 12 in. (76.2 - 304.8 mm.)	Fist-sized to basketball-sized
Gravel	coarse	3/4 -3 in. (19 - 76.2 mm.)	3/4 -3 in. (19 - 76.2 mm.)	Thumb-sized to fist-sized
	fine	#4 - 3/4 in. (#4 - 19 mm.)	0.19 - 0.75 in. (4.8 - 19 mm.)	Pea-sized to thumb-sized
Sand	coarse	#10 - #4	0.079 - 0.19 in. (2 - 4.9 mm.)	Rock salt-sized to pea-sized
	medium	#40 - #10	0.017 - 0.079 in. (0.43 - 2 mm.)	Sugar-sized to rock salt-sized
	fine	#200 - #40	0.0029 - 0.017 in. (0.07 - 0.43 mm.)	Flour-sized to sugar-sized
Fines		Passing #200	<0.0029 in. (<0.07 mm.)	Flour-sized and smaller



SECONDARY CONSTITUENT

	AMOUNT	
Term of Use	Secondary Constituent is Fine Grained	Secondary Constituent is Coarse Grained
Trace	<5%	<15%
With	≥5 to <15%	≥15 to <30%
Modifier	≥15%	≥30%

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

CEMENTATION

DESCRIPTION	FIELD TEST
Weakly	Crumbles or breaks with handling or slight finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

CONSISTENCY - FINE-GRAINED SOIL

CONSISTENCY	SPT - N_{60} (# blows / ft)	Pocket Pen (tsf)	UNCONFINED COMPRESSIVE STRENGTH (Q_u)(psf)	VISUAL / MANUAL CRITERIA
Very Soft	<2	PP < 0.25	<500	Thumb will penetrate more than 1 inch (25 mm). Extrudes between fingers when squeezed.
Soft	2 - 4	0.25 ≤ PP <0.5	500 - 1000	Thumb will penetrate soil about 1 inch (25 mm). Remolded by light finger pressure.
Medium Stiff	4 - 8	0.5 ≤ PP <1	1000 - 2000	Thumb will penetrate soil about 1/4 inch (6 mm). Remolded by strong finger pressure.
Stiff	8 - 15	1 ≤ PP <2	2000 - 4000	Can be imprinted with considerable pressure from thumb.
Very Stiff	15 - 30	2 ≤ PP <4	4000 - 8000	Thumb will not indent soil but readily indented with thumbnail.
Hard	>30	4 ≤ PP	>8000	Thumbnail will not indent soil.

FROM TERZAGHI AND PECK, 1948; LAMBE AND WHITMAN, 1969; FHWA, 2002; AND ASTM D2488

REACTION WITH HYDROCHLORIC ACID

DESCRIPTION	FIELD TEST
None	No visible reaction
Weak	Some reaction, with bubbles forming slowly
Strong	Violent reaction, with bubbles forming immediately

APPARENT / RELATIVE DENSITY - COARSE-GRAINED SOIL

APPARENT DENSITY	SPT-N_{60} (# blows/ft)	MODIFIED CA SAMPLER (# blows/ft)	CALIFORNIA SAMPLER (# blows/ft)	RELATIVE DENSITY (%)
Very Loose	<4	<4	<5	0 - 15
Loose	4 - 10	5 - 12	5 - 15	15 - 35
Medium Dense	10 - 30	12 - 35	15 - 40	35 - 65
Dense	30 - 50	35 - 60	40 - 70	65 - 85
Very Dense	>50	>60	>70	85 - 100

FROM TERZAGHI AND PECK, 1948

PLASTICITY

DESCRIPTION	LL	FIELD TEST
Non-plastic	NP	A 1/8-in. (3 mm.) thread cannot be rolled at any water content.
Low (L)	< 30	The thread can barely be rolled and the lump or thread cannot be formed when drier than the plastic limit.
Medium (M)	30 - 50	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump or thread crumbles when drier than the plastic limit.
High (H)	> 50	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump or thread can be formed without crumbling when drier than the plastic limit.

STRUCTURE

DESCRIPTION	CRITERIA
Stratified	Alternating layers of varying material or color with layers at least 1/4-in. thick, note thickness.
Laminated	Alternating layers of varying material or color with the layer less than 1/4-in. thick, note thickness.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing.
Slickensided	Fracture planes appear polished or glossy, sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay; note thickness.

ANGULARITY

DESCRIPTION	CRITERIA
Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces.
Subangular	Particles are similar to angular description but have rounded edges.
Subrounded	Particles have nearly plane sides but have well-rounded corners and edges.
Rounded	Particles have smoothly curved sides and no edges.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	20172563
DRAWN BY:	JDS
CHECKED BY:	CN
DATE:	5/30/2018
REVISED:	-

SOIL DESCRIPTION KEY

ACFC & WCD LARGE TRASH CAPTURE PROJECT
MEEKLAND AVE. AND LOMA VERDE DR.
SAN LORENZO, CALIFORNIA

FIGURE

A-2

PLOTTED: 12/19/2018 01:17 PM BY: JSala
OFFICE FILTER: OAKLAND
PROJECT NUMBER: 20172563.010A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [LEGEND 2 (SOIL DESC KEY)]

Date Begin - End:	5/15/2018	**Drilling Company:**	Pitcher Drilling	**BORING LOG MK-B1**	
Logged By:	J. Anderson	**Drill Crew:**	James, Viliami		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Cloudy	**Exploration Diameter:**	4 in. O.D.		

Latitude: 37.68575°
Longitude: -122.11712°

Depth (feet)	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)
	3-inches of asphalt											
	Sandy CLAY with Gravel (CL): medium plasticity, moist, (FILL)					CL						
	concrete chunks											
	Sandy Lean CLAY (CL): fine-grained sand, yellowish brown, moist, (FILL)					CL						
5	**Silty SAND (SM)**: fine-grained sand, non-plastic, yellowish brown, moist, loose, wood-chips, (FILL)	2		BC=4 4 5	6"	SM	15.0	111.6				
	roots	3		BC=1 3 4	12"	SM						
10		4		BC=3 4 6	12"	SM	17.6	100.6	100	41		
15	**Sandy Lean CLAY (CL)**: fine-grained sand, medium plasticity, dark grayish brown, moist, medium stiff	5		BC=2 4 5 PP=1.0	12"	CL	23.5	99.3			30	16
20	**Fat CLAY with Sand (CH)**: high plasticity, dark brown, moist, medium stiff	6		BC=4 8 10 PP=2.75	6"	CH	24.9	100.4				
	dark brown, stiff						21.8	103.1			56	41
25	light brownish gray, soft	7		BC=1 4 7 PP=1.75	12"	CH	23.2	104.8				
30	fine-grained sand, yellowish brown, very stiff	8		BC=5 9 12 PP=3.25	12"	CH						

PIEZOMETER CONSTRUCTION*

Completion Method: Flush mount cap in concrete

- 1" SCH 40 Solid PVC
- Grout
- Bentonite
- Sand
- 1" SCH 40 Slotted 0.010 PVC Screen

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	20172563
DRAWN BY:	JDS
CHECKED BY:	CN
DATE:	5/30/2018
REVISED:	-

BORING LOG MK-B1

ACFC & WCD LARGE TRASH CAPTURE PROJECT
MEEKLAND AVE. AND LOMA VERDE DR.
SAN LORENZO, CALIFORNIA

FIGURE

A-3

PLOTTED: 12/21/2018 12:24 PM BY: JSala
OFFICE FILTER: OAKLAND
PROJECT NUMBER: 20172563.010A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End: 5/15/2018 **Drilling Company:** Pitcher Drilling

Logged By: J. Anderson **Drill Crew:** James, Viliami

Hor.-Vert. Datum: Not Available **Drilling Equipment:** CME-55 **Hammer Type - Drop:** 140 lb. Auto - 30 in.

Plunge: -90 degrees **Drilling Method:** Hollow Stem Auger

Weather: Cloudy **Exploration Diameter:** 4 in. O.D.

BORING LOG MK-B1

Latitude: 37.68575°
Longitude: -122.11712°

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)
		Clayey SAND (SC): fine-grained sand, non-plastic, yellow, moist, loose	9		BC=3 5 5	12"	SC	25.7	103.0				
40		**Poorly Graded SAND with Clay (SP-SC)**: fine-grained sand, non-plastic, wet, medium dense	10		BC=8 7 10	8"	SP-SC						
45		**Sandy Lean CLAY (CL)**: fine-grained sand, medium plasticity, grayish brown, moist, medium stiff	11		BC=4 6 16 PP=3.25	12"	CL	17.0 18.6	116.7 112.2			29	16
50		**Poorly Graded SAND (SP)**: medium to coarse-grained sand, non-plastic, moist, medium dense	12		BC=7 7 5	12"	SP						
		Lean CLAY (CL): medium plasticity, yellowish brown, moist, very stiff											
55		trace gravel	13		BC=5 9 12 PP=2.75	12"	CL	17.7	112.2				
60			14		BC=6 8 10	8"	CL						
65													

PIEZOMETER CONSTRUCTION*

Completion Method: Flush mount cap in concrete

Sand

1" SCH 40 Slotted 0.010 PVC Screen

Bottom cap

The boring was terminated at approximately 61.5 ft. below ground surface. A standpipe piezometer was installed on May 15, 2018.

GROUNDWATER LEVEL INFORMATION:

▽ Groundwater was observed at approximately 20 ft. below ground surface during drilling.

▼ Groundwater was observed at approximately 17 ft. below ground surface at the end of drilling.

A PID (ppmv) was used for environmental field screening.

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	20172563
DRAWN BY:	JDS
CHECKED BY:	CN
DATE:	5/30/2018
REVISED:	-

BORING LOG MK-B1

ACFC & WCD LARGE TRASH CAPTURE PROJECT
MEEKLAND AVE. AND LOMA VERDE DR.
SAN LORENZO, CALIFORNIA

FIGURE

A-3

PLOTTED: 12/21/2018 12:24 PM BY: JSala
OFFICE FILTER: OAKLAND
PROJECT NUMBER: 20172563.010A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Appendix III As-Built Boring Logs and Plans

ALAMEDA COUNTY
CALIFORNIA

GEORGE A. POSEY
COUNTY SURVEYOR
454 FIFTH STREET OAKLAND

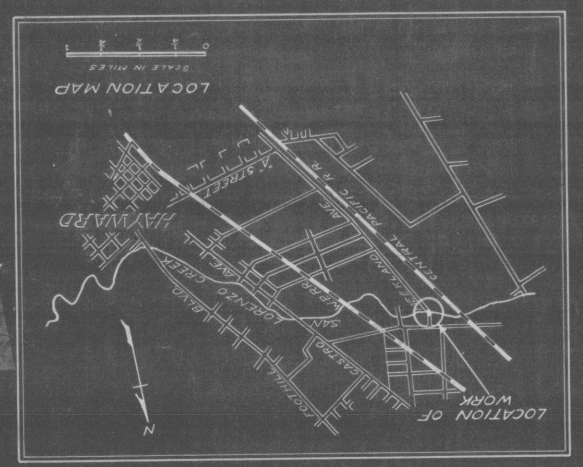
MEEKLAND AVE. BRIDGE
B-16-S
PLAN AND ELEVATION

APPROVED | DATE August 19..

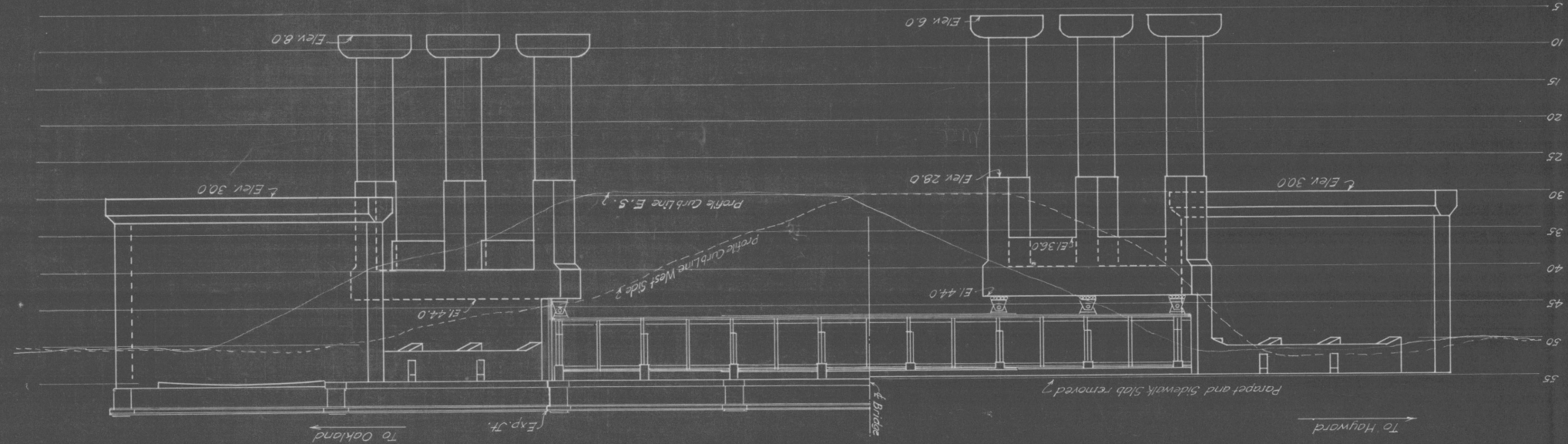
Drawn | Traced | Checked | Scale 1" = 10'

NOTE:
CORRECTIONS TO PLANS NOT SHOWN THIS SET — SEE TRACINGS

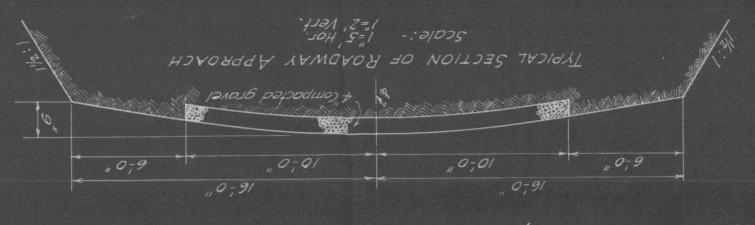
LOCATION MAP
SCALE IN MILES

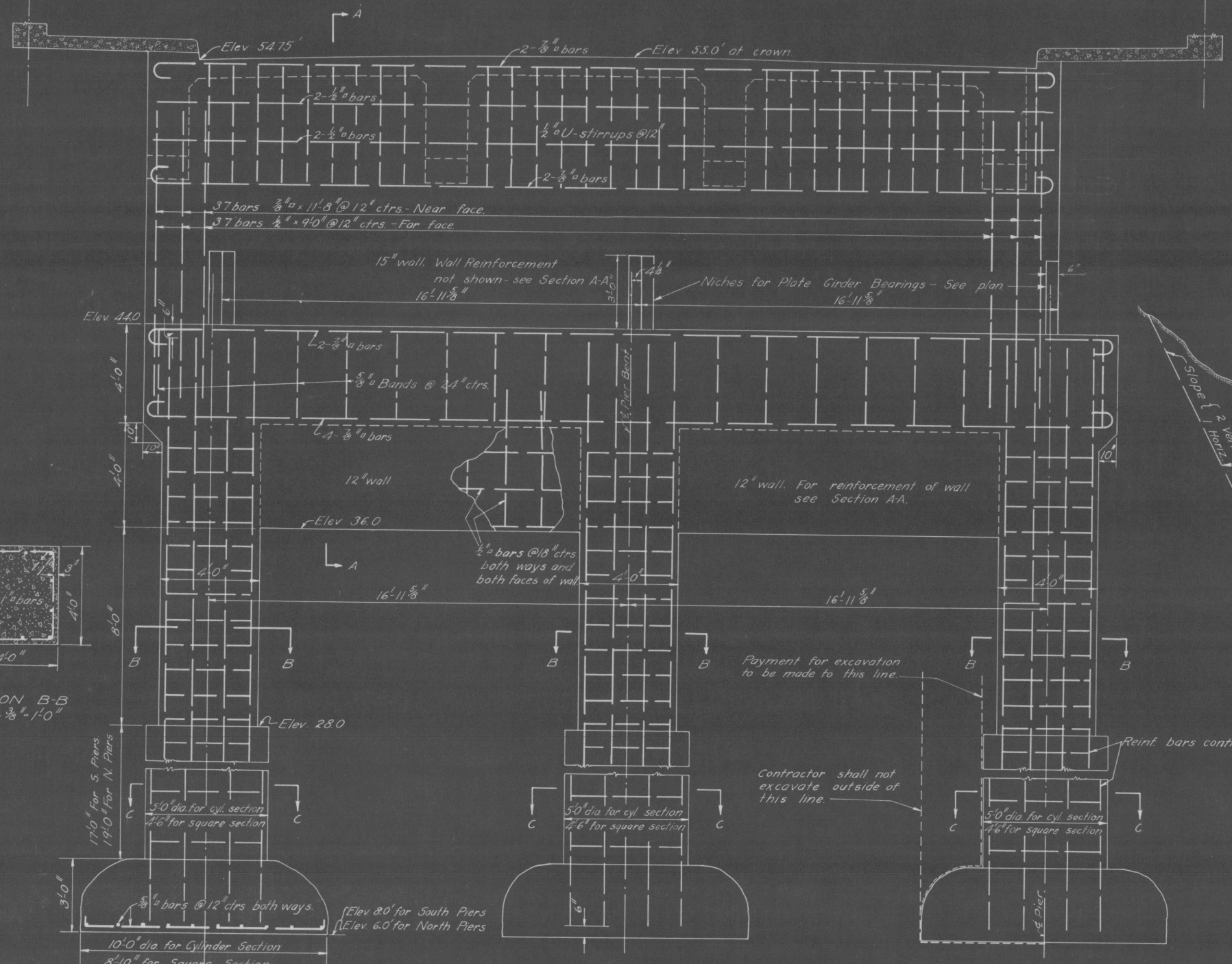


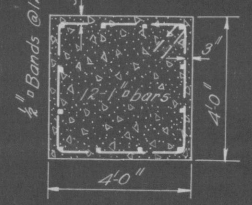
SIDE ELEVATION OF BRIDGE
Scale: 1"=10'



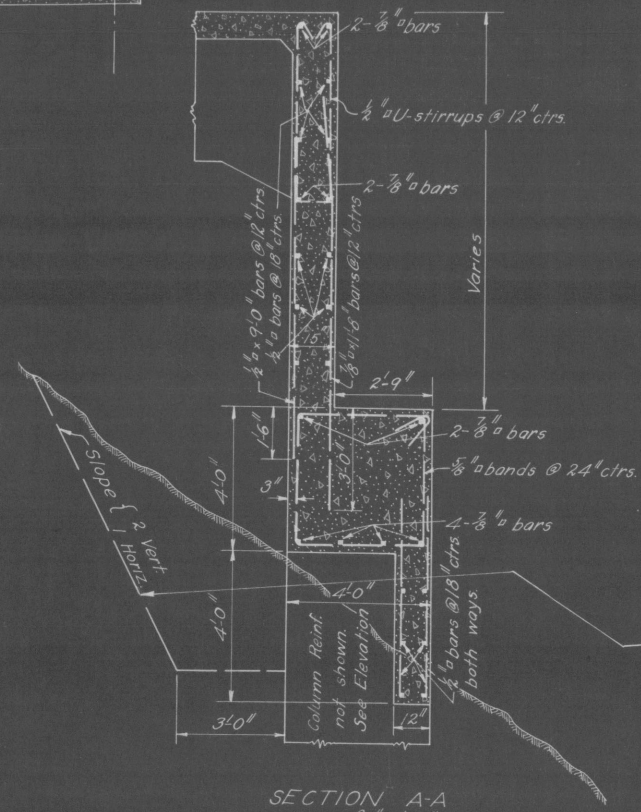
TYPICAL SECTION OF ROADWAY APPROACH
Scale:- 1"=5' Hor. 1"=2' Vert.





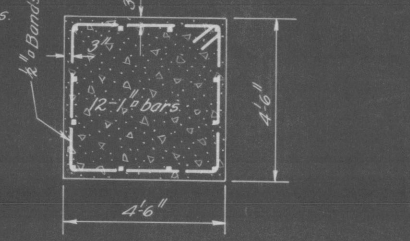


SECTION B-B
Scale - 3/8" = 1'-0"



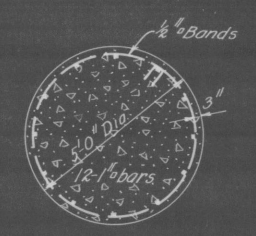
SECTION A-A
Scale - 3/8" = 1'-0"

Contractor shall carefully protect the bank on both sides of the stream. The breaking back of bank for construction purposes will not be allowed. Should contractor damage bank, he shall, at his own expense, repair all damage to bank by the construction of reinforced concrete retaining walls or slope walls, satisfactory to the County Surveyor.
Where necessary contractor will be allowed to cut back bank to this line.

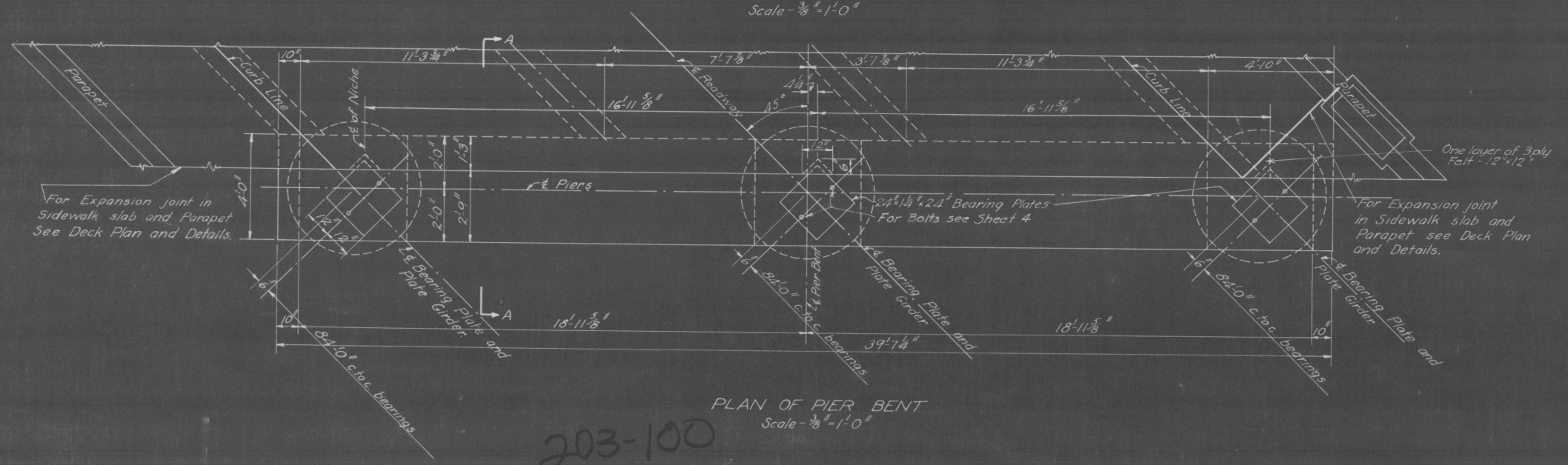


SECTION C-C for square section
Scale - 3/8" = 1'-0"

The contractor will be allowed the option of sinking steel cylinders of 5'-0" diameter, or constructing square 4'-6" x 4'-6" columns in well holes in either case spread footing is to be constructed of minimum dimensions as shown. Contractor may construct footing by undercutting, or by constructing well hole equal to the size of the footing, as he desires.
All timbering, steel cylinders, pumping etc, at the expense of the contractor.



SECTION C-C for cylinder section
Scale 3/8" = 1'-0"



PLAN OF PIER BENT
Scale - 3/8" = 1'-0"

203-100

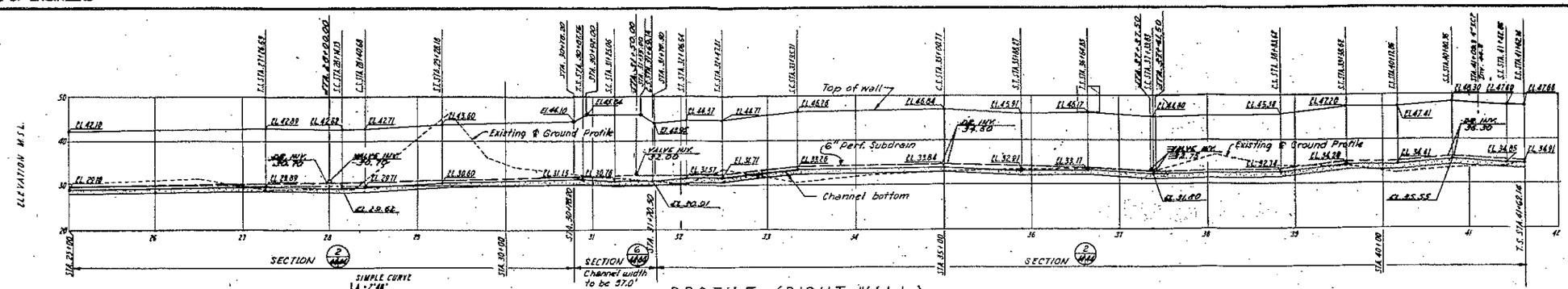
FOUNDATION NOTES FOR SHEETS 5 & 6

Depths and types of footings to be determined in the field by the County Surveyor. (See Specifications) Elevations of foundations on these sheets are not final and may be changed to suit conditions when excavations are opened.
Abutment and footing details shown on these sheets are typical only and will be modified to fit each individual case.

ALAMEDA COUNTY CALIFORNIA	
GEORGE A. POSEY COUNTY SURVEYOR 45-4 FIFTH STREET OAKLAND	
MEEKLAND AVE. BRIDGE B-16-5	
PIER BENT DETAIL	
APPROVED	DATE Aug. 1926

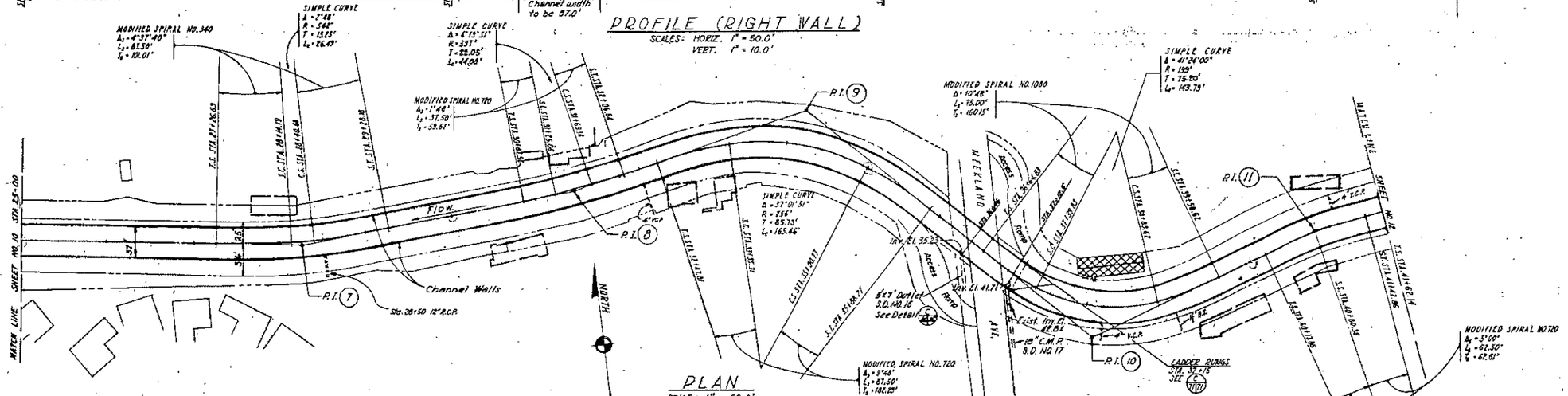
CORPS OF ENGINEERS

U. S. ARMY



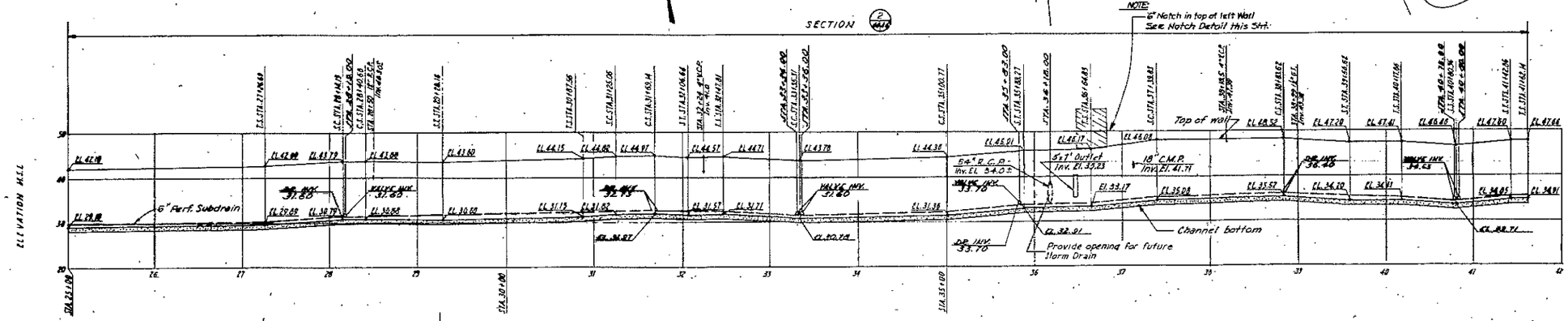
PROFILE (RIGHT WALL)

SCALES: HORIZ. 1" = 50.0'
VERT. 1" = 10.0'



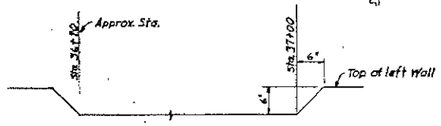
PLAN

SCALE: 1" = 50.0'



PROFILE (LEFT WALL)

SCALES: HORIZ. 1" = 50.0'
VERT. 1" = 10.0'



NOTCH DETAIL

Construct 6' deep notch in top of left channel wall between approximate stations as indicated to provide clearance under Meekland Ave Bridge.

10' 0' 10' 20'
Graphic Scale: 1"=10'

50' 0' 50' 100'
Graphic Scale: 1"=50'

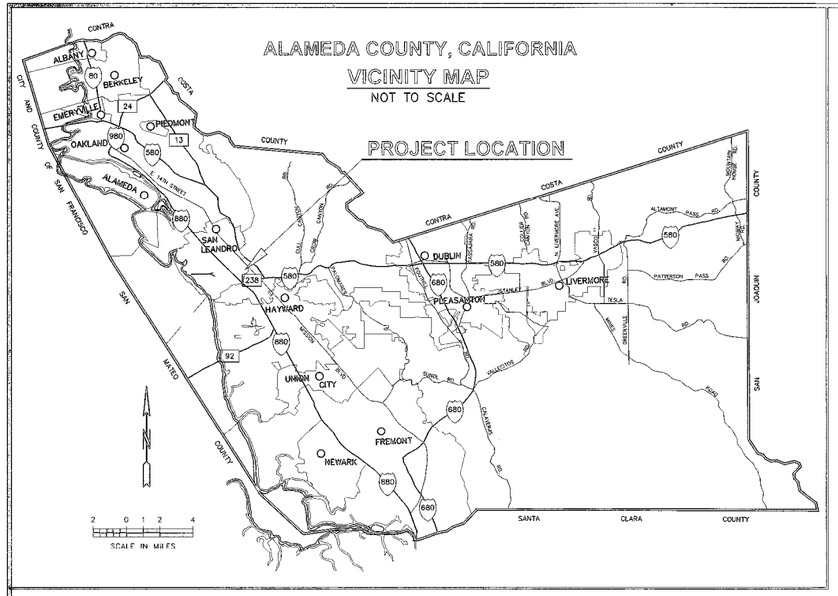
FLOOD CONTROL
SAN LORENZO CREEK FLOOD CONTROL PROJECT
ALAMEDA COUNTY, CALIFORNIA

OPERATION AND MAINTENANCE MANUAL
SAN LORENZO CREEK
CHANNEL IMPROVEMENT

PLAN AND PROFILE
STA. B 25+00 TO STA. B 41+62.14

IN 24 SHEETS	SCALE AS SHOWN	SHEET NO. 11
U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF ENGINEERS		
DRAWN: T.B.K.		FILE NO:
TRACED: H.C.K.	TO ACCOMPANY REPORT DATED DECEMBER 1962	62-39-13
CHECKED: A.C.B.		

EXHIBIT B PLATE 11



PLANS

FOR THE INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVENUE AND LOMA VERDE DRIVE IN SAN LORENZO ALAMEDA COUNTY, CALIFORNIA

DECEMBER 2018

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1.	TITLE SHEET
2.	PLAN OF DESIGN CONTROLS, GENERAL NOTES, AND ABBREVIATIONS
3.	EASEMENT AND RIGHT-OF-WAY MAP
4.	CONCEPTUAL WATER POLLUTION PREVENTION AND STAGING PLAN
5.	EXISTING SITE AND DEMOLITION PLAN
6.	SITE PLAN
7.	SECTION A – DIVERSION BOX
8.	SECTION B – DIVERSION BOX
9.	SHORING PLAN AND PILE DATA TABLE
10.	SHORING – STAGE 1
11.	SHORING – STAGE 2
12.	SHORING – STAGE 3
13.	DIVERSION BOX FOOTING, FLOOR, AND WALL PLAN
14.	DIVERSION BOX ROOF AND SUPERSTRUCTURE PLAN
15.	SECTION C – DIVERSION BOX DETAIL LOCATION KEY
16.	DETAILS – PILES, GRADE BEAM, EXTERIOR WALLS
17.	DETAILS – FLOOR SLAB, FOOTINGS, WEIR
18.	DETAILS – INTERIOR WALL
19.	DETAILS – STRUCTURAL STEEL CONNECTIONS
20.	DETAILS – ROOF SLAB AND SUPERSTRUCTURE
21.	DETAILS – FIXED LADDER AND APPURTENANCES
22.	DETAILS – SELF-ADJUSTING FLOW GATE
23.	GRADING PLAN
24.	ACCESS ROAD SECTIONS
25.	BACKFILL TYPE AND LIMITS PLAN
26.	DETAILS – MISCELLANEOUS

○ THE CONTRACTOR SHALL POSSESS A CLASS A LICENSE AT THE TIME THIS CONTRACT IS AWARDED AND THROUGHOUT THE DURATION OF THE CONSTRUCTION CONTRACT.

CONVENTIONAL SYMBOLS

- PROPERTY, RIGHT OF WAY AND EASEMENT LINES OTHER THAN THOSE FOR PROJECT
- PROJECT RIGHT OF WAY AND EASEMENT LINES
- CONSTRUCTION CENTER LINE (10 — 11)
- TRAVERSE OR SURVEY LINE AND MONUMENT
- CENTER LINE
- CENTER LINE OF CHANNEL, CREEK, OR DITCH
- TOE OF FILL OR SLOPE
- TOP OF CUT OR BANK
- CONCRETE CHANNEL
- ROAD
- EDGE OF PAVEMENT (EP)
- PCC EXTRUDED CURB OR AC BERM
- PCC SIDEWALK, CURB GUTTER & DRIVEWAY
- GUARD RAIL OR BARRICADE
- FENCE (SPECIFY TYPE)
- CHAIN-LINK FENCE
- RAILROAD
- BUILDING
- SHRUBBERY
- MAIL BOX
- TREE
- TREE TO BE REMOVED
- CHANNEL SLOPE
- FLOW DIRECTION

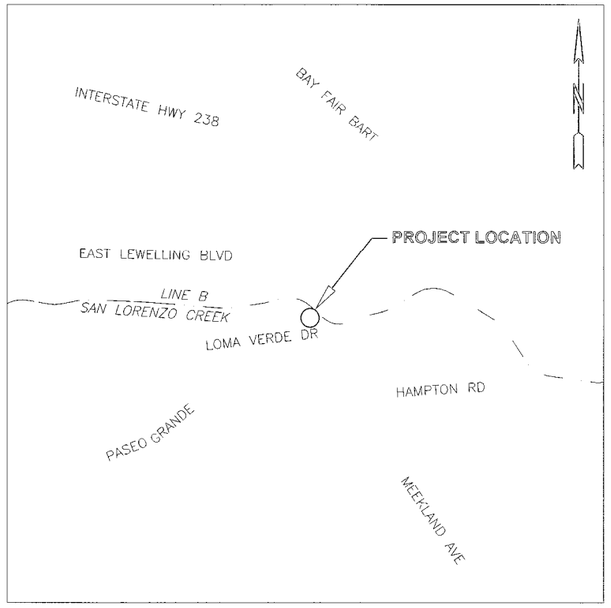
EXISTING UTILITIES:

- WATER (W)
- GAS (G)
- SANITARY SEWER (SS)
- OIL (O)
- GASOLINE (GS)
- STORM DRAIN (SD) (MH)
- ELECTRICAL (E)
- ELECTRICAL UNDERGROUND (UE)
- TELEPHONE (T)
- TELEPHONE UNDERGROUND (UT)
- CABLE TV (CTV)
- CABLE TV UNDERGROUND (UCTV)
- TRANSMISSION LINE AND TOWER
- DROP INLET (DI)
- ELECTROLIER
- FIRE HYDRANT
- MANHOLE (MH)
- MONUMENT (EXISTING) (PROPOSED)

UTILITY POLES:

- JOINT POLE (JP)
- POWER POLE (PP)
- TELEPHONE POLE (TP)
- GUY POLE (GP)

- RIGHT OF WAY MARKER
- ROADWAY SIGN
- STREET NAME SIGN
- WATER METER (WM)
- WATER VALVE (WV)



LOCATION MAP
NOT TO SCALE

CALTRANS STANDARD PLANS 2015		ALAMEDA CO. PUBLIC WORK STD DETAILS	
A24A	RIGHT TURN ARROW AND "STOP" PAVEMENT MARKINGS	SD-407	MANHOLE FRAME AND COVER, TYPE 1
A24F	CROSSWALK PAVEMENT MARKING		
A85	CHAIN LINK FENCE		
A85A	CHAIN LINK FENCE DETAILS		
A85B	CHAIN LINK FENCE DETAILS		
A87A	CURBS AND DRIVEWAYS		
A88A	CURB RAMP DETAILS		
B11-52	CHAIN LINK RAILING TYPE 7		
D71	DRAINAGE INLET MARKERS		
D91B	CAST-IN-PLACE REINFORCED CONCRETE – JUNCTION STRUCTURE		
RSP A24F	PAVEMENT MARKINGS CROSSWALK (BASIC)		
T3A	TEMPORARY RAILING (TYPE K)		
T4	TEMPORARY TRAFFIC SCREEN		
T51	TEMPORARY SILT FENCE		
T56	TEMPORARY FIBER ROLL		

REGISTERED PROFESSIONAL ENGINEER DANIEL WOLDESENBET No. 60306 CIVIL STATE OF CALIFORNIA

DANIEL WOLDESENBET, Ph.D., P.E.
COUNTY ENGINEER
CIVIL ENGINEER CERTIFICATE NO. 60306

12/26/18
PLAN APPROVAL DATE

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES (0 1 2 3)

REVISIONS				
NO.	DESCRIPTION	BY	DATE	APPV'D
1				
2				
3				
4				

REGISTERED PROFESSIONAL ENGINEER DANIEL WOLDESENBET No. Civil C 60897 CIVIL STATE OF CALIFORNIA

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765 Yonacio Valley Road
Walnut Creek, CA 94598
Phone: (925) 935-9771
Fax: (925) 935-9773

DRAWN: M. DROZYNSKA & M. WEHAL
DESIGNED: M. DROZYNSKA & M. WEHAL
CHECKED:
APPROVED:

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY
REVIEWED: MOSES TSANG, APPROVAL RECOMMENDED
APPROVAL RECOMMENDED: MOSES TSANG, ASSISTANT
APPROVED: LORI ROSENBERG, DIRECTOR

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE
TITLE SHEET

DATE	DEC 2018
SCALE	AS SHOWN
WORK ORDER NO.	R34071
SPECIFICATION NO.	2362
SHEET NO.	01 OF 26
FILE NO.	CB-967

	REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION			SURVEY	
MAINTENANCE			TRAFFIC	
REAL ESTATE			ENVIRONMENTAL	

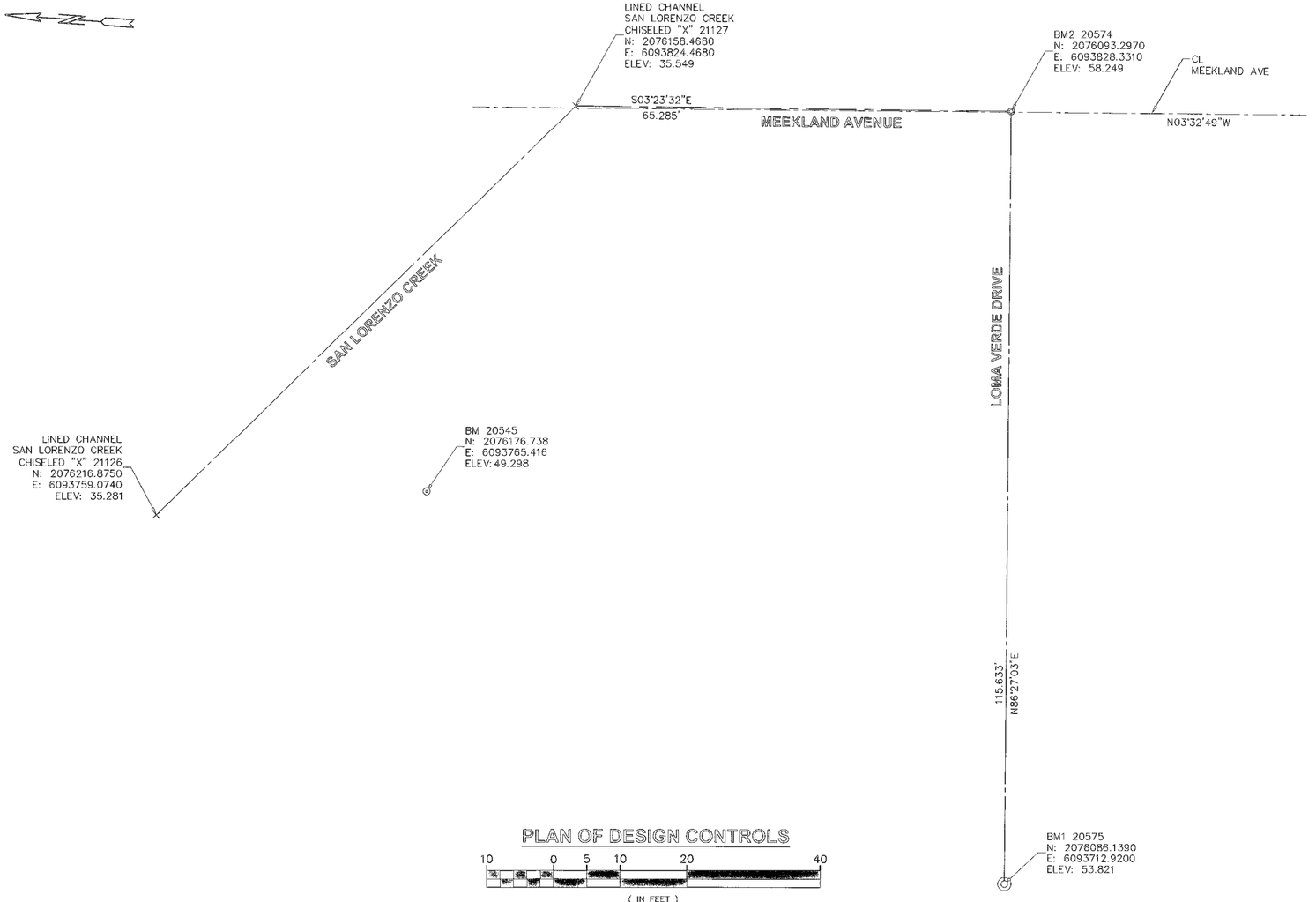
M:\2017\171550 Kleinfelder - ACFC Clean Water Devices\AutoCAD Files (Meekland Ave)\Sheets\Meekland_01-02 Title_Pollution_Notes.dwg 12-20-18 03:59:59 PM kdrozynska

	REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION			SURVEY	
MAINTENANCE			TRAFFIC	
REAL ESTATE			ENVIRONMENTAL	

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GENERAL NOTES

1. ALL WORK IS TO BE DONE UNDER THE DIRECTION OF THE ENGINEER.
2. CALTRANS STANDARD SPECIFICATIONS, 2006 EDITION, AND STANDARD PLANS, 2015 EDITION, ARE PART OF THESE PLANS.
3. IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR THE CONDITIONS OF THE JOB SITE INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORK HOURS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN AND CONSTRUCTION OF PROPER SHORING OF TRENCHES IN ACCORDANCE WITH THE LATEST OCCUPATIONAL SAFETY LAWS. THE DUTIES OF THE ENGINEER DO NOT INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY IN, ON, OR NEAR THE CONSTRUCTION SITE.
4. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY AND ALL DAMAGE TO EXISTING STRUCTURES AND/OR UTILITIES DURING CONSTRUCTION. PROPER REPAIR SHALL BE DONE TO THE SATISFACTION OF THE ENGINEER AND THE RESPECTIVE UTILITY COMPANY.
5. ALL PIPELINES AND OTHER UNDERGROUND FACILITIES MAY NOT BE SHOWN. EXISTING UNDERGROUND FACILITIES AS SHOWN ARE APPROXIMATE ONLY AND WERE OBTAINED FROM AVAILABLE UTILITY RECORDS. HOWEVER, THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THEIR ACCURACY OR COMPLETENESS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT ALL UTILITIES AND TO HAVE ALL FACILITIES LOCATED IN THE FIELD PRIOR TO THE START OF ANY CONSTRUCTION. THE CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT AT 811 OR 1-800-227-2600 AT LEAST TWO WORKING DAYS PRIOR TO EXCAVATION.
6. SLOPES OF ALL EMBANKMENT FILL SHALL BE 4:1 (HORIZONTAL: VERTICAL) UNLESS OTHERWISE NOTED ON PLANS OR AS DIRECTED BY THE ENGINEER. ATTENTION IS DIRECTED TO CALTRANS STANDARD SPECIFICATIONS, SECTION 19, FOR EMBANKMENT CONSTRUCTIONS WHERE APPLICABLE.
7. DUST CONTROL MEASURES, AS APPROVED BY THE ENGINEER, SHALL BE FOLLOWED AT ALL TIMES DURING CONSTRUCTION OPERATIONS.
8. EROSION CONTROL SHALL BE PERFORMED ON ALL DISTURBED AREAS.
9. EROSION CONTROL SHALL BE PERFORMED ON ALL EMBANKMENT CONSTRUCTION.
10. ALL ELEVATIONS SHOWN ARE FINISH ELEVATIONS UNLESS STATED OTHERWISE.
11. ELEVATIONS SHOWN ARE APPROXIMATE AND ARE SUBJECT TO MINOR MODIFICATIONS IN THE FIELD DURING CONSTRUCTION.



PLAN OF DESIGN CONTROLS

10 0 5 10 20 40

(IN FEET)
1" = 10'

HORIZONTAL DATUM: NAD83 CALIFORNIA STATE PLANES, ZONE III
VERTICAL DATUM: NAVD88.

ABBREVIATIONS

AB	AGGREGATE BASE	MAX	MAXIMUM
AC	ASPHALT CONCRETE	MBGR	METAL BEAM GUARD RAILING
ACP	ASBESTOS CEMENT PIPE	MH	MANHOLE
APPROX	APPROXIMATE	MIN	MINIMUM
AS	AGGREGATE SUBBASE	MISC	MISCELLANEOUS
		℄	MONUMENT LINE
BC	BEGINNING OF HORIZONTAL CURVE	MON	MONUMENT
BEG	BEGIN		
BKF	BACKFILL	N	NORTH
ℬ	BOUNDARY LINE	NTS	NOT TO SCALE
BM	BENCHMARK		
BOW, BW	BOTTOM OF WALL	OC	ON CENTER OR OVERCROSSING
BVC	BEGINNING OF VERTICAL CURVE	OD	OUTSIDE DIAMETER
BW	BARBED WIRE	OE	OVERHEAD ELECTRICAL
B/W	BACK OF SIDEWALK	OG	ORIGINAL GROUND
		OH	OVERHEAD
C-C	CENTER TO CENTER		
CB	COLLECTOR BEAM	PCC	POINT OF COMPOUND CURVE OR
CF	CUBIC FEET		PORTLAND CEMENT CONCRETE
C&G	CURB AND GUTTER	PED	PEDESTRIAN
CIDH	CAST-IN-DRILLED-HOLE	PG&E	PACIFIC GAS & ELECTRIC CO.
CIP	CAST-IN-PLACE OR CAST IRON PIPE	PI	POINT OF INTERSECTION
		P/L, ℙ	PROPERTY LINE
CIPCP	CAST-IN-PLACE CONCRETE PIPE	POC	POINT OF HORIZONTAL CURVE
℄	CENTERLINE	POT	POINT OF TANGENCY
CL	CLASS OR CHAIN LINK	POVC	POINT OF VERTICAL CURVE
CLR	CLEAR OR CLEARANCE	PP	POWER POLE, PLASTIC PIPE OR
CONST	CONSTRUCTION		PIPE PILE
CMP	CORRUGATED METAL PIPE	PRC	POINT OF REVERSE CURVE
CY	CUBIC YARD	PRVC	POINT OF REVERSE VERTICAL CURVE
		PT	ANGLE POINT
D	DEPTH	PVMT	PAVEMENT
DET	DETAIL OR DETOUR		
DI	DROP INLET, DRAINAGE INLET	R	RADIUS OR RADIAL
DIA, ⌀	DIAMETER	RCB	REINFORCED CONCRETE BOX
D/S	DOWNSTREAM	RCP	REINFORCED CONCRETE PIPE
DWG	DRAWING	REINF	REINFORCED
DWY	DRIVEWAY	REV	REVISED OR REVISION
		RR	RAILROAD
E	EAST OR ELECTRIC	RSP	ROCK SLOPE PROTECTION
EA	EACH	RT	RIGHT
EASE	EASEMENT	RW	RETAINING WALL, REDWOOD
EBMUD	EAST BAY MUNICIPAL UTILITY DISTRICT	R/W	RIGHT-OF-WAY
EC	END OF HORIZONTAL CURVE	S	SLOPE OR SOUTH
EG	EXISTING GRADE	SD	STORM DRAIN
ELEV	ELEVATION	SHT	SHEET
EP	EDGE OF PAVEMENT	SQFT	SQUARE FOOT OR SQUARE FEET
EQ, =	EQUALS	SS	SANITARY SEWER
EQ	EQUATION OR EQUALS	STA	STATION
ES	EDGE OF SHOULDER	STD	STANDARD
ETW	EDGE OF TRAVELED WAY	SW	SIDEWALK
EVC	END OF VERTICAL CURVE	SWPPP	STORM WATER POLLUTION PREVENTION
EXC	EXCAVATE OR EXCAVATION		PLAN
EXIST, EX	EXISTING	SYM	SYMMETRIC OR SYMMETRICAL
FC	FACE OF CURB	T	TANGENT LENGTH OR TELEPHONE
FG	FINISHED GRADE	TC	TOP OF CURB
FH	FIRE HYDRANT	TEL, T	TELEPHONE
FL, ℄	FLOW LINE	TEMP	TEMPORARY
FO	FIBER OPTIC	TG	TOP OF GRADE
FT, '	FEET OR FOOT	TOW, TW	TOP OF WALL
		TP	TELEPHONE POLE
G	GAS LINE	TS	TRAFFIC SIGNAL, TRANSVERSE OR
GA	GAUGE		TUBULAR STEEL
GB	GRADE BEAM (INSIDE FACE)	TYP	TYPICAL
GAL	GALLON		
GALV	GALVANIZED	UON	UNLESS OTHERWISE NOTED
GP	GRADING PLANE	U/S	UPSTREAM
GR	GUARD RAILING		
		VAR	VARIES OR VARIABLE
H	HEIGHT	VC	VERTICAL CURVE
HORIZ	HORIZONTAL	VERT	VERTICAL
HP	HINGE POINT	V.I.F.	VERIFY IN FIELD
ID	INSIDE DIAMETER	W	WATER, WEST OR WIDTH
IN, "	INCH OR INCHES		
INV	INVERT (GRADE ELEVATION)	∠	ANGLE
IRR	IRRIGATION	°	DEGREE
		Δ	DELTA (ANGLE OF CURVATION)
JP	JOINT POLE	⌀	DIAMETER
		=	EQUALS
L	LENGTH OR LENGTH OF CURVE	'	FEET, FOOT OR ANGULAR MINUTES
LC	LENGTH OF CHORD	"	INCH OR ANGULAR SECONDS
LF	LINEAR FOOT OR FEET	ϕ	PHASE (SIGNAL OR ELECTRICAL)
LOC	LOCATION		
LT	LEFT		

1 — DETAIL NUMBER
SHEET NUMBER OR DASH INDICATING SAME SHEET

A — SECTION LETTER
3 — SHEET NUMBER OR DASH INDICATING SAME SHEET

NO.	DESCRIPTION	BY	DATE	APP'D

REVISIONS

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DRAWN M. DeDonato
CHECKED K. DROZYNSKA
APPROVED K. DRAZYNSKA

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

APPROVAL RECOMMENDED MOSES TSANG
REVISED
APPROVAL RECOMMENDED MOSES TSANG
APPROVAL RECOMMENDED

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE

PLAN OF DESIGN CONTROLS, GENERAL NOTES, AND ABBREVIATIONS

DATE: DEC 2018	SCALE: AS SHOWN
WORK ORDER NO.: R34071	
SPECIFICATION NO.: 2362	
SHEET NO.: 02 OF 26	
FILE NO.: CB-967	

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES
0 1 2 3

MEEKLAND AVENUE

BM2 20574

EXIST BRIDGE SUPPORT ABUTMENT

EXIST ELEVATED, UNKNOWN 4" PIPE

RETAINING WALL #1

EXIST 5'x5.5' RCB CULVERT

EXIST MEEKLAND AVENUE RIGHT-OF-WAY

CONCRETE CURB

EXIST MEEKLAND AVENUE RIGHT-OF-WAY

EXIST CHANNEL WALL

EXIST 54" RCP

ALAMEDA COUNTY FLOOD CONTROL
413-63-19
1971 TRAN-157045

SAN LORENZO CREEK

BURIED RETAINING WALL

LIMITS OF DIVERSION BOX

DIVERSION BOX WALL

A.C.F.C & W.C.D. STORM DRAIN EASEMENT

A.C.F.C. & W.C.D. INGRESS-EGRESS AND STORM DRAIN EASEMENT

RETAINING WALL #2

EXIST LOMA VERDE DRIVE (PRIVATE STREET & P.U.E.)

LOMA VERDE DRIVE (PRIVATE STREET)

EXIST INGRESS-EGRESS AND STORM DRAIN EASEMENT, A.C.F.C. & W.C.D.

RETAINING WALL #3

APPROX LOCATION OF EXIST RESIDENCES

DISTRICT RIGHT-OF-WAY

EXIST PROPERTY LINE

RESIDENCES LOCATED ADJACENT TO PROJECT SITE
LISTED FROM NORTH TO SOUTH:

APN	STREET ADDRESS
413-63-23	226 LOMA VERDE DRIVE, SAN LORENZO
413-63-22	232 LOMA VERDE DRIVE, SAN LORENZO
413-63-21	238 LOMA VERDE DRIVE, SAN LORENZO
413-63-20	244 LOMA VERDE DRIVE, SAN LORENZO

BOUNDARY AND TOPOGRAPHY SOURCE

COUNTY OF ALAMEDA SURVEYOR
ZONE 2 PROJECT
IMPROVEMENTS OF LINE B
MEEKLAND AVENUE
DATE OF FIELD SURVEY: 5/18/2018
SURVEY SHEET DATED: 6/8/18
SURVEY REQUEST: R34071 / R32114

PLAN

5 0 2.5 5 10 20

(IN FEET)
1" = 5'

FOR REDUCED ENGLISH PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

REVIEWED BY:	DATE:
CONSTRUCTION	
MAINTENANCE	
REAL ESTATE	

REVIEWED BY:	DATE:
SURVEY	
TRAFFIC	
ENVIRONMENTAL	

REVISIONS				
NO.	DESCRIPTION	BY	DATE	APPV'D
1				
2				
3				
4				
5				

CAL ENGINEERING & GEOLOGY
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Phone: (925) 935-9771
Fax: (925) 935-9773

DRAWN: V. Dominguez, K. Drozynska & M. Hall
CHECKED: K. Klenfelder
APPROVED: E. Escobedo
DESIGNED: K. Klenfelder

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

APPROVAL RECOMMENDED: MOSES TSANG
REVIEWED: MOSES TSANG
APPROVAL RECOMMENDED: ANDY ROSSMANN

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE

EASEMENT AND RIGHT-OF-WAY MAP

DATE	SCALE
DEC 2018	AS SHOWN

WORK ORDER NO. R34071

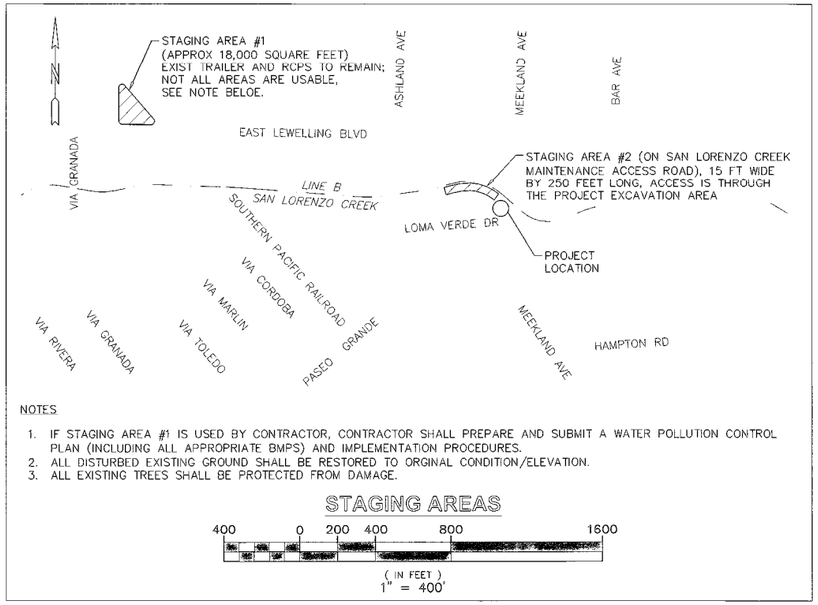
SPECIFICATION NO. 2362

SHEET NO. 03 OF 26

FILE NO. CB-967

M:\2017\171550 Klenfelder - ACFC Clean Water Devices\AutoCAD Files (MeeklandAve)\Sheets\Meekland_03 Easement and Right-of-Way Map.dwg 12-20-18 04:01:08 PM kdrozynska

REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY	
MAINTENANCE		TRAFFIC	
REAL ESTATE		ENVIRONMENTAL	



NOTES

1. IF STAGING AREA #1 IS USED BY CONTRACTOR, CONTRACTOR SHALL PREPARE AND SUBMIT A WATER POLLUTION CONTROL PLAN (INCLUDING ALL APPROPRIATE BMPS) AND IMPLEMENTATION PROCEDURES.
2. ALL DISTURBED EXISTING GROUND SHALL BE RESTORED TO ORGINAL CONDITION/ELEVATION.
3. ALL EXISTING TREES SHALL BE PROTECTED FROM DAMAGE.

STAGING AREAS

400 0 200 400 800 1600

(IN FEET)
1" = 400'

ALAMEDA COUNTY FLOOD CONTROL
#13-63-19
1971 TRAN-157045

SAN LORENZO CREEK

BM2 20574

EXIST BRIDGE SUPPORT ABUTMENT

MEEKLAND AVENUE

PLACE SILT FENCE BELOW BRIDGE

SEE APPROX PAVEMENT MARKINGS AREA ON THIS SHT FOR MARKINGS LIMITS

EXIST RCB CULVERT OUTFALL

EXIST JOINT UTILITY POLE

EXIST CROSSWALK

EXIST CROSSWALK

EXIST RCP OUTFALL

EXIST CHANNEL WALL

EXIST ASPHALT

EXIST SLOW SIGN / PRIVATE PROPERTY NO PUBLIC PARKING SIGN TO REMAIN

EXIST LOMA VERDE DRIVE (PRIVATE STREET)

±122'

END TEMPORARY SILT FENCE
BEGIN STAGING AREA #2
BEGIN TEMP RAILING (TYPE K)
WITH TEMP FIBER ROLL AT ITS
INBOARD SIDE

TEMP RAILING (TYPE K), STD PLAN T3A, WITH TEMP SCREEN, STD PLAN T4

250'

TEMPORARY FIBER ROLL, STD PLAN T56

TEMPORARY SILT FENCE STD PLAN T51

EXIST UNPAVED ACCESS ROAD

APPROX LIMITS OF WORK

END OF NEW AC, BEGIN STAGING AREA #2, SEE SHT 23 FOR PAVEMENT BOUNDARY LOCATION

EXIST CHAIN-LINK FENCE TO REMAIN

END STAGING AREA #2
15 WIDE BY 250 FEET LONG
END TEMP RAILING WITH TEMP FIBER ROLL

16'

NO CONSTRUCTION ACCESS BEYOND STAGING AREA #2

EXIST RETAINING WALL TO REMAIN

EXIST WOOD FENCE TO REMAIN

APPROX LOCATION OF EXIST RESIDENCES

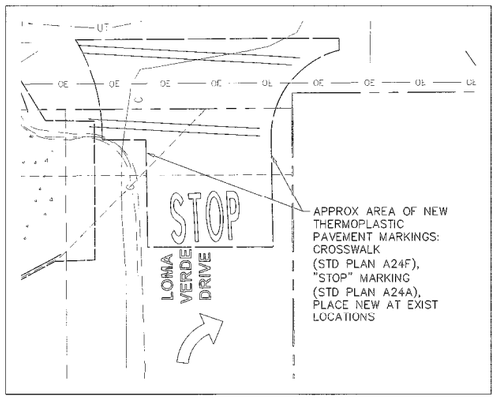
LEGEND

- TEMPORARY SILT FENCE
- TEMPORARY FIBER ROLL
- APPROXIMATE LIMITS OF WORK

PLAN

5 0 2.5 5 10 20

(IN FEET)
1" = 5'



APPROXIMATE PAVEMENT MARKINGS AREA

10 0 5 10 20 40

(IN FEET)
1" = 10'

INSTALL TEMP DI PROTECTION

EXIST DROP INLET LOCATED IN CORNER OF PARKING LOT

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

REVISIONS

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
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5				

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COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

RECOMMENDED: MOSES TSANG
APPROVAL RECOMMENDED: MOSES TSANG
APPROVED: HAO ZHONG

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE
CONCEPTUAL WATER POLLUTION PREVENTION AND STAGING PLAN

DATE	SCALE
DEC 2018	AS NOTED

WORK ORDER NO. R34071
SPECIFICATION NO. 2362
SHEET NO. 04 OF 26
FILE NO. CB-967

M:\2017\171550 Kleinfelder - ACFC Clean Water Devices\AutoCAD Files (Meekland Ave)\Sheets\Meekland_04 Erosion Control and Staging.dwg 12-20-18 04:02:20 PM kdrozynska

BM2 20574

EXIST BRIDGE SUPPORT ABUTMENT

MEEKLAND AVENUE

EXIST METAL GUARDRAIL

"CAUTION" OVERHEAD LINES LOW POINT=15.33' (AT TIME OF SURVEY) ABOVE SIDEWALK

EXIST BRIDGE SIDEWALK, DECK OVERHANG

EXIST BRIDGE SUPPORT ABUTMENT

REMOVE CHAIN LINK FENCE
N: 2076153.68
E: 6093809.35

REMOVE CHAIN LINK FENCE
N: 2076148.95
E: 6093806.10

EXIST ELEVATED, UNKNOWN 4" PIPE

BEGIN REMOVE CHAIN LINK FENCE
N: 2076120.89
E: 6093807.72

EXIST RCB CULVERT OUTFALL

REMOVE RCB CULVERT WITHIN INTERIOR OF DIVERSION BOX

EXIST JOINT UTILITY POLE
PROTECT, SEE NOTE 1

CONTRACTOR SHALL PROVIDE TEMPORARY FLOW DIVERSION DURING CONSTRUCTION

REMOVE EXIST THERMOPLASTIC PAVEMENT MARKINGS

EXIST CHANNEL WALL
PROTECT

REMOVE CHAIN LINK FENCE

REMOVE RCP WITHIN INTERIOR OF DIVERSION BOX

APPROX LIMITS, REMOVE EXIST SIDEWALK AND EXIST DRIVEWAY

ALAMEDA COUNTY FLOOD CONTROL
#13-63-19
1971 TRAM-157045

SAN LORENZO CREEK

EXIST RCP OUTFALL

REMOVE ENTIRE EXIST AC ACCESS ROAD

18.0'

8.0'

EXIST ASPHALT

EXIST SLOW SIGN
PRIVATE PROPERTY
NO PUBLIC PARKING
SIGN PROTECT

REMOVE EXIST THERMOPLASTIC PAVEMENT MARKINGS

LOMA VERDE DRIVE
(PRIVATE STREET)

PROTECT

EXIST WOOD FENCE
PROTECT

EXIST RETAINING WALL
PROTECT

EXIST UNPAVED ACCESS ROAD

APPROX LOCATION OF EXIST RESIDENCES

END REMOVE CHAIN LINK FENCE
N: 2076194.29
E: 6093739.07

EXIST CHAINLINK FENCE

NOTE

EXIST JOINT POLE TO REMAIN. THE CONTRACTOR SHALL PROTECT THE POLE AT ALL TIMES DURING THE WORK. THE CONTRACTOR SHALL COORDINATE WITH PG&E IN ADVANCE OF EXCAVATION TO BOTH INFORM PG&E OF THE WORK TO TAKE PLACE IN PROXIMITY OF THE JOINT POLE AND TO DEVELOP AND PROVIDE TEMPORARY SUPPORT PLANS FOR THE POLE AS REQUIRED BY PG&E AND THE ENGINEER. THE CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FROM PG&E AND OTHER UTILITIES ABOUT HOW TO PROTECT THE POLE DURING CONSTRUCTION BEFORE EXCAVATION WITHIN 10 FEET OF THE POLE BEGINS AND SHALL SUBMIT A COPY OF THE WRITTEN APPROVAL AND THE POLE PROTECTION PLANS TO THE ENGINEER.

PLAN

5 0 2.5 5 10 20

(IN FEET)
1" = 5'

LEGEND

X REMOVE TREE STUMP

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY	
MAINTENANCE		TRAFFIC	
REAL ESTATE		ENVIRONMENTAL	

NO.	DESCRIPTION	BY	DATE	APP'D
1				
2				
3				
4				
5				

REVISIONS

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COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

APPROVAL RECOMMENDED: MOSES TSANG 12/6/18
APPROVAL RECOMMENDED: MOSES TSANG 12/6/18

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE

EXISTING SITE AND DEMOLITION PLAN

DATE: DEC 2018
SCALE: AS SHOWN
WORK ORDER NO.: R34071
SPECIFICATION NO.: 2362
SHEET NO.: 05 OF 26
FILE NO.: CB-967

M:\2017\17550 Kleinfelder - ACFC Clean Water Devices\AutoCAD Files (MeeklandAve)\Sheets\Meekland_05 Existing Site and Demolition Plan.dwg 12-20-18 04:03:16 PM kdrozynska

REVIEWED BY:	DATE:
CONSTRUCTION	
MAINTENANCE	
REAL ESTATE	

REVIEWED BY:	DATE:
SURVEY	
TRAFFIC	
ENVIRONMENTAL	

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21127

BM2 20574

EXIST BRIDGE SUPPORT ABUTMENT

MEEKLAND AVENUE

EXIST METAL GUARDRAIL

"CAUTION" OVERHEAD LINES LOW POINT=15.33' (AT TIME OF SURVEY) ABOVE SIDEWALK

EXIST BRIDGE SIDEWALK, DECK OVERHANG

EXIST ELEVATED, UNKNOWN 4" PIPE

EXIST RCB CULVERT OUTFALL

EXIST BRIDGE SUPPORT ABUTMENT

21475

3' WIDE CHAIN LINK FENCE GATE

EXIST SIGN

EXIST EDGE OF MEEKLAND AVE BRIDGE DECK SIDEWALK

MONITORING POINT (TYP)

M1

SELF-ADJUSTING FLOW GATE

RCB CULVERT OUTLET AT DIVERSION BOX

RETAINING WALL (CONNECTED TO ROOF SLAB)

RCB CULVERT INLET AT DIVERSION BOX

EXIST JOINT UTILITY POLE PROTECT

EXIST 5'x5.5' RCB CULVERT

ACCESS HATCH COVER

END OF RETAINING WALL #1

CONFORM TO EXIST CURB

EXIST CHANNEL WALL PROTECT

M2

ACCESS HATCH WALL, TYP

BEGIN RETAINING WALL #1

BURIED RETAINING WALLL

WEIR

CONC CURB

EXIST UG UTILITY PROTECT

EXIST 54" RCP

RCP INLET AT DIVERSION BOX

ROOF INTERIOR COLUMN, TYP

MAINTENANCE HATCH GRATES, TYP

36" DIA ACCESS MH, TYP

BURIED DIVERSION BOX

APPROX LIMIT OF NEW 18' WIDE DRIVEWAY AND SIDEWALK

EXIST SLOW SIGN / PRIVATE PROPERTY NO PUBLIC PARKING SIGN

LOMA VERDE DRIVE (PRIVATE STREET)

EXIST RCP OUTFALL

18" DIA STORMFLO DEVICES, NOT SHOWN, SEE SHT 13

MAINTENANCE HATCH WALL, TYP

RCP OUTLET AT DIVERSION BOX

6' HIGH CHAIN LINK FENCE ALONG TOP OF RETAINING WALL

RETAINING WALL #2

DIVERSION BOX WALL AND GRADE BEAM

DIVERSION BOX WALL PILE, TYP

EXIST PIEZOMETER

20545

M3

M4

21126

EXIST GATE

13'±

EXIST WOOD FENCE

EXIST RETAINING WALL PROTECT

1.0' TYP

RETAINING WALL #3

EXIST A.C.F.C & W.C.D INGRESS-EGREES AND STORM DRAIN EASEMENT

END AC PAVEMENT

12 FT GATE

8.0' TYP

EXIST UNPAVED ACCESS ROAD

16'±

STORAGE FOR REMOVABLE SAFETY RAILING (TYP, 3 TOT) 2" DIA HOLES IN RET WALL, 6" DEEP, 6 HOLES TOTAL, CENTERLINE SYMM WITH STEM, MATCH HOLES WITH RAILING POLES

EXIST CHAINLINK FENCE

APPROX LOCATION OF EXIST RESIDENCES

EXIST CHAINLINK FENCE

ALAMEDA COUNTY FLOOD CONTROL 413-63-19 1971 TRAN-157045

SAN LORENZO CREEK

NOTES

1. FOR PILE LOCATIONS AND ELEVATIONS, SEE PILE TABLES ON SHEET 9.
2. SEE GRADING PLAN ON SHEET 23 FOR INFORMATION NOT SHOWN ON THIS SHEET.

PLAN

5 0 2.5 5 10 20

(IN FEET) 1" = 5'

MONITORING POINTS TABLE		
POINT #	NORTHING	EASTING
M1	2076134.68	6093808.26
M2	2076170.70	6093791.03
M3	2076166.33	6093762.01
M4	2076125.95	6093764.63

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

REVISIONS

NO.	DESCRIPTION	BY	DATE	APP'VD
5				
4				
3				
2				
1				

PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — No. Civil C 54877 — CIVIL — REGISTERED

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DESIGNED: K. JONES 12/20/18

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

APPROVAL RECOMMENDED: MOSES TSANG 12/20/18
APPROVAL RECOMMENDED: HANK FERGUSON 12/20/18

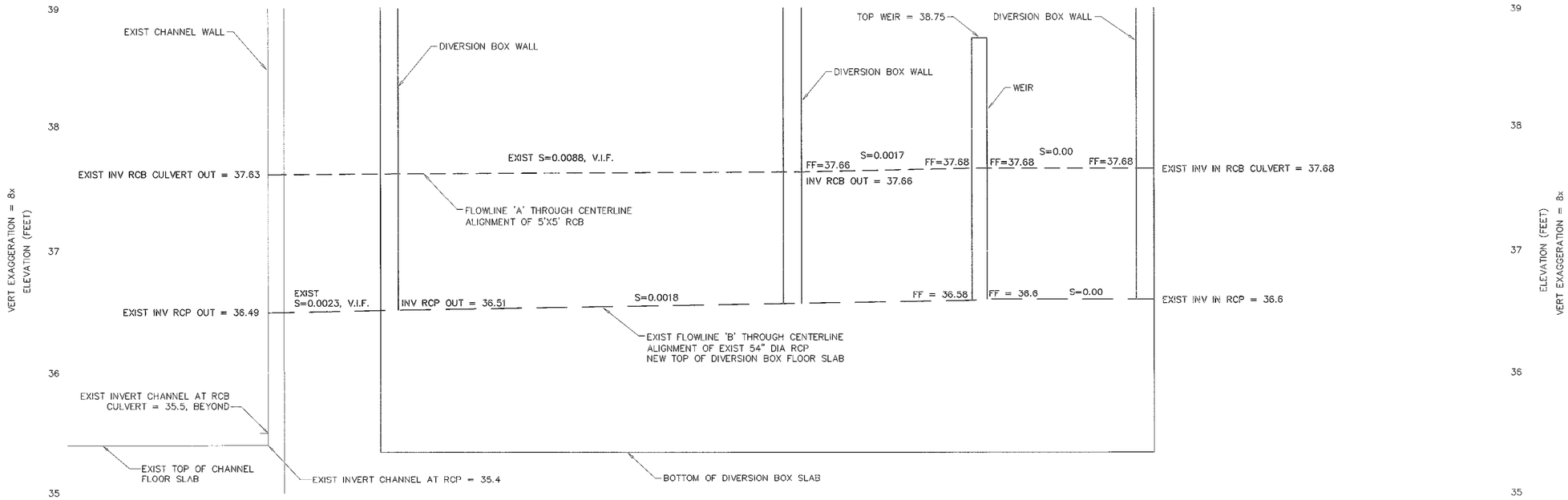
INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE

SITE PLAN

DATE: DEC 2018
SCALE: AS SHOWN
WORK ORDER NO.: R34071
SPECIFICATION NO.: 2362
SHEET NO.: 06 OF 26
FILE NO.: CB-967

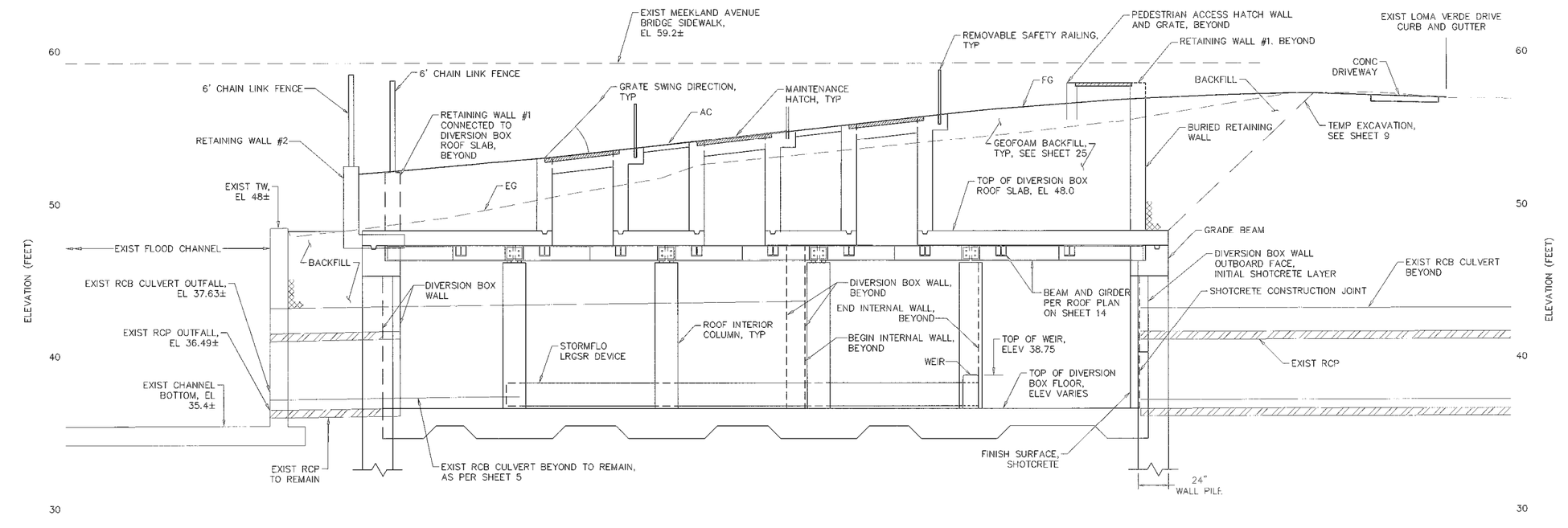
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MAINTENANCE		
REAL ESTATE		

	REVIEWED BY:	DATE:
SURVEY		
TRAFFIC		
ENVIRONMENTAL		



FLOWLINES PROFILE

HORIZ SCALE 1" = 4
VERT SCALE 1" = 1/2'



4 0 2 4 8 16
(IN FEET)
1" = 4'

SECTION A/6
SCALE 1" = 4'

FOR REDUCED ENGLISH PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

NO.	DESCRIPTION	BY	DATE	APP'D

REVISIONS

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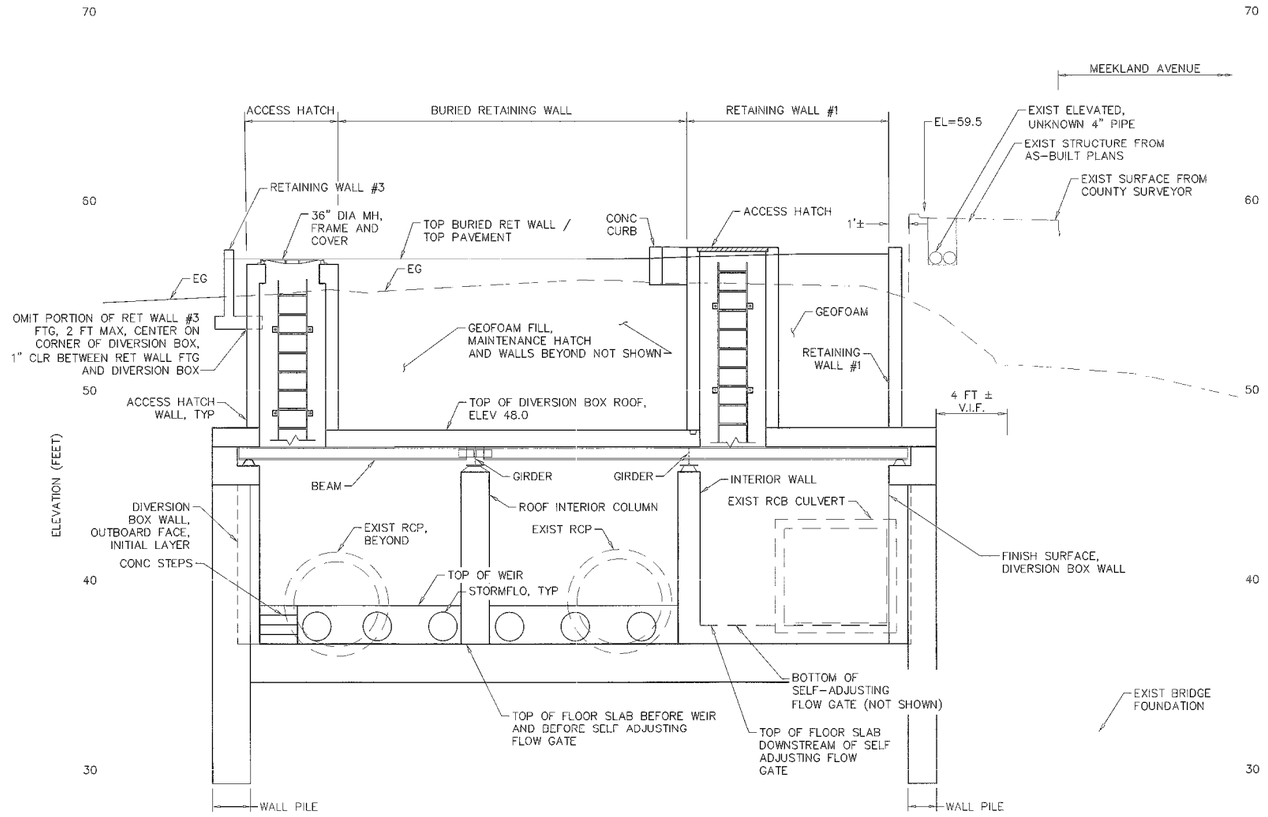
COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

REVIEWED: MOSES TSANG, APPROVAL RECOMMENDED
MOSES TSANG, APPROVAL RECOMMENDED
HUGO TADEO, APPROVAL RECOMMENDED

INSTALLATION OF
FULL TRASH CAPTURE DEVICES
IN THE VICINITY OF
MEEKLAND AVE AND LOMA VERDE DRIVE
SECTION A - DIVERSION BOX

DATE	DEC 2018
SCALE	AS SHOWN
WORK ORDER NO.	R34071
SPECIFICATION NO.	2362
SHEET NO.	07 OF 26
FILE NO.	CB-967

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SECTION B / 6
SCALE 1" = 4'

SOURCES

1. MEEKLAND AVENUE BRIDGE
   B-16-5, 503-24 6 SHEETS DATED AUGUST 1926
2. ACFCWCD ZONE 2, LINE L FROM SAN LORENZO CREEK TO SUNSET BLVD.
   SPEC # FC2-36 13 SHEETS DATED JAN 1961.

4 0 2 4 8 16
(IN FEET)
1" = 4'

FOR REDUCED ENGLISH PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

	REVIEWED BY:	DATE:		REVIEWED BY:	DATE:
CONSTRUCTION			SURVEY		
MAINTENANCE			TRAFFIC		
REAL ESTATE			ENVIRONMENTAL		

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REVISIONS

NO.	DESCRIPTION	BY	DATE	APP'D
1				
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5				

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12-20-2018

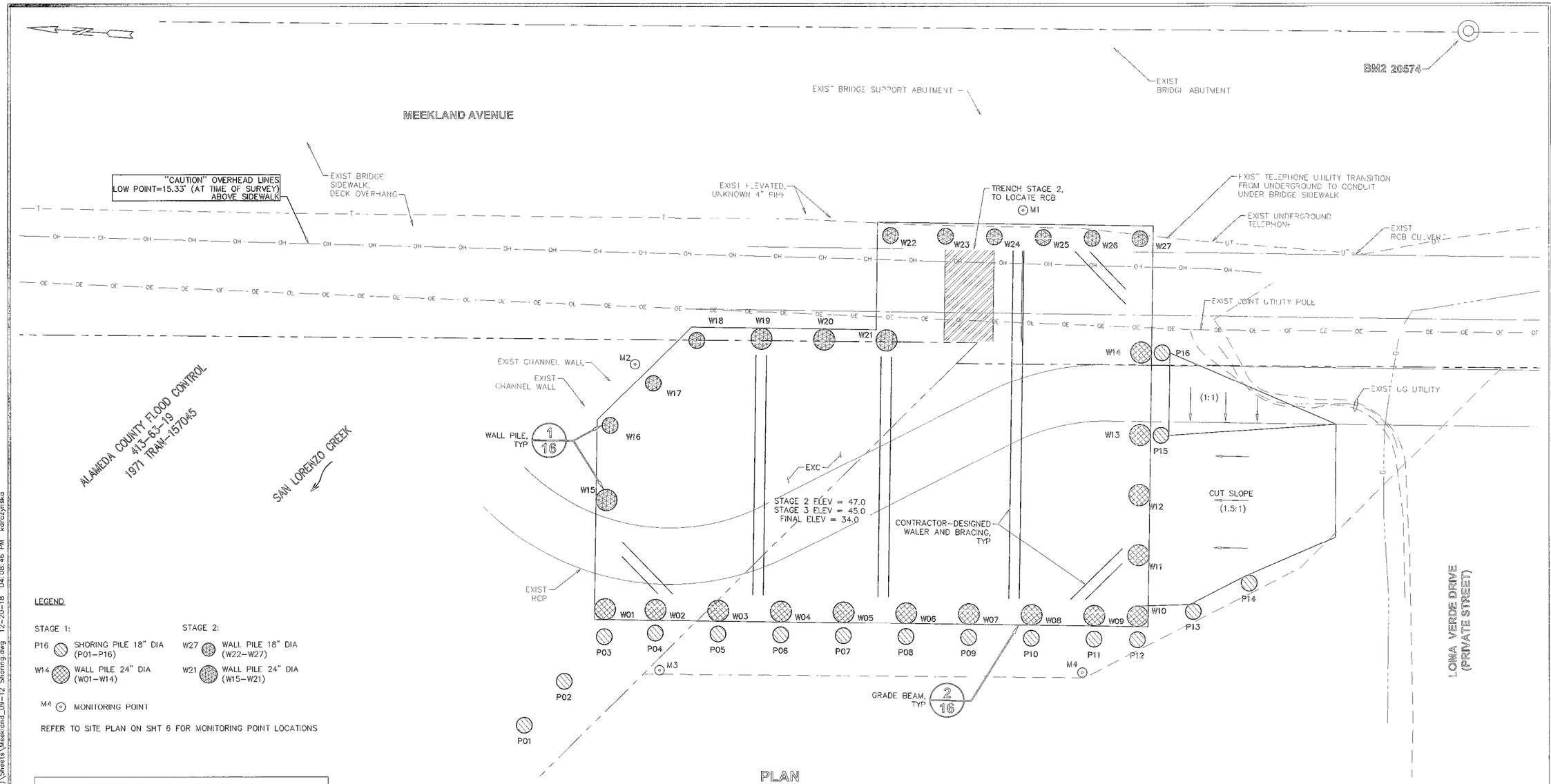
COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

REVIEWED: MOSES TSANG
APPROVAL RECOMMENDED: MOSES TSANG
APPROVED: HAWK ACKERMAN

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE
SECTION B
DIVERSION BOX

DATE	SCALE
DEC 2018	AS SHOWN

WORK ORDER NO. R34071
SPECIFICATION NO. 2362
SHEET NO. 08 OF 26
FILE NO. CB-967



PLAN

5 0 2.5 5 10 20

(IN FEET)
1" = 5'

LEGEND

STAGE 1:

P16 SHORING PILE 18" DIA (P01–P16)

W14 WALL PILE 24" DIA (W01–W14)

STAGE 2:

W27 WALL PILE 18" DIA (W22–W27)

W21 WALL PILE 24" DIA (W15–W21)

M4 ⊙ MONITORING POINT

REFER TO SITE PLAN ON SHT 6 FOR MONITORING POINT LOCATIONS

SHORING PILE TABLE - STAGE 1

NO.	DIA	NORTHING	EASTING	TIP EL.	TOP EL.	REINFORCING
P01	18	2076178.87	6093755.82	32.00'	49.55'	W8x40
P02	18	2076175.35	6093760.31	32.00'	49.46'	W8x40
P03	18	2076171.82	6093764.80	32.00'	49.93'	W8x40
P04	18	2076166.98	6093765.49	32.00'	50.58'	W8x40
P05	18	2076160.99	6093765.83	32.00'	51.28'	W8x40
P06	18	2076155.00	6093766.17	32.00'	52.57'	W8x40
P07	18	2076149.01	6093766.51	32.00'	53.13'	W8x40
P08	18	2076143.02	6093766.84	32.00'	53.34'	W8x40
P09	18	2076137.03	6093767.18	32.00'	54.11'	W8x40
P10	18	2076131.04	6093767.52	32.00'	54.63'	W8x40
P11	18	2076125.05	6093767.86	32.00'	54.79'	W8x40
P12	18	2076120.89	6093768.10	32.00'	55.06'	W8x40
P13	18	2076115.74	6093771.18	32.00'	55.91'	W8x40
P14	18	2076110.59	6093774.26	32.00'	56.68'	W8x40
P15	18	2076120.00	6093787.76	32.00'	56.28'	W8x40
P16	18	2076120.44	6093795.65	32.00'	56.17'	W8x40

WALL PILE TABLE - STAGE 1

NO.	DIA	NORTHING	EASTING	TIP EL.	TOP EL.	REINFORCING
W01	24	2076171.94	6093767.46	25.00'	45.17'	CAGE PER PLAN
W02	24	2076167.11	6093767.74	25.00'	45.17'	CAGE PER PLAN
W03	24	2076161.12	6093768.08	25.00'	45.17'	CAGE PER PLAN
W04	24	2076155.13	6093768.41	25.00'	45.17'	CAGE PER PLAN
W05	24	2076149.14	6093768.75	25.00'	45.17'	CAGE PER PLAN
W06	24	2076143.15	6093769.09	25.00'	45.17'	CAGE PER PLAN
W07	24	2076137.16	6093769.43	25.00'	45.17'	CAGE PER PLAN

WALL PILE TABLE - STAGE 1

NO.	DIA	NORTHING	EASTING	TIP EL.	TOP EL.	REINFORCING
W08	24	2076131.17	6093769.77	25.00'	45.17'	CAGE PER PLAN
W09	24	2076125.18	6093770.11	25.00'	45.17'	CAGE PER PLAN
W10	24	2076121.02	6093770.34	25.00'	45.17'	CAGE PER PLAN
W11	24	2076121.35	6093776.17	25.00'	45.17'	CAGE PER PLAN
W12	24	2076121.67	6093781.91	25.00'	45.17'	CAGE PER PLAN
W13	24	2076121.99	6093787.65	25.00'	45.17'	CAGE PER PLAN
W14	24	2076122.44	6093795.53	29.00'	45.17'	CAGE PER PLAN

WALL PILE TABLE - STAGE 2

NO.	DIA	NORTHING	EASTING	TIP EL.	TOP EL.	REINFORCING
W15	24	2076172.52	6093777.87	29.00'	45.17'	CAGE PER PLAN
W16	18	2076172.67	6093785.00	29.00'	45.17'	CAGE PER PLAN
W17	18	2076168.83	6093789.33	29.00'	45.17'	CAGE PER PLAN
W18	18	2076164.96	6093793.70	29.00'	45.17'	CAGE PER PLAN
W19	24	2076158.80	6093794.28	29.00'	45.17'	CAGE PER PLAN
W20	24	2076152.81	6093794.62	29.00'	45.17'	CAGE PER PLAN
W21	24	2076146.85	6093794.96	29.00'	45.17'	CAGE PER PLAN
W22	18	2076147.07	6093804.86	29.00'	45.17'	CAGE PER PLAN
W23	18	2076141.91	6093805.24	29.00'	45.17'	CAGE PER PLAN
W24	18	2076137.23	6093805.50	29.00'	45.17'	CAGE PER PLAN
W25	18	2076132.56	6093805.77	29.00'	45.17'	CAGE PER PLAN
W26	18	2076127.89	6093806.03	29.00'	45.17'	CAGE PER PLAN
W27	18	2076123.30	6093806.30	29.00'	45.17'	CAGE PER PLAN

	REVIEWED BY:	DATE:
CONSTRUCTION		
MAINTENANCE		
REAL ESTATE		

	REVIEWED BY:	DATE:
SURVEY		
TRAFFIC		
ENVIRONMENTAL		

NO.	DESCRIPTION	BY	DATE	APPV'D
5				
4				
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1				

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CHECKED: M. GARCIA
APPROVED: P. GREGORY
DESIGNED: K. DROZYNSKA & M. ARNAL

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE

SHORING PLAN AND PILE DATA TABLE

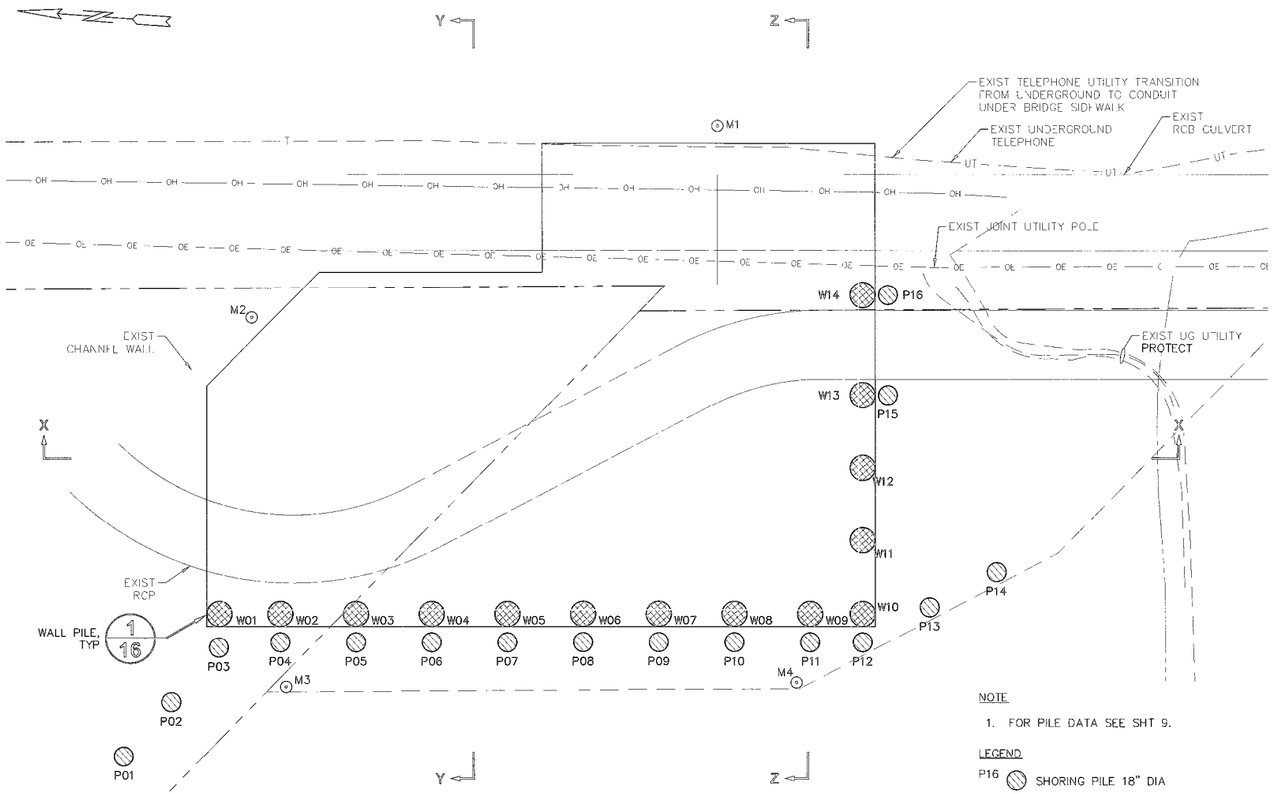
REVIEWED: MOSES TSANG
APPROVAL RECOMMENDED: MOSES TSANG
APPROVED: HAO ZHONG

DATE: DEC 2018
SCALE: AS SHOWN
WORK ORDER NO. R34071
SPECIFICATION NO. 2362
SHEET NO. 09 OF 26
FILE NO. CB-967

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

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	REVIEWED BY:	DATE:		REVIEWED BY:	DATE:
CONSTRUCTION			SURVEY		
MAINTENANCE			TRAFFIC		
REAL ESTATE			ENVIRONMENTAL		



PLAN
1" = 6'

NOTE

1. FOR PILE DATA SEE SHT 9.

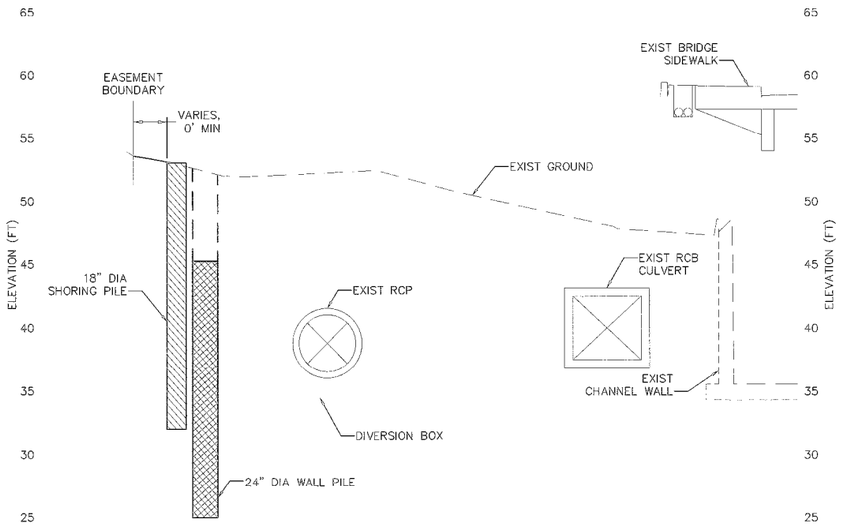
LEGEND

P16 SHORING PILE 18" DIA

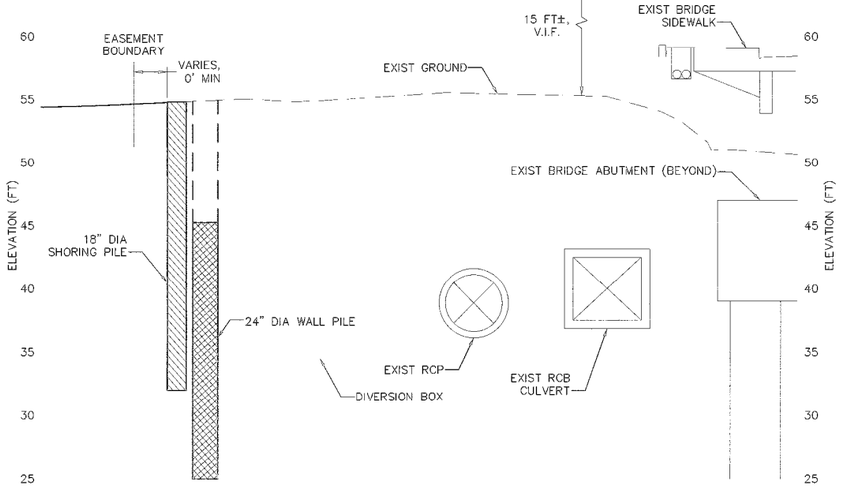
W14 WALL PILE 24" DIA

M4 MONITORING POINT

SECTION X
1" = 6'



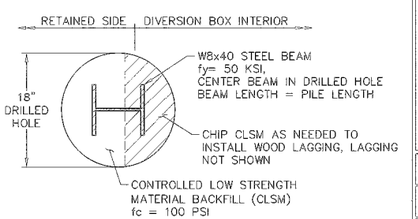
SECTION Y
1" = 6'



SECTION Z
1" = 6'

STAGE 1 SEQUENCE:

1. ESTABLISH MONITORING POINTS AS SHOWN ON SITE PLAN ON SHT 6.
2. CONSTRUCT 18" CIDH SHORING PILES (P01–P16) PER DETAIL ON THIS SHEET AND AS SHOWN IN PILE DATA TABLE ON SHORING PLAN. STAGGER PILE CONSTRUCTION SO THAT EVERY OTHER SHORING PILE IS DRILLED AND BACKFILLED PRIOR TO CONSTRUCTING THE REMAINING INTERMEDIATE SHORING PILES.
3. CONSTRUCT 24" DIVERSION BOX WALL PILES (STAGE 1 W01–W14 CIDH PILES) PER PLAN AND AS SHOWN IN PILE DATA TABLE ON SHORING PLAN. STAGGER PILE CONSTRUCTION SO THAT EVERY OTHER WALL PILE IS DRILLED AND BACKFILLED PRIOR TO CONSTRUCTING THE REMAINING INTERMEDIATE WALL PILES.



18" DIA SHORING PILE
1" = 1'

6 0 3 6 12 24
(IN FEET)
1" = 6'

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES
0 1 2 3

NO.	DESCRIPTION	BY	DATE	APP'D

REVISIONS

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APPROVED: P. Campbell
DRAWN: K. DROZYNSKA & M. ATHAL
DESIGNED: K. DROZYNSKA

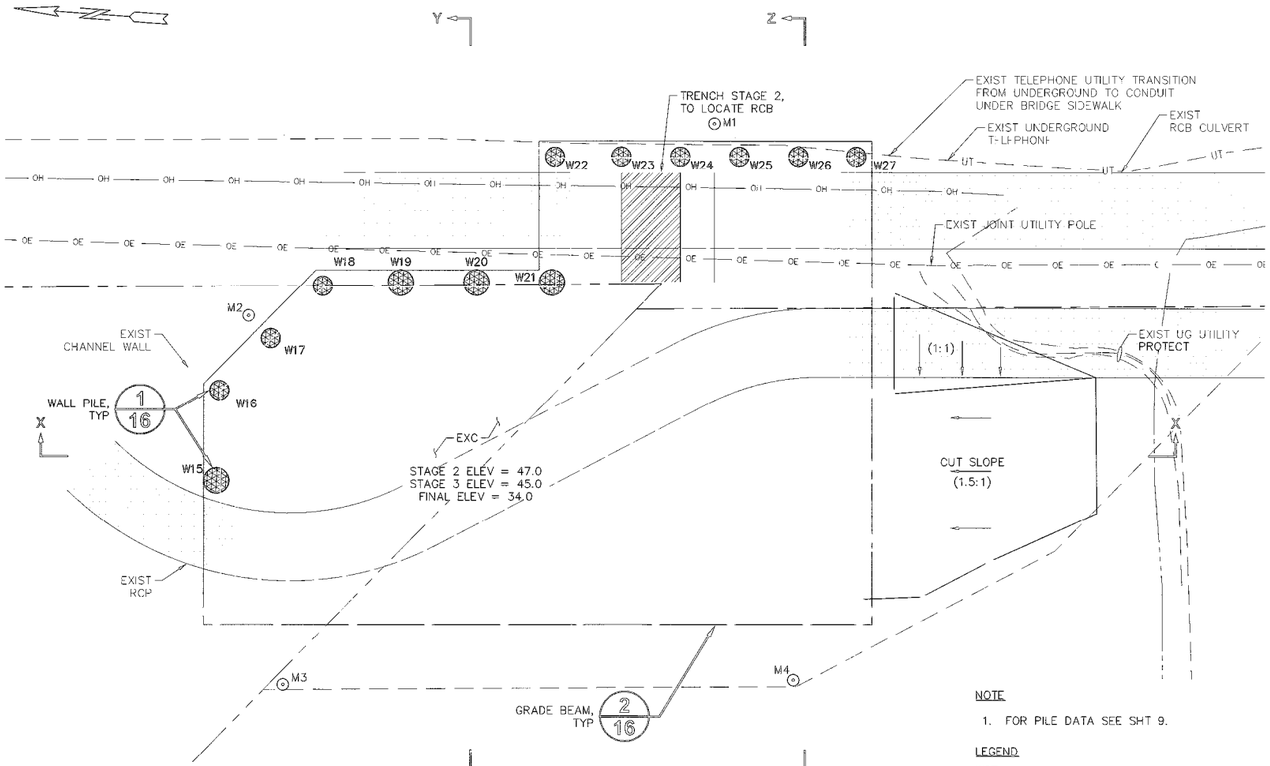
COUNTY OF ALAMEDA ★ PUBLIC WORKS AGENCY

RECOMMENDED: MOSES TSANG
APPROVAL RECOMMENDED: MOSES TSANG
APPROVED AND RECOMMENDED FOR APPROVAL: MARK ROCKWAY

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE
SHORING - STAGE 1

DATE: DEC 2018
SCALE: AS SHOWN
WORK ORDER NO.: R34071
SPECIFICATION NO.: 2362
SHEET NO.: 10 OF 26
FILE NO.: CB-967

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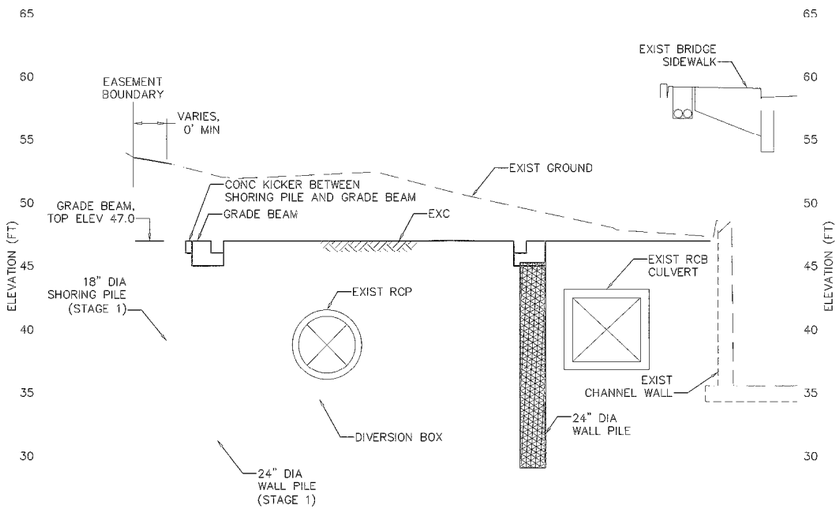
PLAN
1" = 6'

NOTE

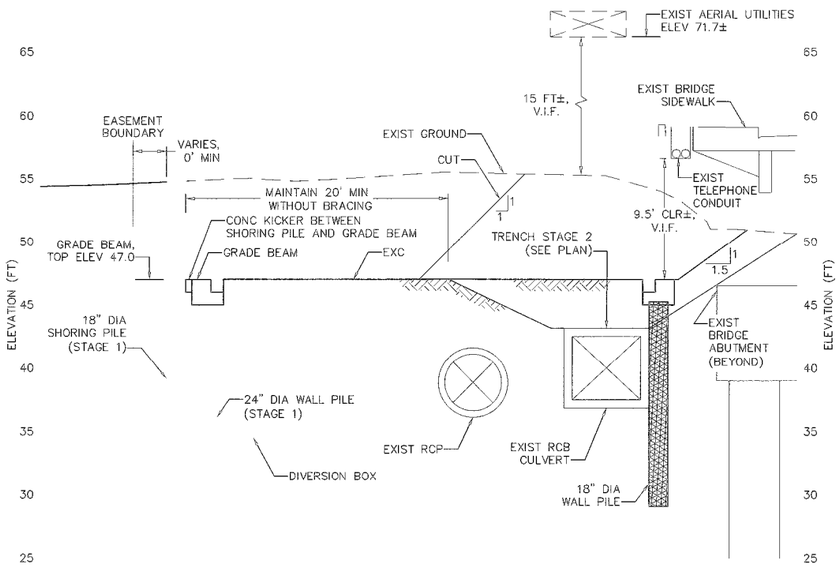
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LEGEND

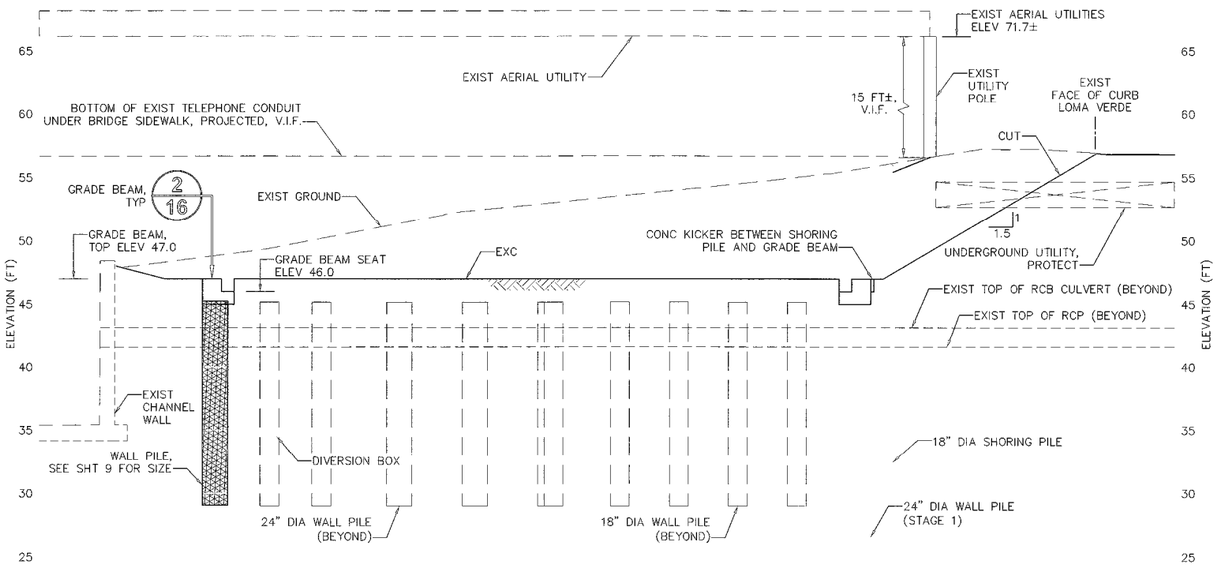
W27 WALL PILE 18" DIA
W21 WALL PILE 24" DIA
M4 MONITORING POINT



SECTION Y
1" = 6'



SECTION Z
1" = 6'



SECTION X
1" = 6'

STAGE 2 SEQUENCE:

1. PROTECT EXISTING UNDERGROUND UTILITIES AT ALL TIMES.
2. EXCAVATE TO ELEVATION 47.0 AND INSTALL TEMPORARY LAGGING BETWEEN SHORING PILES. TEMPORARY LAGGING DESIGNED BY CONTRACTOR.
3. EXCAVATE TRENCH TO LOCATE RCB CULVERT PRIOR TO CONSTRUCTION OF 18" WALL PILES (W22 THROUGH W27) ALONG RCB CULVERT.
4. CONSTRUCT REMAINING 24" AND 18" DIVERSION BOX WALL PILES (STAGE 2 W15 THROUGH W27 CIDH PILES) PER PLAN AND AS SHOWN IN PILE DATA TABLE ON SHORING PLAN. STAGGER PILE CONSTRUCTION SO THAT EVERY OTHER WALL PILE IS DRILLED AND BACKFILLED PRIOR TO CONSTRUCTING THE REMAINING INTERMEDIATE WALL PILES.
3. EXCAVATE GRADE BEAM TRENCH AND CONSTRUCT GRADE BEAM.
4. CONSTRUCT CONCRETE LOAD TRANSFER KICKER (SEE DETAIL 2 ON SHEET 16) BETWEEN SHORING PILES AND DIVERSION BOX WALL PILES, WHERE SHORING PILES ARE LOCATED DIRECTLY BEHIND WALL PILES.

6 0 3 6 12 24
(IN FEET)
1" = 6'

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES
0 1 2 3

REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY	
MAINTENANCE		TRAFFIC	
REAL ESTATE		ENVIRONMENTAL	

NO.	DESCRIPTION	BY	DATE	APP'D
1				
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4				
5				

REVISIONS

STATE OF CALIFORNIA — PROFESSIONAL ENGINEER — No. Civil C 43997 — EXP. 12-31-19

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APPROVED: P. GRIFFIN
DESIGNED: K. DROZYNSKA & M. NITHAL

REVIEWED: MOSES TSANG
APPROVED RECOMMENDED: MOSES TSANG
APPROVED RECOMMENDED: HANY ASSAAD

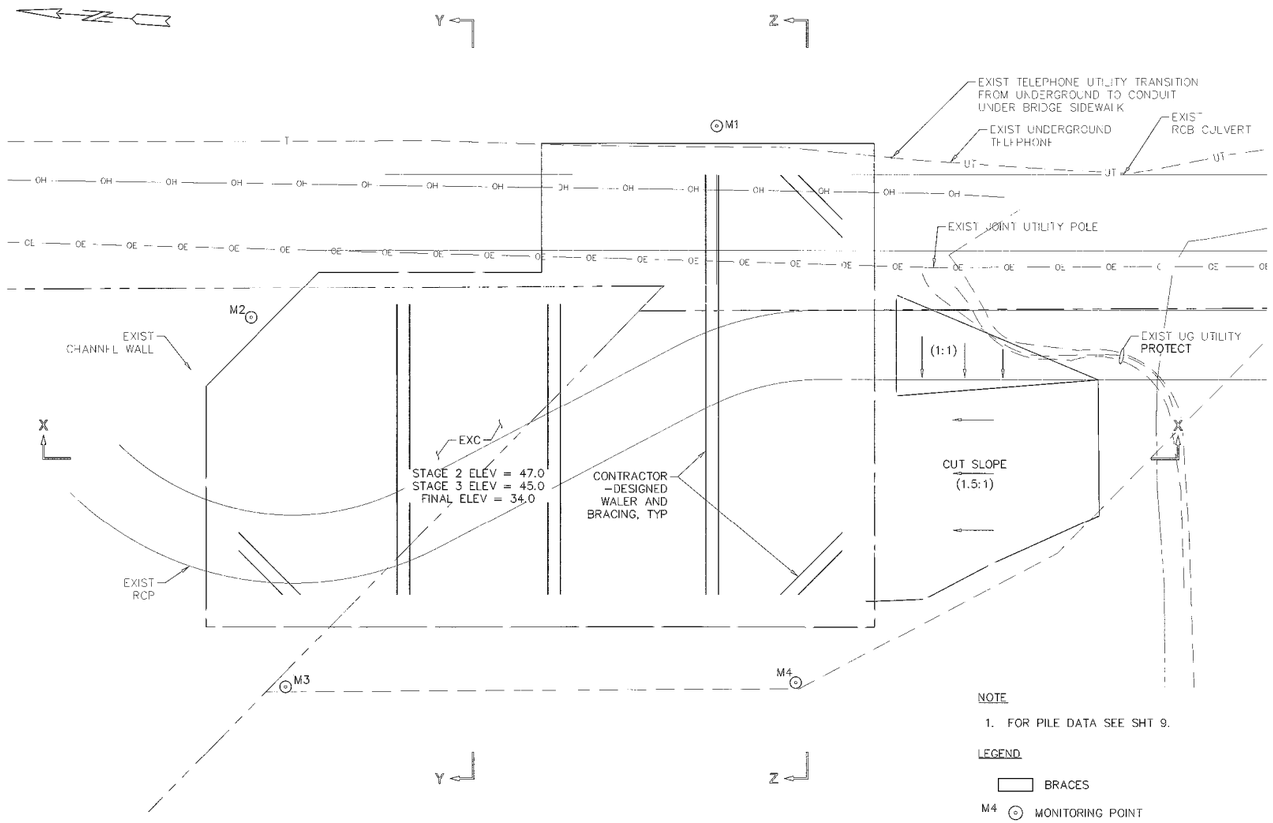
COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE

SHORING - STAGE 2

DATE: DEC 2018
SCALE: AS SHOWN
WORK ORDER NO.: R34071
SPECIFICATION NO.: 2362
SHEET NO.: 11 OF 26
FILE NO.: CB-967

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PLAN
1" = 6'

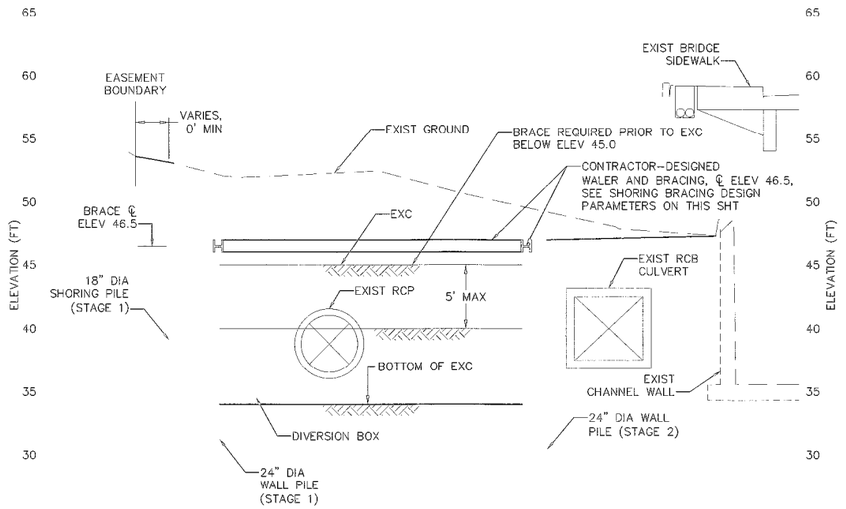
NOTE

1. FOR PILE DATA SEE SHT 9.

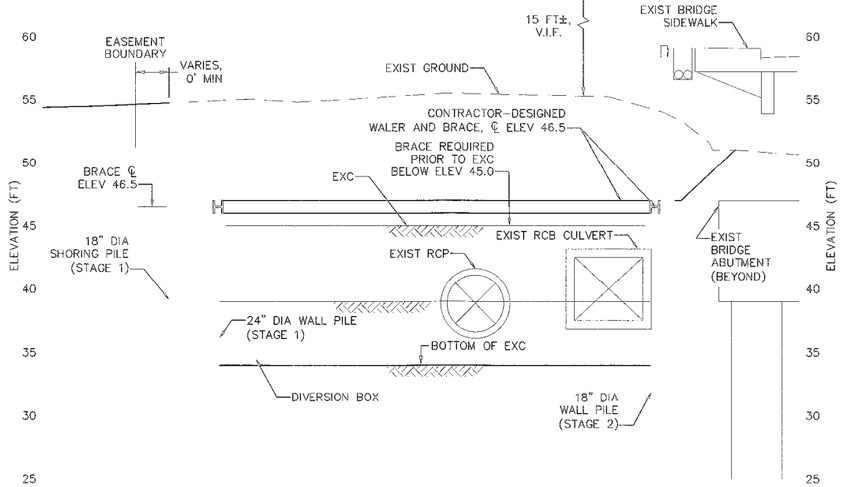
LEGEND

BRACES

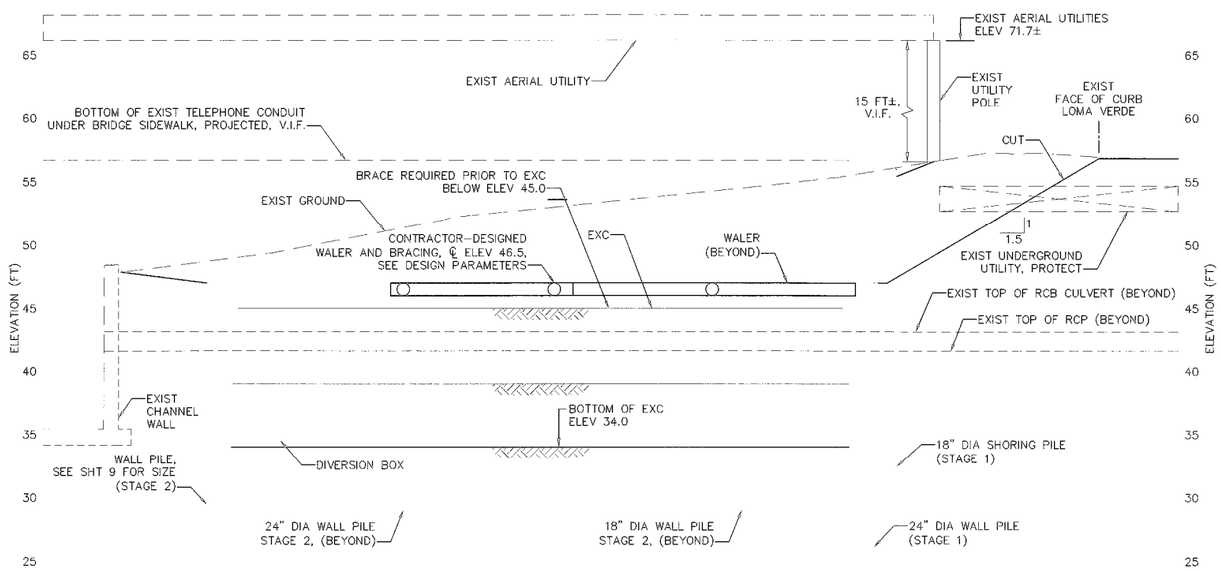
M4 ⊙ MONITORING POINT



SECTION Y
1" = 6'



SECTION Z
1" = 6'



SECTION X
1" = 6'

6 0 3 6 12 24
(IN FEET)
1" = 6'

STAGE 3 SEQUENCE

1. EXCAVATE TO ELEVATION 45.0 (LOWEST ELEVATION ALLOWED PRIOR TO INSTALLING BRACING SYSTEM).
2. INSTALL CONTRACTOR-DESIGNED WALER AND BRACING SYSTEM AT A BRACE CENTERLINE, ELEVATION 46.5. BRACING SHALL BE DESIGNED TO BE POSITIONED ALONG GRADE BEAM SEAT AND A WALER SHALL BE USED TO DISTRIBUTE LOAD ACROSS GRADE BEAM CONCRETE.
3. EXCAVATE IN MAXIMUM 5 FEET VERTICAL INCREMENTS AND CONSTRUCT INITIAL SHOTCRETE FACING (SEE DETAIL 3 ON SHT 16). BOTTOM OF EXCAVATION ELEVATION IS 34.0.
4. SAWCUT AND DEMOLISH RCB CULVERT AND RCP WITHIN LIMITS OF DIVERSION BOX.
5. CONSTRUCT FLOOR SLAB/FOOTINGS AND ASSOCIATED CONNECTIONS AS SHOWN ON SHT 17.

SHORING BRACING DESIGN PARAMETERS

BRACE LOCATION – ELEV 46.5 (CENTERLINE)

BRACE LINE LOAD (UNFACTORED) – 10.2 KIP/FT

MAX BRACE SPACING (PLAN) – 15 FEET HORIZONTAL

NO BRACING SHALL BE INSTALLED BETWEEN WALL PILES W16–W19 DUE TO LOADING ON EXIST CHANNEL WALL

REFER TO SHORING PLAN FOR OTHER REQUIREMENTS OR CONSTRAINTS

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES
0 1 2 3

REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY	
MAINTENANCE		TRAFFIC	
REAL ESTATE		ENVIRONMENTAL	

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CE&G CAL ENGINEERING & GEOLOGY
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DESIGNED: K. DROZYNSKA
CHECKED: K. DROZYNSKA
APPROVED: R. WALDEN

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

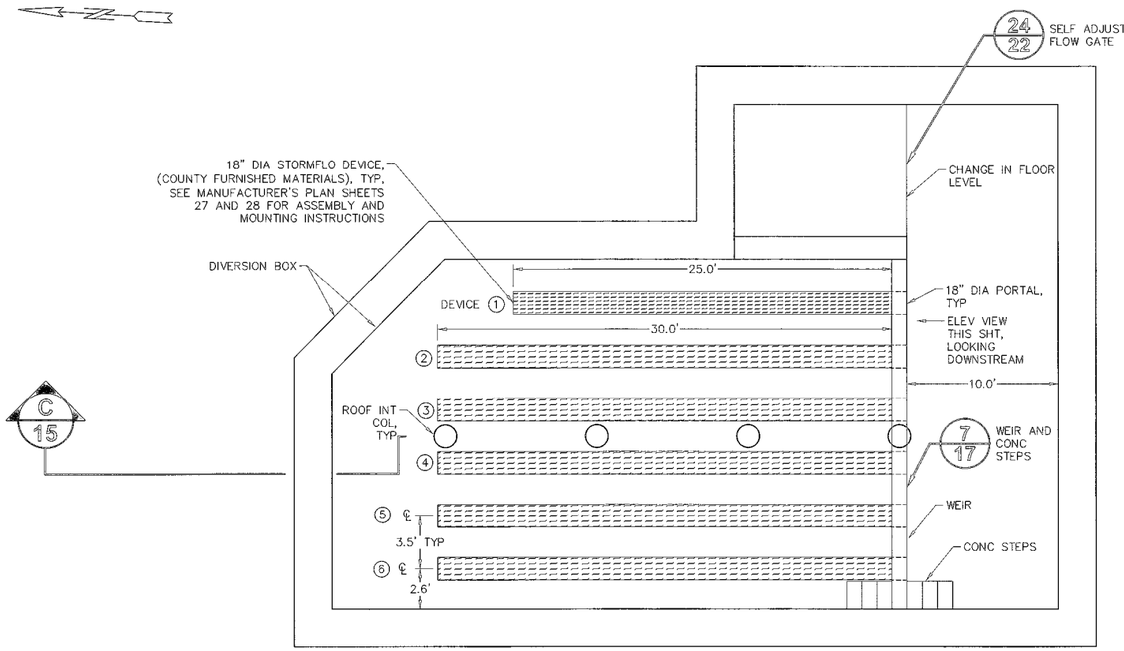
APPROVAL RECOMMENDED: MOSES TSANG
REVIEWED: MOSES TSANG
APPROVAL RECOMMENDED: ANDY GRAY

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE

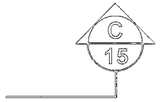
SHORING - STAGE 3

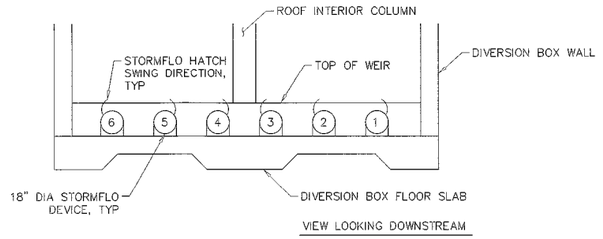
DATE: DEC 2018
SCALE: AS SHOWN
WORK ORDER NO.: R34071
SPECIFICATION NO.: 2362
SHEET NO.: 12 OF 26
FILE NO.: CB-967

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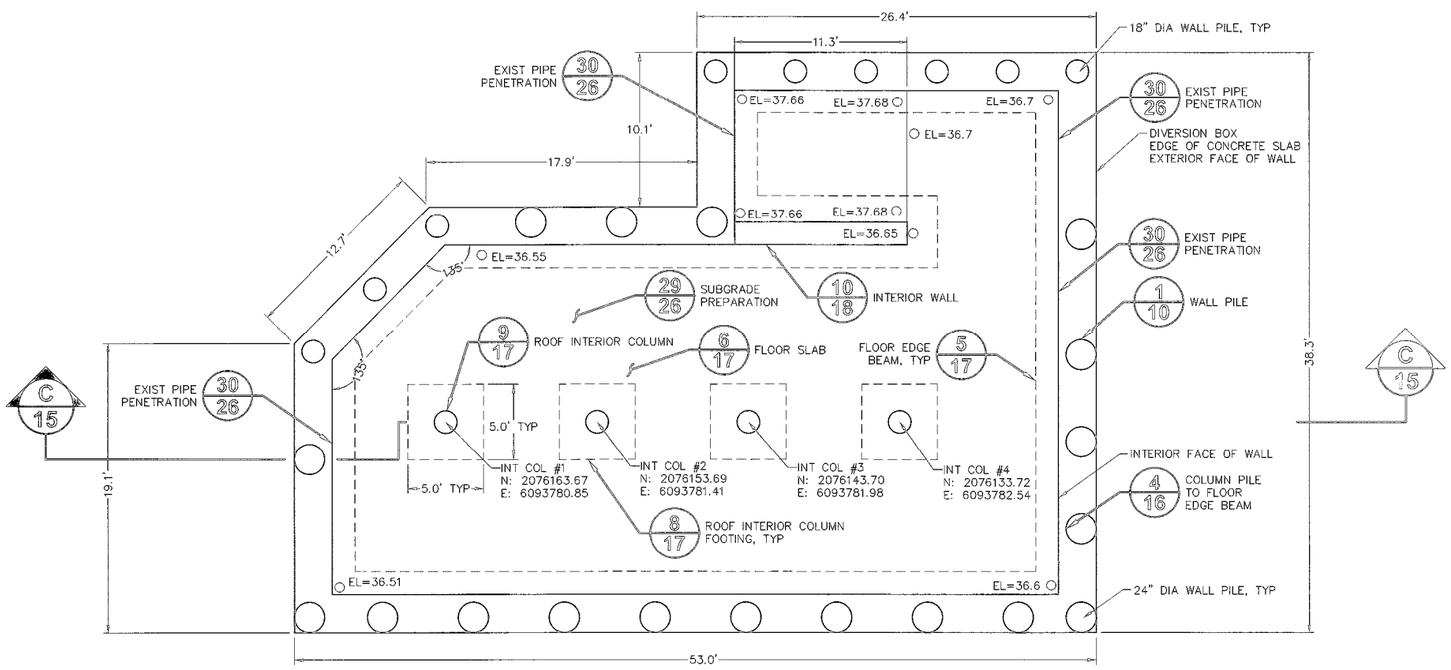


STORMFLO DEVICE PLAN





ELEVATION



FLOOR AND FOUNDATION PLAN

5 0 2.5 5 10 20

(IN FEET)
1" = 5'

LEGEND

○ TOP OF FLOOR SLAB ELEVATION

NOTE

FOR A PILE LAOUT SEE PILE TABLES ON SHEET 9

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

REVIEWED BY:	DATE:
CONSTRUCTION	
MAINTENANCE	
REAL ESTATE	

REVIEWED BY:	DATE:
SURVEY	
TRAFFIC	
ENVIRONMENTAL	

NO.	DESCRIPTION	BY	DATE	APP'D
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4				
5				

REVISIONS

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DESIGNED:
CHECKED
APPROVED

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

RECOMMENDED: MOSES TSANG
APPROVAL RECOMMENDED: MOSES TSANG
APPROVED AS CONFORMED TO: HANS MATHAI, ASSISTANT

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE, DIVERSION BOX FOOTING, FLOOR, AND WALL PLAN

DATE	SCALE
DEC 2018	AS SHOWN

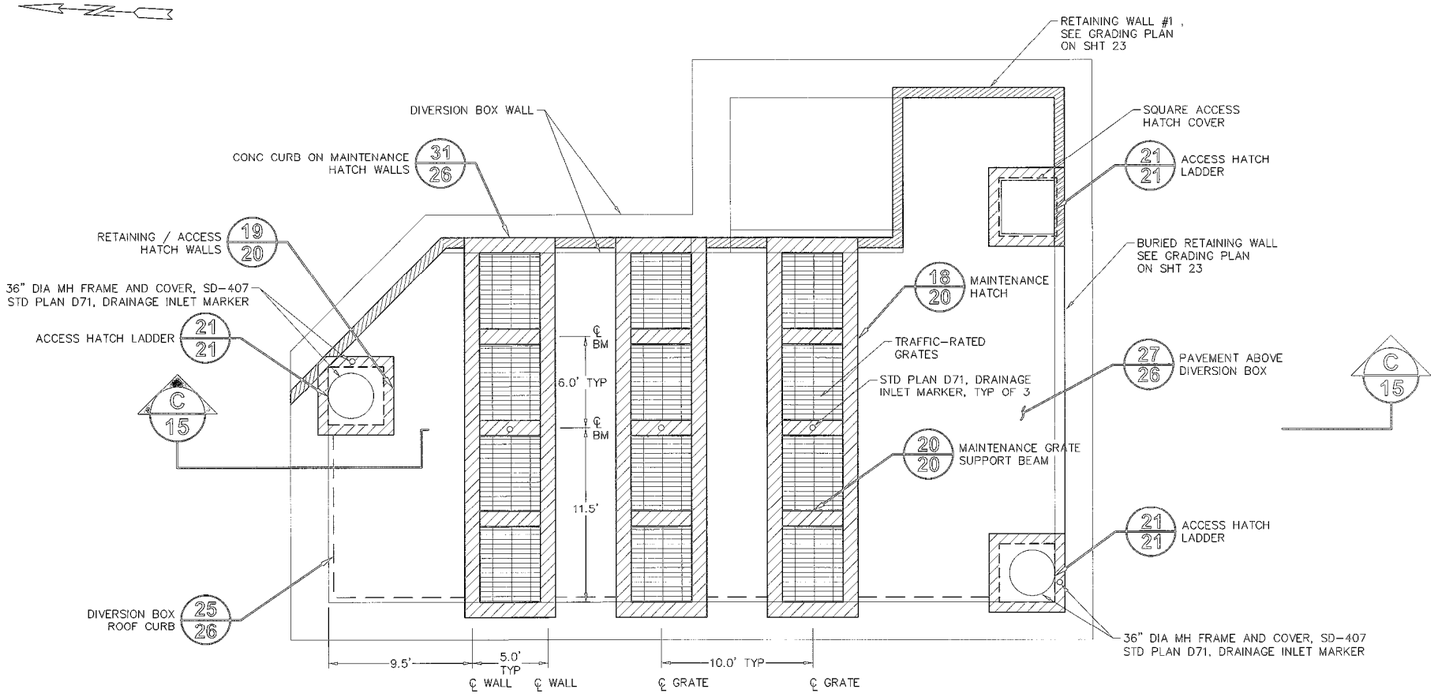
WORK ORDER NO. R34071

SPECIFICATION NO. 2362

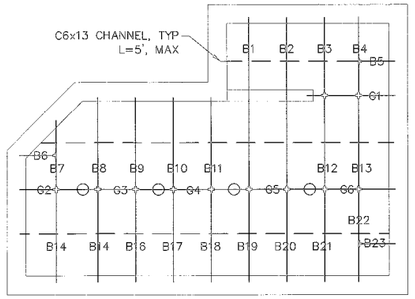
SHEET NO. 13 OF 26

FILE NO. CB-967

M:\2017\171550 Kleinfelder - ACFC Clean Water Devices\AutoCAD Files (Meekland Ave)\Sheets\Meekland_13 Diversion Box Floor and Stormflo Plan.dwg 12-20-18 04:10:21 PM kdrozynska



SUPERSTRUCTURE PLAN



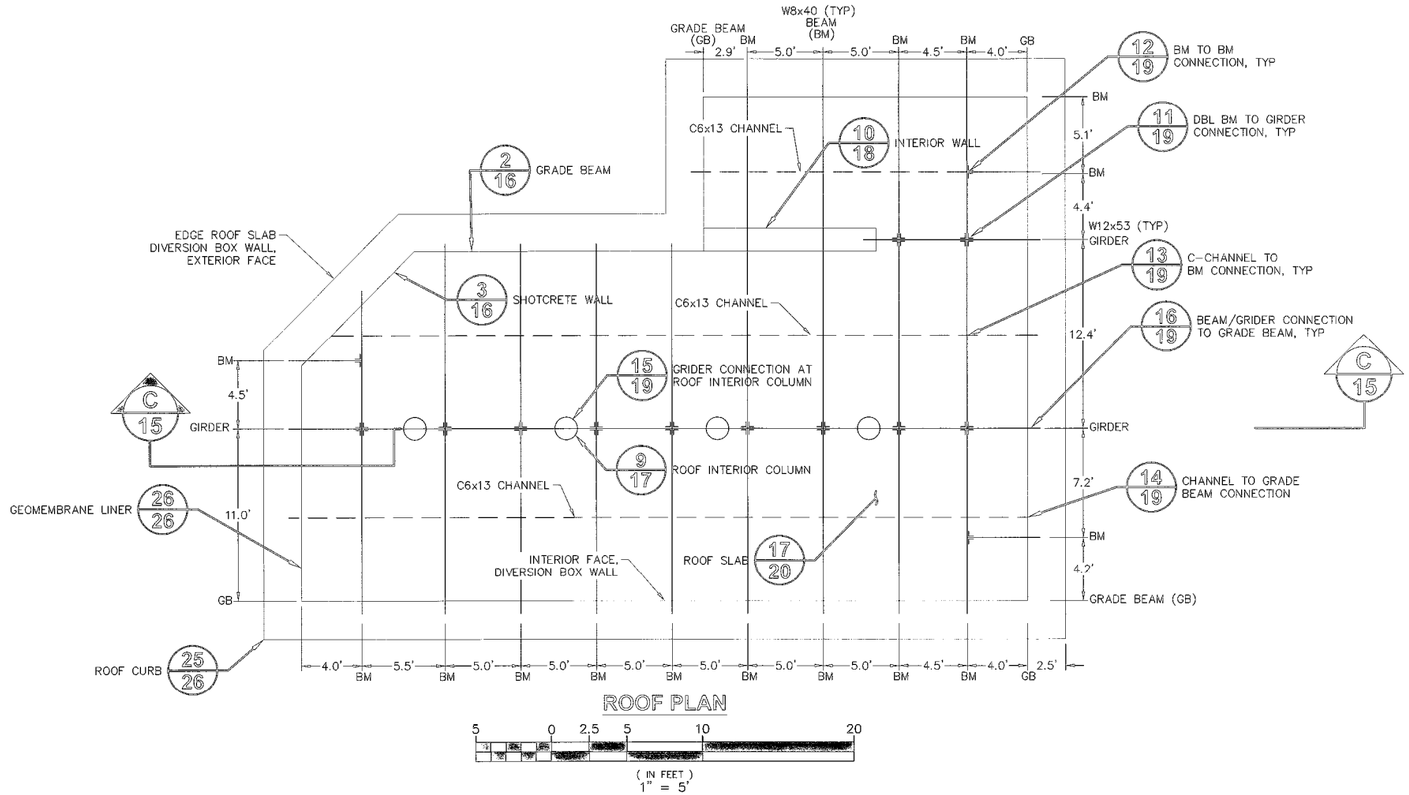
PLAN - ROOF BEAMS AND GIRDERS

W8x40 BEAM (BX*)	LENGTH (FEET)	W12x53 GIRDER (GY**)	LENGTH (FEET)
B1 – B2	23	G1	12
B3 – B4	10	G2	8
B5 – B6	6	G3	10
B7	8	G4	10
B8 – B22	12	G5	10
B23	5	G6	11
*X = 1–23	TOTAL 221 FEET	**Y = 1–6	TOTAL 61 FEET

GIRDER AND BEAM LENGTH AND QUANTITY TABLE

10 0 5 10 20 40

(IN FEET)
1" = 10'



ROOF PLAN

5 0 2.5 5 10 20

(IN FEET)
1" = 5'

FOR REDUCED ENGLISH PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

REVISIONS

NO.	DESCRIPTION	BY	DATE	APP'VD

REVIEWED BY: DATE:
CONSTRUCTION
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CE&G
CAL ENGINEERING & GEOLOGY
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DRAWN: K. DROZYNSKA & M. UTHAL
CHECKED: K. DROZYNSKA
APPROVED: P. THOMSEN
DESIGNED: K. DROZYNSKA

COUNTY OF ALAMEDA ★ PUBLIC WORKS AGENCY

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LORA VERDE DRIVE: DIVERSION BOX ROOF AND SUPERSTRUCTURE PLAN

DATE	DEC 2018
SCALE	AS SHOWN
WORK ORDER NO.	R34071
SPECIFICATION NO.	2362
SHEET NO.	14 OF 26
FILE NO.	CB-967

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REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY	
MAINTENANCE		TRAFFIC	
REAL ESTATE		ENVIRONMENTAL	

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MAINTENANCE HATCH, TYP 18/20

REMOVABLE SAFETY RAIL, TYP

℄ WALL — 5', TYP, MAINTENANCE HATCH — ℄ WALL

19/20 RETAINING WALL ACCESS HATCH WALL CONNECTED TO ROOF SLAB

PAVEMENT

42"

RETAINING WALL OR ACCESS HATCH WALLS

GEOFOAM

ALL REINF NOT SHOWN

ACCESS HATCH WALL (PROJECTED)

15/19 GIRDER CONNECTION AT ROOF INTERIOR COLUMN

ROOF SLAB 17/20

GEOFOAM

GEOFOAM

4' CLR, TYP

GEOFOAM

ALL REINFORCEMENT NOT SHOWN

STRUCTURAL STEEL PER PLAN

2/16 GRADE BEAM

ROOF INTERIOR COLUMN, TYP

9/17

8/17 ROOF INTERIOR COLUMN FOOTING

PAINT ALL EXPOSED STEEL SEE SPECIAL PROVISIONS

BEAM/GIRDER CONNECTION AT GRADE BEAM 16/19

9.5'±

SHOTCRETE WALL 3/16

WEIR 7/17

1/16

4/16 WALL PILE TO FLOOR EDGE BEAM CONNECTION

STORMFLO LRGSR DEVICE

FLOOR EDGE BEAM 5/17

ALL REINFORCEMENT NOT SHOWN

6/17 FLOOR SLAB, TYP

SECTION C - DETAIL LOCATION KEY (C)

SCALE 1" = 2'

2 0 1 2 4 8

(IN FEET)
1" = 2'

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES

0 1 2 3

NO.	DESCRIPTION	BY	DATE	APPVD
1				
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3				
4				

REVISIONS

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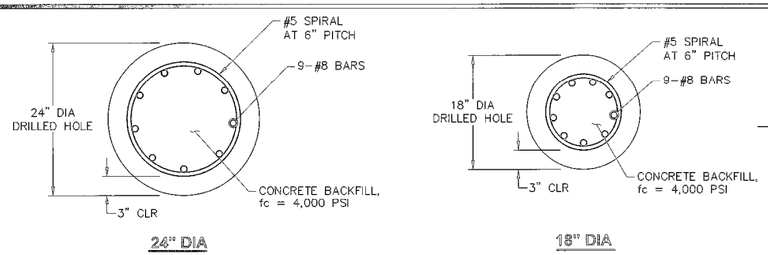
DRAWN: K. DROZYNSKA & M. VITAL
CHECKED: K. DROZYNSKA
APPROVED: P. SWIERCZEK
DESIGNED: K. DROZYNSKA & M. VITAL

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

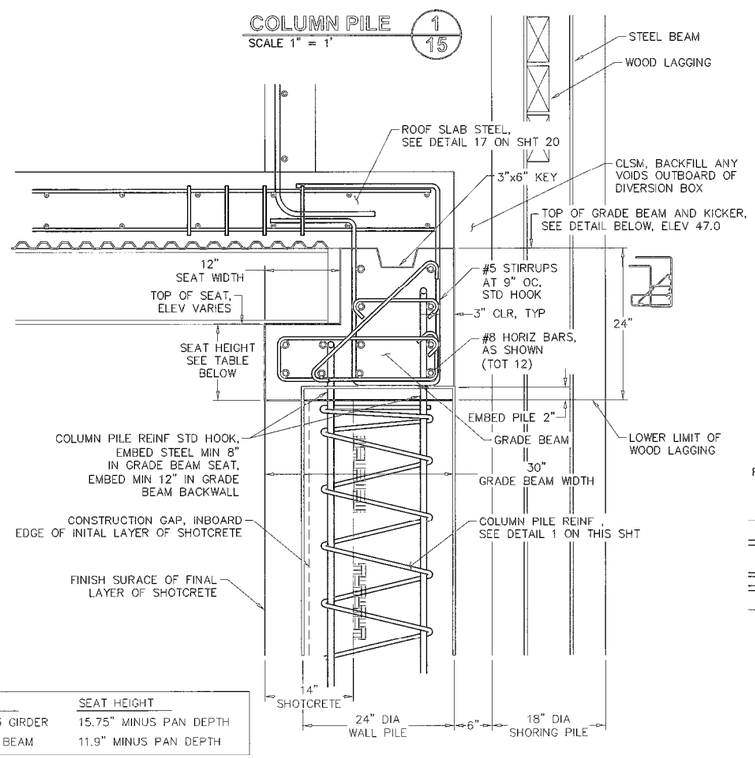
RECOMMENDED: MOSES TSANG, APPROVAL RECOMMENDED
APPROVED: MOSES TSANG, APPROVAL RECOMMENDED
APPROVED: HUAN VU, DIRECTOR

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE
SECTION C - DIVERSION BOX
DETAIL LOCATION KEY

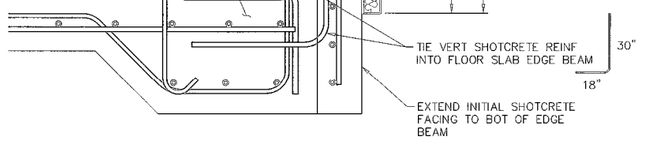
DATE	DEC 2018
SCALE	AS SHOWN
WORK ORDER NO.	R34071
SPECIFICATION NO.	2362
SHEET NO.	15 OF 26
FILE NO.	CB-967



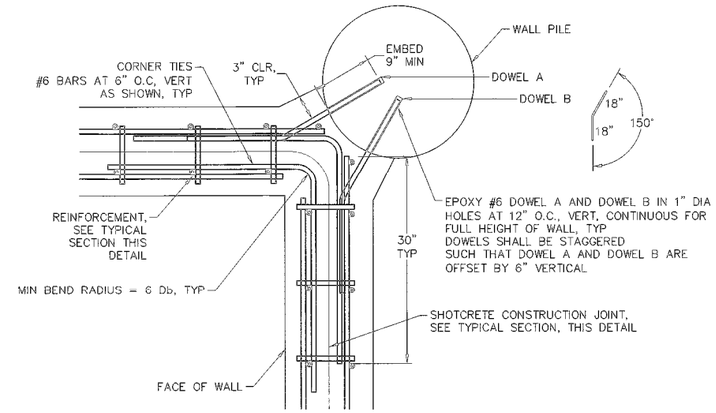
COLUMN PILE 1/15
SCALE 1" = 1'



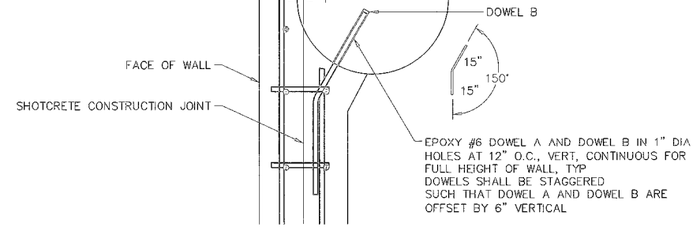
ITEM	SEAT HEIGHT
W12x53 GIRDER	15.75" MINUS PAN DEPTH
W8x40 BEAM	11.9" MINUS PAN DEPTH



SECTION

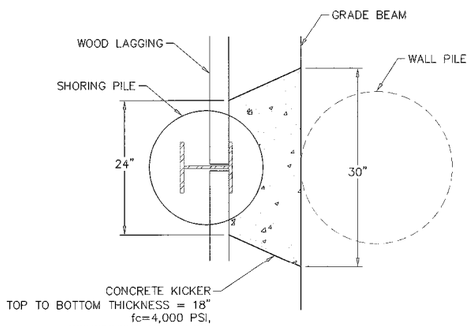


CORNER RETURN CONNECTION - PLAN

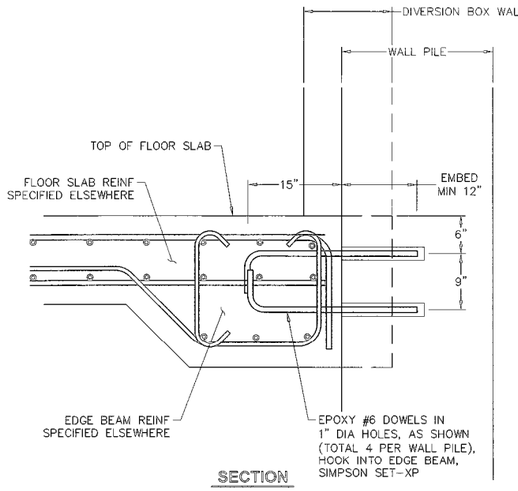


WALL PILE CONNECTION - PLAN

GRADE BEAM 2/15
SCALE 1" = 1'

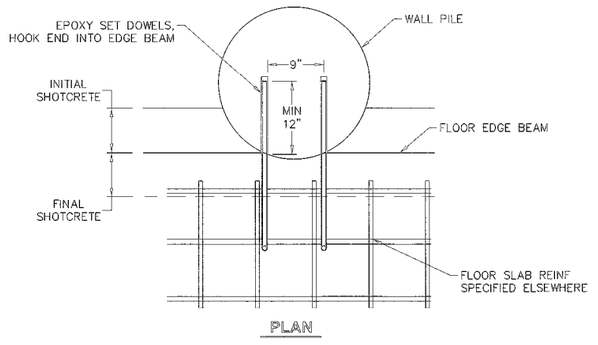


KICKER



SECTION

SHOTCRETE DIVERSION BOX WALL - TYPICAL SECTION AND CONNECTIONS 3/15
SCALE 1" = 1'



PLAN

WALL PILE TO FLOOR EDGE BEAM CONNECTION 4/15
SCALE 1" = 1'

1 0 1/2 1 2 4
(IN FEET)
1" = 1'

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES
0 1 2 3

REVISIONS						
NO.	DESCRIPTION	BY	DATE	APPV'D
1				
2				
3				
4				
5				

REGISTERED PROFESSIONAL ENGINEER — KEITH CRANE — No. Civil C 048977 — CIVIL — STATE OF CALIFORNIA

C2&G
CAL ENGINEERING & GEOLOGY
785 Ygnacio Valley Road
Walnut Creek, CA 94596
Phone: (925) 935-9771
Fax: (925) 935-9773

DRAWN: K. DROZYNSKA & M. yithal
CHECKED: K. CRANE
DESIGNED: K. CRANE
APPROVED: P. PATOAY
12-21-18

REVIEWED BY:	DATE:
CONSTRUCTION	
MAINTENANCE	
REAL ESTATE	

REVIEWED BY:	DATE:
SURVEY	
TRAFFIC	
ENVIRONMENTAL	

APPROVAL RECOMMENDED: MOSES TSANG
APPROVAL RECOMMENDED: HANS KOEPCHEN
APPROVED: MOSES TSANG

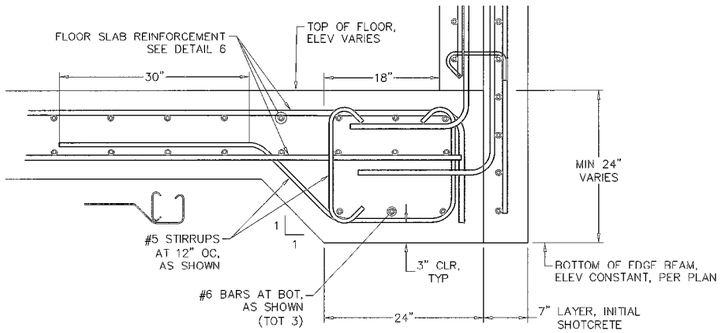
COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE
DETAILS - PILES, GRADE BEAM, EXTERIOR WALLS

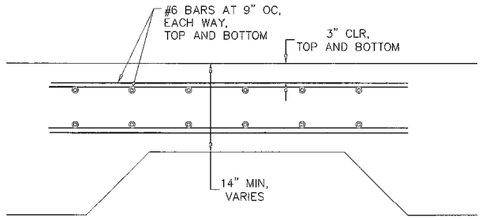
DATE	SCALE
DEC 2018	AS SHOWN

WORK ORDER NO. R34071
SPECIFICATION NO. 2362
SHEET NO. 16 OF 26
FILE NO. CB-967

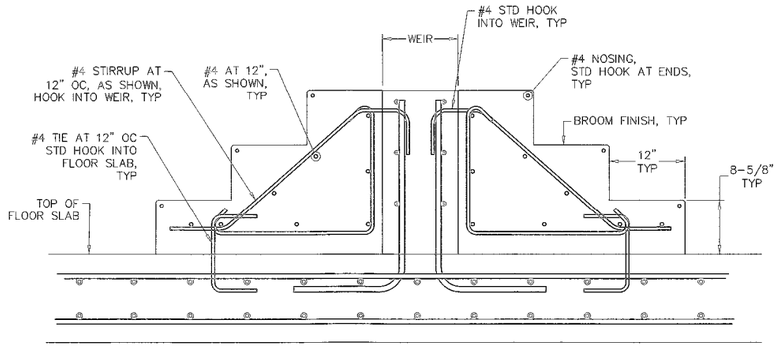
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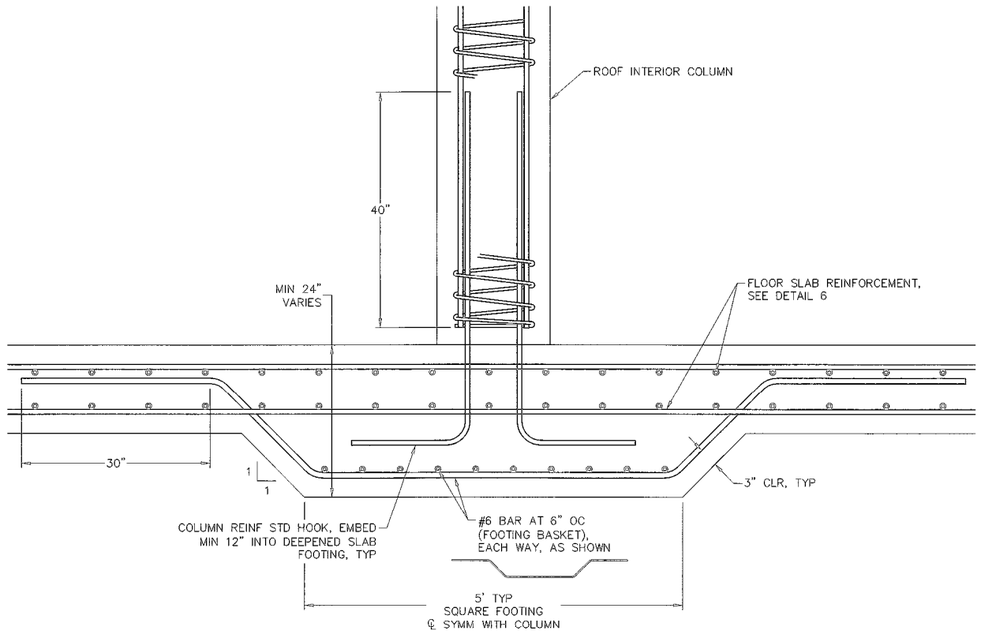
FLOOR EDGE BEAM 5/15
SCALE 1" = 1'



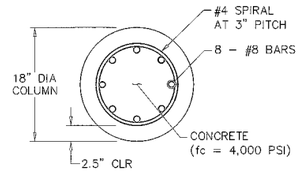
FLOOR SLAB 6/15
SCALE 1" = 1'



CONCRETE STEPS AT WEIR



ROOF INTERIOR COLUMN FOOTING 8/15
SCALE 1" = 1'



ROOF INTERIOR COLUMN 9/14, 15
SCALE 1" = 1'

WEIR

WEIR AND CONCRETE STEPS 7/15
SCALE 1" = 1'

1 0 1/2 1 2 4
(IN FEET)
1" = 1'

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES
0 1 2 3

	REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION			SURVEY	
MAINTENANCE			TRAFFIC	
REAL ESTATE			ENVIRONMENTAL	

REVISIONS

NO.	DESCRIPTION	BY	DATE	APPV'D
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3				
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PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — No. CIVIL C 51807 — CIVIL — REGISTERED

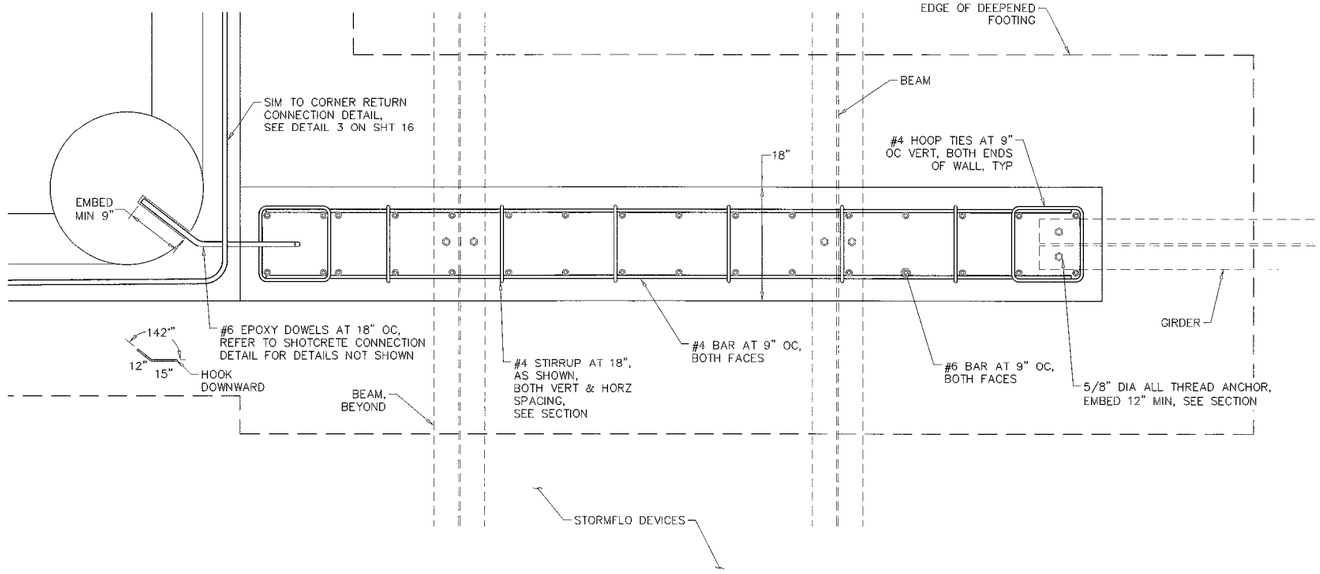
CE&G
CAL ENGINEERING & GEOLOGY
785 Yonacio Valley Road
Walnut Creek, CA 94598
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Fax: (925) 935-9773
DRAWN: K. DROZYNSKA & M. KOHAL
DESIGNED:
CHECKED:
APPROVED

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY
REVIEWED: MOSES TSANG, APPROVAL RECOMMENDED
APPROVED: RECOMMENDED, MARK CONTRERAS

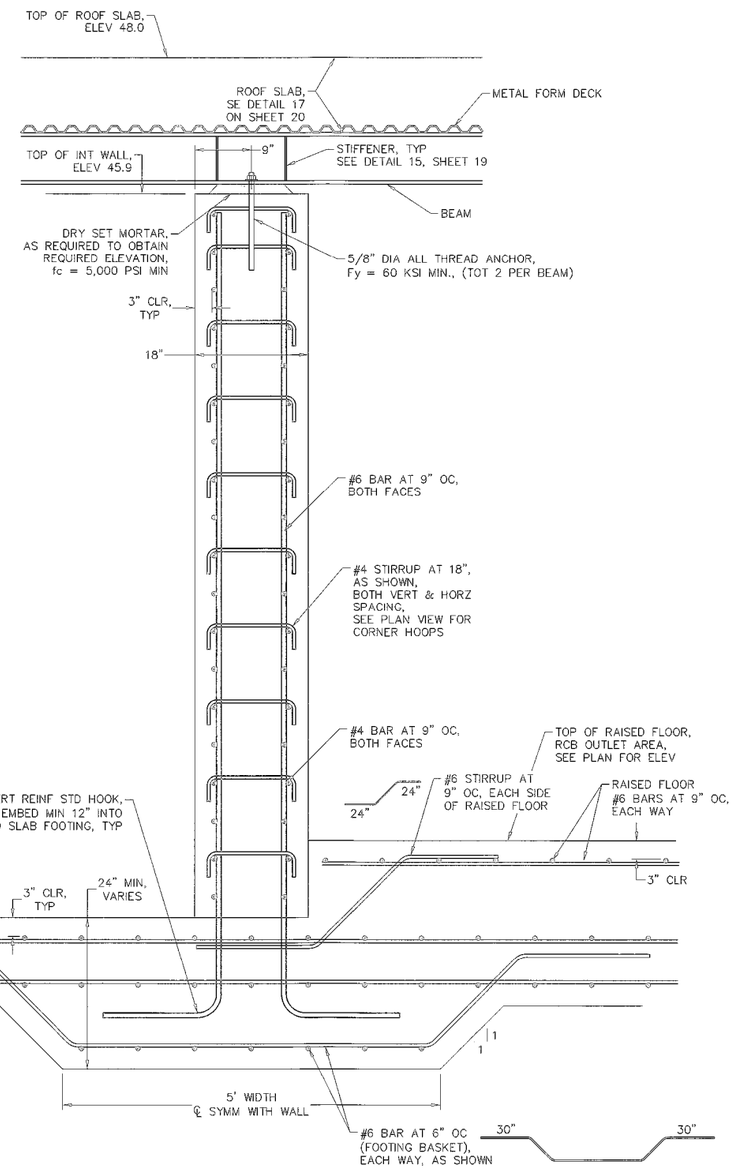
INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE
DETAILS - FLOOR SLAB, FOOTINGS, WEIR

DATE	DEC 2018
SCALE	AS SHOWN
WORK ORDER NO.	R34071
SPECIFICATION NO.	2362
SHEET NO.	17 OF 26
FILE NO.	CB-967

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PLAN - INTERIOR WALL



SECTION - INTERIOR WALL

INTERIOR WALL 10/13
SCALE 1" = 1'

1 0 1/2 1 2 4
(IN FEET)
1" = 1'

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES
0 1 2 3

	REVIEWED BY:	DATE:		REVIEWED BY:	DATE:
CONSTRUCTION			SURVEY		
MAINTENANCE			TRAFFIC		
REAL ESTATE			ENVIRONMENTAL		

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
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3				
4				
5				

REVISIONS

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DRAWN K. DROZYNSKA & M. VIRAL
DESIGNED K. DROZYNSKA & M. VIRAL
CHECKED K. GRAHAM
APPROVED P. SWIGART

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

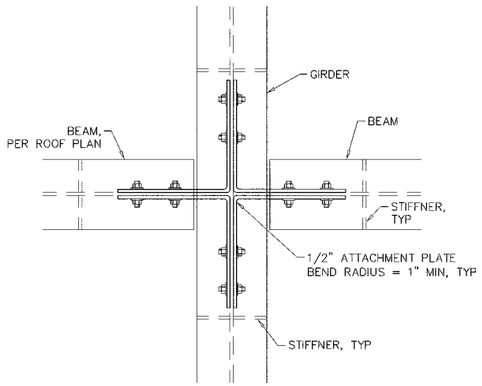
REVIEWED: MOSES TSANG
APPROVAL RECOMMENDED
APPROVAL RECOMMENDED: MOSES TSANG
APPROVED: HUGH STANLEY

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE

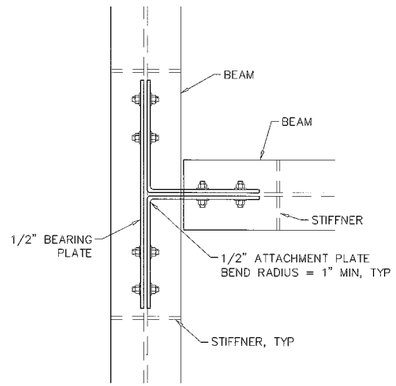
DETAILS - INTERIOR WALL

DATE: DEC 2018
SCALE: AS SHOWN
WORK ORDER NO.: R34071
SPECIFICATION NO.: 2362
SHEET NO.: 18 OF 26
FILE NO.: CB-967

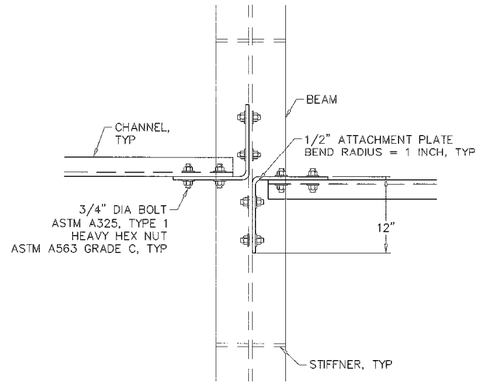
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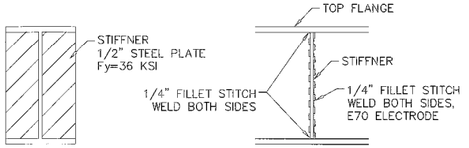
PLAN



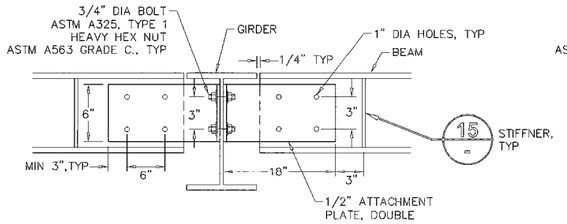
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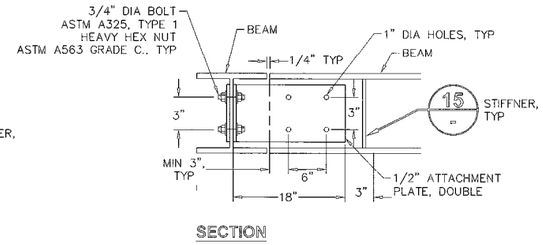
PLAN



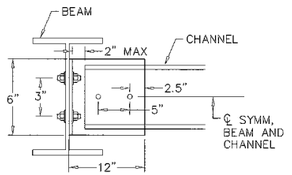
STIFFENER 15
SCALE 1" = 1'



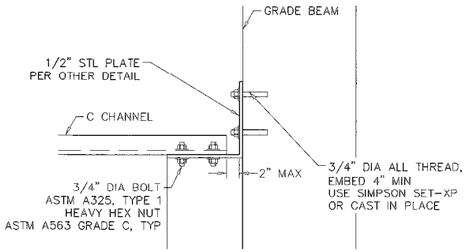
SECTION



SECTION



SECTION

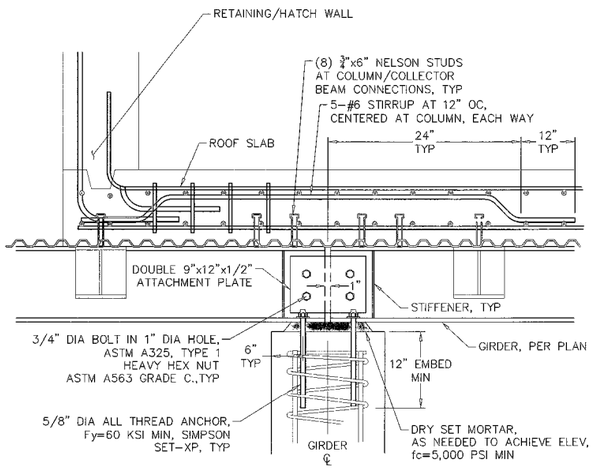


DOUBLE BEAM TO GIRDER CONNECTION 11/14
SCALE 1" = 1'

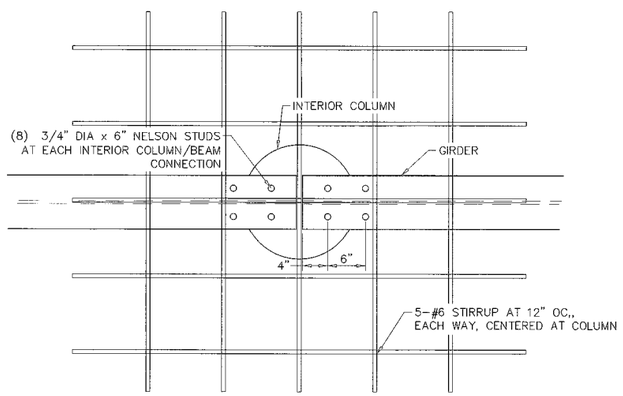
BEAM TO BEAM CONNECTION 12/14
SCALE 1" = 1'

CHANNEL TO BEAM CONNECTION 13/14
SCALE 1" = 1'

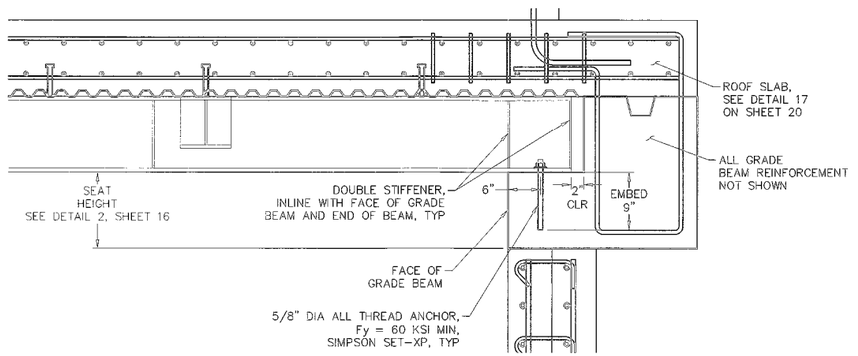
CHANNEL TO GRADE BEAM CONNECTION 14/14
SCALE 1" = 1'



SECTION



PLAN



BEAM / GIRDER CONNECTION AT GRADE BEAM 16/14
SCALE 1" = 1'

GIRDER CONNECTION AT ROOF INTERIOR COLUMN 15/14
SCALE 1" = 1'

1 0 1/2 1 2 4
(IN FEET)
1" = 1'

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

	REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION			SURVEY	
MAINTENANCE			TRAFFIC	
REAL ESTATE			ENVIRONMENTAL	

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
2				
3				
4				

REVISIONS

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DRAWN: K. DROZYNSKA & M. ARTHUR
CHECKED: K. DROZYNSKA
DESIGNED: K. DROZYNSKA
APPROVED: P. GREGORY

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

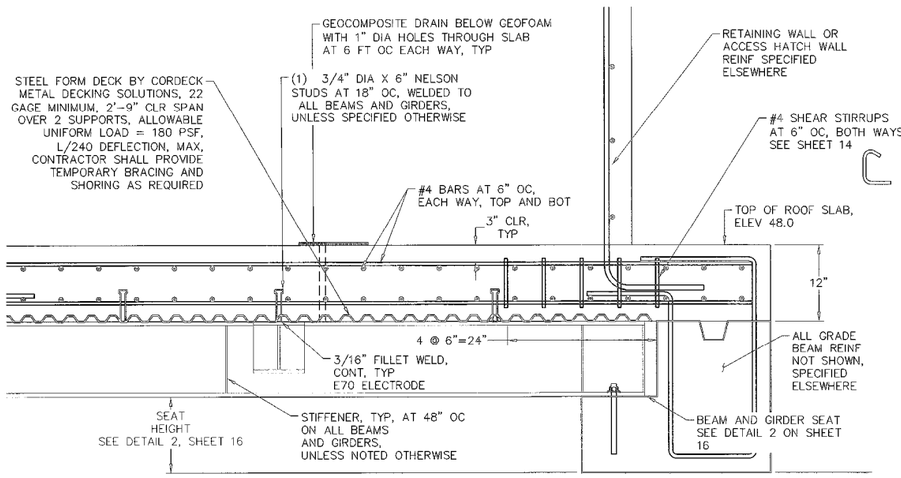
INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE

DETAILS - STRUCTURAL STEEL CONNECTIONS

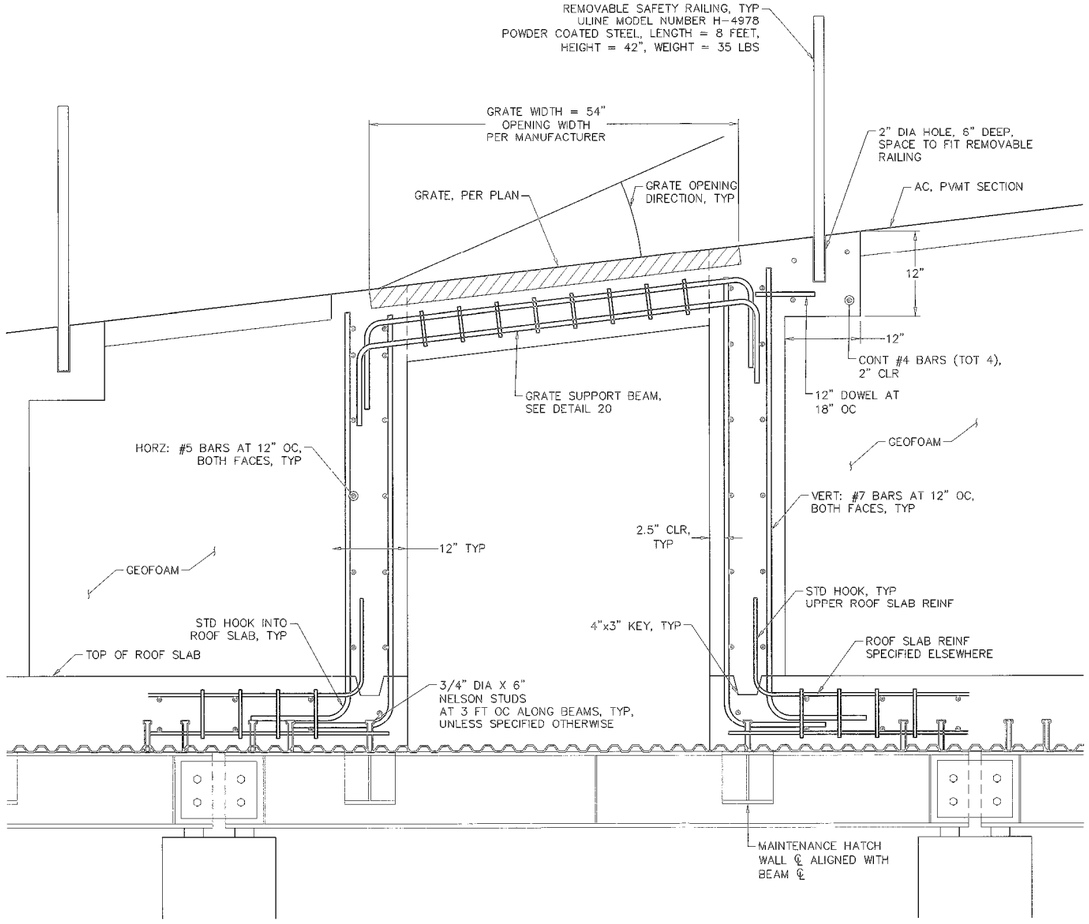
RECOMMENDED: MOSES TSANG, APPROVAL RECOMMENDED
APPROVED AND RECOMMENDED: HANS LARSEN

DATE: DEC 2018
SCALE: AS SHOWN
WORK ORDER NO.: R34071
SPECIFICATION NO.: 2362
SHEET NO.: 19 OF 26
FILE NO.: CB-967

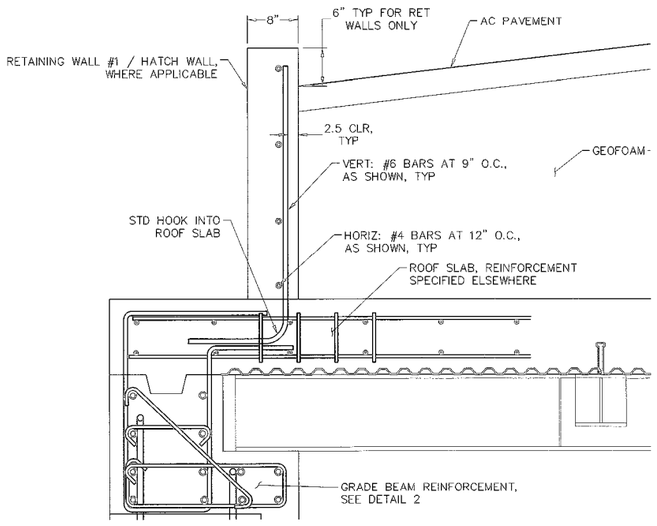
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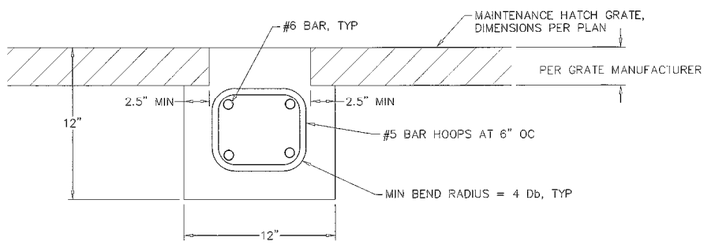
ROOF SLAB (17/15)
SCALE 1" = 1'



MAINTENANCE HATCH WITH TRAFFIC-RATED GRATE (18/15)
SCALE 1" = 1'



RETAINING WALL #1 / ACCESS HATCH WALL (19/15)
SCALE 1" = 1'



SECTION

MAINTENANCE GRATE SUPPORT BEAM (20/14)
SCALE 1" = 1/2'

1 0 1/2 1 2 4
(IN FEET)
1" = 1'

1/2 0 1/4 1/2 1 2
(IN FEET)
1" = 1/2'

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES
0 1 2 3

	REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION			SURVEY	
MAINTENANCE			TRAFFIC	
REAL ESTATE			ENVIRONMENTAL	

NO.	DESCRIPTION	BY	DATE	APPV'D
	REVISIONS			

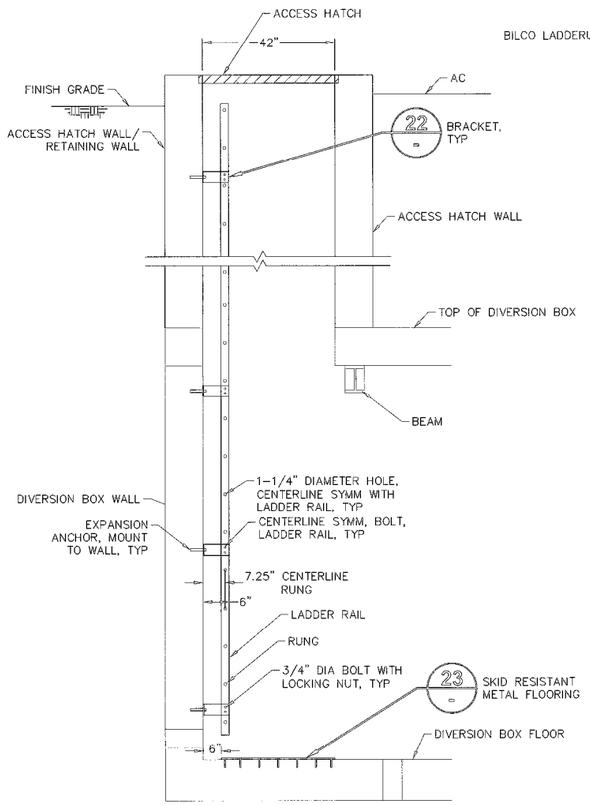
CE&G
CIVIL ENGINEERING & GEOLOGY
785 Ygnacio Valley Road
Walnut Creek, CA 94598
Phone: (925) 935-6771
Fax: (925) 935-6773

CHECKED: K. Granat
APPROVED: R. Bhatia
CAL ENGINEER: K. Granat
DRAWN: K. Drozynska & M. Vitkus
DESIGNED: K. Granat

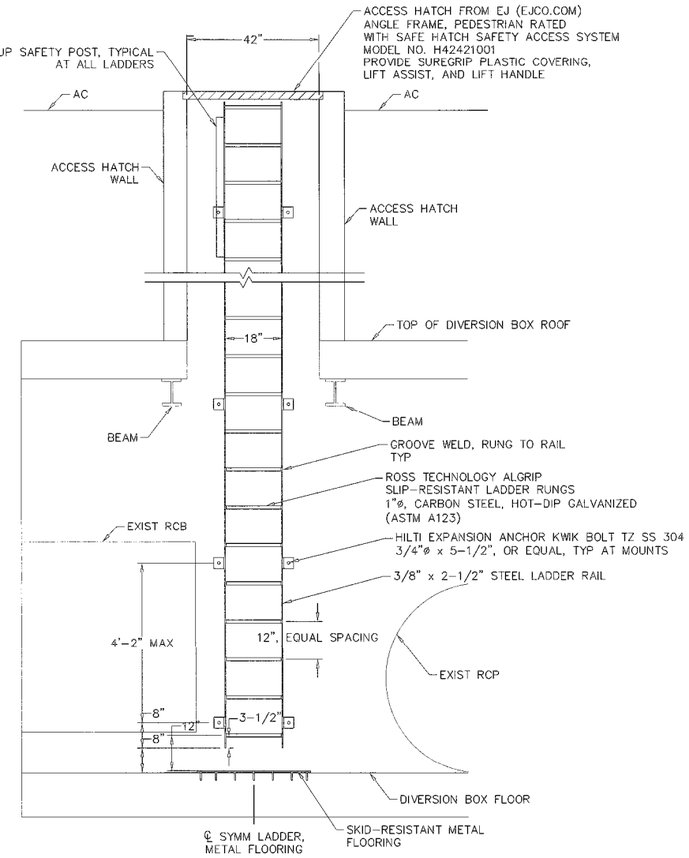
COUNTY OF ALAMEDA ★ PUBLIC WORKS AGENCY
REVIEWED: M. Tsang
APPROVAL RECOMMENDED: M. Tsang
APPROVED: H. Rivera
INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE
DETAILS - ROOF SLAB AND SUPERSTRUCTURE

DATE: DEC 2018
SCALE: AS SHOWN
WORK ORDER NO.: R34071
SPECIFICATION NO.: 2362
SHEET NO.: 20 OF 26
FILE NO.: CB-967

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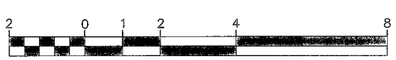


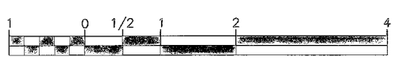
SECTION

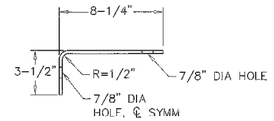


ELEVATION

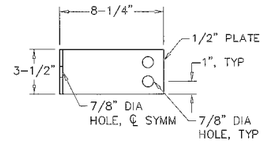
ACCESS HATCH LADDER 21/14
SCALE 1" = 2'





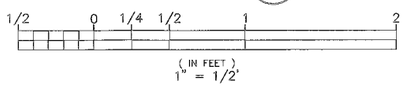


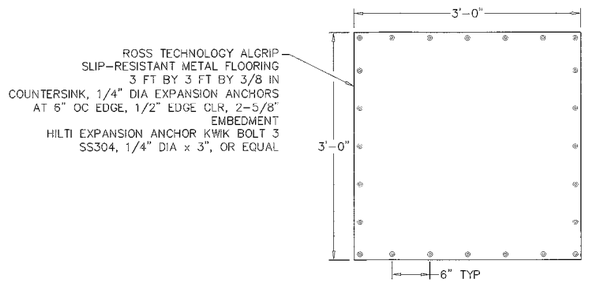
ELEVATION



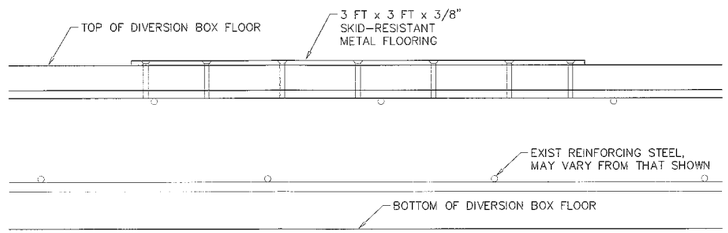
SECTION

BRACKET 22
SCALE 1" = 1/2'





PLAN
SCALE 1" = 1'



ELEVATION
SCALE 1" = 1/2'

SKID-RESISTANT METAL FLOOR IN DIVERSION BOX 23



FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES

REVISIONS				
NO.	DESCRIPTION	BY	DATE	APPV'D
1				
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5				

REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY	
MAINTENANCE		TRAFFIC	
REAL ESTATE		ENVIRONMENTAL	

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DRAWN: K. DROZYNSKA & M. MIHAL
CHECKED: K. DROZYNSKA
DESIGNED: K. CRAWFORD
APPROVED: D. CARLSON

RETIRED: 12-31-18
MOSES TSANG
APPROVAL RECOMMENDED: 12-31-18
MOSES TSANG
APPROVAL RECOMMENDED: 12-31-18
HANS KOBLER

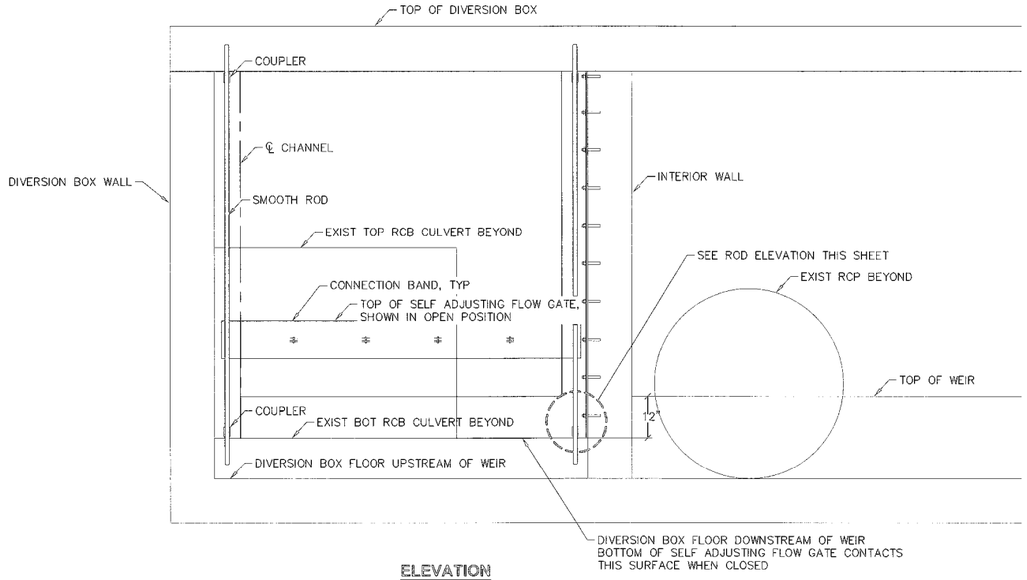
COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE

DETAILS - FIXED LADDER AND APPURTENANCES

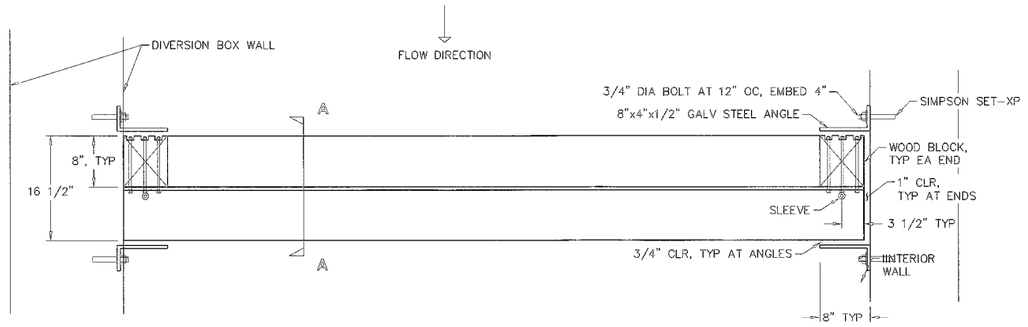
DATE	DEC 2018
SCALE	AS SHOWN
WORK ORDER NO.	R34071
SPECIFICATION NO.	2362
SHEET NO.	21 OF 26
FILE NO.	CB-967

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ELEVATION

SCALE 1" = 2'

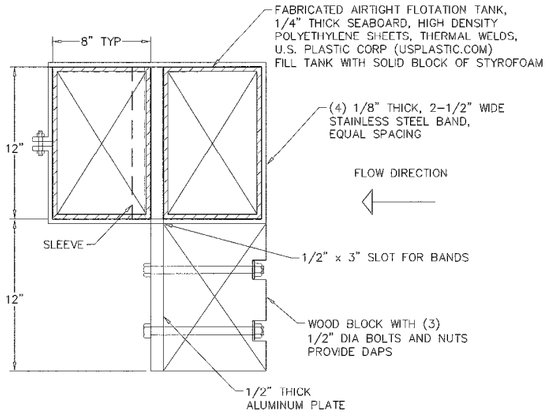


PLAN

SCALE 1" = 1'

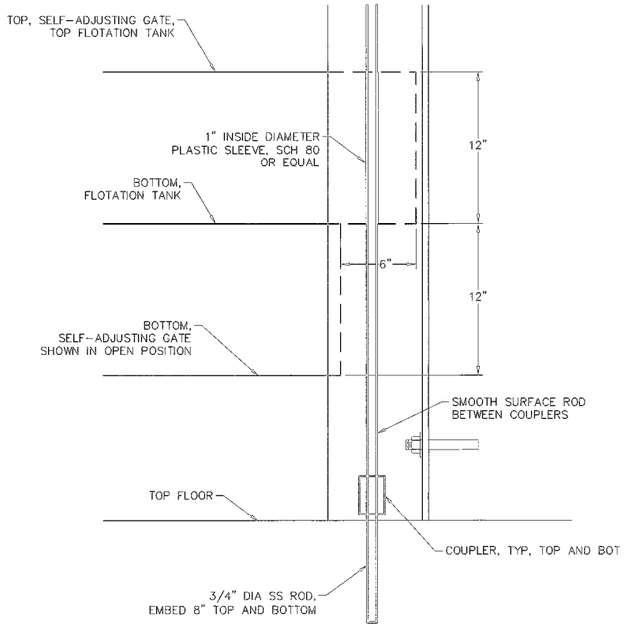
1 0 1/2 1 2 4

(IN FEET)
1" = 1'



GATE SECTION A-A

SCALE 1" = 1/2'



ROD ELEVATION

SCALE 1" = 1/2'

SELF-ADJUSTING FLOW GATE 24

SCALE 1" = 2'

1/2 0 1/4 1/2 1 2

(IN FEET)
1" = 1/2'

2 0 1 2 4 8

(IN FEET)
1" = 2'

FOR REDUCED ENGLISH PLANS
ORIGINAL SCALE IS IN INCHES

0 1 2 3

	REVIEWED BY:	DATE:
CONSTRUCTION		
MAINTENANCE		
REAL ESTATE		

	REVIEWED BY:	DATE:
SURVEY		
TRAFFIC		
ENVIRONMENTAL		

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
2				
3				
4				
5				

REVISIONS

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CHECKED: K. DRAKE
APPROVED: P. JACOBS
DESIGNED: K. DRAKE

COUNTY OF ALAMEDA ★ PUBLIC WORKS AGENCY

REVIEWED: MOSES TSANG
APPROVAL RECOMMENDED: MOSES TSANG
APPROVAL RECOMMENDED: HANS KEBBEKUS

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOWA VERDE DRIVE

DETAILS - SELF-ADJUSTING FLOW GATE

DATE	DEC 2018
SCALE	AS SHOWN
WORK ORDER NO.	R34071
SPECIFICATION NO.	2362
SHEET NO.	22 OF 26
FILE NO.	CB-967

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RETAINING WALL #1							
Number	Radius	Length	Delta	Start Northing	Start Easting	End Northing	End Easting
L4		14.59		2076173.75	6093781.92	2076164.06	6093792.82
L5		30.21		2076164.06	6093792.82	2076133.90	6093794.53
L6		9.89		2076133.90	6093794.53	2076134.46	6093804.41
L7		10.00		2076134.46	6093804.41	2076124.48	6093804.97
L8		9.81		2076124.48	6093804.97	2076123.92	6093795.18

RETAINING WALL #2							
Number	Radius	Length	Delta	Start Northing	Start Easting	End Northing	End Easting
L9		39.95		2076200.44	6093752.19	2076173.75	6093781.92

RETAINING WALL #3							
Number	Radius	Length	Delta	Start Northing	Start Easting	End Northing	End Easting
L10		7.12		2076185.07	6093750.00	2076180.28	6093755.27
C3	30.67	23.62	44°07'43"				
L11		27.77		2076159.50	6093765.23	2076131.78	6093766.95
C4	19.33	7.60	22°31'31"				
L12		15.98		2076124.48	6093768.88	2076110.12	6093775.90

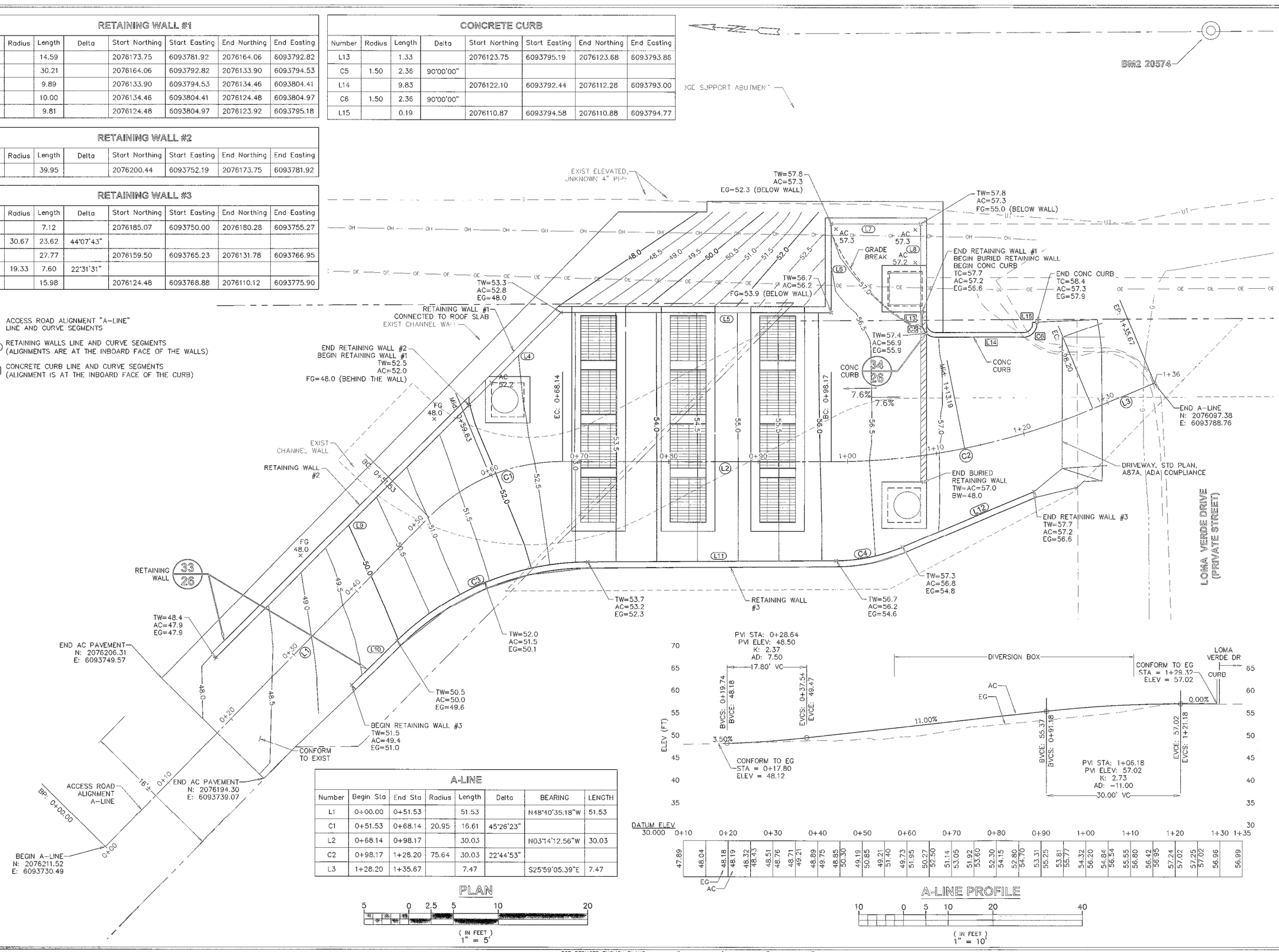
CONCRETE CURB							
Number	Radius	Length	Delta	Start Northing	Start Easting	End Northing	End Easting
L13		1.33		2076123.75	6093795.19	2076123.68	6093793.86
C5	1.50	2.36	90°00'00"				
L14		9.83		2076122.10	6093792.44	2076112.28	6093793.00
C6	1.50	2.36	90°00'00"				
L15		0.19		2076110.87	6093794.58	2076110.88	6093794.77

LEGEND

(L3)(C2) ACCESS ROAD ALIGNMENT "A-LINE" LINE AND CURVE SEGMENTS

(L12)(C4) RETAINING WALLS LINE AND CURVE SEGMENTS (ALIGNMENTS ARE AT THE INBOARD FACE OF THE WALLS)

[L15][C6] CONCRETE CURB LINE AND CURVE SEGMENTS (ALIGNMENT IS AT THE INBOARD FACE OF THE CURB)



A-LINE							
Number	Begin Sta	End Sta	Radius	Length	Delta	BEARING	LENGTH
L1	0+00.00	0+51.53		51.53		N48°40'35.18"W	51.53
C1	0+51.53	0+68.14	20.95	16.61	45°26'23"		
L2	0+68.14	0+98.17		30.03		N03°14'12.56"W	30.03
C2	0+98.17	1+28.20	75.64	30.03	22°44'53"		
L3	1+28.20	1+35.67		7.47		S25°59'05.39"E	7.47

PLAN

5 0 2.5 5 10 20

(IN FEET)
1" = 5'

A-LINE PROFILE

10 0 5 10 20 40

(IN FEET)
1" = 10'

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES
0 1 2 3

REVISIONS

NO.	DESCRIPTION	BY	DATE	APP'VD
1				
2				
3				
4				

REVIEWED BY: CONSTRUCTION, MAINTENANCE, REAL ESTATE — DATE:
REVIEWED BY: SURVEY, TRAFFIC, ENVIRONMENTAL — DATE:

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CAL ENGINEERING & GEOLOGY
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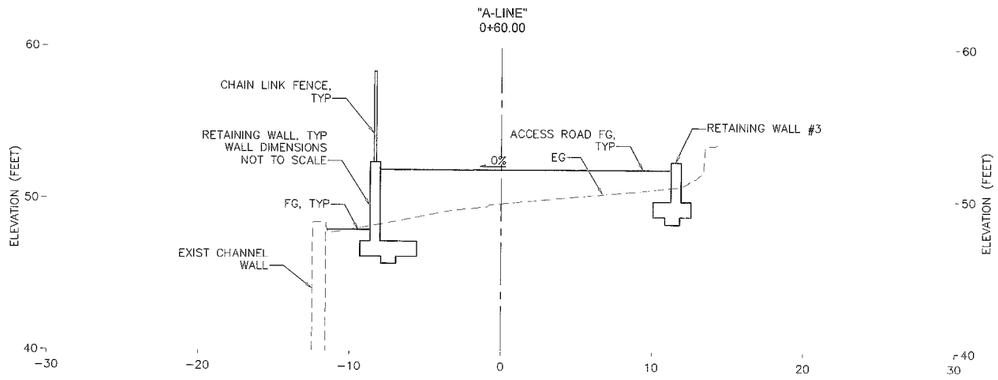
DRAWN: K. Drozynska & M. Vidal
CHECKED:
DESIGNED: K. DROZYNSKA & M. VIDAL
APPROVED:
K. DROZYNSKA 12-21-18

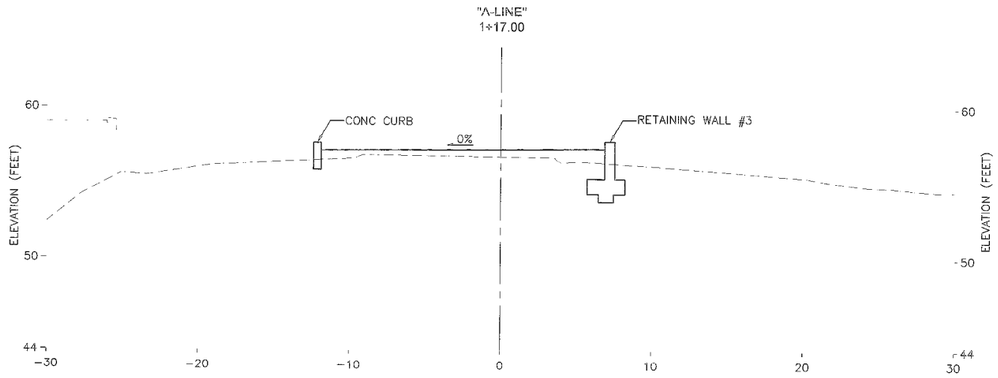
COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY
REVIEWED: MOSES TSANG 12/21/18
APPROVAL RECOMMENDED: MOSES TSANG 12/21/18
APPROVED: 12/21/18

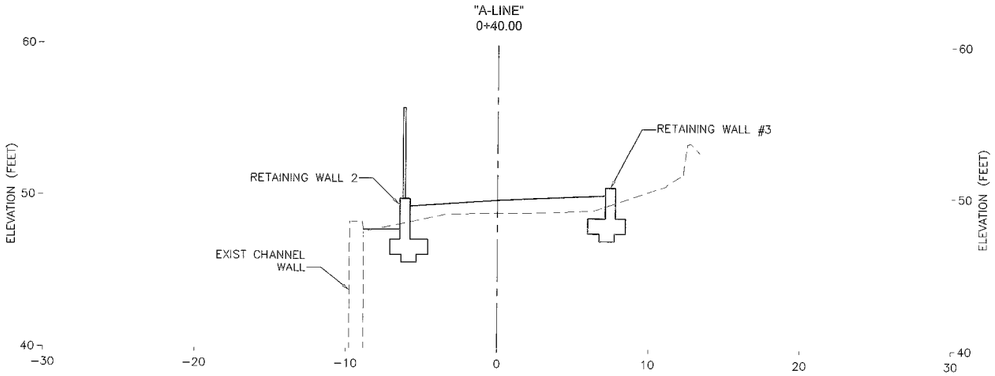
INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEK AND AVE AND LOMA VERDE DRIVE
GRADING PLAN

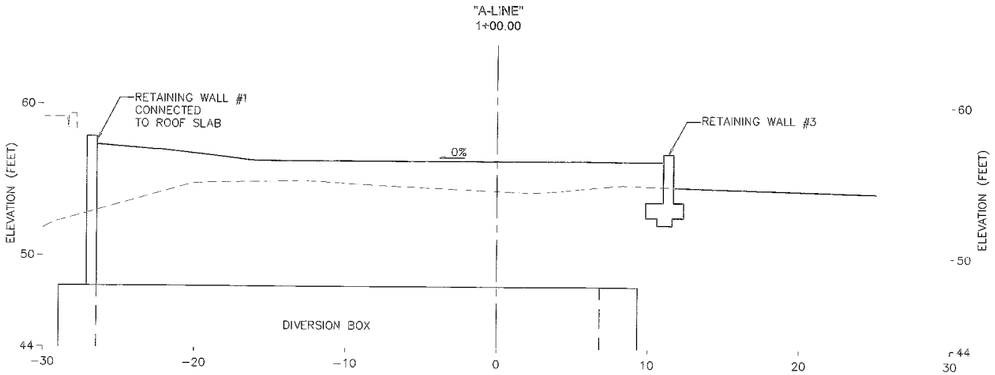
DATE: DEC 2018
SCALE: AS SHOWN
WORK ORDER NO.: R34071
SPECIFICATION NO.: 2362
SHEET NO.: 23 OF 26
FILE NO.: CB-967

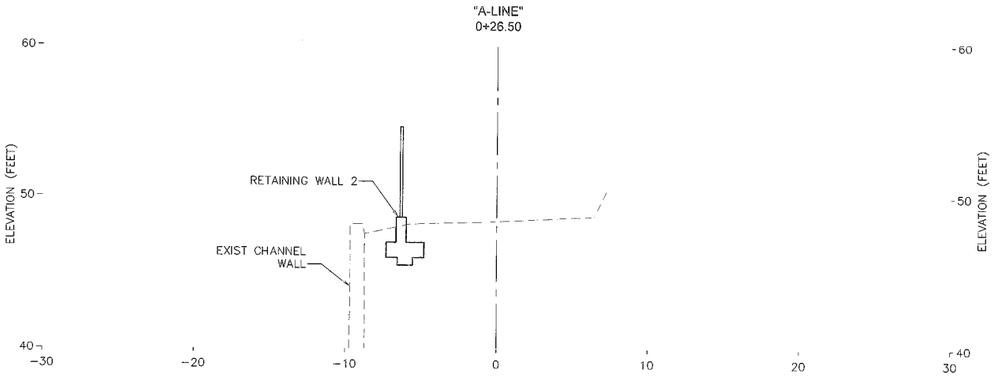
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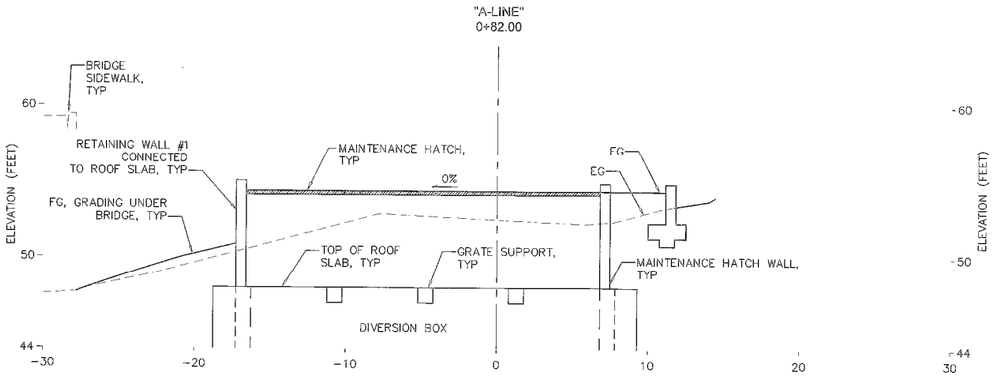












5 0 2.5 5 10 20
(IN FEET)
1" = 5'

FOR REDUCED ENGLISH PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

	REVIEWED BY:	DATE:
CONSTRUCTION		
MAINTENANCE		
REAL ESTATE		

	REVIEWED BY:	DATE:
SURVEY		
TRAFFIC		
ENVIRONMENTAL		

NO.	DESCRIPTION	BY	DATE	APP'D
1				
2				
3				
4				
5				

REVISIONS

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CHECKED: K. Dashiell
APPROVED: K. Dashiell
DESIGNED: M. FRANCESCHINI

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

APPROVAL RECOMMENDED: MOSES TSANG
APPROVAL RECOMMENDED: MOSES TSANG
APPROVED: MARK ASCHEMAN

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE

ACCESS ROAD SECTIONS

DATE: DEC 2018
SCALE: AS SHOWN
WORK ORDER NO.: R34071
SPECIFICATION NO.: 2362
SHEET NO.: 24 OF 26
FILE NO.: CB-967

M:\2017\171550 Kleinfelder - ACFC Clean Water Devices\AutoCAD Files (MeeklandAve)\Sheets\Meekland_24_Access Road Sections.dwg 12-20-18 04:16:44 PM kurczynski

REVIEWED BY:	DATE:		REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY		
MAINTENANCE		TRAFFIC		
REAL ESTATE		ENVIRONMENTAL		

M:\2017\171550 Kleinfelder - ACFC Clean Water Devices\AutoCAD Files (MeeklandAve)\Sheets\Meekland_23 & 25 Grading and Backfill.dwg 12-20-18 04:18:23 PM kdrozynska

MEEKLAND AVENUE

BM2 20574

EXIST BRIDGE SUPPORT ABUTMENT

"CAUTION" OVERHEAD LINES
LOW POINT=15.33' (AT TIME OF SURVEY)
ABOVE SIDEWALK

EXIST BRIDGE SIDEWALK, DECK OVERHANG

EXIST ELEVATED, UNKNOWN 4" PIPE

EXIST CHANNEL WALL

ALAMEDA COUNTY FLOOD CONTROL
413-63-19
1971 TRAN-157045

SAN LORENZO CREEK

END A-LINE
N: 2076097.38
E: 6093788.76

END AC PAVEMENT
N: 2076206.31
E: 6093749.57

ACCESS ROAD ALIGNMENT A-LINE

END AC PAVEMENT
N: 2076194.30
E: 6093739.07

BEGIN A-LINE
N: 2076211.52
E: 6093730.49

0+00 0+10 0+20 0+30 0+40 0+50 0+60 0+70 0+80 0+90 1+00 1+10 1+20 1+30 1+36

LOMA VERDE DRIVE
(PRIVATE STREET)

APPROX LOCATION OF EXIST RESIDENCES

PLAN
5 0 2.5 5 10 20
(IN FEET)
1" = 5'

LEGEND
- BACKFILL PER SPECIFICATIONS AS APPROVED BY THE ENGINEER
- GEOFOAM BACKFILL

FOR REDUCED ENGLISH PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

REVISIONS

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
2				
3				
4				
5				

CAL ENGINEERING & GEOLOGY
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DESIGNED: K. DROZYNSKA & M. MITAL
DRAWN: K. DROZYNSKA & M. MITAL
CHECKED: K. DROZYNSKA & M. MITAL
APPROVED: K. DROZYNSKA & M. MITAL

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

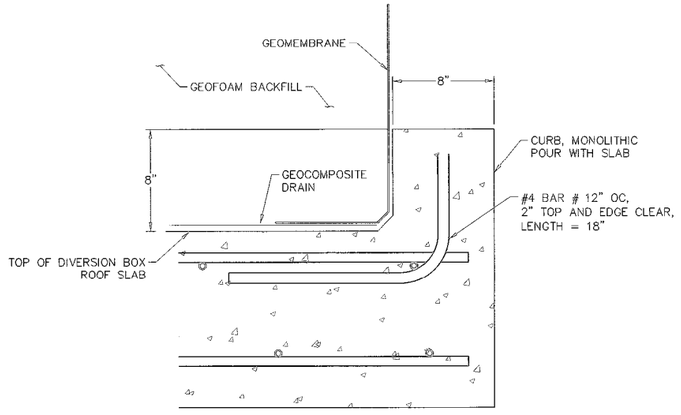
REVIEWED: MOSES TSANG, APPROVAL RECOMMENDED
MOSES TSANG, APPROVAL RECOMMENDED
HUGH PETERSON

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE

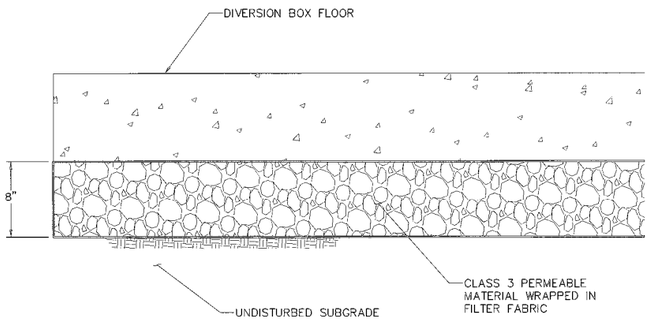
BACKFILL TYPE AND LIMITS PLAN

DATE	DEC 2018
SCALE	AS SHOWN
WORK ORDER NO.	R34071
SPECIFICATION NO.	2362
SHEET NO.	25 OF 26
FILE NO.	CB-967

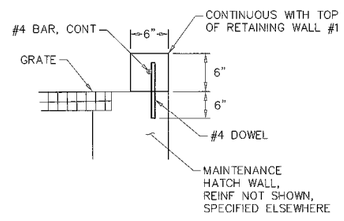
REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY	
MAINTENANCE		TRAFFIC	
REAL ESTATE		ENVIRONMENTAL	



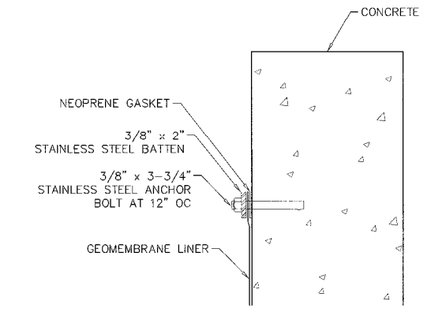
DIVERSION BOX ROOF CURB 25
SCALE 1" = 1/2'



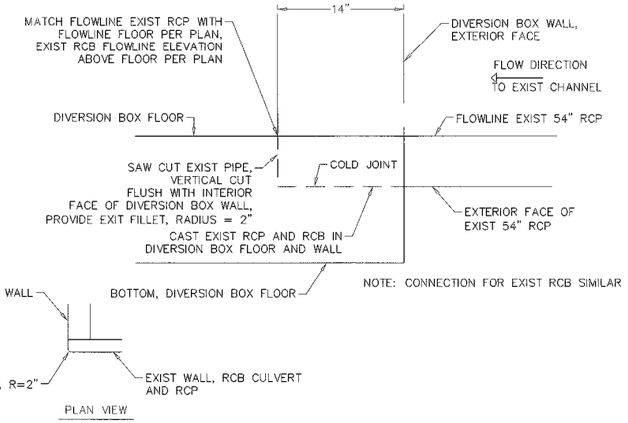
SUBGRADE PREPARATION 29
SCALE 1" = 1'



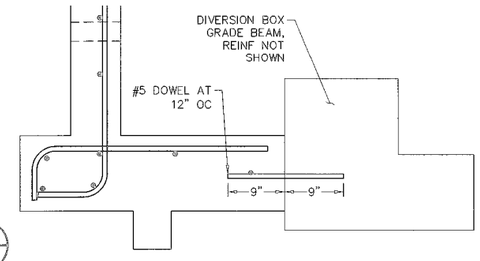
CONC CURB ON MAINTENANCE HATCH WALL 31
SCALE 1" = 1'



GEOMEMBRANE LINER BATTEN 28
SCALE 1" = 1/2'



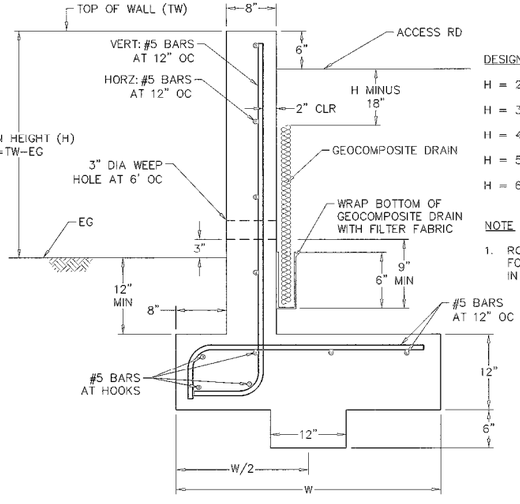
PIPE PENETRATION 30
SCALE 1" = 1'



NOTE

1. DOWEL RETAINING WALL FOOTING INTO DIVERSION BOX GRADE BEAM WHERE WALL FOOTING IS IN CONFLICT WITH DIVERSION BOX

RETAINING WALL DOWEL INTO GRADE BEAM 32
SCALE 1" = 1'



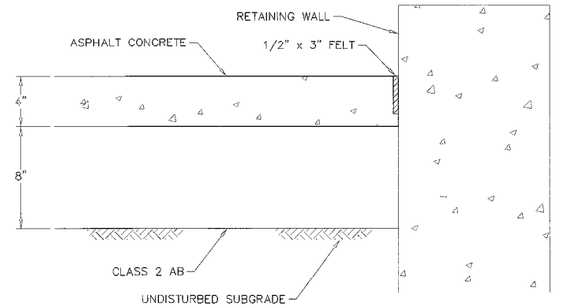
DESIGN DIMENSIONS:

H = 2 FT, W = 2.5 FT
H = 3 FT, W = 3.0 FT
H = 4 FT, W = 3.75 FT
H = 5 FT, W = 4.5 FT
H = 6 FT, W = 5.5 FT

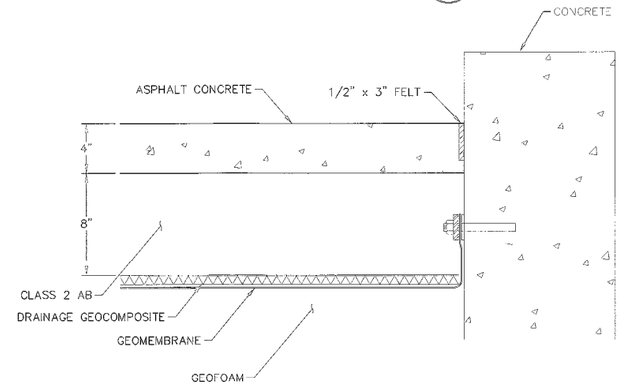
NOTE

1. ROUND TO THE NEAREST FOOT FOR WALL HEIGHTS THAT FALL IN BETWEEN DESIGN DIMENSIONS.

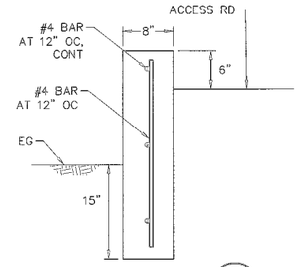
RETAINING WALL 33
SCALE 1" = 1'



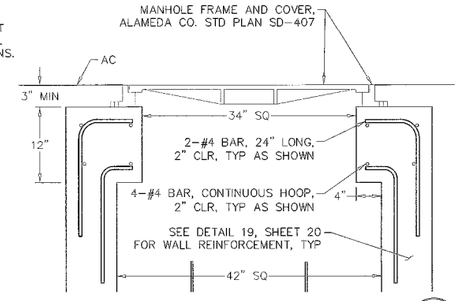
PAVEMENT SECTION 28
SCALE 1" = 1/2'



PAVEMENT ABOVE DIVERSION BOX 27 / 14
SCALE 1" = 1/2'



CONC CURB 34
SCALE 1" = 1'



MH FRAME TO ACCESS HATCH WALLS 35
SCALE 1" = 1'

1/2 0 1/4 1/2 1 2
(IN FEET)
1" = 1/2'

1 0 1/2 1 2 4
(IN FEET)
1" = 1'

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES
0 1 2 3

NO.	DESCRIPTION	BY	DATE	APP'D

REVISIONS

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Fax: (925) 935-9773

CE&G
CAL ENGINEERING & GEOLOGY

DRAWN: K. DROZYNSKA & M. SMITH
DESIGNED: K. DROZYNSKA & M. SMITH
CHECKED: K. CRANE
APPROVED: P. DEGGES

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

REVIEWED: MOSES TSANG
APPROVAL RECOMMENDED: MOSES TSANG
APPROVED: KAREN ATHERTON

INSTALLATION OF FULL TRASH CAPTURE DEVICES IN THE VICINITY OF MEEKLAND AVE AND LOMA VERDE DRIVE
DETAILS - MISCELLANEOUS

DATE	SCALE
DEC 2018	AS SHOWN

WORK ORDER NO. R34071
SPECIFICATION NO. 2362
SHEET NO. 26 OF 26
FILE NO. CB-967

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Appendix IV Laboratory Test Reports

Unconfined Compression
ASTM D 2166

Project Name: WRECO - P20101 Meekland Ave
Project Number: 3390.X
Sample ID: A-21-001, S6
Type of Sample: 2.4" Cal Mod
Sample Description: Lean CLAY with SAND, dark olive brown
Depth: 21-21.5'

Sample Data

Sample Length:	5.01	in	Sample + Tube:	734	g
Diameter:	2.39	in	Tube:	0.00	g
Height-to-Diameter Ratio:	2.09		Sample Weight:	734	g
Sample Area:	4.50	in^2	Wet Density:	124.3	pcf
Sample Volume:	22.5	in^3	Moisture:	21	%
Specific Gravity:	2.65	(assumed)	Dry Density:	102.5	pcf
			Saturation:	91.9	%

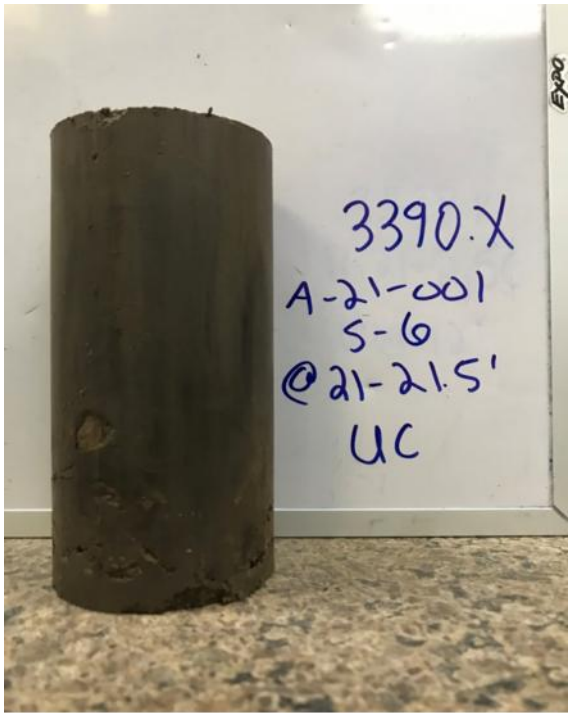
**Moisture content taken after test*

Test Results

Rate of Strain:	0.0501	in/min
Deflection at Max. Load:	0.453	in
Maximum Load:	74	lbs
Strain at Failure:	8.55	%
Average cross-sectional area at failure:	4.92	in^2
Compressive Strength:	**1.07**	**tsf**
	14.8	**psi**

Strain Information

Rate of Strain ½%:	0.025	in/min
Rate of Strain 2%:	0.100	in/min
Strain Rate:	0.050	in/min
15% Strain:	0.751	in

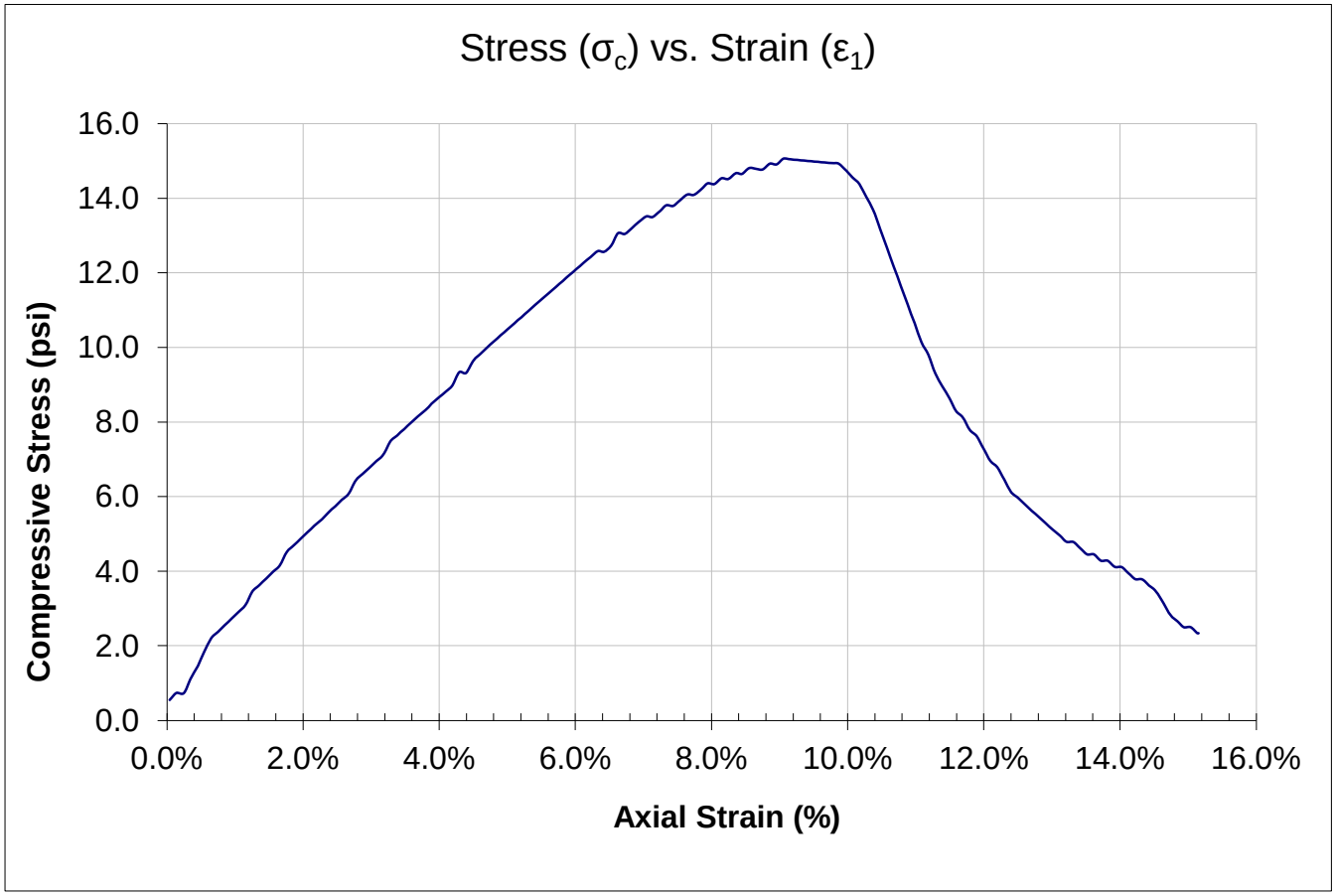




Unconfined Compression
ASTM D 2166

Project Name: WRECO - P20101 Meekland Ave
Project Number: 3390.X
Sample ID: A-21-001, S6
Type of Sample: 2.4" Cal Mod
Sample Description: Lean CLAY with SAND, dark olive brown
Depth: 21-21.5'

Compressive Strength: **1.07** **tsf**
14.8 **psi**



Unconfined Compression
ASTM D 2166

Project Name: WRECO - P20101 Meekland Ave.
Project Number: 3390.X
Sample ID: A-21-001, 8
Type of Sample: 2.4" Cal Mod
Sample Description: Lean CLAY, dark grayish brown
Depth: 31-31.5'

Sample Data

Sample Length:	5.01	in	Sample + Tube:	763	g
Diameter:	2.40	in	Tube:	0.00	g
Height-to-Diameter Ratio:	2.09		Sample Weight:	763	g
Sample Area:	4.52	in^2	Wet Density:	128.4	pcf
Sample Volume:	22.6	in^3	Moisture:	23	%
Specific Gravity:	2.65	(assumed)	Dry Density:	104.5	pcf
			Saturation:	104.1	%

**Moisture content taken after test*

Test Results

Rate of Strain:	0.0501	in/min
Deflection at Max. Load:	0.723	in
Maximum Load:	185	lbs
Strain at Failure:	11.00	%
Average cross-sectional area at failure:	5.08	in^2
Compressive Strength:	**2.56**	**tsf**
	35.5	**psi**

Strain Information

Rate of Strain ½%:	0.025	in/min
Rate of Strain 2%:	0.100	in/min
Strain Rate:	0.050	in/min
15% Strain:	0.752	in

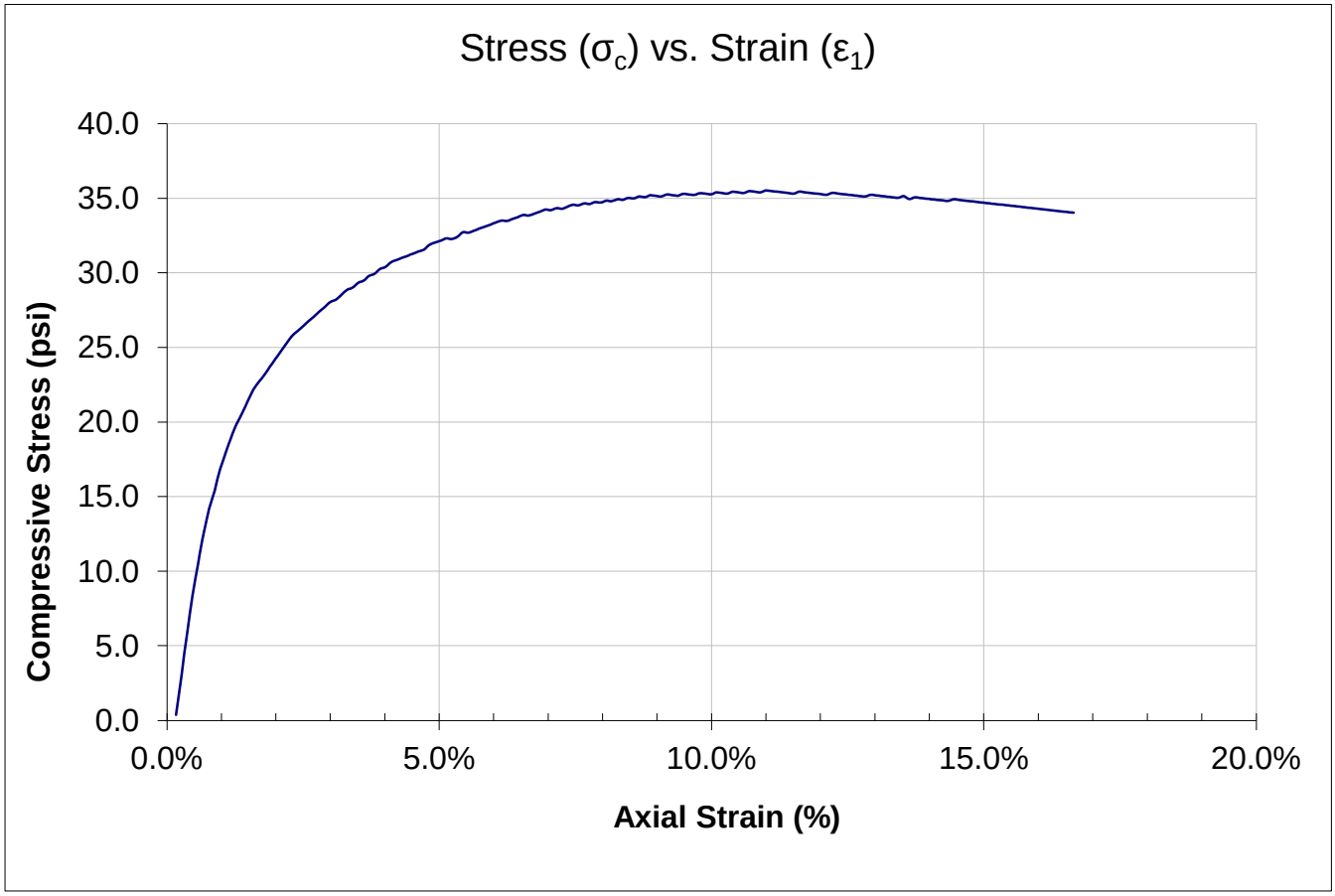




Unconfined Compression
ASTM D 2166

Project Name:	WRECO - P20101 Meekland Ave.
Project Number:	3390.X
Sample ID:	A-21-001, 8
Type of Sample:	2.4" Cal Mod
Sample Description:	Lean CLAY, dark grayish brown
Depth:	31-31.5'

Compressive Strength: **2.56** **tsf**
35.5 **psi**



Unconfined Compression
ASTM D 2166

Project Name: WRECO - P20101 Meekland Ave.
Project Number: 3390.X
Sample ID: A-21-001, S-9
Type of Sample: 2.4" Cal Mod
Sample Description: Lean CLAY, olive brown
Depth: 36-36.5'

Sample Data

Sample Length:	5.00	in	Sample + Tube:	725	g
Diameter:	2.40	in	Tube:	0.00	g
Height-to-Diameter Ratio:	2.09		Sample Weight:	725	g
Sample Area:	4.51	in^2	Wet Density:	122.4	pcf
Sample Volume:	22.6	in^3	Moisture:	29	%
Specific Gravity:	2.65	(assumed)	Dry Density:	95.1	pcf
			Saturation:	103.0	%

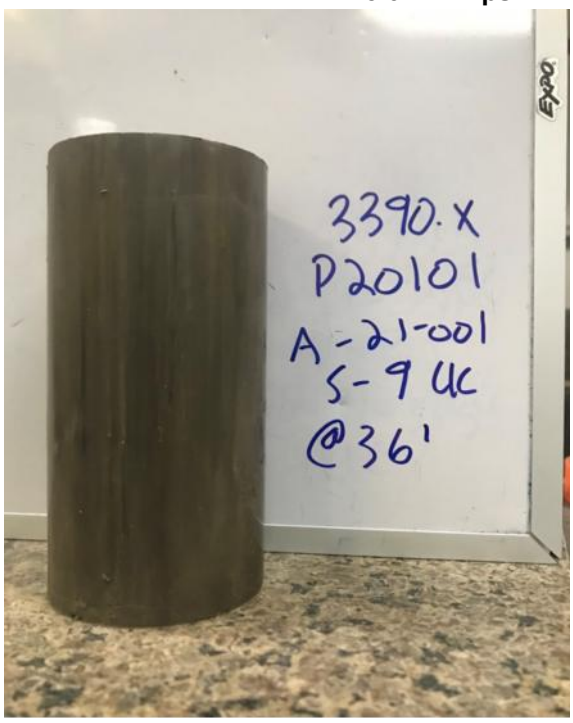
**Moisture content taken after test*

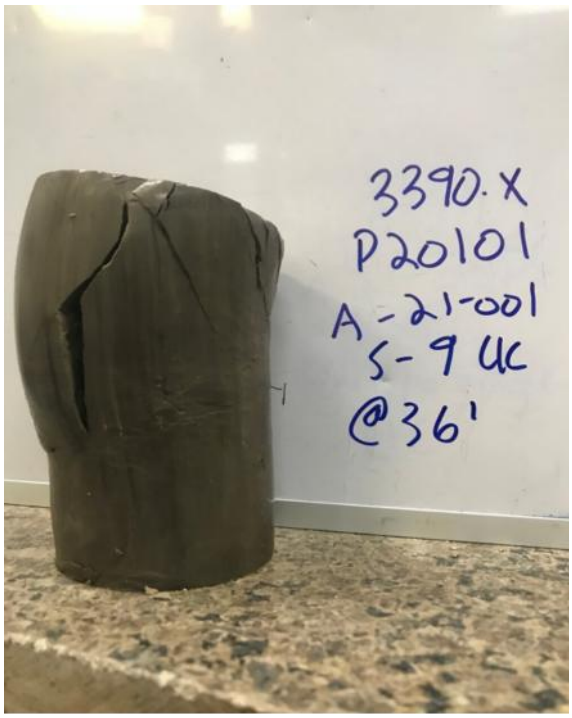
Test Results

Rate of Strain:	0.0500	in/min
Deflection at Max. Load:	0.726	in
Maximum Load:	100	lbs
Strain at Failure:	12.90	%
Average cross-sectional area at failure:	5.18	in^2
Compressive Strength:	**1.37**	**tsf**
	19.0	**psi**

Strain Information

Rate of Strain ½%:	0.025	in/min
Rate of Strain 2%:	0.100	in/min
Strain Rate:	0.050	in/min
15% Strain:	0.750	in

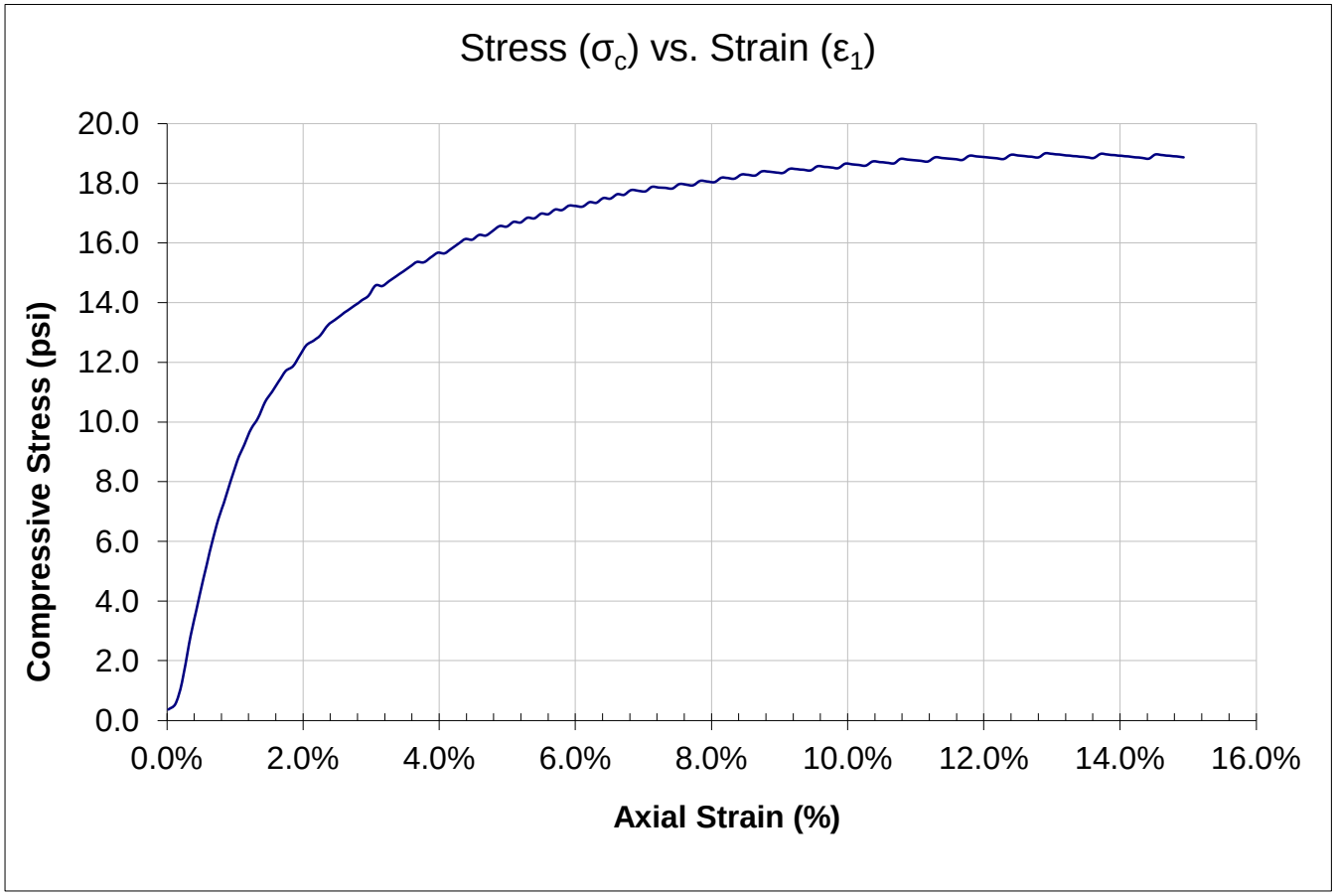




Unconfined Compression
ASTM D 2166

Project Name: WRECO - P20101 Meekland Ave.
Project Number: 3390.X
Sample ID: A-21-001, S-9
Type of Sample: 2.4" Cal Mod
Sample Description: Lean CLAY, olive brown
Depth: 36-36.5'

Compressive Strength: **1.37** **tsf**
19.0 **psi**



Unconfined Compression
ASTM D 2166

Project Name: WRECO -P20101 Meekland Ave.
Project Number: 3390.X
Sample ID: A-21-001, S-11
Type of Sample: 2.4" Cal Mod
Sample Description: SANDY SILT, olive brown
Depth: 46-46.5'

Sample Data

Sample Length:	4.98	in	Sample + Tube:	736	g
Diameter:	2.39	in	Tube:	0.00	g
Height-to-Diameter Ratio:	2.09		Sample Weight:	736	g
Sample Area:	4.48	in^2	Wet Density:	125.7	pcf
Sample Volume:	22.3	in^3	Moisture:	27	%
Specific Gravity:	2.65	(assumed)	Dry Density:	99.3	pcf
			Saturation:	105.8	%

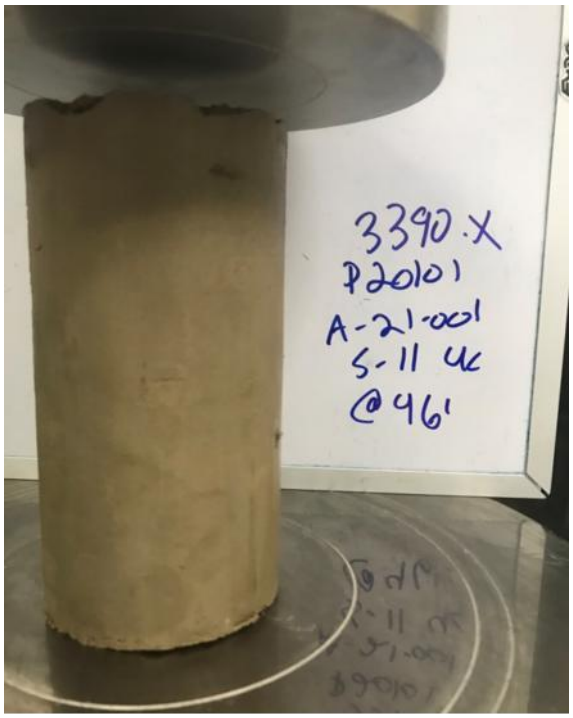
**Moisture content taken after test*

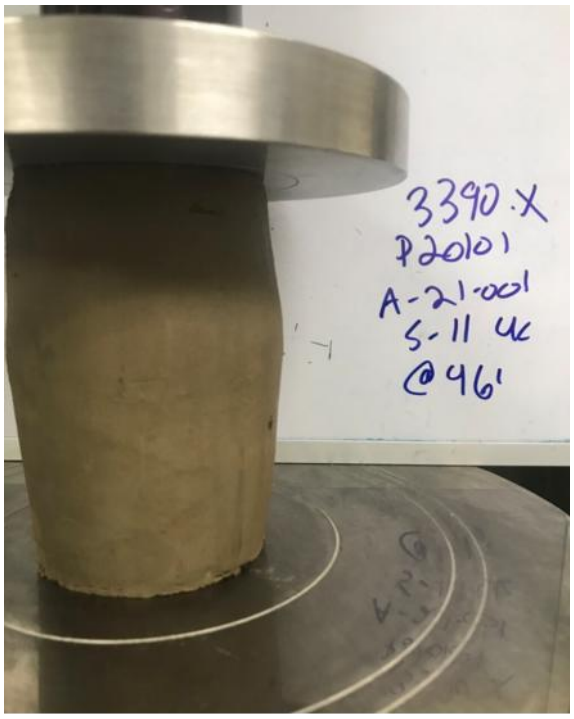
Test Results

Rate of Strain:	0.0498	in/min
Deflection at Max. Load:	0.636	in
Maximum Load:	60	lbs
Strain at Failure:	11.44	%
Average cross-sectional area at failure:	5.06	in^2
Compressive Strength:	**0.84**	**tsf**
	11.6	**psi**

Strain Information

Rate of Strain ½%:	0.025	in/min
Rate of Strain 2%:	0.100	in/min
Strain Rate:	0.050	in/min
15% Strain:	0.747	in

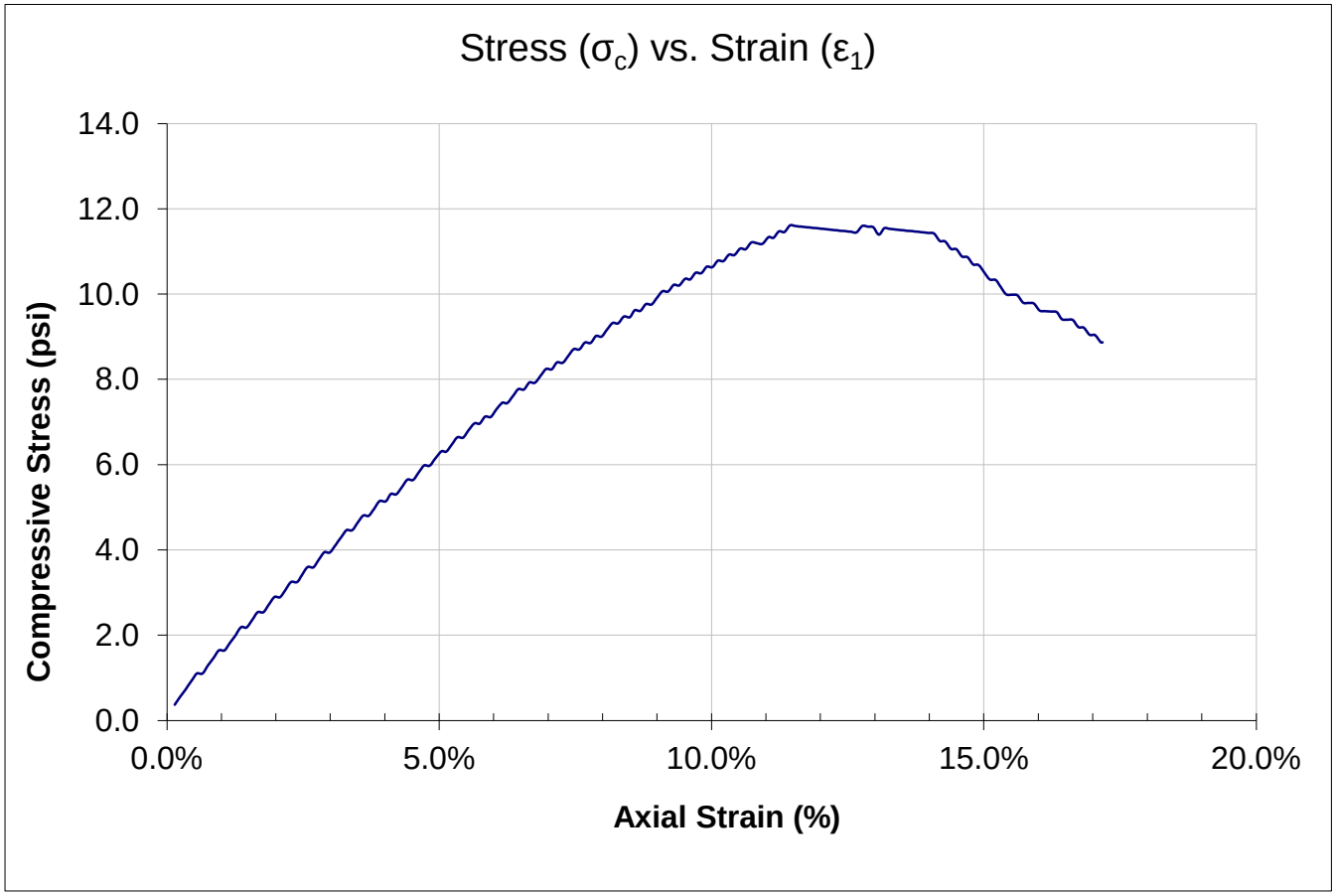




Unconfined Compression
ASTM D 2166

Project Name: WRECO -P20101 Meekland Ave.
Project Number: 3390.X
Sample ID: A-21-001, S-1
Type of Sample: 2.4" Cal Mod
Sample Description: SANDY SILT, olive brown
Depth: 46-46.5'

Compressive Strength: **0.84** **tsf**
11.6 **psi**



BLACKBURN CONSULTING

Project Name: WRECO - P20101 Meekland Ave.

BCI File No: 3390.X

Date: 3/31/2021

Technician: PFH

MOISTURE-DENSITY TESTS

ASTM D 2216 / D 7263

Sample No.	R-21-001, S-5	R-21-001, S7	R-21-001, S-10	R-21-001, S-12			
Depth (ft.)	15.5-16	25-25.5	40.5-41	50.5-51			
Moisture (%)	**16.5**	**25.1**	**22.6**	**26.2**			
Wet Density (pcf)	**127.2**	**121.6**	**129.1**	**124.0**			
Dry Density (pcf)	**109**	**97.2**	**105.3**	**98.3**			
Pocket Pen (tsf)	**4.25**	**1.50**	**2.00**	**1.50**			

Sample: R-21-001, S-5 Description: CLAYEY SAND, dark brown

Moisture (Appearance): moist Consistency/Cementation:

Sample: R-21-001, S7 Description: Lean CLAY, dark olive brown

Moisture (Appearance): moist Consistency/Cementation:

Sample: R-21-001, S-10 Description: Lean CLAY, light olive brown

Moisture (Appearance): moist Consistency/Cementation:

Sample: R-21-001, S-12 Description: CLAYEY SAND, light olive brown

Moisture (Appearance): moist Consistency/Cementation:

Sample: Description:

Moisture (Appearance): Consistency/Cementation:

Sample: Description:

Moisture (Appearance):

Sample: Description:

Moisture (Appearance): Consistency/Cementation:

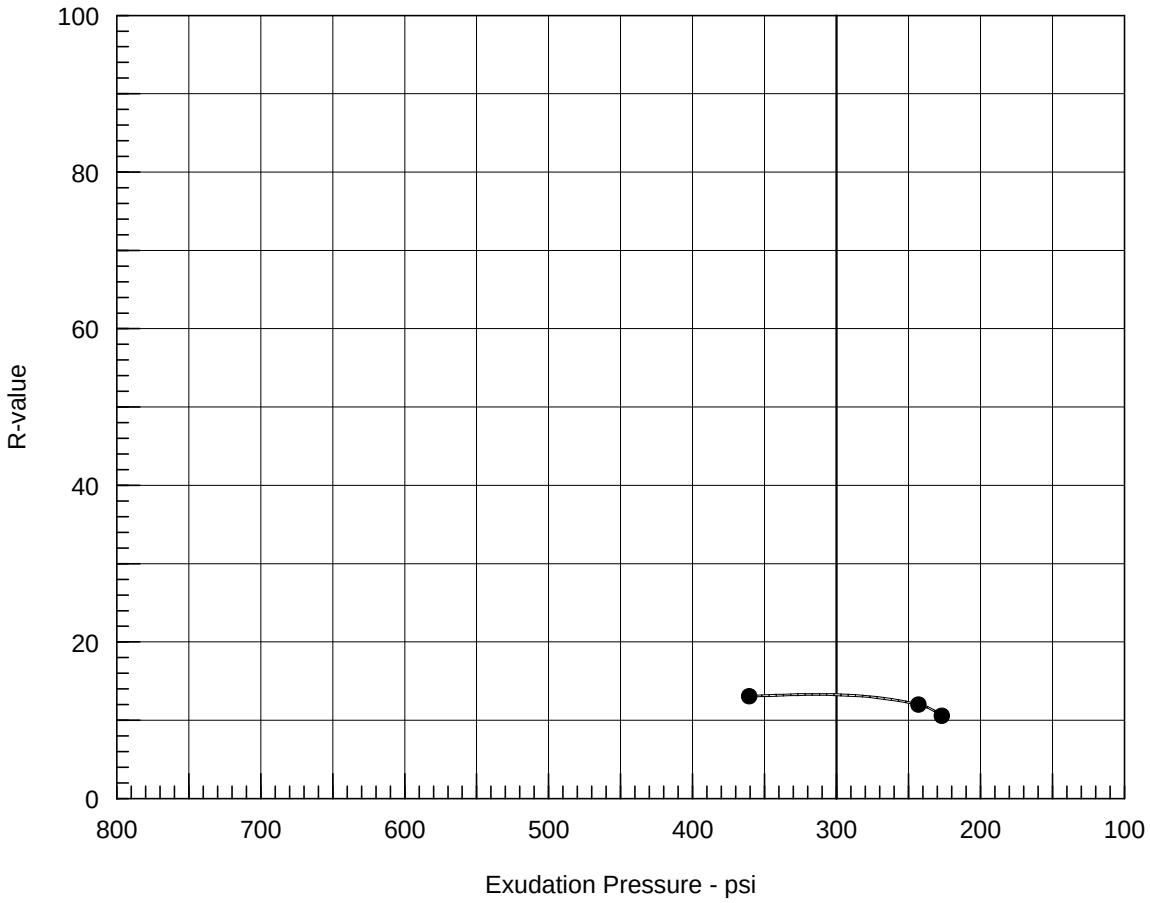
Sample: Description:

Moisture (Appearance): Consistency/Cementation:

Diameter = 1.44" for 1.5-inch Tubes Diameter = 2.43" for 2.5-inch Brass / 2.40" for SS

Diameter = 1.938" for 2-inch Tubes Diameter= 2.850" for 3.0-inch Shelby Tubes

R-VALUE TEST REPORT



Resistance R-Value and Expansion Pressure - Cal Test 301

No.	Compact. Pressure psi	Density pcf	Moist. %	Expansion Pressure psf	Horizontal Press. psi @ 160 psi	Sample Height in.	Exud. Pressure psi	R Value	R Value Corr.
1	52	106.8	18.2	17	124	2.44	361	14	13
2	42	105.0	19.4	17	127	2.37	243	13	12
3	31	103.6	20.6	13	135	2.51	227	11	11

Test Results	Material Description
R-value at 300 psi exudation pressure = 13	Lean CLAY, dark grayish brown

Project No.: 3390.X
Project: WRECO Lab Testing
Source of Sample: P20101 Meekland Avenue **Depth:** 2-5'
Sample Number: A-21-004, S-2
Date: 3/31/2021

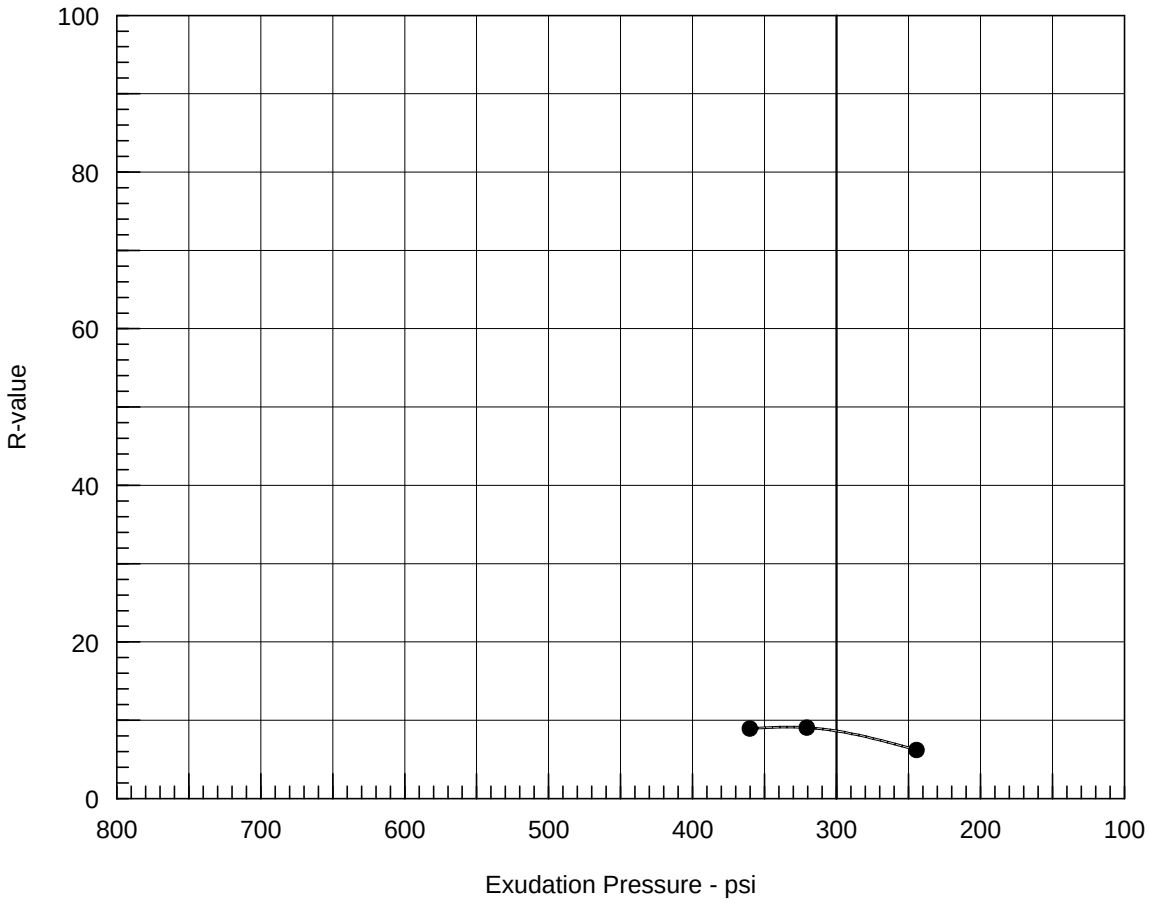
Tested by:
Checked by:
Remarks:

R-VALUE TEST REPORT

Blackburn Consulting

Figure _____

R-VALUE TEST REPORT



Resistance R-Value and Expansion Pressure - Cal Test 301

No.	Compact. Pressure psi	Density pcf	Moist. %	Expansion Pressure psf	Horizontal Press. psi @ 160 psi	Sample Height in.	Exud. Pressure psi	R Value	R Value Corr.
1	31	109.9	17.8	52	130	2.32	360	10	9
2	31	108.5	19.0	35	138	2.36	321	10	9
3	31	105.0	20.1	0	143	2.44	244	6	6

Test Results	Material Description
R-value at 300 psi exudation pressure = 9	Lean CLAY, dark yellowish brown

Project No.: 3390.X
Project: WRECO Lab Testing
Source of Sample: P20101 Meekland Avenue **Depth:** 1.5-5'
Sample Number: A-21-006, S-3
Date: 3/31/2021

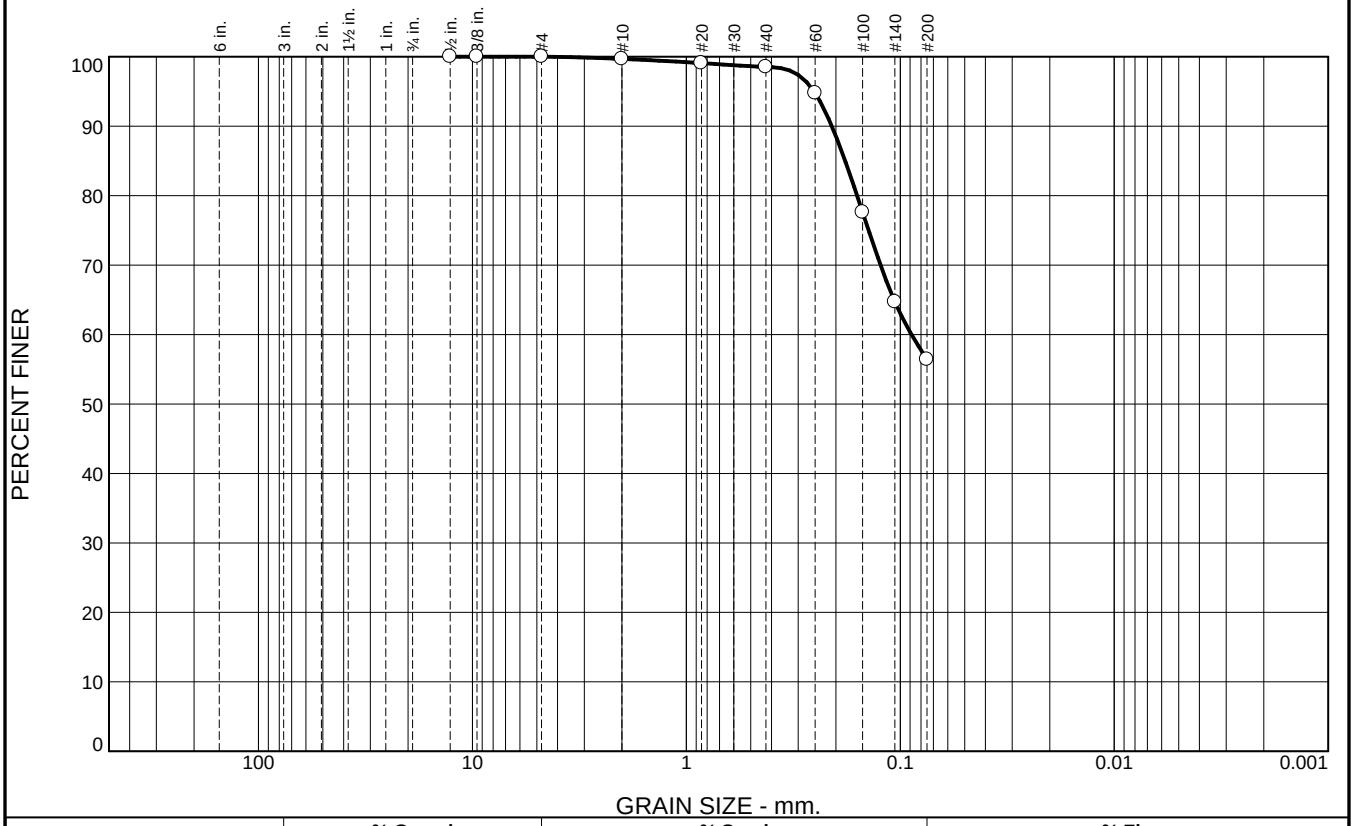
Tested by: BRL
Checked by: RBL
Remarks:

R-VALUE TEST REPORT

Blackburn Consulting

Figure _____

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	1	43	56	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100		
3/8"	100		
#4	100		
#10	100		
#20	99		
#40	99		
#60	95		
#100	78		
#140	65		
#200	56		

* (no specification provided)

Material Description

SANDY lean CLAY, light olive brown

Atterberg Limits

PL= 14 LL= 30 PI= 16

Coefficients

D_{90}= 0.2090 D_{85}= 0.1811 D_{60}= 0.0887
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(6)

Remarks

Source of Sample: P20101 Meekland Avenue **Depth:** 55'
Sample Number: R-21-001, S-13 **Date:**

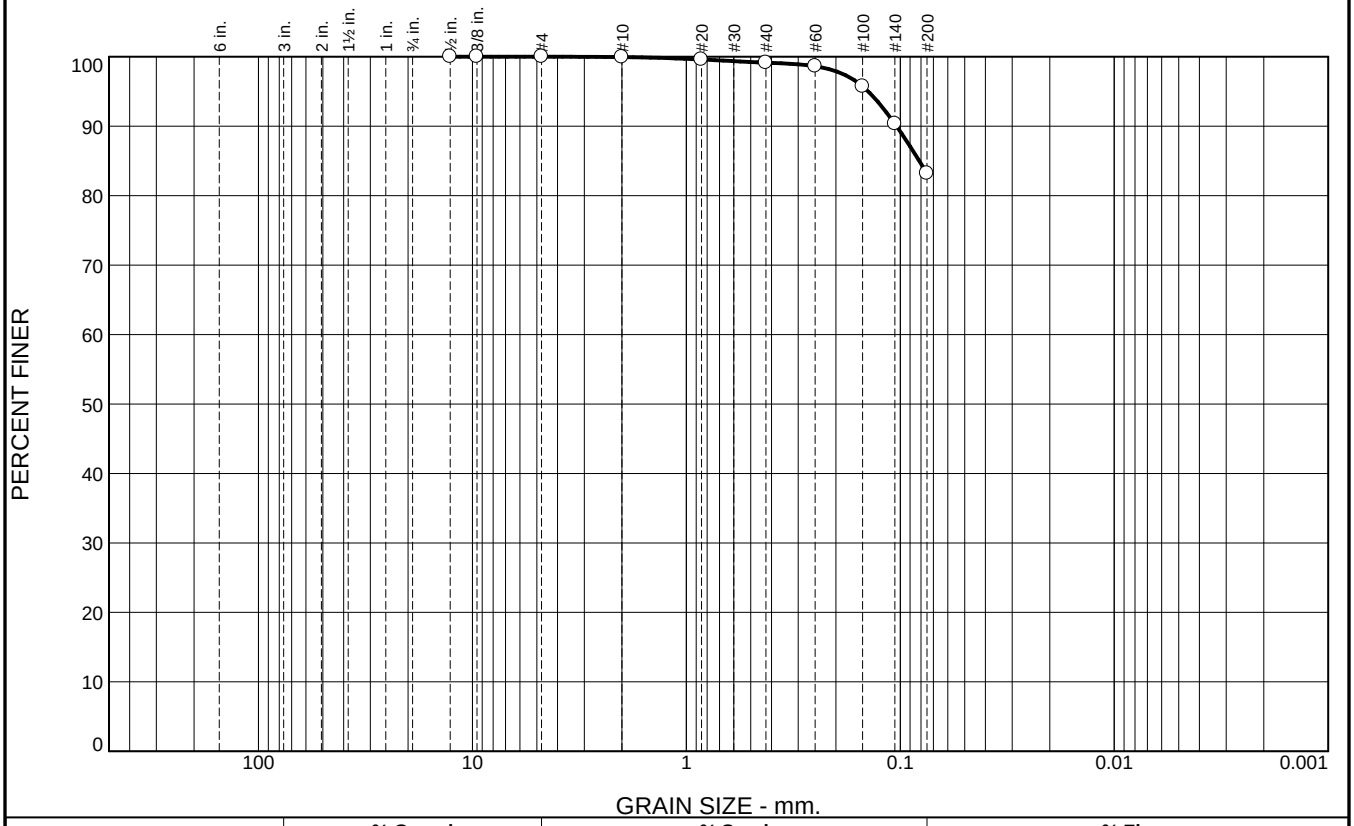
Blackburn Consulting

W. Sacramento, CA

Client: WRECO
Project: WRECO Lab Testing

Project No: 3390.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	1	16	83	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100		
3/8"	100		
#4	100		
#10	100		
#20	100		
#40	99		
#60	99		
#100	96		
#140	90		
#200	83		

* (no specification provided)

Material Description

Lean CLAY with SAND, dark olive brown

Atterberg Limits

PL= 20 LL= 40 PI= 20

Coefficients

D_{90}= 0.1042 D_{85}= 0.0816 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(16)

Remarks

Source of Sample: P20101 Meekland Avenue **Depth:** 5'
Sample Number: R-21-002, S-2 **Date:**

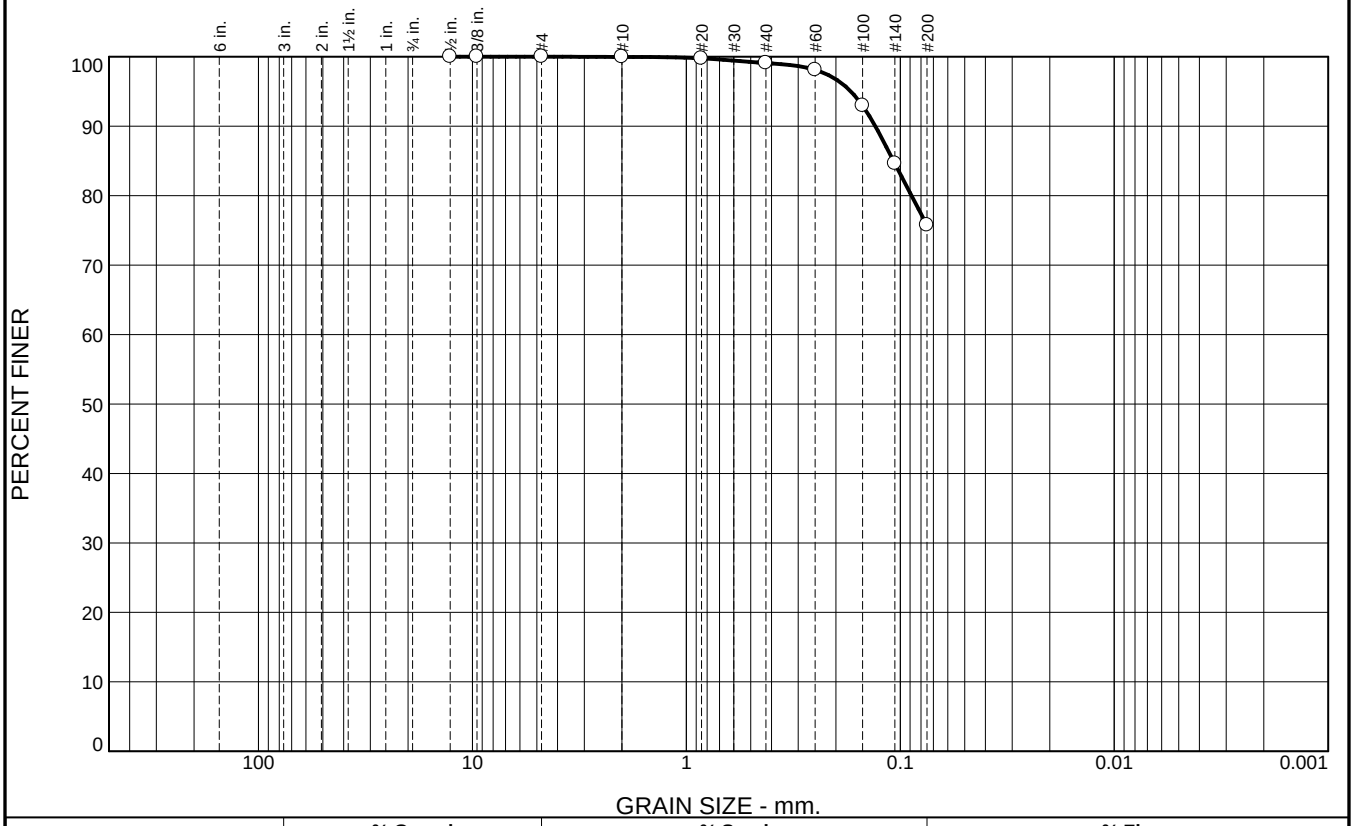
Blackburn Consulting

W. Sacramento, CA

Client: WRECO
Project: WRECO Lab Testing

Project No: 3390.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	1	23	76	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100		
3/8"	100		
#4	100		
#10	100		
#20	100		
#40	99		
#60	98		
#100	93		
#140	85		
#200	76		

* (no specification provided)

Material Description

Lean CLAY with SAND, dark yellowish brown

Atterberg Limits

PL= 18 LL= 34 PI= 16

Coefficients

D_{90}= 0.1310 D_{85}= 0.1076 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(11)

Remarks

Source of Sample: P20101 Meekland Avenue **Depth:** 20'
Sample Number: R-21-002, S-5 **Date:**

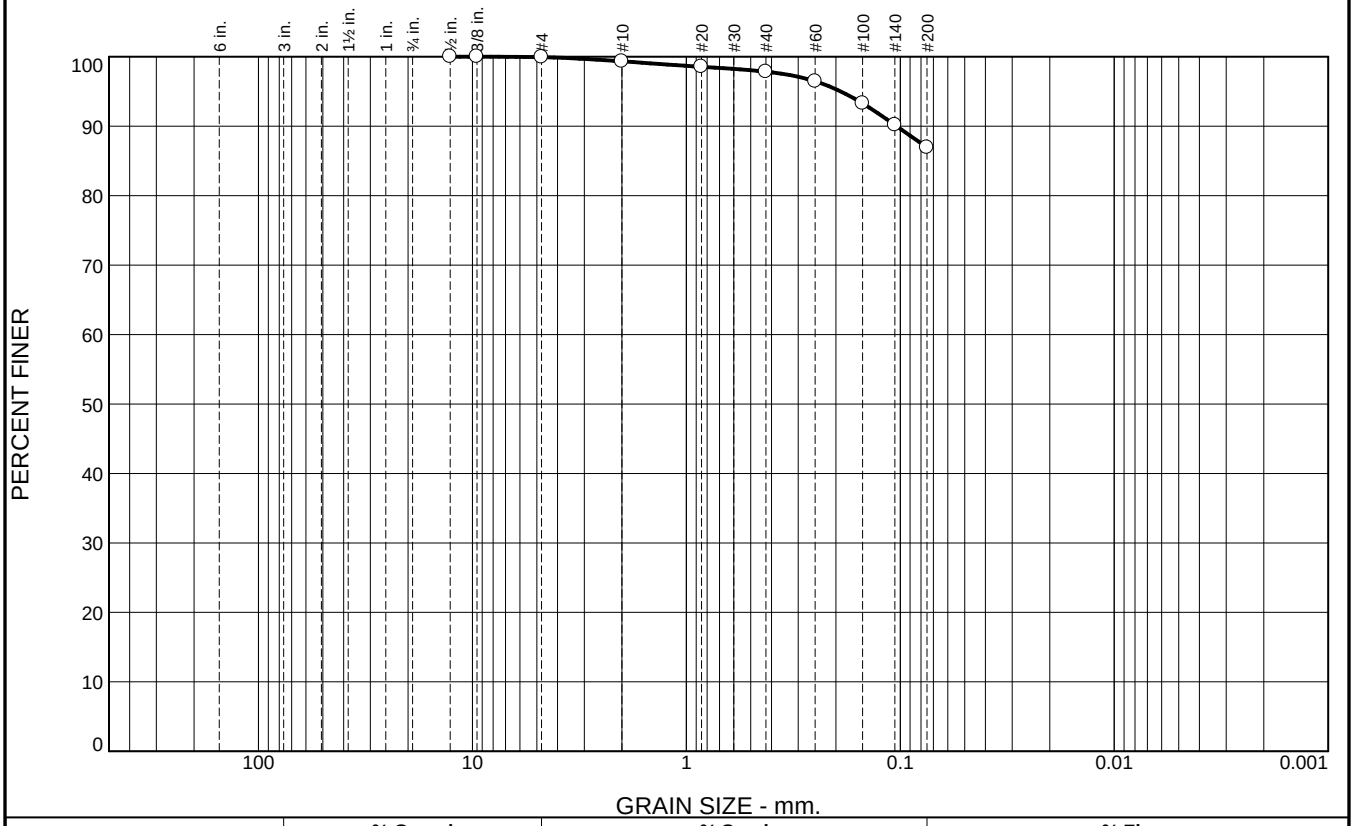
Blackburn Consulting

W. Sacramento, CA

Client: WRECO
Project: WRECO Lab Testing

Project No: 3390.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	1	1	11	87	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100		
3/8"	100		
#4	100		
#10	99		
#20	99		
#40	98		
#60	96		
#100	93		
#140	90		
#200	87		

* (no specification provided)

Material Description

Lean CLAY with SAND, olive gray

Atterberg Limits

PL= 16 LL= 46 PI= 30

Coefficients

D_{90}= 0.1041 D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(26)

Remarks

Source of Sample: P20101 Meekland Avenue **Depth:** 35.5'
Sample Number: R-21-002, S-8 **Date:**

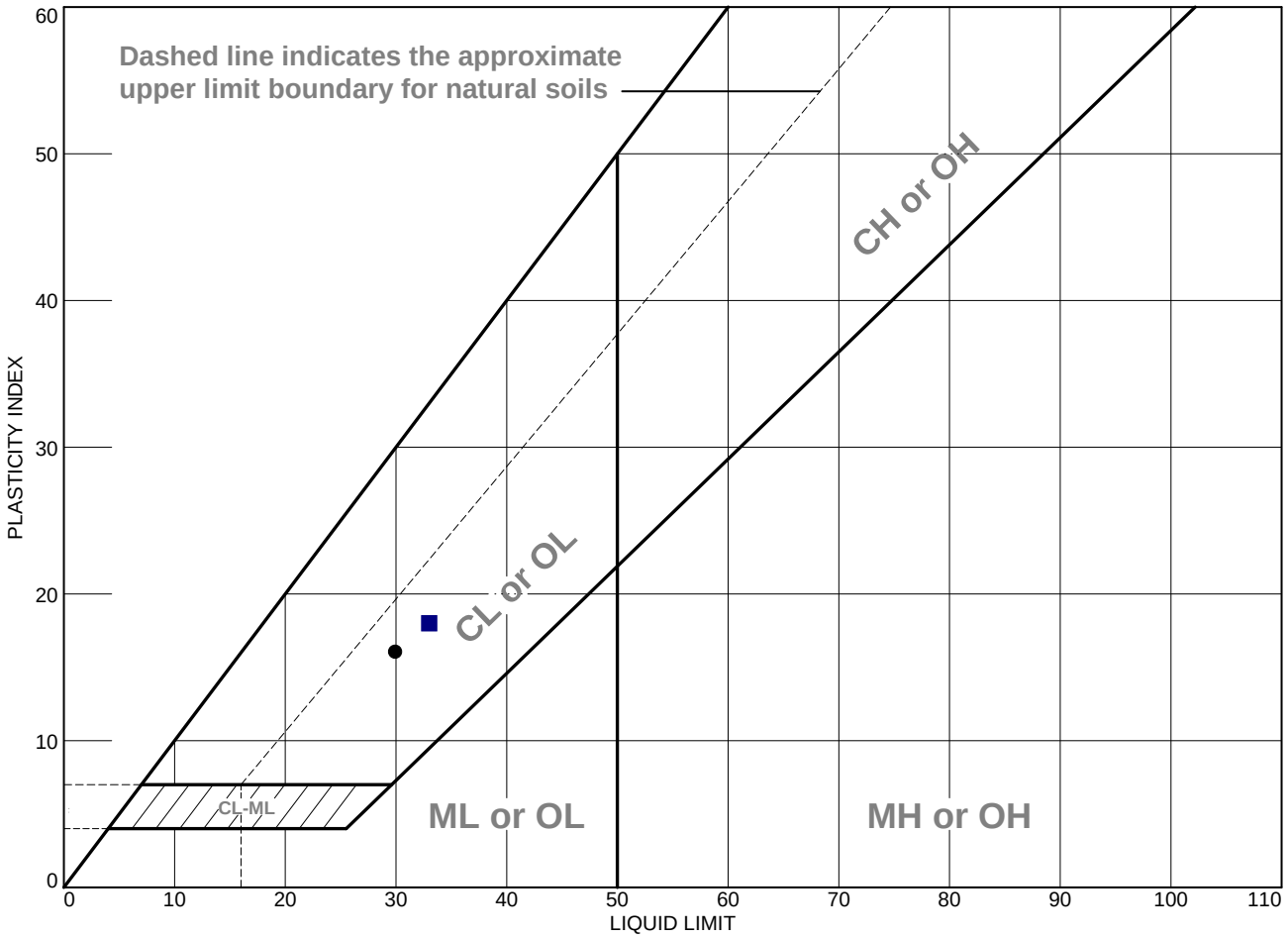
Blackburn Consulting

W. Sacramento, CA

Client: WRECO
Project: WRECO Lab Testing

Project No: 3390.X **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	SANDY lean CLAY, light olive brown	30	14	16	99	56	CL
■	Lean CLAY, light olive brown	33	15	18			CL

Project No. 3390.X **Client:** WRECO

Project: WRECO Lab Testing

Remarks:

●**Source of Sample:** P20101 Meekland Avenue **Depth:** 55' **Sample Number:** R-21-001, S-13

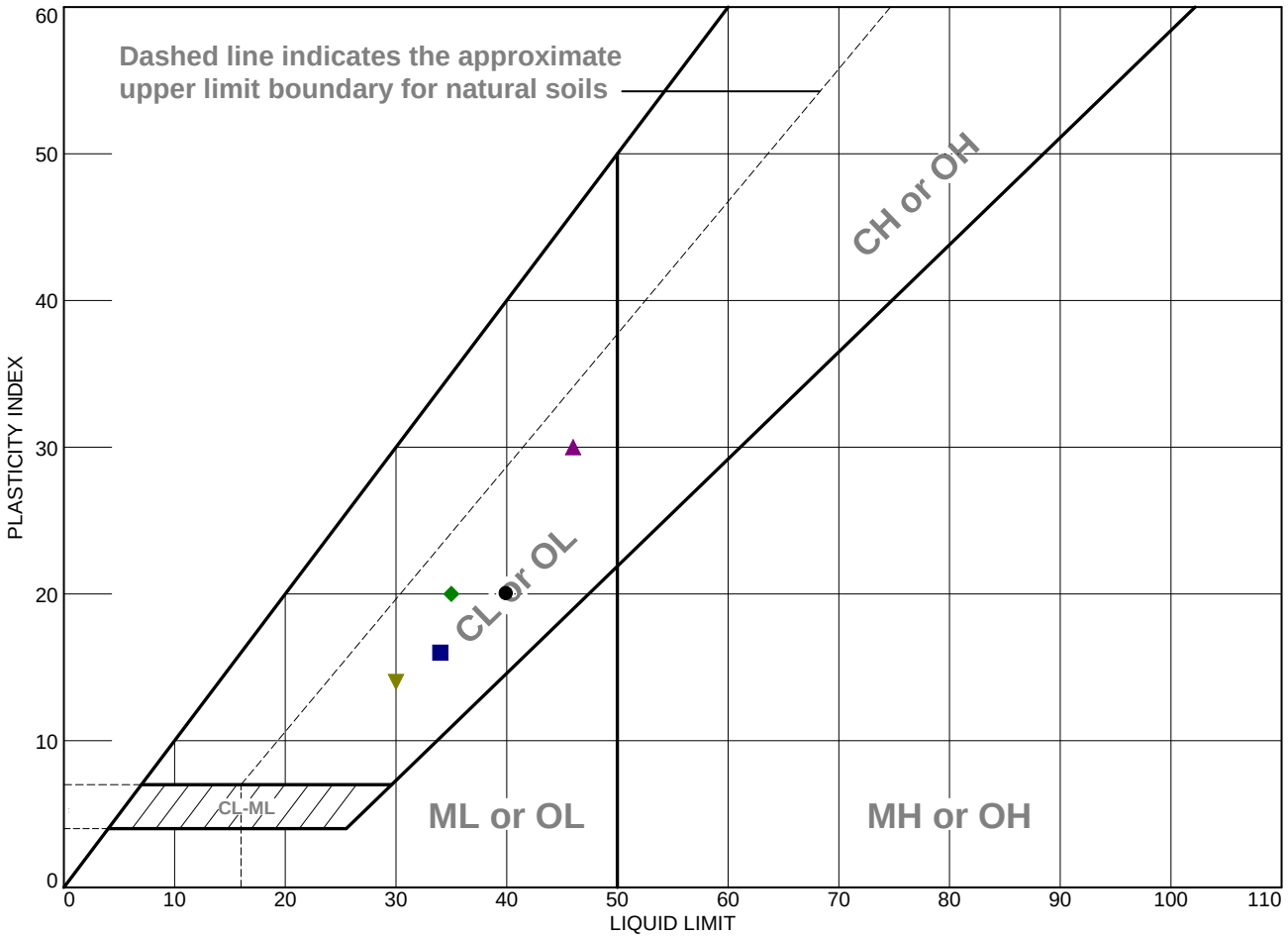
■**Source of Sample:** P20101 Meekland Avenue **Depth:** 65' **Sample Number:** R-21-001, S-15

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W. Sacramento, CA

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Lean CLAY with SAND, dark olive brown	40	20	20	99	83	CL
■	Lean CLAY with SAND, dark yellowish brown	34	18	16	99	76	CL
▲	Lean CLAY with SAND, olive gray	46	16	30	98	87	CL
◆	Lean CLAY with SAND, olive brown	35	15	20			CL
▼	Lean CLAY with SAND, dark yellowish brown	30	16	14			CL

Project No. 3390.X **Client:** WRECO

Project: WRECO Lab Testing

Remarks:

● **Source of Sample:** P20101 Meekland Avenue **Depth:** 5' **Sample Number:** R-21-002, S-2

■ **Source of Sample:** P20101 Meekland Avenue **Depth:** 20' **Sample Number:** R-21-002, S-5

▲ **Source of Sample:** P20101 Meekland Avenue **Depth:** 35.5' **Sample Number:** R-21-002, S-8

◆ **Source of Sample:** P20101 Meekland Avenue **Depth:** 50.5' **Sample Number:** R-21-002, S-11

▼ **Source of Sample:** P20101 Meekland Avenue **Depth:** 70.5' **Sample Number:** R-21-002, S-14

Blackburn Consulting

W. Sacramento, CA

Figure

Sunland Analytical

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

Date Reported 03/17/2021
Date Submitted 03/10/2021

To: Megan Walls
WRECO
1243 Alpine Rd. Ste# 108
Walnut Creek, CA 94596

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

The reported analysis was requested for the following location:
Location : P20101 MEEHLAND AVE Site ID : R-21-001 S2@0-5.
Thank you for your business.

* For future reference to this analysis please use SUN # 84251-175637.

EVALUATION FOR SOIL CORROSION

Soil pH	6.97	
Minimum Resistivity	1.72 ohm-cm (x1000)	
Chloride	9.4 ppm	00.00094 %
Sulfate	65.0 ppm	00.00650 %

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

Sunland Analytical

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

Date Reported 03/17/2021
Date Submitted 03/10/2021

To: Megan Walls
WRECO
1243 Alpine Rd. Ste# 108
Walnut Creek, CA 94596

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

The reported analysis was requested for the following location:
Location : P20101 MEEHLAND AVE Site ID : R21-002 S3@10.5.
Thank you for your business.

* For future reference to this analysis please use SUN # 84251-175638.

EVALUATION FOR SOIL CORROSION

Soil pH	6.79	
Minimum Resistivity	0.51 ohm-cm (x1000)	
Chloride	99.0 ppm	00.00990 %
Sulfate	48.3 ppm	00.00483 %

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

APPENDIX B

LABORATORY TEST RESULTS

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Exploration ID	Depth (ft.)	Sample No.	Sample Description	Water Content (%)	Dry Unit Wt. (pcf)	Sieve Analysis (%)			Atterberg Limits			Additional Tests
						Passing 3/4"	Passing #4	Passing #200	Liquid Limit	Plastic Limit	Plasticity Index	
MK-B1	6.0			15.0	111.6							
MK-B1	11.0		DARK BROWN SILTY SAND (SM)	17.6	100.6		100	41				
MK-B1	16.0		DARK GRAYISH BROWN SANDY LEAN CLAY (CL)	23.5	99.3				30	14	16	
MK-B1	20.5		DARK GRAYISH BROWN FAT CLAY (CH)	24.9	100.4							TXUU Saturated: c = 1.12 ksf
MK-B1	21.0		DARK BROWN FAT CLAY WITH SAND (CH)	21.8	103.1				56	15	41	
MK-B1	26.0		OLIVE BROWN LEAN CLAY (CL)	23.2	104.8							TXUU Saturated: c = 0.72 ksf
MK-B1	36.0			25.7	103.0							
MK-B1	45.5		DARK YELLOWISH BROWN SANDY LEAN CLAY (CL)	17.0	116.7							TXUU Saturated: c = 1.44 ksf
MK-B1	46.0		GRAYISH BROWN SANDY LEAN CLAY (CL)	18.6	112.2				29	13	16	
MK-B1	56.0			17.7	112.2							

Refer to the Geotechnical Evaluation Report or the supplemental plates for the method used for the testing performed above.
NP = NonPlastic
NA = Not Available

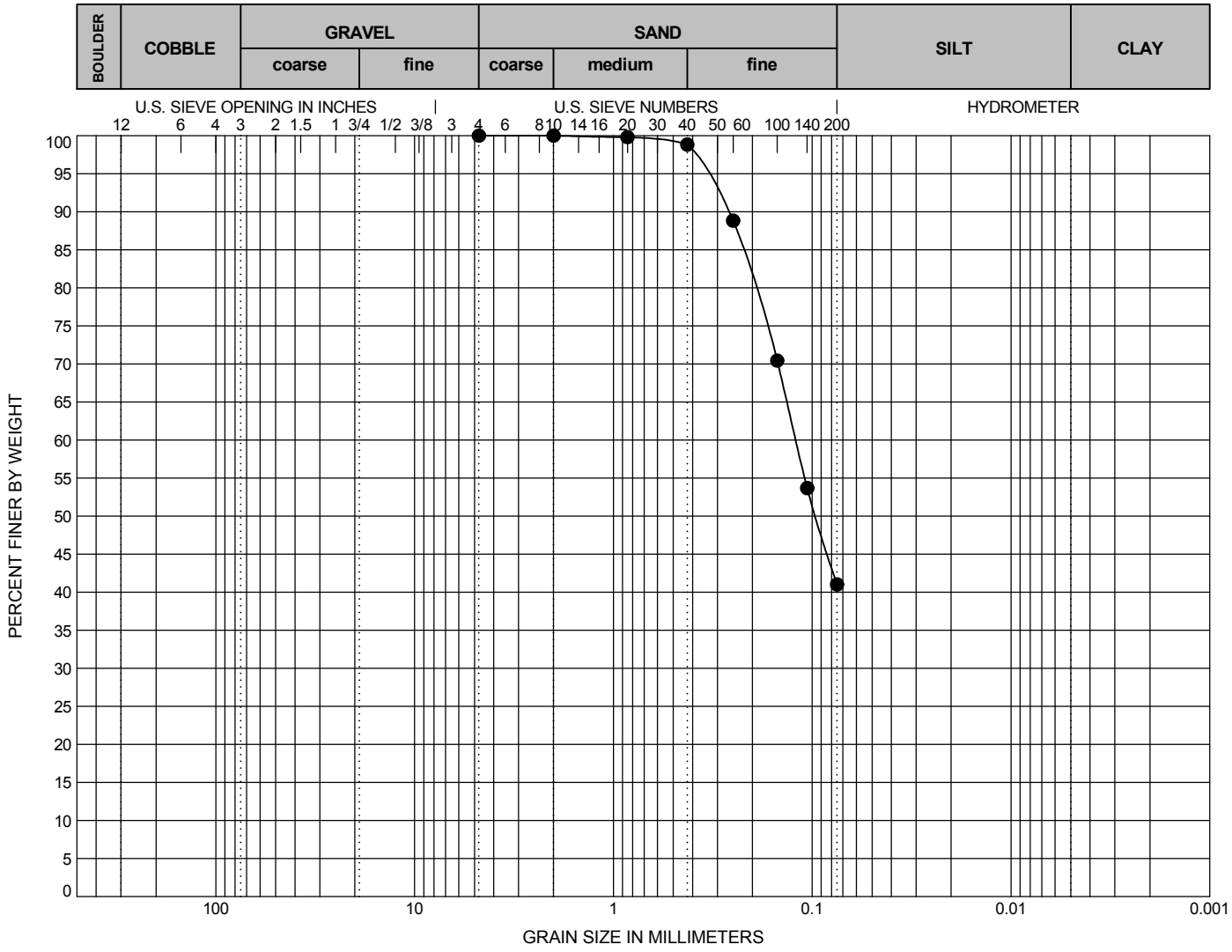
KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.: 20172563
DRAWN BY: JDS
CHECKED BY: CN
DATE: 5/30/2018
REVISED: -

LABORATORY TEST RESULT SUMMARY

ACFC & WCD LARGE TRASH CAPTURE PROJECT
MEEKLAND AVE. AND LOMA VERDE DR.
SAN LORENZO, CALIFORNIA

FIGURE
B-1



Exploration ID	Depth (ft.)	Sample Number	Sample Description	LL	PL	PI
● MK-B1	11	NA	DARK BROWN SILTY SAND (SM)	NM	NM	NM

Exploration ID	Depth (ft.)	D_{100}	D_{60}	D_{30}	D_{10}	Cc	Cu	Passing 3/4"	Passing #4	Passing #200	%Silt	%Clay
● MK-B1	11	4.75	0.121	NM	NM	NM	NM		100	41	NM	NM

Sieve Analysis and Hydrometer Analysis testing performed in general accordance with ASTM D422.
NP = Nonplastic
NA = Not Available
NM = Not Measured

Coefficients of Uniformity - $C_u = D_{60} / D_{10}$
Coefficients of Curvature - $C_C = (D_{30})^2 / D_{60}\, D_{10}$
D_{60} = Grain diameter at 60% passing
D_{30} = Grain diameter at 30% passing
D_{10} = Grain diameter at 10% passing

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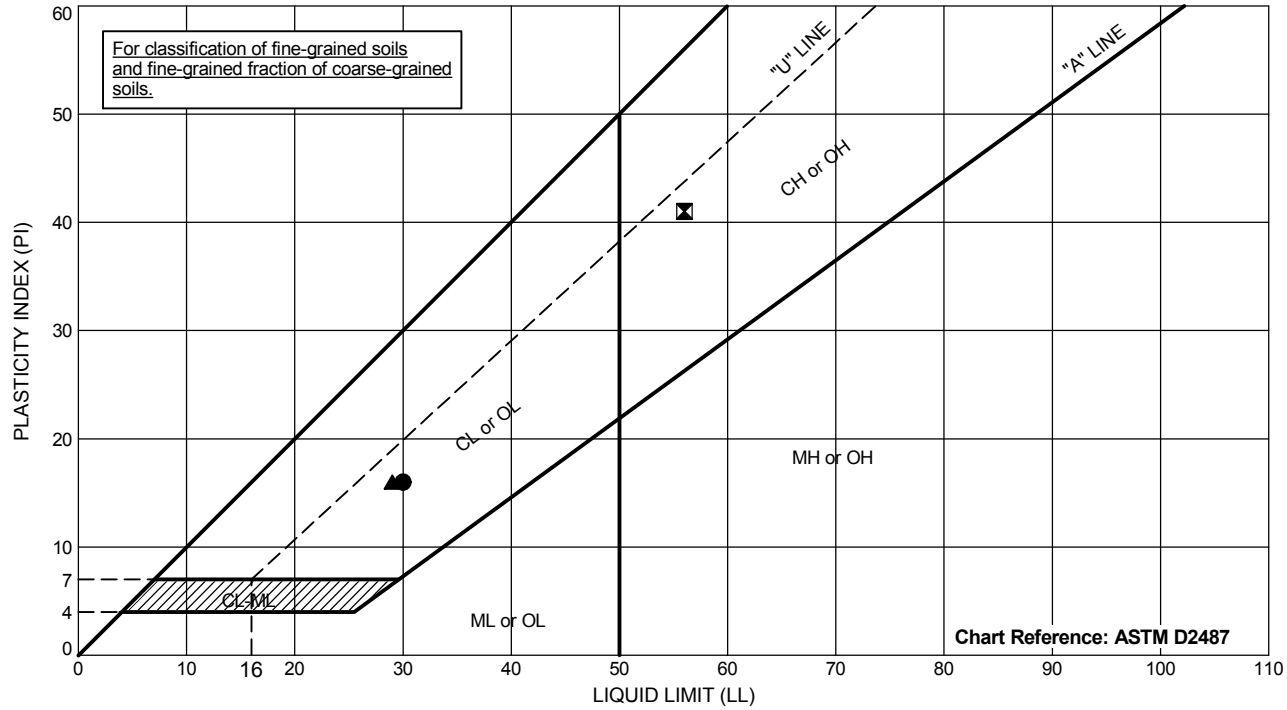
PROJECT NO.:	20172563
DRAWN BY:	JDS
CHECKED BY:	CN
DATE:	5/30/2018
REVISED:	-

SIEVE ANALYSIS

ACFC & WCD LARGE TRASH CAPTURE PROJECT
MEEKLAND AVE. AND LOMA VERDE DR.
SAN LORENZO, CALIFORNIA

FIGURE
B-2

PLOTTED: 12/21/2018 12:30 PM BY: JSala
OFFICE FILTER: OAKLAND
PROJECT NUMBER: 20172563.010A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [LKLF_SIEVE ANALYSIS]



Exploration ID		Depth (ft.)	Sample Number	Sample Description	Passing #200	LL	PL	PI
●	MK-B1	16	NA	DARK GRAYISH BROWN SANDY LEAN CLAY (CL)	NM	30	14	16
⊠	MK-B1	21	NA	DARK BROWN FAT CLAY WITH SAND (CH)	NM	56	15	41
▲	MK-B1	46	NA	GRAYISH BROWN SANDY LEAN CLAY (CL)	NM	29	13	16

Testing performed in general accordance with ASTM D4318.
NP = Nonplastic
NA = Not Available
NM = Not Measured

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	20172563
DRAWN BY:	JDS
CHECKED BY:	CN
DATE:	5/30/2018
REVISED:	-

ATTERBERG LIMITS

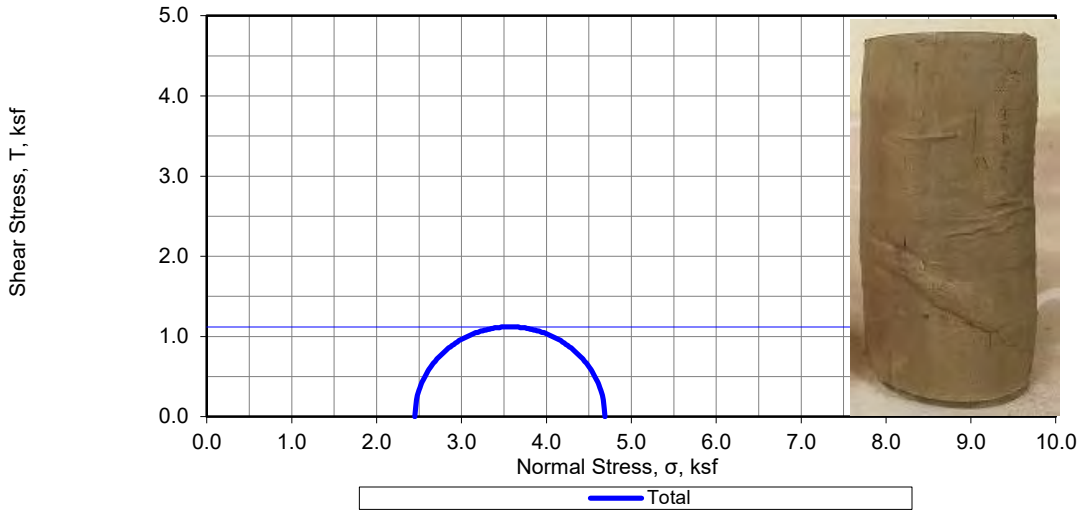
ACFC & WCD LARGE TRASH CAPTURE PROJECT
MEEKLAND AVE. AND LOMA VERDE DR.
SAN LORENZO, CALIFORNIA

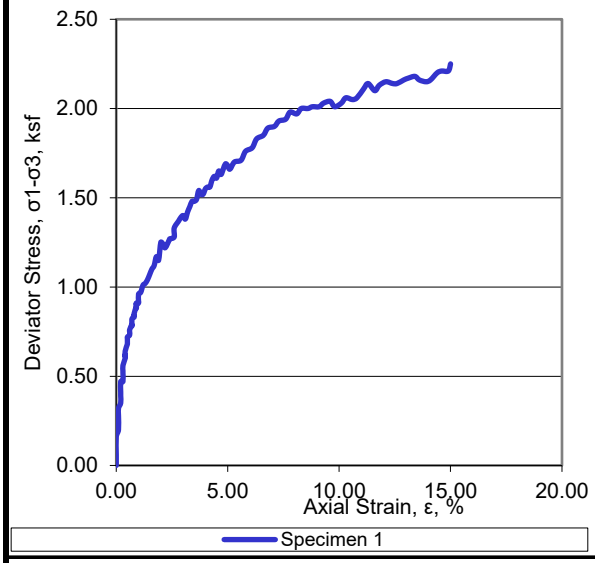
FIGURE

B-3

PLOTTED: 12/21/2018 12:31 PM BY: JSala
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PROJECT NUMBER: 20172563.010A
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gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [KLF_ATTERBERG (ASTM)]

Total		
c =	1.12	ksf





Specimen No.			1
Initial	Diameter, in	D_O	2.41
	Height, in	H_O	5.61
	Water Content,	ω_O	24.9
	Dry Density, lbs	$^{\gamma}d_o$	100.4
	Saturation, %	S_O	99
	Void Ratio	e_O	0.68
Before Shear	Water Content, %	ω_f	26.2
	Dry Density, lbs/ft^3	$^{\gamma}d_c$	98.6
	Saturation, %	S_C	100
	Void Ratio	e_C	0.71
	Final Back Pressure, ksf	U_O	5.8
Minor Principal Stress, ksf		σ_3	2.45
Maximum Deviator Stress, ksf		$(\sigma1\text{-}\sigma3)_{max}$	2.25
Time to $(s_1\text{-}s_3)_{max}$, min		t_f	15.0
Deviator Stress @ 15% Axial Strain, k		$(\sigma_1\text{-}\sigma_3)_{15\%}$	2.25
Rate of strain, %/min		'ε	1.0

Method of Saturation: Wet Mounted

Description of Specimen 1: Dark Grayish Brown Fat Clay (CH)

Amount of Material Finer than the No. 200, %: nm

LL:	PL:	PI:	G_S:	Specimen Type:	Test Method:
56	41	15	2.70 Assumed	Undisturbed	ASTM D2850 Modified

Membrane Correction applied.

Boring:	MK-B1
Sample:	6B
Depth, ft:	20.5
Test Date:	6/18/18

Membrane and Filter Strip Correction applied. Parameter B for all Specimens >/= 0.96

The determination of strength envelopes and the development of relationships to aid in interpreting and evaluating test results are beyond the scope of this test method. Interpreted values provided herein must be evaluated and approved by the user of this report.

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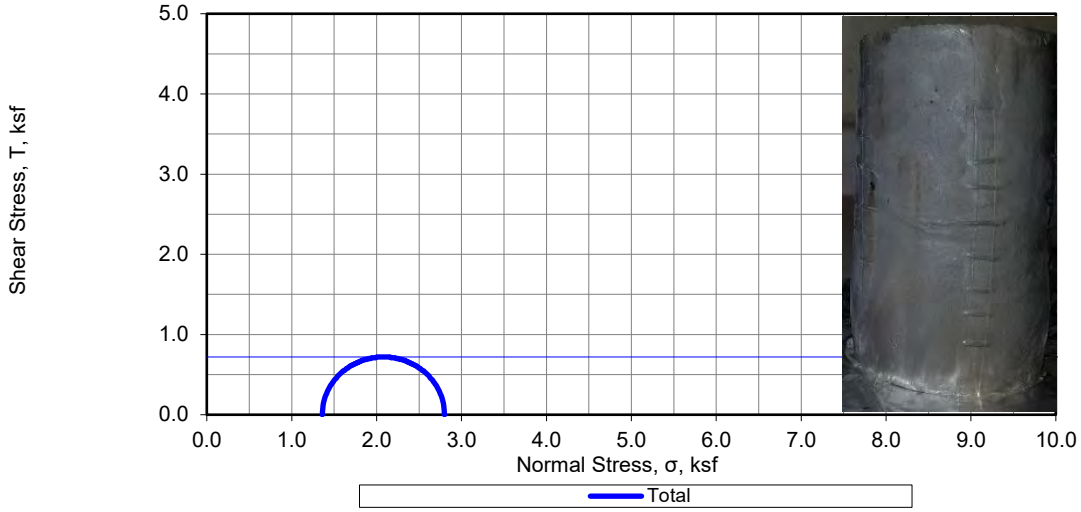
Project No.:	20172563.010A
Date:	6/19/18
Entry By:	C Pimentel
Checked By:	C. Pimentel
File Name:	HL11268

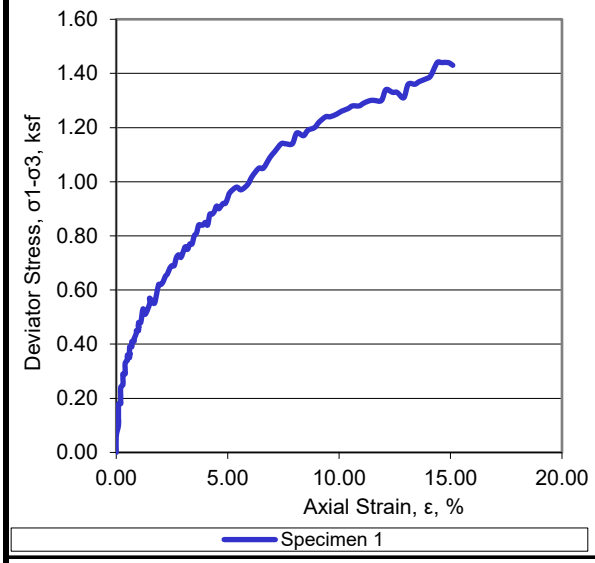
TRIAXIAL COMPRESSION TEST (UU)

ACFC & WCD LARGE TRASH CAPTURE PROJECT
MEEKLAND AVE. AND LOMA VERDE DR.
SAN LORENZO, CALIFORNIA

FIGURE
B-4

Total		
c =	0.72	ksf





Specimen No.			1
Initial	Diameter, in	D_O	2.41
	Height, in	H_O	5.22
	Water Content,	ω_O	23.2
	Dry Density, lbs	$^{\gamma}d_o$	104.8
	Saturation, %	S_O	103
	Void Ratio	e_O	0.61
Before Shear	Water Content, %	ω_f	23.1
	Dry Density, lbs/ft^3	$^{\gamma}d_c$	103.7
	Saturation, %	S_C	100
	Void Ratio	e_C	0.62
	Final Back Pressure, ksf	U_O	5.8
Minor Principal Stress, ksf		σ_3	1.35
Maximum Deviator Stress, ksf		$(\sigma1-\sigma3)_{max}$	1.44
Time to $(s_1-s_3)_{max}$, min		t_f	14.4
Deviator Stress @ 15% Axial Strain, k		$(\sigma_1-\sigma_3)_{15\%}$	1.44
Rate of strain, %/min		'ε	1.0

Method of Saturation: Wet Mounted

Description of Specimen 1: Olive Brown Lean Clay (CL)

Amount of Material Finer than the No. 200, %: nm

LL: nm	PL: nm	PI: nm	G_S: 2.70 Assumed	Specimen Type: Undisturbed	Test Method: ASTM D2850 Modified

Membrane Correction applied.

Boring:	MK-B1
Sample:	7C
Depth, ft:	26
Test Date:	6/6/18

Membrane and Filter Strip Correction applied. Parameter B for all Specimens >/= 0.98

The determination of strength envelopes and the development of relationships to aid in interpreting and evaluating test results are beyond the scope of this test method. Interpreted values provided herein must be evaluated and approved by the user of this report.

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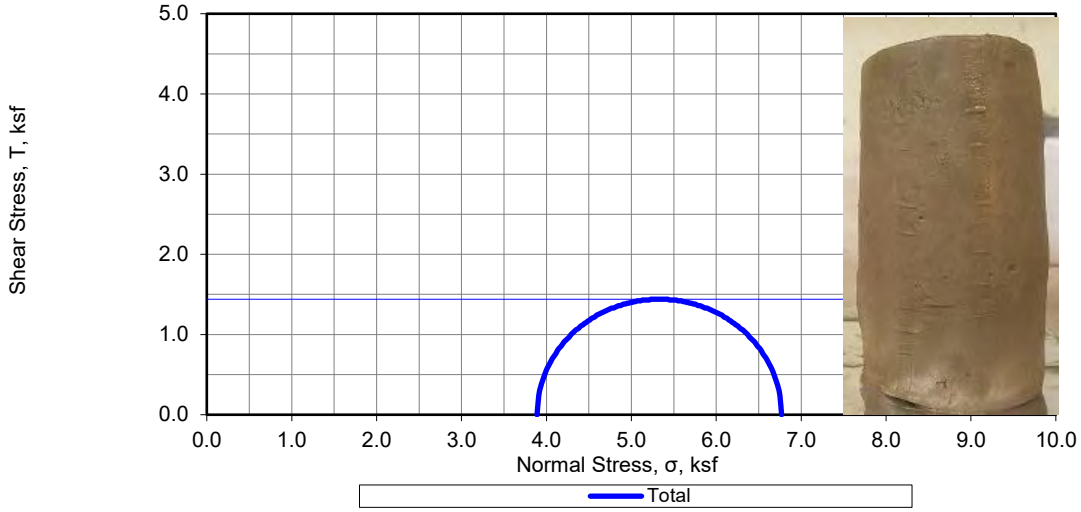
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Checked By:	C. Pimentel
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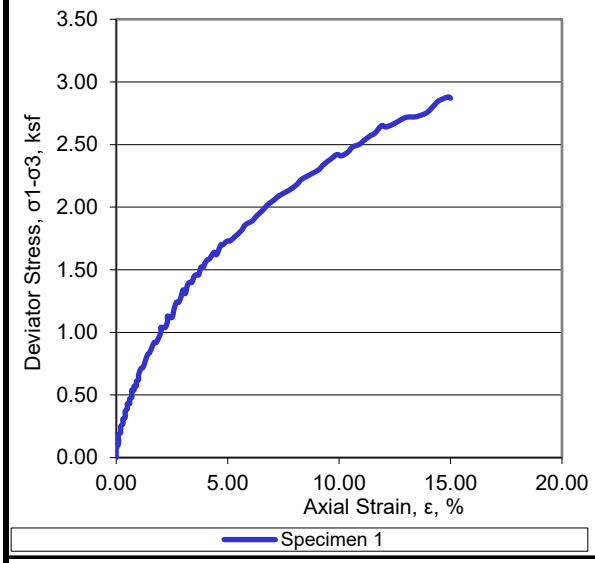
TRIAXIAL COMPRESSION TEST (UU)

ACFC & WCD LARGE TRASH CAPTURE PROJECT
MEEKLAND AVE. AND LOMA VERDE DR.
SAN LORENZO, CALIFORNIA

FIGURE
B-5

Total		
c =	1.44	ksf





Specimen No.			1
Initial	Diameter, in	D_O	2.39
	Height, in	H_O	5.40
	Water Content,	ω_O	17.0
	Dry Density, lbs	$^{\gamma}d_o$	116.7
	Saturation, %	S_O	104
	Void Ratio	e_O	0.44
Before Shear	Water Content, %	ω_f	16.6
	Dry Density, lbs/ft^3	$^{\gamma}d_c$	116.4
	Saturation, %	S_C	100
	Void Ratio	e_C	0.45
	Final Back Pressure, ksf	U_O	2.9
Minor Principal Stress, ksf		σ_3	3.89
Maximum Deviator Stress, ksf		$(\sigma1-\sigma3)_{max}$	2.88
Time to $(s_1-s_3)_{max}$, min		t_f	14.9
Deviator Stress @ 15% Axial Strain, k		$(\sigma_1-\sigma_3)_{15\%}$	2.87
Rate of strain, %/min		'ε	1.0

Method of Saturation: Wet Mounted

Description of Specimen 1: Dark Yellowish Brown Sandy Lean Clay (CL)

Amount of Material Finer than the No. 200, %: nm

LL:	PL:	PI:	G_S:	Specimen Type:	Test Method:
29	16	13	2.70 Assumed	Undisturbed	ASTM D2850 Modified

Membrane Correction applied.

Boring:	MK-B1
Sample:	11B
Depth, ft:	45.5
Test Date:	6/18/18

Membrane and Filter Strip Correction applied. Parameter B for all Specimens >/= 0.96

The determination of strength envelopes and the development of relationships to aid in interpreting and evaluating test results are beyond the scope of this test method. Interpreted values provided herein must be evaluated and approved by the user of this report.

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Project No.:	20172563.010A
Date:	6/19/18
Entry By:	C Pimentel
Checked By:	C. Pimentel
File Name:	HL11268

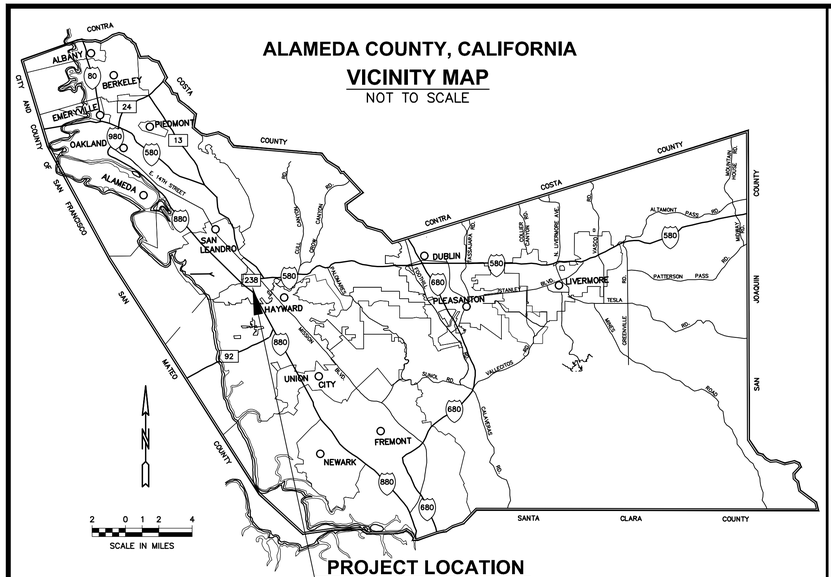
TRIAXIAL COMPRESSION TEST (UU)

ACFC & WCD LARGE TRASH CAPTURE PROJECT
MEEKLAND AVE. AND LOMA VERDE DR.
SAN LORENZO, CALIFORNIA

FIGURE
B-6

Appendix V Plans

REVIEWED BY:	DATE:		REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY		
MAINTENANCE		TRAFFIC		
REAL ESTATE		ENVIRONMENTAL		



PLANS

FOR THE IMPROVEMENTS OF

MEEKLAND AVENUE

FROM BLOSSOM WAY TO LEWELLING BLVD

EDEN TOWNSHIP

ALAMEDA COUNTY, CALIFORNIA

FEDERAL PROJECT No. CML-5933(168)

JUNE 2023

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	POLLUTION PREVENTION
3	NOTES AND ABBREVIATIONS
4–5	TYPICAL CROSS SECTIONS
6	HORIZONTAL CONTROL PLAN
7–11	DEMOLITION PLAN
12–20	LAYOUT
21–22	PROFILE & SUPERELEVATION DIAGRAM
23	DRIVEWAY PROFILES
24–26	CONSTRUCTION DETAILS – CURB RETURN
27–31	CONSTRUCTION DETAILS – DRIVEWAY IMPROVEMENTS
32	CONSTRUCTION DETAILS – MODULAR RAMP SYSTEM
33–34	CONSTRUCTION DETAILS – MISCELLANEOUS DETAILS
35	CONTOUR GRADING
36–44	UTILITY PLAN
45	DRAINAGE DETAILS
46–47	DETOUR PLAN
48	PAVEMENT DELINEATION & SIGNING LEGEND
49–53	PAVEMENT DELINEATION PLAN
54–58	SIGN PLAN
59–63	LANDSCAPE PLAN
64	STREET LIGHTING PLAN
65–67	TRAFFIC SIGNAL PLAN

STRUCTURE PLANS

68–99	SAN LORENZO CREEK, Br. No. xxxxx

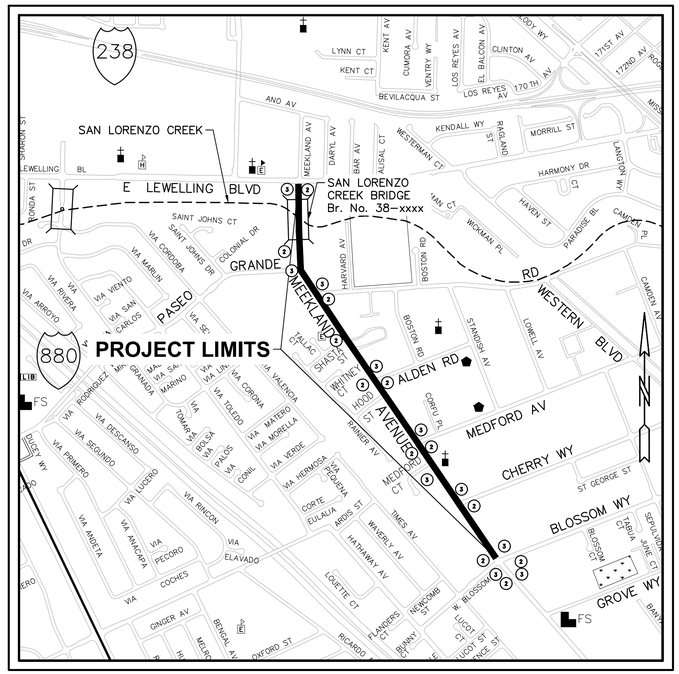
THE CONTRACTOR SHALL POSSESS A CLASS A LICENSE AT THE TIME THE CONTRACT IS AWARDED.

CONVENTIONAL SYMBOLS

- PROPERTY, RIGHT OF WAY AND EASEMENT LINES OTHER THAN THOSE FOR PROJECT
- PROJECT RIGHT OF WAY AND EASEMENT LINES
- CONSTRUCTION CENTER LINE (1+00 + 2+00)
- TRAVERSE OR SURVEY LINE AND MONUMENT
- CENTER LINE
- CENTER LINE OF CHANNEL, CREEK, OR DITCH
- TOE OF FILL OR SLOPE
- TOP OF CUT OR BANK
- CONCRETE CHANNEL
- ROAD
- EDGE OF PAVEMENT (EP)
- PCC EXTRUDED CURB OR AC BERM
- PCC SIDEWALK, CURB GUTTER & DRIVEWAY
- GUARD RAIL OR BARRICADE
- FENCE (SPECIFY TYPE)
- CHAIN–LINK FENCE
- RAILROAD
- BUILDING
- SHRUBBERY
- MAIL BOX
- TREE
- TREE TO BE REMOVED
- CHANNEL SLOPE

EXISTING UTILITIES:

- WATER (W)
- GAS (G)
- SANITARY SEWER (SS)
- OIL (O)
- GASOLINE (GS)
- STORM DRAIN (SD)
- FIBER OPTIC CONDUIT (C)
- ELECTRICAL UNDERGROUND (UE)
- TELEPHONE UNDERGROUND (UT)
- CABLE TV UNDERGROUND (UCTV)
- TRANSMISSION LINE AND TOWER
- DROP INLET (DI)
- ELECTROLIER
- FIRE HYDRANT
- MANHOLE (MH)
- MONUMENT (EXISTING / PROPOSED)
- UTILITY POLES: JOINT POLE (JP), POWER POLE (PP), TELEPHONE POLE (TP), GUY POLE
- RIGHT OF WAY MARKER
- ROADWAY SIGN
- STREET NAME SIGN
- WATER METER (WM)
- WATER VALVE (WV)



LOCATION MAP
NOT TO SCALE

CONSTRUCTION AREA SIGNS

TYPE	QUANTITY	DESCRIPTION	DIMENSION (in)
① C30 (CA)	1 (MIN.)	LANE CLOSED	36 x 36
② G20–2	9	END ROAD WORK	36 x 18
③ W20–1	7	ROAD WORK AHEAD	36 x 36

DANIEL WOLDESENBET, Ph.D., P.E.
COUNTY ENGINEER
CIVIL ENGINEER CERTIFICATE NO. 60306

REGISTERED PROFESSIONAL ENGINEER — DANIEL WOLDESENBET — No. 60306 — CIVIL — STATE OF CALIFORNIA

PLAN APPROVAL DATE

REVISIONS

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
2				
3				
4				
5				

APPROVED — REGISTERED PROFESSIONAL ENGINEER — DEAN ZURCHER — No. 86371 — STATE OF CALIFORNIA — APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST, Bldg. 100-B, SACRAMENTO, CA 95816
TEL 916.341.7760 FAX 916.341.7767

DRAWN: C. RODRIGUEZ
DESIGNED: C. RODRIGUEZ
CHECKED: D. ZURCHER
APPROVED: C. HODGE

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

REVIEWED:	REVIEWED:	APPROVAL RECOMMENDED:

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

TITLE SHEET

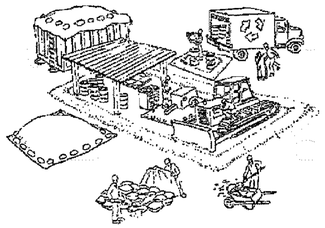
DATE	SCALE
JUNE 2023	NO SCALE

WORK ORDER NO. R32114
SPECIFICATION NO. 2329
SHEET NO. 1 OF 99
FILE NO. U-157-8

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES (0 1 2 3)

J:\Jobs\8781_Alameda Co\8781.004_Meekland Ave Corridor\70_CADD\RDWY\02_Sheets\8781.004 ab001 T&GN.dwg 7-04-23 10:51:37 PM wchang

Pollution Prevention - It's Part of the Plan



Make sure your crews and subs do the job right!

Runoff from streets and other paved areas is a major source of pollution and damage to creeks and the San Francisco Bay. Construction activities can directly affect the health of creeks and the Bay unless contractors and crews plan ahead to keep dirt, debris, and other construction waste away from storm drains and local creeks. Following these guidelines and the project specifications will ensure your compliance with County of Alameda requirements.

Materials storage & spill cleanup

Non-hazardous materials management

- Sand, dirt, and similar materials must be stored at least 10 feet (3 meters) from catch basins. All construction material must be covered with a tarp and contained with a perimeter control during wet weather or when rain is forecasted or when not actively being used within 14 days.
- Use (but don't overuse) reclaimed water for dust control as needed.
- Sweep or vacuum streets and other paved areas daily. Do not wash down streets or work areas with water!
- Recycle all asphalt, concrete, and aggregate base material from demolition activities. Comply with Alameda County Ordinances for recycling construction materials, wood, gyp board, pipe, etc.
- Check dumpsters regularly for leaks and to make sure they are not overfilled. Repair or replace leaking dumpsters promptly.
- Cover all dumpsters with a tarp at the end of every work day or during wet weather.

Hazardous materials management

- Label all hazardous materials and hazardous wastes (such as pesticides, paints, thinners, solvents, fuel, oil, and antifreeze) in accordance with city, county, state, and federal regulations.
- Store hazardous materials and wastes in water tight containers, store in appropriate secondary containment, and cover them at the end of every work day or during wet weather or when rain is forecasted.
- Follow manufacturer's application instructions for hazardous materials and be careful not to use more than necessary. Do not apply chemicals outdoors when rain is forecasted within 24 hours.
- Be sure to arrange for appropriate disposal of all hazardous wastes.

Spill prevention and control

- Keep a stockpile of spill cleanup materials (rags, absorbents, etc.) available at the construction site at all times.
- When spills or leaks occur, contain them immediately and be particularly careful to prevent leaks and spills from reaching the gutter, street, or storm drain. Never wash spilled material into a gutter, street, storm drain, or creek!
- Dispose of all containment and cleanup materials properly.
- Report any hazardous materials spills immediately! Dial 911 or Alameda County Public Works Agency dispatch at (510) 670-5500

Construction Entrances and Perimeter

- Establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from site and tracking off site.
- Sweep or vacuum any street tracking immediately and secure sediment source to prevent further tracking.

Vehicle and equipment maintenance & cleaning

- Inspect vehicles and equipment for leaks frequently. Use drip pans to catch leaks until repairs are made; repair leaks promptly.
- Fuel and maintain vehicles on site only in a bermed area or over a drip pan that is big enough to prevent runoff.
- If you must clean vehicles or equipment on site, clean with water only in a bermed area that will not allow rinse water to run into gutters, streets, storm drains, or creeks.
- Do not clean vehicles or equipment on-site using soaps, solvents, degreasers, steam cleaning equipment, etc.



Earthwork & contaminated soils

- Keep excavated soil on the site where it will not collect in the street.
- Transfer to dump trucks should take place on the site, not in the street.
- Use fiber rolls, silt fences, or other control measures to minimize the flow of silt off the site.



- Earth moving activities are only allowed during dry weather by permit and as approved by the County Inspector in the Field.
- Mature vegetation is the best form of erosion control. Minimize disturbance to existing vegetation whenever possible.
- If you disturb a slope during construction, prevent erosion by securing the soil with erosion control fabric, or seed with fast-growing grasses as soon as possible. Place fiber rolls down-slope until soil is secure.
- If you suspect contamination (from site history, discoloration, odor, texture, abandoned underground tanks or pipes, or buried debris), call the Engineer for help in determining what should be done, and manage disposal of cntaminated soil according to their instructions.

Dewatering operations

- Effectively manage all run-on, all runoff within the site, and all runoff that discharges from the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance.
- Reuse water for dust control, irrigation, or another on-site purpose to the greatest extent possible.



- Be sure to notify and obtain approval from the Engineer before discharging water to a street, gutter, or storm drain. Filtration or diversion through a basin, tank, or sediment trap may be required.
- In areas of known contamination, testing is required prior to reuse or discharge of groundwater. Consult with the Engineer to determine what testing is required and how to interpret results. Contaminated groundwater must be treated or hauled off-site for proper disposal.

Saw cutting

- Always completely cover and barricade storm drain inlets when saw cutting. Use plastic sheeting (Visqueen) to keep slurry out of the storm drain system.
- Shovel, absorb, or vacuum saw-cut slurry and pick up all waste as soon as you are finished in one location or at the end of each work day (whichever is sooner!).
- If saw cut slurry enters a catch basin, clean it up immediately.

Paving/asphalt work



- Always cover storm drain inlets and manholes when paving or applying seal coat, tack coat, slurry seal, or fog seal.
- Protect gutters, ditches, and drainage courses with sand/gravel bags, or earthen berms.
- Do not sweep or wash down excess sand from sand sealing into gutters, storm drains, or creeks. Collect sand and return it to the stockpile, or dispose of it as trash.
- Do not use water to wash down fresh asphalt concrete pavement.

Concrete, grout, and mortar storage & waste disposal

- Store concrete, grout, and mortar under cover, on pallets, and away from drainage areas. These materials must never reach a storm drain.
- Wash out concrete equipment/trucks off-site or into contained washout areas that will not allow discharge of wash water onto the underlying soil or onto the surrounding areas.



- Collect the wash water from washing exposed aggregate concrete and remove it for appropriate disposal off site.

Painting



- Never rinse paint brushes or materials in a gutter or street!
- Paint out excess water-based paint before rinsing brushes, rollers, or containers in a sink.
- Paint out excess oil-based paint before cleaning brushes in thinner.
- Filter paint thinners and solvents for reuse whenever possible. Dispose of oil-based paint sludge and unusable thinner as hazardous waste.

Landscape Materials

- Contain, cover, and store on pallets all stockpiled landscape materials (mulch, compost, fertilizers, etc.) during wet weather or when rain is forecasted or when not actively being used within 14 days.
- Discontinue the application of any erodible landscape material within 2 days of forecasted rain and during wet weather.

Storm drain polluters may be liable for fines of $10,000 or more per day!

For references and more detailed information:
www.cleanwaterprogram.org
www.cabmphandbooks.com

REVIEWED BY:	DATE:
CONSTRUCTION	
MAINTENANCE	
REAL ESTATE	

REVIEWED BY:	DATE:
SURVEY	
TRAFFIC	
ENVIRONMENTAL	

REVISIONS			
NO.	DESCRIPTION	BY	DATE APPV'D
1			
2			
3			
4			
5			

APPROVED: REGISTERED PROFESSIONAL ENGINEER DEAN ZURCHER No. 86371 STATE OF CALIFORNIA — APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C St, Bldg. 100-B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

DRAWN: C. RODRIGUEZ | CHECKED: D. ZURCHER | DESIGNED: C. RODRIGUEZ | APPROVED: C. HODGE

REVIEWED: | REVIEWED: | APPROVAL RECOMMENDED:

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

POLLUTION PREVENTION

DATE: JUNE 2023 | SCALE: AS SHOWN
WORK ORDER NO.: R32114
SPECIFICATION NO.: 2329
SHEET NO.: 2 OF 99
FILE NO.: U-157-8

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

J:\Jobs\8781_Alameda Co\8781.004_Meekland Ave Corridor\70_CADD\RDWY\02_Sheets\8781.004 sb001 T&GN.dwg 7-04-23 10:51:39 PM wchang

	REVIEWED BY:	DATE:
CONSTRUCTION		
MAINTENANCE		
REAL ESTATE		

	REVIEWED BY:	DATE:
SURVEY		
TRAFFIC		
ENVIRONMENTAL		

ABBREVIATIONS

AB	AGGREGATE BASE
AC	ASPHALT CONCRETE
AD	ALGEBRAIC DIFFERENCE
ADT	AVERAGE DAILY TRAFFIC
ACP	ASBESTOS CEMENT PIPE
ALT	ALTERNATIVE
AP	ANGLE POINT
APN	ASSESSOR'S PARCEL NUMBER
APPROX	APPROXIMATE
AS	AGGREGATE SUBBASE
BB	BEGIN BRIDGE
BC	BEGINNING OF HORIZONTAL CURVE
BEG	BEGIN
℄	BOUNDARY LINE
BOW	BACK OF SIDEWALK
BVC	BEGINNING OF VERTICAL CURVE
BVCE	BEGINNING OF VERTICAL CURVE ELEVATION
BVCS	BEGINNING OF VERTICAL CURVE STATION
BW	BOTTOM OF WALL
CAB	CABINET
CF	CUBIC FEET
C&G	CURB AND GUTTER
CIDH	CAST-IN-DRILLED-HOLE
CIP	CAST-IN-PLACE OR CAST IRON PIPE
CIPCP	CAST-IN-PLACE CONCRETE PIPE
℄	CENTERLINE
CL	CLASS OR CHAIN LINK
CLR	CLEAR OR CLEARANCE
CMP	CORRUGATED METAL PIPE
CY	CUBIC YARD
D	DEPTH
DET	DETAIL OR DETOUR
DI	DROP INLET, DRAINAGE INLET
DIA, ø	DIAMETER
D/S	DOWNSTREAM
DWG	DRAWING
DWY	DRIVEWAY
E	EAST OR ELECTRIC
EA	EACH
EASE	EASEMENT
EB	END BRIDGE
EBMUD	EAST BAY MUNICIPAL UTILITY DISTRICT
EC	END OF HORIZONTAL CURVE
EG	EXISTING GRADE
ELEV	ELEVATION
EP	EDGE OF PAVEMENT
EQ, =	EQUALS
EQ	EQUATION OR EQUALS
ES	EDGE OF SHOULDER
ETW	EDGE OF TRAVELED WAY
EVC	END OF VERTICAL CURVE ELEVATION
EVCE	END OF VERTICAL CURVE STATION
EVCS	
EXC	EXCAVATE OR EXCAVATION
Exist, EX	EXISTING
FC	FACE OF CURB
FG	FINISHED GRADE
FH	FIRE HYDRANT
FL, ℄	FLOW LINE
FO	FIBER OPTIC
FT, '	FEET OR FOOT
G	GAS LINE
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GP	GRADING PLANE
GR	GUARD RAILING
GV	GAS VALVE
H	HEIGHT
HMA	HOT MIX ASPHALT
HORIZ	HORIZONTAL
HP	HINGE POINT
ID	INSIDE DIAMETER
IN, "	INCH OR INCHES
INV	INVERT (GRADE ELEVATION)
IRR	IRRIGATION
JP	JOINT POLE
K	RATE OF VERTICAL CURVATURE
L	LENGTH OR LENGTH OF CURVE
LC	LENGTH OF CHORD
LF	LINEAR FOOT OR FEET
LOC	LOCATION
LT	LEFT
LL	LANE LINE
MAX	MAXIMUM
MBGR	METAL BEAM GUARD RAILING
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
ℳ	MONUMENT LINE
MON	MONUMENT
MRS	MODULAR RAMP SYSTEM
N	NORTH
NTS	NOT TO SCALE
OC	ON CENTER OR OVERCROSSING
OD	OUTSIDE DIAMETER
OG	ORIGINAL GROUND
OH	OVERHEAD
PCC	POINT OF COMPOUND CURVE OR PORTLAND CEMENT CONCRETE
PED	PEDESTRIAN
PG	PROPOSED GRADE
PG&E	PACIFIC GAS & ELECTRIC CO.
PI	POINT OF INTERSECTION
P/L, ℙ	PROPERTY LINE
POC	POINT OF HORIZONTAL CURVE
POT	POINT OF TANGENCY
POVC	POINT OF VERTICAL CURVE
PP	POWER POLE, PLASTIC PIPE OR PIPE PILE
PRC	POINT OF REVERSE CURVE
PRVC	POINT OF REVERSE VERTICAL CURVE
PT	ANGLE POINT
PVMT	PAVEMENT
R	RADIUS OR RADIAL
RCB	REINFORCED CONCRETE BOX
RCP	REINFORCED CONCRETE PIPE
REINF	REINFORCED
REV	REVISED OR REVISION
RR	RAILROAD
RSP	ROCK SLOPE PROTECTION
RT	RIGHT
RW	RETAINING WALL, REDWOOD
R/W	RIGHT-OF-WAY
S	SLOPE OR SOUTH
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SHT	SHEET
SQFT	SQUARE FOOT OR SQUARE FEET
SL	STREET LIGHT
SS	SANITARY SEWER
SSCO	SANITARY SEWER CLEANOUT
SSMH	SANITARY SEWER MANHOLE
STA	STATION
STD	STANDARD
SW	SIDEWALK
SWD	SIDEWALK DRAIN
SWPPP	STORM WATER POLLUTION PREVENTION PLAN
SYM	SYMMETRIC OR SYMMETRICAL
T	TANGENT LENGTH OR TELEPHONE
TBC	TOP BACK OF CURB
TC	TOP OF CURB
TCE	TEMPORARY CONSTRUCTION EASEMENT
TEL, T	TELEPHONE
TEMP	TEMPORARY
TG	TOP OF GRADE
TI	TRAFFIC INDEX
TOW, TW	TOP OF WALL
TP	TELEPHONE POLE
TS	TRAFFIC SIGNAL, TRANSVERSE OR TUBULAR STEEL
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
U/S	UPSTREAM
UB	UTILITY BOX
V	SPEED
VAR	VARIES OR VARIABLE
VC	VERTICAL CURVE
VERT	VERTICAL
W	WATER, WEST OR WIDTH
WM	WATER METER
WV	WATER VALVE
∠	ANGLE
°	DEGREE
Δ	DELTA (ANGLE OF CURVATION)
ø	DIAMETER
=	EQUALS
'	FEET, FOOT OR ANGULAR MINUTES
"	INCH OR ANGULAR SECONDS
ϕ	PHASE (SIGNAL OR ELECTRICAL)



1 — DETAIL NUMBER
SHEET NUMBER OR DASH INDICATING SAME SHEET
A — SECTION LETTER
3 — SHEET NUMBER OR DASH INDICATING SAME SHEET

GENERAL NOTES:

1. ALL WORK IS TO BE DONE UNDER THE DIRECTION OF THE ENGINEER.
2. CALTRANS STANDARD SPECIFICATIONS AND STANDARD PLANS 2018 EDITION, ARE PART OF THESE PLANS.
3. IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR THE CONDITIONS OF THE JOB SITE INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORK HOURS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN AND CONSTRUCTION OF PROPER SHORING OF TRENCHES IN ACCORDANCE WITH THE LATEST OCCUPATIONAL SAFETY LAWS. THE DUTIES OF THE ENGINEER DO NOT INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY IN, ON, OR NEAR THE CONSTRUCTION SITE.
4. CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY AND ALL DAMAGE TO EXISTING STRUCTURES AND/OR UTILITIES DURING CONSTRUCTION. PROPER REPAIR SHALL BE DONE TO THE SATISFACTION OF THE ENGINEER AND THE RESPECTIVE UTILITY COMPANY.
5. ALL PIPELINES AND OTHER UNDERGROUND FACILITIES MAY NOT BE SHOWN. EXISTING UNDERGROUND FACILITIES AS SHOWN ARE APPROXIMATE ONLY AND WERE OBTAINED FROM AVAILABLE UTILITY RECORDS. HOWEVER, THE COUNTY ASSUMES NO RESPONSIBILITY FOR THEIR ACCURACY OR COMPLETENESS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT ALL UTILITIES AND TO HAVE ALL FACILITIES LOCATED IN THE FIELD PRIOR TO THE START OF ANY CONSTRUCTION. THE CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT AT 811 OR 1-800-227-2600 AT LEAST TWO WORKING DAYS PRIOR TO EXCAVATION.
6. SLOPES OF ALL EMBANKMENT FILL SHALL BE 2:1 (HORIZONTAL: VERTICAL) UNLESS OTHERWISE NOTED ON PLANS OR AS DIRECTED BY THE ENGINEER. ATTENTION IS DIRECTED TO CALTRANS STANDARD SPECIFICATIONS, SECTION 19, FOR EMBANKMENT CONSTRUCTIONS WHERE APPLICABLE.
7. DUST CONTROL MEASURES, AS APPROVED BY THE ENGINEER, SHALL BE FOLLOWED AT ALL TIMES DURING CONSTRUCTION OPERATIONS.
8. EROSION CONTROL SHALL BE PERFORMED ON ALL DISTURBED AREAS.
9. TREES DESIGNATED ⊗ ON THE PLANS ARE TO BE REMOVED UNLESS DIRECTED OTHERWISE IN WRITING BY THE ENGINEER.
10. ALL ELEVATIONS SHOWN ARE FINISHED ELEVATIONS UNLESS STATED OTHERWISE.
11. THE CONTRACTOR SHALL NOT PERFORM WORK OUTSIDE THE RIGHT OF WAY UNLESS SHOWN ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.
12. SEE SPECIFICATIONS FOR DETAILS NOT SHOWN HEREIN.

COUNTY OF ALAMEDA STANDARD DETAILS/DESIGN GUIDELINES REVISED 2016

SD-300	SD-504
SD-304	SD-511
SD-306	SD-513
SD-308	SD-516
SD-313	SD-518
SD-404	SD-520
SD-407	SD-527
SD-414	SD-604
SD-415	SD-700
SD-419	SD-703
SD-421	SD-704
SD-424	SD-800
SD-434A	
SD-436	

CALTRANS STANDARD PLANS 2018 EDITION

A20A	RSP A24G	A85A
RSP A20B	A62A	A85B
RSP A20D	RSP A62B	A88A
A24A	A62C	A88B
A24B	RSP A62D	T62
A24C	A62F	
A24D	RSP A73B	
RSP A24E	A73C	
A24F	RSP A85	

NO.	DESCRIPTION	BY	DATE	APPV'D
	REVISIONS			

APPROVED — REGISTERED PROFESSIONAL ENGINEER — DEAN ZURCHER — No. 86371 — STATE OF CALIFORNIA — APPROVAL DATE:

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DRAWN: C. RODRIGUEZ
DESIGNED: C. RODRIGUEZ
CHECKED: D. ZURCHER
APPROVED: C. HODGE

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

APPROVAL RECOMMENDED: — REVIEWED: — REVIEWED:

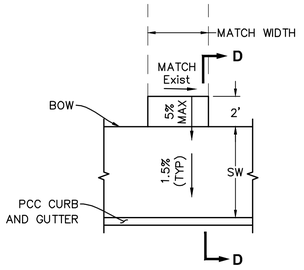
THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

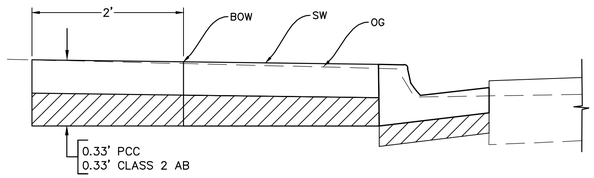
NOTES AND ABBREVIATIONS

DATE	JUNE 2023
SCALE	NO SCALE
WORK ORDER NO.	R32114
SPECIFICATION NO.	2329
SHEET NO.	3 OF 99
FILE NO.	U-157-8

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

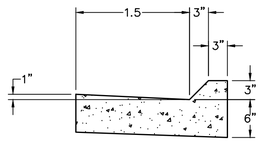
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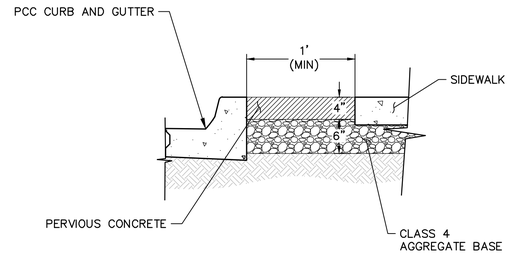


SECTION D–D

TYPICAL SIDEWALK CONNECTION 1
NTS

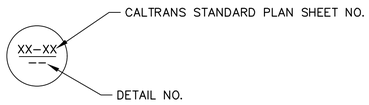


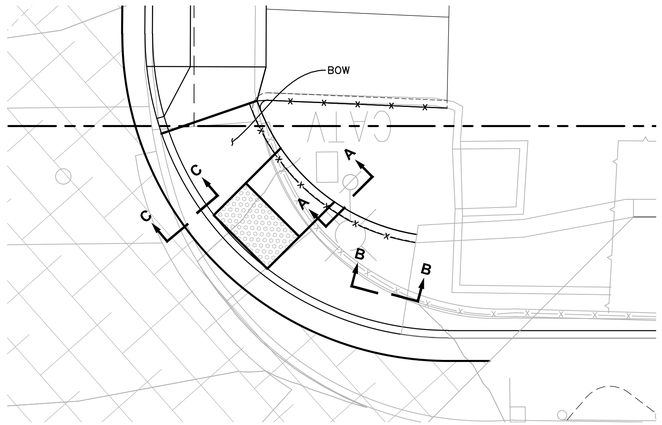
LOW PROFILE CURB 2
NTS



PERVIOUS CONCRETE 3
NTS

LEGEND

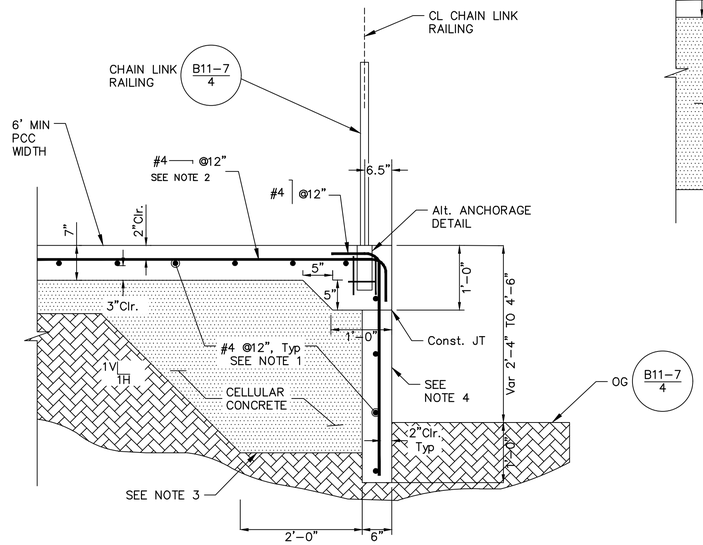




PLAN
SCALE: 1"=5'

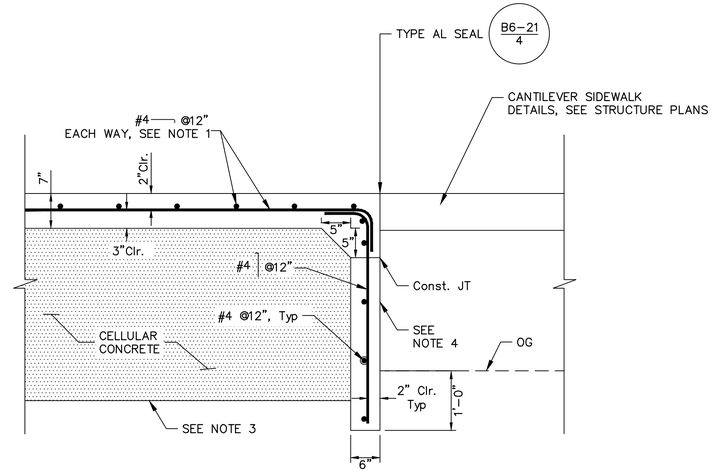
NOTES

1. BAR RUNNING PARALLEL TO CURVED EDGE OF SIDEWALK SHALL BE FIELD BENT TO FOLLOW CURVE.
2. EXTEND REINFORCEMENT TO THE OPPOSITE EDGE OF SIDEWALK.
3. BOTTOM OF EXCAVATION TO BE SACRIFICED 6 INCHES, MOISTURE CONDITIONED AND COMPACTED TO 95% RELATIVE COMPACTION.
4. WALL MUST BE LATERALLY SUPPORTED UNTIL SIDEWALK HAS CURED.
5. CURB, GUTTER, SIDEWALK, CURB RAMP, DRIVEWAY AND PERVIOUS CONCRETE CUSHION MATERIAL SHALL BE CLASS 4 ASPHALT BASE.

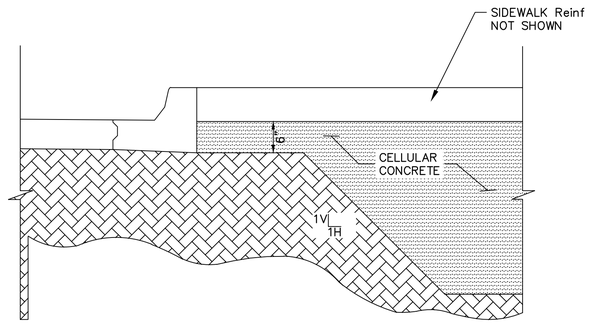


SECTION A
NTS

INTEGRAL CURB 4
NTS



SECTION B
NTS



SECTION C
NTS

FOR REDUCED ENGLISH PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

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REVISIONS

APPROVED — REGISTERED PROFESSIONAL ENGINEER — DEAN ZURCHER — No. 86371 — STATE OF CALIFORNIA — APPROVAL DATE:

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TEL 916.341.7760 FAX 916.341.7767

CHECKED: D. ZURCHER
APPROVED: C. HODGE
DRAWN: C. RODRIGUEZ
DESIGNED: C. RODRIGUEZ

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
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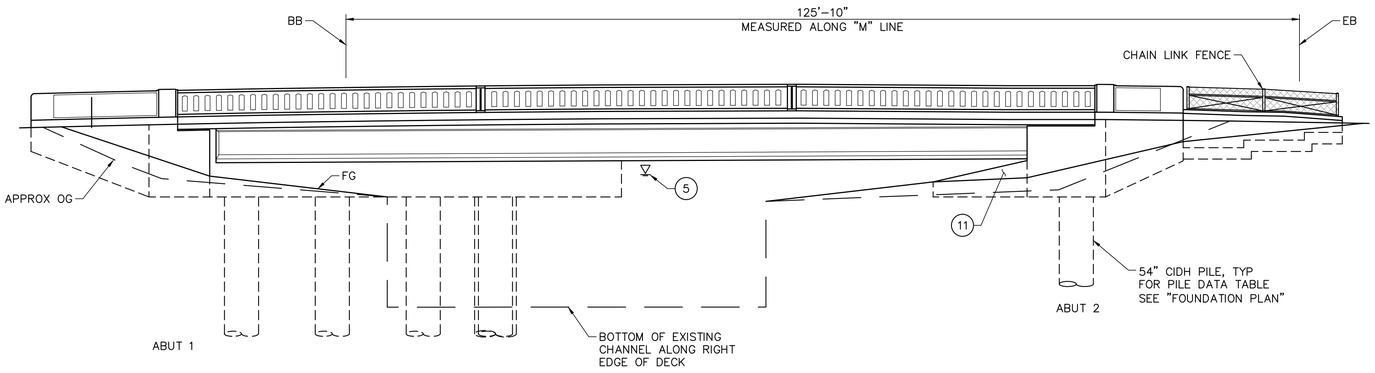
CONSTRUCTION DETAILS - MISCELLANEOUS DETAILS

DATE	JUNE 2023
SCALE	1"=xx'
WORK ORDER NO.	R32114
SPECIFICATION NO.	2329
SHEET NO.	33 OF 99
FILE NO.	U-157-8



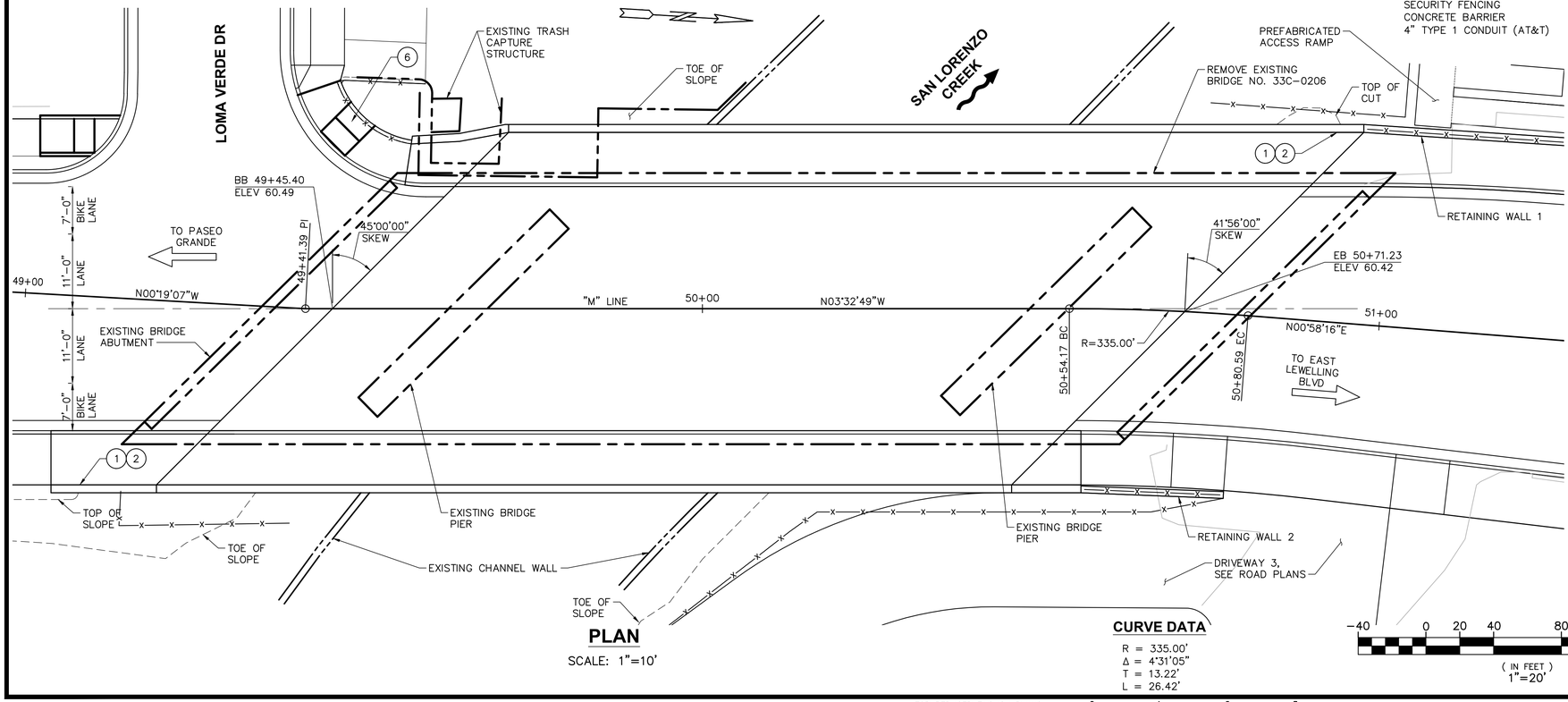
PROFILE GRADE

NTS



ELEVATION

SCALE: 1"=10'



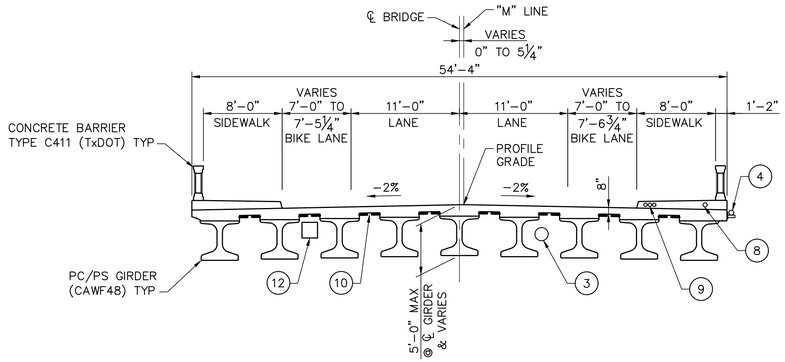
PLAN

SCALE: 1"=10'

CURVE DATA

R = 335.00'
Δ = 4°31'05"
T = 13.22'
L = 26.42'

-40 0 20 40 80 160
(IN FEET)
1"=20'



TYPICAL SECTION

SCALE: 1/8"=1'-0"

QUANTITIES

ITEMS	UNITS	QUANTITY
EXCAVATION SAFETY PLAN	LS	1
STRUCTURE EXCAVATION (BRIDGE)	CY	259
STRUCTURE EXCAVATION (RETAINING WALL)	CY	48
EXPANDED POLYSTYRENE (EPS) GEOFOAM BLOCKS	CY	9
STRUCTURE BACKFILL (BRIDGE)	CY	104
STRUCTURE BACKFILL (RETAINING WALL)	CY	76
54" CAST-IN-DRILLED-HOLE CONCRETE PILING	LF	631
STRUCTURAL CONCRETE, BRIDGE	CY	349
STRUCTURAL CONCRETE, BRIDGE (POLYMER FIBER)	CY	215
STRUCTURAL CONCRETE, RETAINING WALL	CY	34
ERECT PRECAST PRESTRESSED CONCRETE GIRDER	EA	9
FURNISH PRECAST PRESTRESSED CONCRETE WIDE FLANGE GIRDER (110'-120')	LF	9
BAR REINFORCING STEEL (BRIDGE)	LB	213106
BAR REINFORCING STEEL (RETAINING WALL)	LB	4158
HEADED BAR REINFORCEMENT	EA	18
REMOVE TRASH CAPTURE STRUCTURE (PORTION)	LS	1
BRIDGE REMOVAL	LS	1
8" HDPE PIPE (EBMUD)	LF	136
12" WELDED STEEL PIPE (.375" THICK) (EBMUD)	LF	132
ISOLATION STEEL CASING	LB	1625
MISCELLANEOUS METAL (BRIDGE)	LB	1660
MISCELLANEOUS METAL (AT&T)	LB	124
MISCELLANEOUS METAL (EBMUD)	LB	369
MISCELLANEOUS METAL (PG&E)	LB	462
RECONSTRUCT TRASH CAPTURE STRUCTURE (PORTION)	LS	1
SECURITY FENCING	LS	1
CONCRETE BARRIER	LF	292
4" TYPE 1 CONDUIT (AT&T)	LF	272

LEGEND

- INDICATES DIRECTION OF FLOW
- INDICATES DIRECTION OF TRAFFIC
- INDICATES EXISTING STRUCTURE TO BE REMOVED
- INDICATES NEW STRUCTURE

NOTES

1. PAINT BRIDGE NO. "XXXXXXX".
2. PAINT "SAN LORENZO CREEK BRIDGE".
3. 8" HDPE PIPE IN 12" STEEL CASING (EBMUD).
4. 4" STEEL GAS LINE (PG&E).
5. HIGH WATER ELEVATION = 53.4 (100 YR FLOOD) FOR HYDROLOGIC SUMMARY TABLE SEE "FOUNDATION PLAN".
6. CURB RAMP, SEE ROAD PLANS CONSTRUCTION DETAILS.
7. FOR GENERAL NOTES, INDEX TO PLANS AND LIST OF STANDARD PLANS SEE "GENERAL NOTES AND INDEX TO PLANS SHEETS".
8. 3" CONDUIT WITH PULL WIRE (FUTURE FIBER OPTIC LINE).
9. FUTURE UTILITY CONDUITS.
10. PERMANENT STEEL DECK FORM.
11. REVERSE WINGWALL
12. (2) 4" CONDUITS (AT&T).
13. SEE ROADWAY PLANS FOR CONTOUR GRADING.

FOR REDUCED ENGLISH PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

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REVISIONS

APPROVED — REGISTERED PROFESSIONAL ENGINEER — Jennifer Grant-Martinez — No. 77567 — EXP. 6/30/2025 — CIVIL — STATE OF CALIFORNIA — APPROVAL DATE:

WOOD RODGERS
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3301 C ST. BLDG. 100-B TEL 916.341.7760
SACRAMENTO, CA 95816 FAX 916.341.7767

DESIGNED: J. GRANT-MARTINEZ
DRAWN: A. SANCHEZ
CHECKED: J. HAMILTON
APPROVED: C. HODGE
APPROVAL RECOMMENDED:
REVIEWED:
REVIEWED:

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

GENERAL PLAN

DATE: JUNE 2023
SCALE: AS NOTED
WORK ORDER NO. R32114
SPECIFICATION NO. 2329
SHEET NO. 68 OF 99
FILE NO. U-157-8

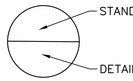
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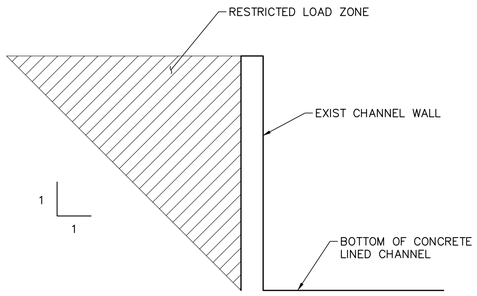
CALTRANS STANDARD PLANS DATED 2018

A3A	ABBREVIATIONS (SHEET 1 OF 3)
A3B	ABBREVIATIONS (SHEET 2 OF 3)
A3C	ABBREVIATIONS (SHEET 3 OF 3)
A10A	LEGEND–LINES AND SYMBOLS (SHEET 1 OF 5)
A10B	LEGEND–LINES AND SYMBOLS (SHEET 2 OF 5)
A10C	LEGEND–LINES AND SYMBOLS (SHEET 3 OF 5)
A10D	LEGEND–LINES AND SYMBOLS (SHEET 4 OF 5)
A10E	LEGEND–LINES AND SYMBOLS (SHEET 5 OF 5)
A10F	LEGEND–SOIL (SHEET 1 OF 2)
A10G	LEGEND–SOIL (SHEET 2 OF 2)
A62C	LIMITS OF PAYMENT FOR EXCAVATION AND BACKFILL – BRIDGE
RSP A85	CHAIN LINK FENCE
A86B	BARBED WIRE AND WIRE MESH FENCE DETAILS
RSP B0–1	BRIDGE DETAILS
RSP B0–3	BRIDGE DETAILS
RSP B0–13	BRIDGE DETAILS
B0–3	BRIDGE DETAILS
B0–5	BRIDGE DETAILS
B3–4A	RETAINING WALL TYPE 5 (CASE 1)
B3–5	RETAINING WALL DETAILS NO. 1
B6–10	UTILITY OPENINGS T–BEAM
B6–21	JOINT SEALS (MAXIMUM MOVEMENT RATING = 2")
B7–11	UTILITY DETAILS



INDEX TO PLANS

SHEET NO.	DRAWING	DRAWING
68	S–01	GENERAL PLAN
69	S–02	GENERAL NOTES AND INDEX TO PLANS
70	S–03	DECK CONTOURS
71	S–04	FOUNDATION PLAN
72	S–05	BRIDGE REMOVAL DETAILS
73	S–06	ABUTMENT 1 LAYOUT
74	S–07	ABUTMENT 2 LAYOUT
75	S–08	ABUTMENT DETAILS NO. 1
76	S–09	ABUTMENT DETAILS NO. 2
77	S–10	ABUTMENT DETAILS NO. 3
78	S–11	ABUTMENT DETAILS NO. 4
79	S–12	ABUTMENT DETAILS NO. 5
80	S–13	ABUTMENT DETAILS NO. 6
81	S–14	TYPICAL SECTION
82	S–15	GIRDER LAYOUT
83	S–16	DECK DETAILS NO. 1
84	S–17	DECK DETAILS NO. 2
85	S–18	GIRDER DETAILS NO. 1
86	S–19	GIRDER DETAILS NO. 2
87	S–20	TRASH CAPTURE STRUCTURE MODIFICATION DETAILS NO. 1
88	S–21	TRASH CAPTURE STRUCTURE MODIFICATION DETAILS NO. 2
89	S–22	CONCRETE BARRIER DETAILS NO. 1
90	S–23	CONCRETE BARRIER DETAILS NO. 2
91	S–24	CONCRETE BARRIER DETAILS NO. 3
92	S–25	CANTILEVER SIDEWALK DETAILS
93	S–26	JOINT ARMOR FOR PEDESTRIAN WALKWAYS
94	S–27	SECURITY FENCE DETAILS
95	S–28	UTILITY ATTACHMENT DETAILS
96	S–29	WATERLINE DETAILS
97	S–30	RETAINING WALL 1 LAYOUT
98	S–31	RETAINING WALL 2 LAYOUT
99	S–32	LOG OF TEST BORINGS

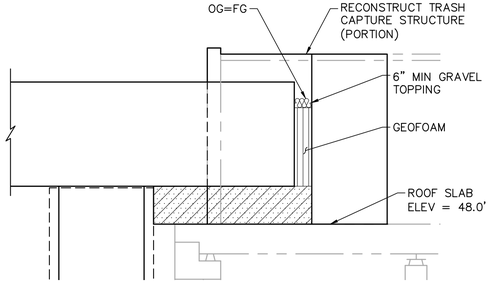


Vehicles or equipment weighing more than 1,000 lbs may not be placed within the prism shown.

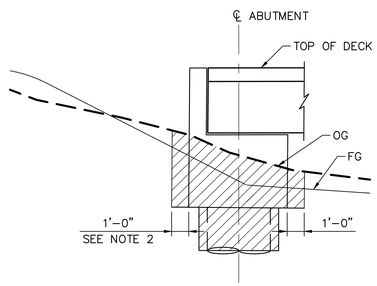
EXISTING CHANNEL WALL LOAD LIMITS

NTS

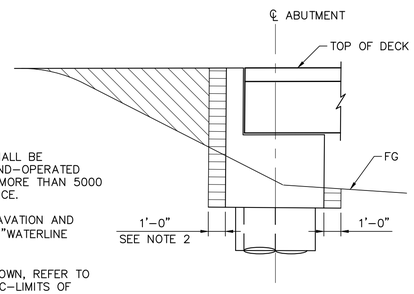
- GEOFOAM
- STRUCTURAL EXCAVATION BRIDGE
- STRUCTURAL BACKFILL
- ROADWAY EMBANKMENT
- STRUCTURAL BACKFILL (HAND COMPACTED), SEE NOTE 1.



SOUTHWEST CORNER OF ABUTMENT 1



EXCAVATION



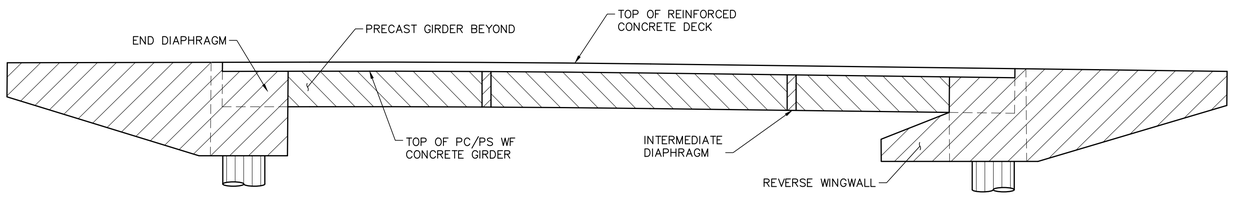
BACKFILL

NOTES

1. HAND COMPACTED SHALL BE COMPACTED WITH HAND–OPERATED EQUIPMENT WITH NO MORE THAN 5000 PCF COMPACTIVE FORCE.
2. FOR ADDITIONAL EXCAVATION AND BACKFILL LIMITS SEE "WATERLINE DETAILS."
3. FOR DETAILS NOT SHOWN, REFER TO STANDARD PLAN A62C–LIMITS OF PAYMENT FOR EXCAVATION AND BACKFILL–BRIDGE

LIMITS OF PAYMENT FOR EXCAVATION AND BACKFILL

NTS



CONCRETE STRENGTH AND TYPE LIMITS

NTS

- STRUCTURAL CONCRETE, BRIDGE (POLYMER FIBER) (f'c = 4 KSI AT 28 DAYS)
- PRECAST PRESTRESSED WIDE FLANGE GIRDER (SEE "GIRDER DETAILS NO. 1" SHEET FOR STRENGTH REQUIRED)
- STRUCTURAL CONCRETE, BRIDGE (f'c = 4.0 KSI AT 28 DAYS)
- CAST–IN–DRILLED–HOLE CONCRETE PILE (f'c = 4 KSI AT 28 DAYS)

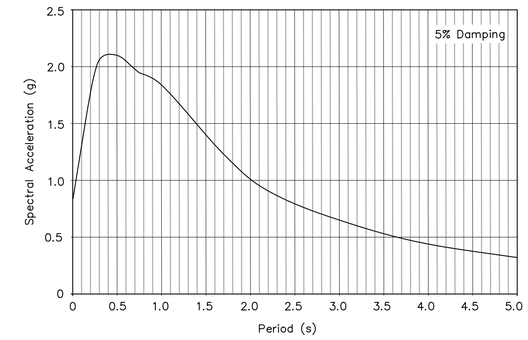
LOAD AND RESISTANCE FACTOR DESIGN

DESIGN:	AASHTO LRFD Bridge Design Specifications, 8th Edition and the Caltrans Amendments, preface dated November 2019. Caltrans Structural Technical Policy 9.4, "Deck Overhang and Soffit Design", dated August 2020. Caltrans Structural Technical Policy 14.1, "Bridge Bearings", dated February 2020.
SEISMIC DESIGN:	Caltrans Seismic Design Criteria (SDC), Version 2.0 dated April 2019.
DEAD LOAD:	Permanent Steel Deck Forms = 10 psf. Includes 35 psf for future wearing surface. Future Utility Load of 100 plf
TEMPORARY CONSTRUCTION LOAD:	940 psf; For limits refer to "Trash Capture Structure Modification Details No. 2"
LIVE LOADING:	HL–93 and permit design loading.

LIVE LOAD DISTRIBUTION

GIRDER	Ⓐ Ⓘ	Ⓑ Ⓗ	Ⓒ Ⓓ Ⓔ Ⓕ Ⓖ
MOMENT	0.22	0.34	AASHTO–CA BDS ARTICLE 4.6.2
SHEAR	0.23	0.44	

SEISMIC LOADING: Soil classification: S2
V_{S30} = 243 m/s
Moment Magnitude = 6.87
Peak Ground Acceleration = 0.83g



GEOFOAM:	γ = 2 pcf
REINFORCED CONCRETE:	fy = 60 ksi f'c = 4.0 ksi unless otherwise noted, see "Concrete Strength and Type Limits" Detail
PRESTRESSED CONCRETE:	See "Prestressing Notes" on PRECAST PRESTRESSED WIDE FLANGE GIRDER" sheet.
STRUCTURAL STEEL:	Plates: fy = 36 ksi Shapes: fy = 36 ksi
SOIL PARAMETERS:	γ = 120 pcf ϕ = 34 degrees c = 0 ksf
ALLOWABLE FOOTING PRESSURE:	Existing Trash Capture Structure: 2.8 ksf Retaining Walls: See "Retaining Wall Plans"
EXISTING TRASH CAPTURE STRUCTURE:	fy: 50 ksi f'c: 4 ksi fyr: 60 ksi

BRIDGE CONSTRUCTION SEQUENCE

1. AT&T CONDUITS RELOCATED OFF BRIDGE.
2. REMOVE BRIDGE – LOW OVERHEAD EQUIPMENT AND METHODS MUST BE UTILIZED TO AVOID 12KV OVERHEAD ELECTRIC LINES (PG&E).
3. PLACE STAGE 1 PILES, CONSTRUCT STAGE 1 ABUTMENT, ERECT STAGE 1 GIRDERS.
4. OVERHEAD LINES WILL BE MOVED TO EAST SIDE OF MEEKLAND AVENUE AT STRUCTURE BY OTHERS (PG&E AND AT&T).
5. PLACE STAGE 2 PILES, CONSTRUCT STAGE 2 ABUTMENT, ERECT STAGE 2 GIRDERS.
6. CONSTRUCT REMAINING STRUCTURE. INSTALL PROPOSED UTITLITIES TO BE ATTACHED TO BRIDGE.

STAGE CONSTRUCTION LIMITS SHOWN. VERIFY CONSTRUCTION CLEARANCE TO OVERHEAD UTIILTIES MEET APPLICABLE STANDARDS. CONSTRUCTION SEQUENCE MAY BE MODIFIED AT THE APPROVAL OF THE ENGINEER

NO.	DESCRIPTION	BY	DATE	APPV'D
	REVISIONS			

APPROVED: Jennifer Grant-Martinez, No. 77367, EXP. 6/30/2025, CIVIL, STATE OF CALIFORNIA, PROFESSIONAL ENGINEER — APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST. BLDG. 100-B SACRAMENTO, CA 95816
TEL 916.341.7760 FAX 916.341.7767

CHECKED: J. HAMILTON
APPROVED: C. HODGE
DRAWN: A. SANCHEZ
DESIGNED: J. GRANT-MARTINEZ

REVIEWED:
REVIEWED:
APPROVAL RECOMMENDED:

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

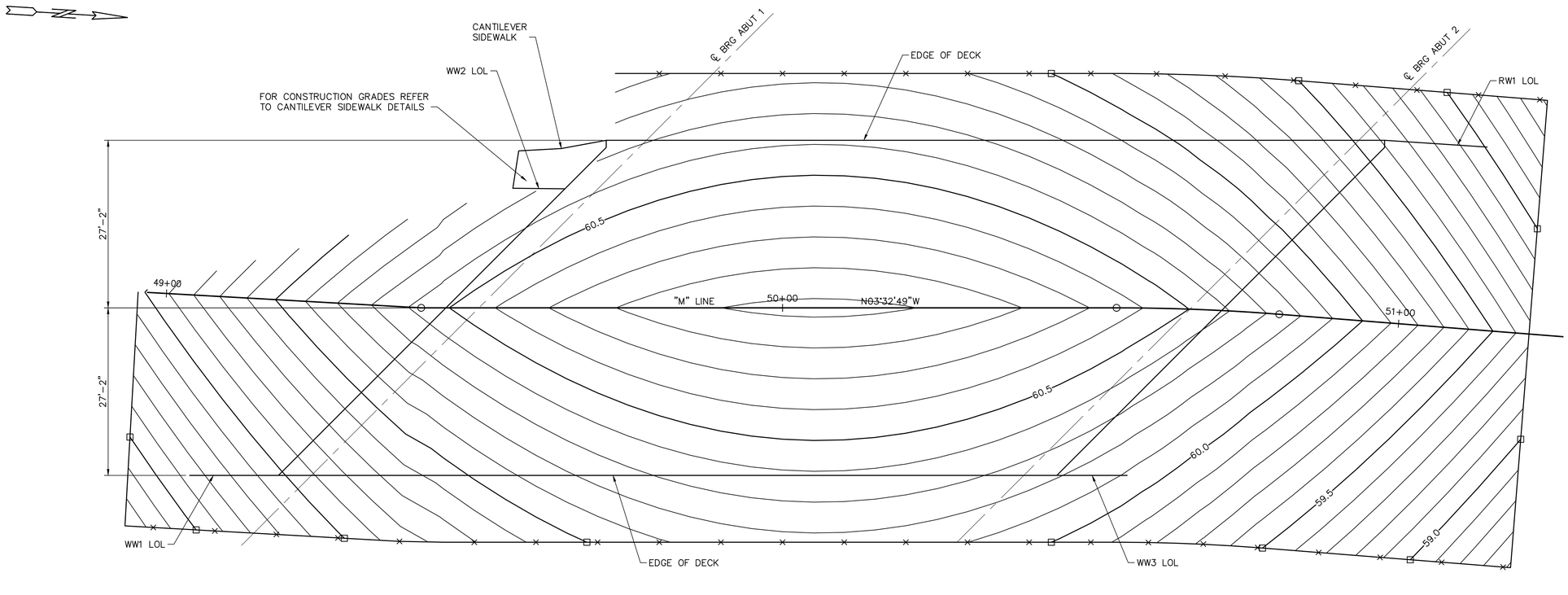
THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

GENERAL NOTES AND INDEX TO PLANS

DATE: JUNE 2023
SCALE: AS NOTED
WORK ORDER NO.: R32114
SPECIFICATION NO.: 2329
SHEET NO.: 69 OF 99
FILE NO.: U-157-8

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES
0 1 2 3

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PLAN

SCALE: 1"=10'

NOTES

1. CONTOURS DO NOT INCLUDE CAMBER.
2. 0.1' CONTOUR INTERVALS.
3. X = INDICATES 10' INTERVALS ALONG "M" LINE.
4. □ = INDICATES 0.5 FOOT CONTOURS.

	REVIEWED BY:	DATE:
CONSTRUCTION		
MAINTENANCE		
REAL ESTATE		
SURVEY		
TRAFFIC		
ENVIRONMENTAL		

NO.	DESCRIPTION	BY	DATE	APPV'D
5				
4				
3				
2				
1				

REVISIONS

REGISTERED PROFESSIONAL ENGINEER — Jennifer Grant-Martinez — No. 77367 — EXP. 6/30/2025 — CIVIL — STATE OF CALIFORNIA

APPROVED — APPROVAL DATE

WOOD RODGERS
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SACRAMENTO, CA 95816 FAX 916.341.7767

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DRAWN: A. SANCHEZ
DESIGNED: J. GRANT-MARTINEZ

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

REVIEWED:
REVIEWED:
APPROVAL RECOMMENDED::

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

DECK CONTOURS

DATE: JUNE 2023
SCALE: AS NOTED
WORK ORDER NO.: R32114
SPECIFICATION NO.: 2329
SHEET NO.: 70 OF 99
FILE NO.: U-157-8

FOR REDUCED ENGLISH PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

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REVIEWED BY:	DATE:
CONSTRUCTION	
MAINTENANCE	
REAL ESTATE	
SURVEY	
TRAFFIC	
ENVIRONMENTAL	

HYDROLOGIC SUMMARY

	DESIGN FLOOD	BASE FLOOD
Frequency (Years)	SPF	100
Discharge (Cubic feet per second)	10,300	12,500
Water Surface (Elevation at Bridge)	51.5	53.4

FLOOD PLAIN DATA IS BASED UPON INFORMATION AVAILABLE WHEN THE PLANS WERE PREPARED AND ARE SHOWN TO MEET FEDERAL REQUIREMENTS. THE ACCURACY OF SAID INFORMATION IS NOT WARRANTED BY THE COUNTY AND INTERESTED OR AFFECTED PARTIES SHOULD MAKE THEIR OWN INVESTIGATION.

SPF = STANDARD PROJECT FLOOD

STA "M" LINE	NORTHING	EASTING
(1) ℄ ABUT 1 49+49.99	2076115.9832	6093826.8060
(2) ℄ ABUT 2 50+66.82	2076232.6031	6093819.8165

PILE DATA – CIDH PILES

LOCATION	PILE TYPE	CUT–OFF ELEVATION	NOMINAL RESISTANCE (kips)		BOTTOM OF CASING ELEVATION (ft)	DESIGN * TIP ELEVATION (ft)	SPECIFIED TIP ELEVATION (ft)
			COMPRESSION	TENSION			
ABUT 1	54"ø CIDH CONCRETE PILE	50.25 ft	1180 k	0 k	–	(a)–28 (c) (d)–18	–28
ABUT 1	54"ø CIDH CONCRETE PILE IN 66"ø ISOLATION CASING				32.00 ft	(a)–37 (c) (d)–23	–37 (SEE NOTE 3)
ABUT 2	54"ø CIDH CONCRETE PILE	50.25 ft	1170 k	0 k	–	(a)–27 (c) (d)–10	–27

NOTES
1. EXTREME EVENT LIMIT STATE NOT APPLICABLE TO ABUTMENT DESIGN
2. DESIGN TIP ELEVATIONS ARE CONTROLLED BY (a) COMPRESSION; (c) SETTLEMENT; (b) LATERAL LOADS
3. CONFIRM TIP ELEVATION WITH SUPPLEMENTAL BORING. SUBMIT PILE TIP VERICATION CALCULATION SEALED AND SIGNED BY AN ENGINEER WHO IS REGISTERED AS A CIVIL ENGINEER IN THE STATE. COMPLETE VERIFICATION PRIOR TO ORDERING OR FABRICATING ANY MATERIALS.

LEGEND

– DENOTES BOTTOM OF FOOTING ELEVATION

INDICATES DIRECTION OF FLOW

INDICATES EXISTING STRUCTURE

INDICATES 54"ø CIDH PILE

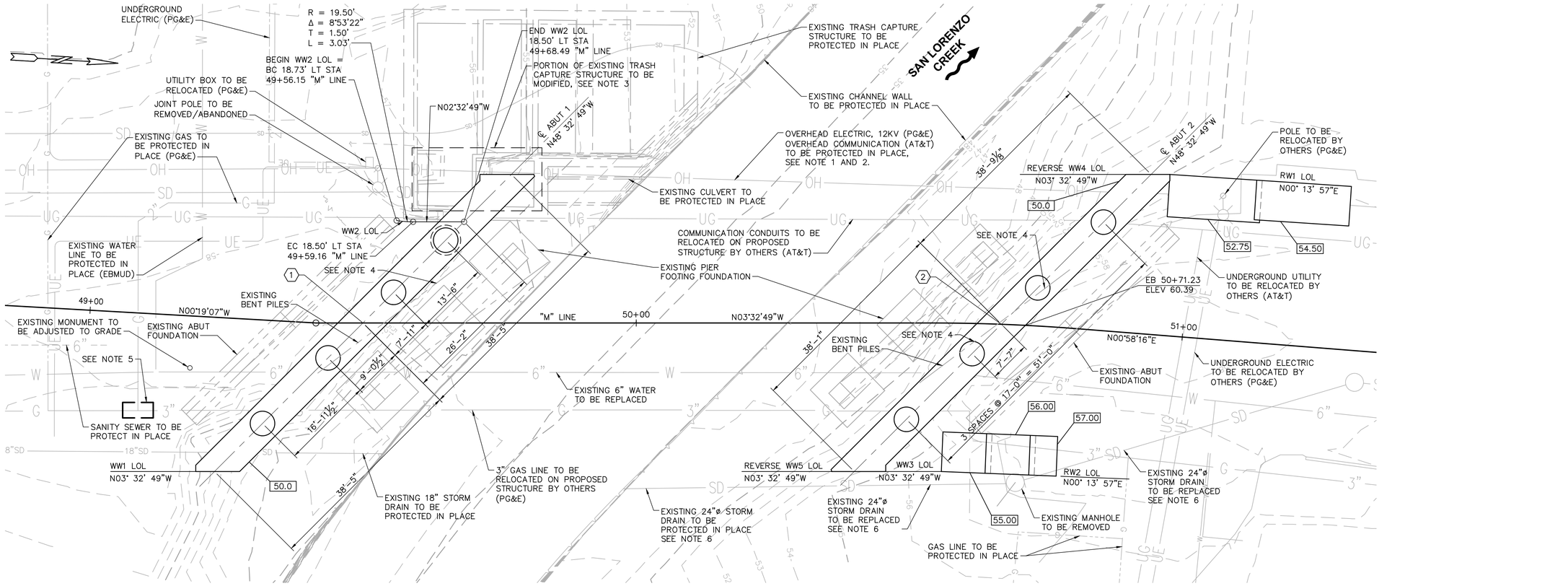
INDICATES 54"ø CIDH PILE WITH 66"ø ISOLATION CASING

NOTES

ELEVATION DATUM = NAVD 88

BENCHMARK DATA: SEE ROAD PLANS

1. LOW OVERHEAD EQUIPMENT WILL BE REQUIRED LEFT OF THE "M" LINE FOR BRIDGE REMOVAL. REFER TO "BRIDGE CONSTRUCTION SEQUENCE ON "INDEX TO PLANS".
2. REFER TO OSHA POWERLINE SAFETY GUIDELINES FOR OPERATING EQUIPMENT AROUND POWER LINES. CONTRACTOR MUST COORDINATE WITH PG&E TO SCHEDULE DE–ENERGIZATION OF LINES FOR CONSTRUCTION OPERATIONS WHICH ENCROACH ON MINIMUM OPERATING CLEARANCE.
3. REFER TO "TRASH CAPTURE STRUCTURE MODIFICATION DETAILS".
4. FOR EXISTING BENT PILE REMOVAL SEE BRIDGE REMOVAL PLANS.
5. 3" INLINE PLASTIC TEE AND END CAP TO BE PROTECTED IN PLACE. INLINE TEE AND END CAP MUST BE BURIED AND CANNOT BE EXPOSED FOR EXTENDED LENGTH OF TIME.
6. SEE ROAD PLANS FOR LIMITS OF STORM DRAIN TO BE PROTECTED IN PLACE AND TO BE REPLACED.



FOUNDATION PLAN

SCALE: 1"=10'

–40 0 20 40 80 160

(IN FEET)
1"=10'

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

REVISIONS

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
2				
3				
4				
5				

APPROVED: PROFESSIONAL ENGINEER Jennifer Grant–Martinez No. 77567 EXP. 6/30/2025 CIVIL STATE OF CALIFORNIA APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST, Bldg. 100-B TEL 916.341.7760
SACRAMENTO, CA 95816 FAX 916.341.7767

DRAWN: A. SANCHEZ
DESIGNED: J. GRANT–MARTINEZ
APPROVAL RECOMMENDED:
REVIEWED:
REVIEWED:
CHECKED: J. HAMILTON
APPROVED: C. HODGE

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE BLOSSOM WAY TO LEWELLING BLVD

FOUNDATION PLAN

DATE	SCALE
JUNE 2023	AS NOTED

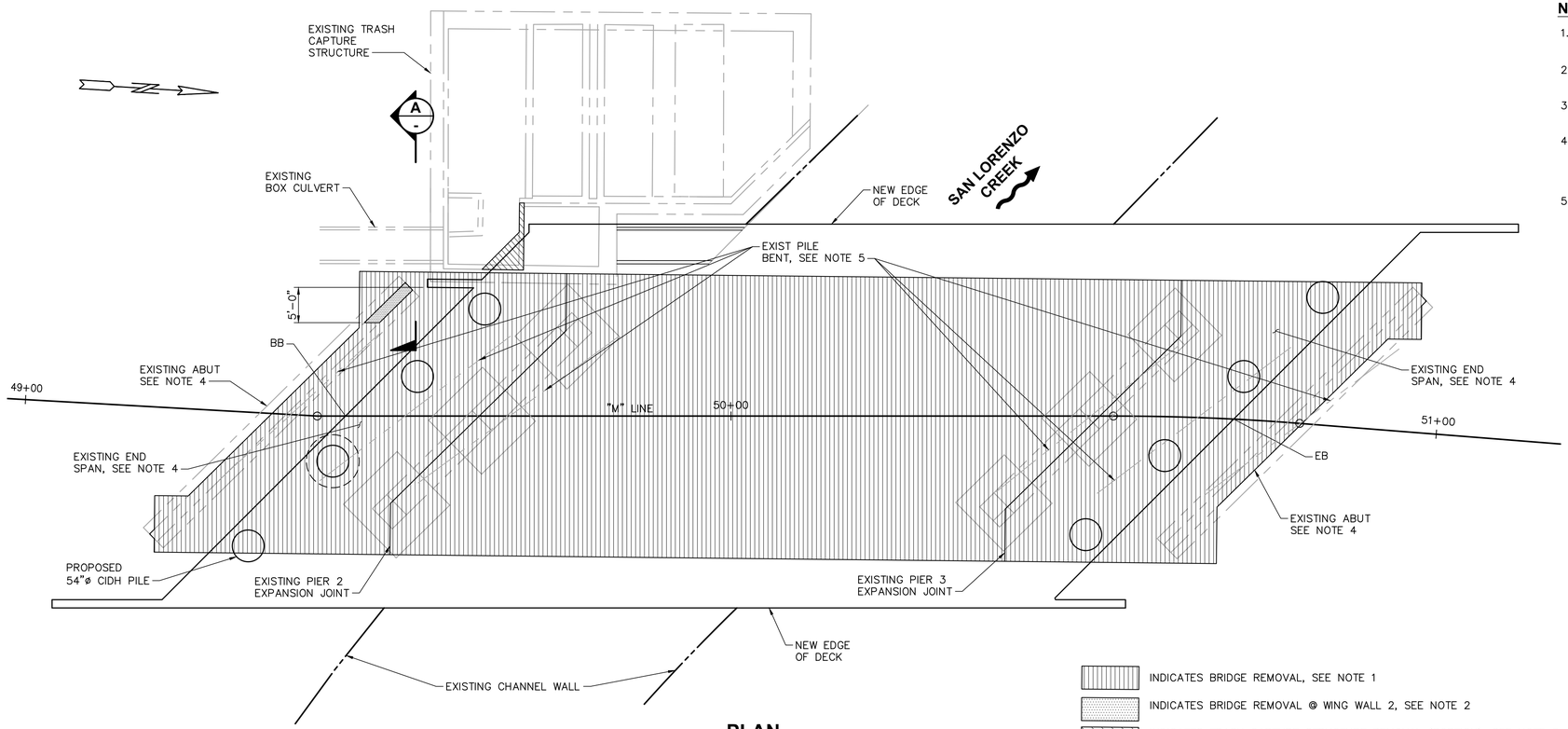
WORK ORDER NO. R32114

SPECIFICATION NO. 2329

SHEET NO. 71 OF 99

FILE NO. U-157-8

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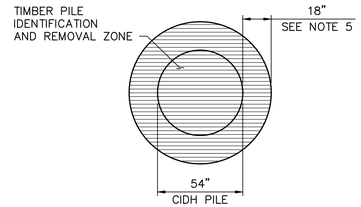


PLAN

SCALE: 1"=10'

NOTES

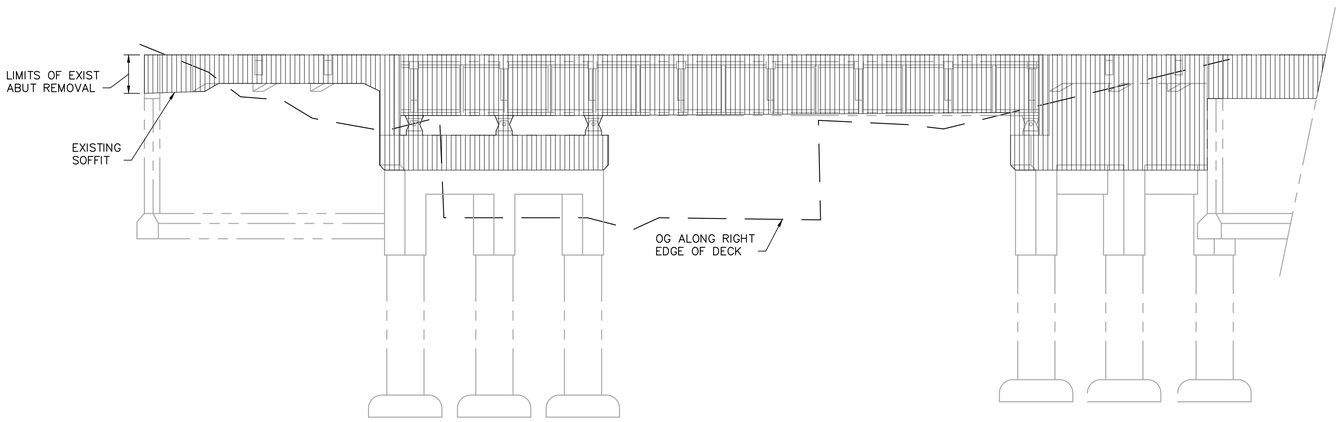
1. REMOVE EXISTING STRUCTURE TO 3' BELOW FG OR 1' BELOW GROUND SURFACE, WHICHEVER IS LESSER, EXCEPT WHERE NOTED.
2. ABUTMENT MUST BE REMOVED TO AN ELEVATION OF 53.50' IN LOCATION SHOWN TO ACCOMMODATE WINGWALL.
3. FOR REMOVAL AND MODIFICATION DETAILS NOT SHOWN, SEE TRASH CAPTURE STRUCTURE MODIFICATION DETAILS.
4. EXISTING ABUTMENT IS MONOLITHIC WITH END SPAN SUPERSTRUCTURE. EXISTING ABUTMENT REQUIRES EXCAVATION PRIOR TO END SPAN REMOVAL. ALTERNATIVELY, EXISTING ABUTMENTS MAY BE TEMPORARILY BRACED AT THE APPROVAL OF THE ENGINEER.
5. ALL TIMBER PILES WITHIN 1.5' OF PROPOSED 54"ø CIDH PILE MUST BE POSITIVELY IDENTIFIED AND REMOVED PRIOR TO CIDH CONSTRUCTION.



INDICATES BRIDGE REMOVAL, SEE NOTE 1

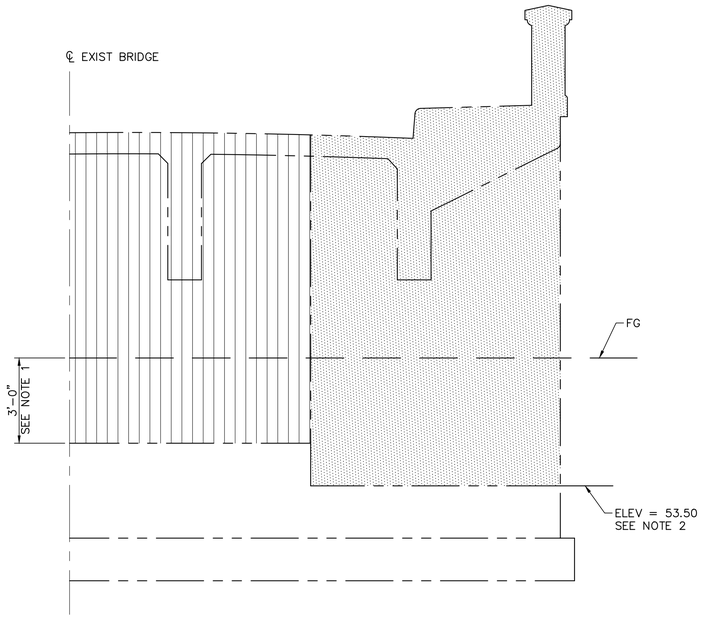
INDICATES BRIDGE REMOVAL @ WING WALL 2, SEE NOTE 2

INDICATES TRASH CAPTURE STRUCTURE REMOVAL (PORTION), SEE NOTE 3



ELEVATION

SCALE: 1"=10'



SECTION A - A

SCALE: 3/8" = 1'-0"

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

REVISIONS

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
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REGISTERED PROFESSIONAL ENGINEER — Jennifer Grant-Martinez — No. 77567 — EXP. 6/30/2025 — CIVIL — STATE OF CALIFORNIA — APPROVED — APPROVAL DATE:

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WOOD RODGERS
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TEL 916.341.7760 FAX 916.341.7767

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APPROVED: C. HODGE
APPROVAL RECOMMENDED:
REVIEWED:
REVIEWED:

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

BRIDGE REMOVAL DETAILS

DATE	SCALE
JUNE 2023	AS NOTED

WORK ORDER NO: R32114

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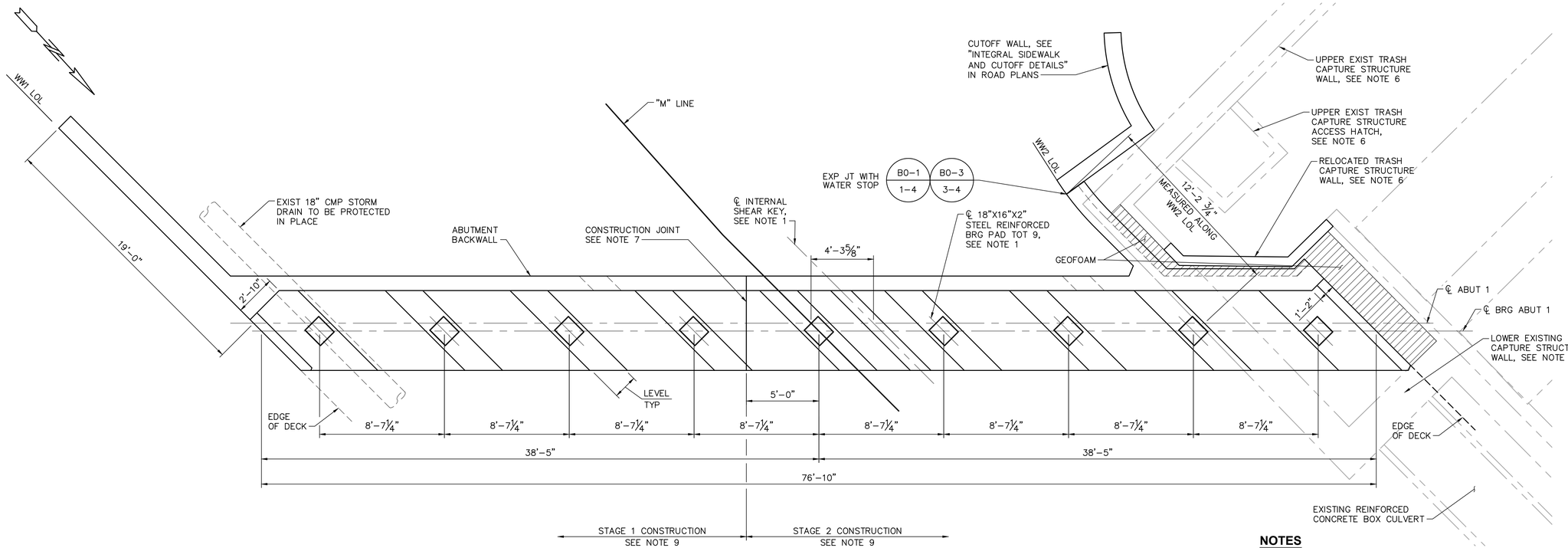
SHEET NO: 72 OF 99

FILE NO: U-157-8

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	REVIEWED BY:	DATE:
SURVEY		
TRAFFIC		
ENVIRONMENTAL		



PLAN

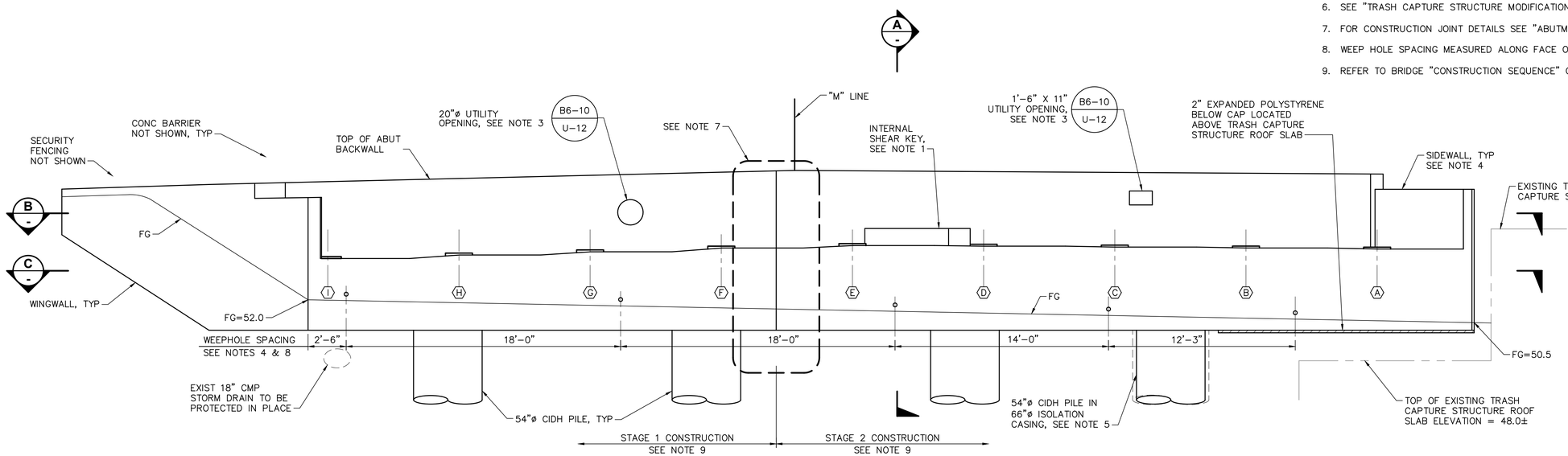
SCALE: 1/4"=1'-0"

LEGEND

⟨X⟩ GIRDER IDENTIFICATION LETTER

NOTES

1. FOR BEARING PAD DETAILS, INTERNAL SHEAR KEY DETAILS AND SECTION A-A, SEE "ABUTMENT DETAIL NO. 1".
2. FOR SECTION B-B AND SECTION C-C SEE "ABUTMENT DETAILS NO. 5".
3. FOR OPENING AND UTILITY DETAILS NOT SHOWN, SEE "TYPICAL SECTION" AND "GIRDER LAYOUT" SHEETS.
4. FOR SIDEWALL DETAILS AND WEEPHOLE AND GEOCOMPOSITE DRAIN DETAILS SEE "ABUTMENT DETAILS NO. 4" SHEET.
5. FOR ISOLATION CASING DETAILS SEE "ABUTMENT DETAILS NO. 2".
6. SEE "TRASH CAPTURE STRUCTURE MODIFICATION DETAILS" SHEET.
7. FOR CONSTRUCTION JOINT DETAILS SEE "ABUTMENT DETAILS NO. 3" SHEET.
8. WEEP HOLE SPACING MEASURED ALONG FACE OF ABUTMENT.
9. REFER TO BRIDGE "CONSTRUCTION SEQUENCE" ON "INDEX TO PLANS" SHEET.



ELEVATION

SCALE: 1/4"=1'-0"

ABUTMENT 1 SEAT ELEVATION TABLE	
GIRDER DESIGNATION	SEAT ELEVATION
⟨A⟩	55.26
⟨B⟩	55.33
⟨C⟩	55.40
⟨D⟩	55.45
⟨E⟩	55.50
⟨F⟩	55.29
⟨G⟩	55.09
⟨H⟩	54.86
⟨I⟩	54.63

-40 0 20 40 80 160

(IN FEET)
1/4"=1'-0"

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

NO.	DESCRIPTION	BY	DATE	APPV'D
4				
3				
2				
1				

REVISIONS

PROFESSIONAL ENGINEER — Jennifer Grant-Martinez — No. 77367 — EXP. 6/30/2025 — CIVIL — STATE OF CALIFORNIA
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BLOSSOM WAY
TO LEWELLING BLVD

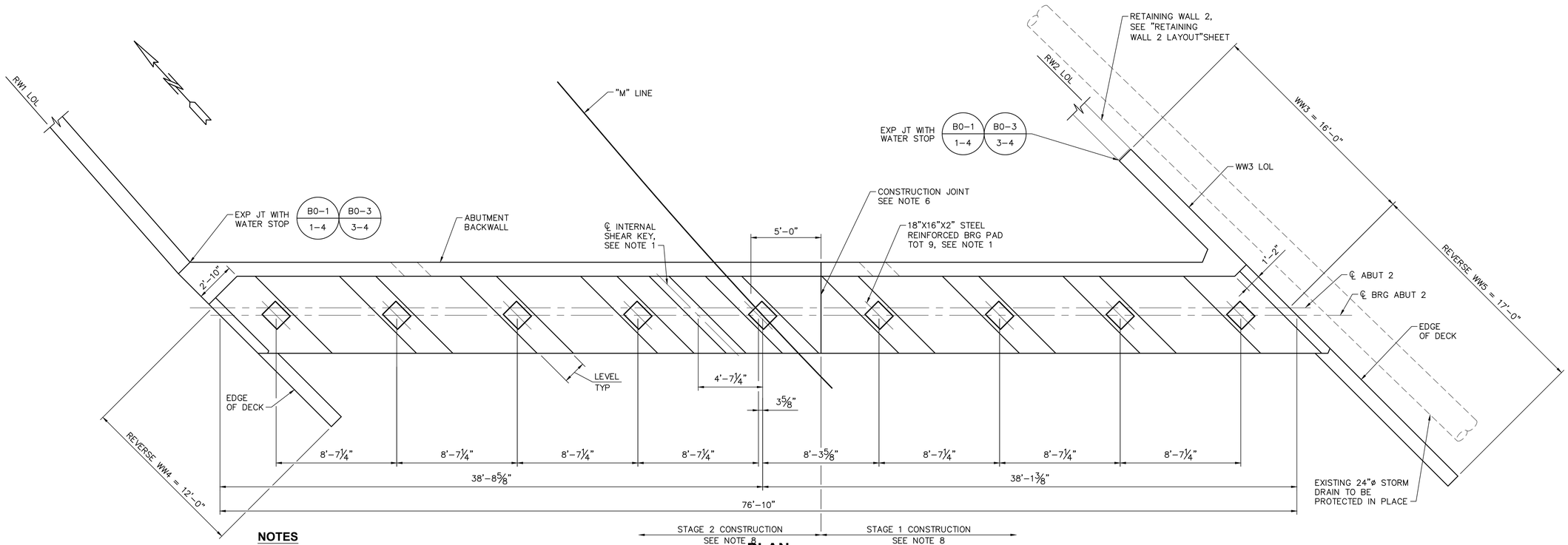
ABUTMENT 1 LAYOUT

DATE: JUNE 2023	SCALE: AS NOTED
WORK ORDER NO.: R32114	
SPECIFICATION NO.: 2329	
SHEET NO.: 73 OF 99	
FILE NO.: U-157-8	

C:\projects\1030(Wood Rodgers)\010 (Alameda County)\02 (Meekland Ave Br)\8781.004-f-al001.DWG 6-30-23 09:36:47 AM Al

	REVIEWED BY:	DATE:
CONSTRUCTION		
MAINTENANCE		
REAL ESTATE		

	REVIEWED BY:	DATE:
SURVEY		
TRAFFIC		
ENVIRONMENTAL		



PLAN

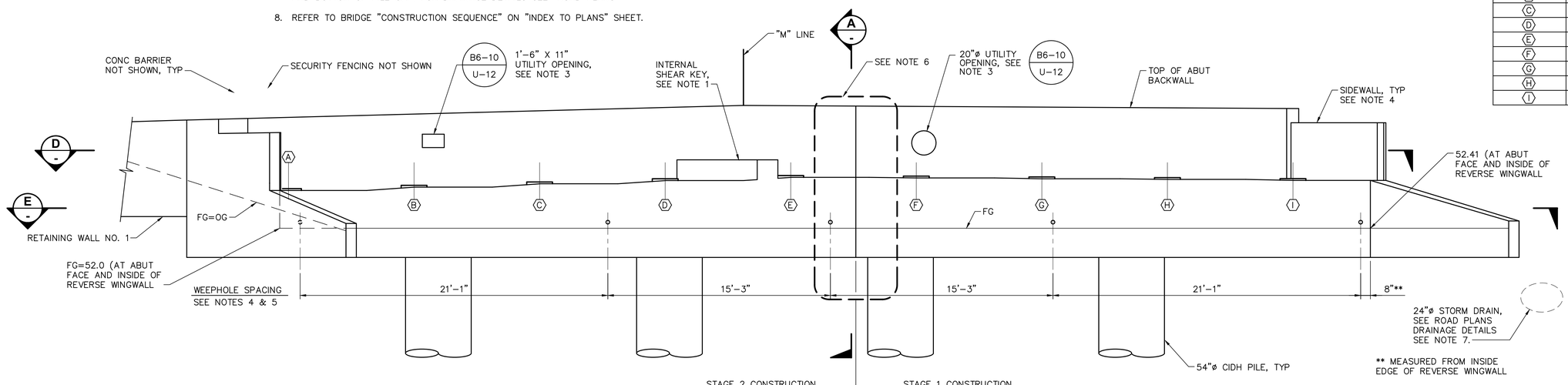
SCALE: 1/4"=1'-0"

LEGEND

(X) GIRDER IDENTIFICATION LETTER

NOTES

1. FOR BEARING PAD DETAILS, INTERNAL SHEAR KEY DETAILS, AND SECTION A–A SEE "ABUTMENT DETAIL NO. 1".
2. FOR SECTION D–D AND SECTION E–E SEE "ABUTMENT DETAILS NO. 5".
3. FOR OPENING AND UTILITY DETAILS NOT SHOWN, SEE "TYPICAL SECTION" AND "GIRDER LAYOUT" SHEETS.
4. FOR SIDEWALL DETAILS AND WEEPHOLE AND GEOCOMPOSITE DRAIN DETAILS SEE "ABUTMENT DETAILS NO. 4" SHEET.
5. WEEPHOLE SPACING MEASURED ALONG FACE OF ABUTMENT.
6. FOR CONSTRUCTION JOINT DETAILS SEE "ABUTMENT DETAILS NO. 3" SHEET.
7. 1.75'± MINIMUM CLEAR BETWEEN TOP OF EXISTING 24" DIAMETER STORM DRAIN AND BOTTOM OF PILE CAP. FOR DRAINAGE DETAILS SEE "ROAD PLANS".
8. REFER TO BRIDGE "CONSTRUCTION SEQUENCE" ON "INDEX TO PLANS" SHEET.



ELEVATION

SCALE: 1/4"=1'-0"

ABUTMENT 2 SEAT ELEVATION TABLE	
GIRDER DESIGNATION	SEAT ELEVATION
(A)	54.52
(B)	54.76
(C)	54.99
(D)	55.21
(E)	55.42
(F)	55.39
(G)	55.34
(H)	55.28
(I)	55.22

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

–40 0 20 40 80 160
(IN FEET)
1/4"=1'-0"

REVISIONS			
NO.	DESCRIPTION	BY	DATE APPV'D
1			
2			
3			
4			
5			

PROFESSIONAL ENGINEER — Jennifer Grant-Martinez — No. 77367 — EXP. 6/30/2025 — CIVIL — STATE OF CALIFORNIA
APPROVED: APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST, BLDG. 100-B TEL 916.341.7760
SACRAMENTO, CA 95816 FAX 916.341.7767

DRAWN: A. SANCHEZ — DESIGNED: J. GRANT-MARTINEZ — CHECKED: J. HAMILTON — APPROVED: C. HODGE

REVIEWED: — REVIEWED: — APPROVAL RECOMMENDED:

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

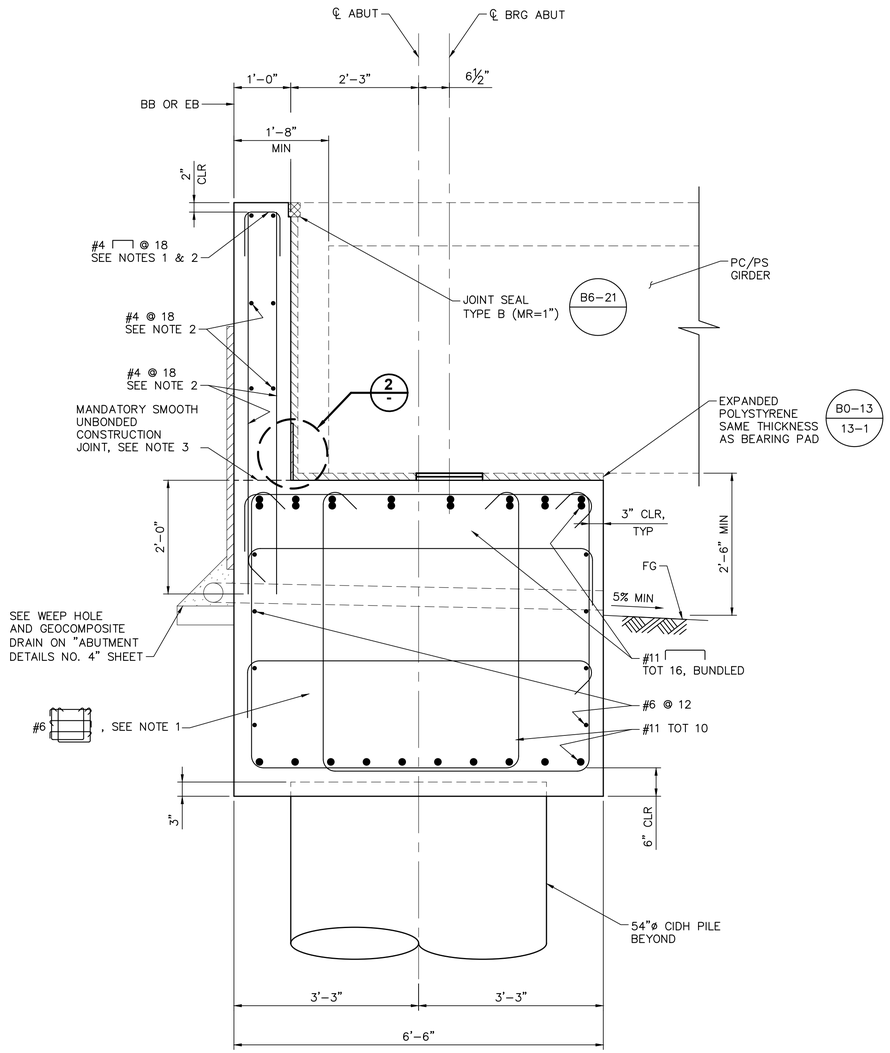
ABUTMENT 2 LAYOUT

DATE	SCALE
JUNE 2023	AS NOTED
WORK ORDER NO.	
R32114	
SPECIFICATION NO.	
2329	
SHEET NO.	
74 OF 99	
FILE NO.	
U-157-8	

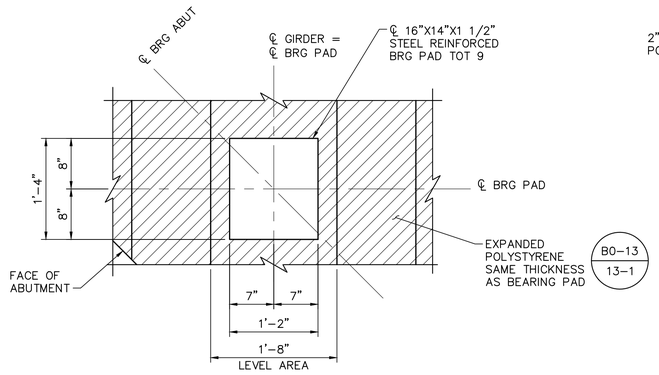
C:\projects\1030(Wood Rodgers)\010 (Alameda County)\02 (Meekland Ave Br)\8781.004-f-a001.DWG 6-30-23 09:36:50 AM AI

REVIEWED BY:	DATE:
CONSTRUCTION	
MAINTENANCE	
REAL ESTATE	

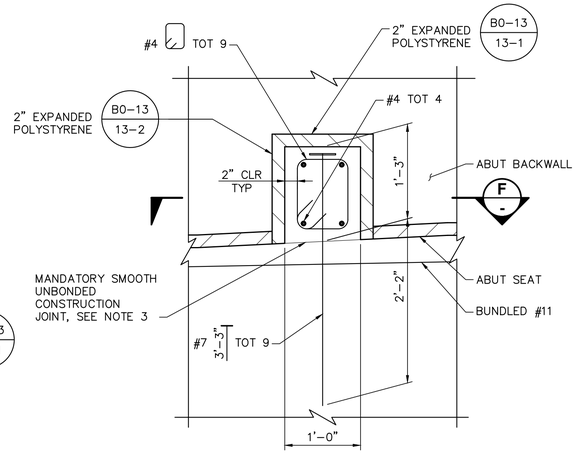
REVIEWED BY:	DATE:
SURVEY	
TRAFFIC	
ENVIRONMENTAL	



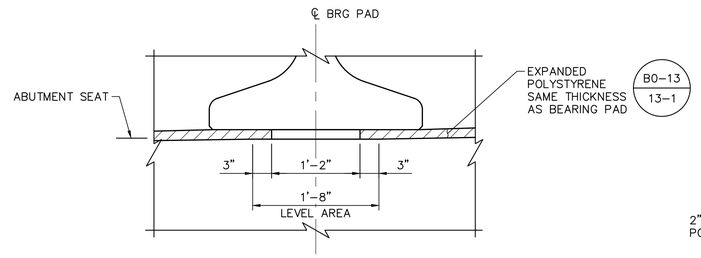
SECTION A / -
SCALE: 3/4" = 1'–0"



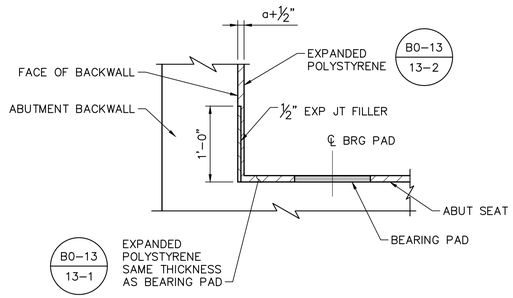
PLAN
SCALE: 1"=1'–0"



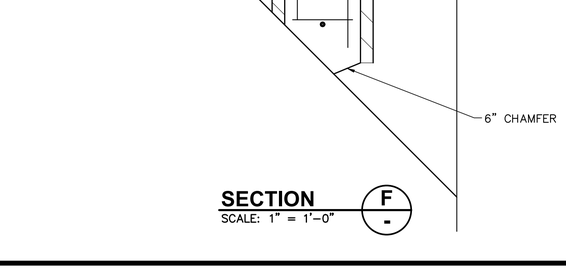
INTERNAL SHEAR KEY ELEVATION
SCALE: 1"=1'–0"



ELEVATION
SCALE: 1"=1'–0"



DETAIL 2 / -
NTS



SECTION F / -
SCALE: 1" = 1'–0"

NOTES

1. STIRRUPS SPACED ALONG AND PLACED NORMAL TO ℄ ABUT. SEE "ABUTMENT DETAILS NO. 3" SHEET FOR STIRRUP DETAILS AND SPACING.
2. PLACE REINFORCEMENT SHOWN UNLESS OTHERWISE NOTED. REFER TO "CANTILEVER SIDEWALK DETAILS" FOR REINFORCEMENT LAYOUT.
3. CONSTRUCTION JOINT MUST BE LINED WITH BOND BREAKER. FORM OIL IS NOT PERMITTED FOR USE AS BOND BREAKER.

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
2				
3				
4				
5				

REVISIONS

REGISTERED PROFESSIONAL ENGINEER — Jennifer Grant-Martinez — No. 77567 — EXP. 6/30/2025 — CIVIL — STATE OF CALIFORNIA
APPROVED: APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST, BLDG. 100-B TEL 916.341.7760
SACRAMENTO, CA 95816 FAX 916.341.7767

DRAWN: A. SANCHEZ — CHECKED: J. HAMILTON — DESIGNED: J. GRANT-MARTINEZ — APPROVAL RECOMMENDED: — REVIEWED: — REVIEWED:

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

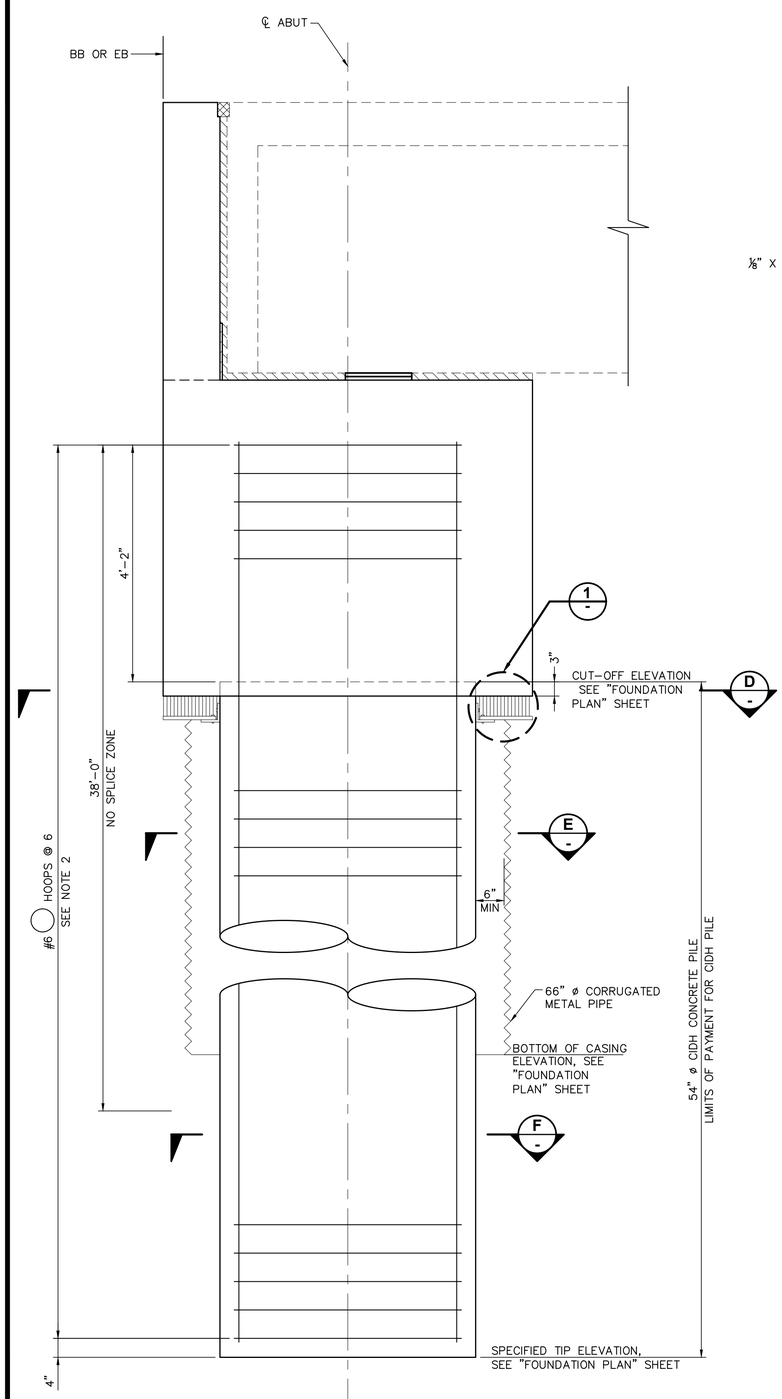
ABUTMENT DETAILS NO. 1

DATE: JUNE 2023	SCALE: AS NOTED
WORK ORDER NO.: R32114	
SPECIFICATION NO.: 2329	
SHEET NO.: 75 OF 99	
FILE NO.: U-157-8	

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES
0 1 2 3

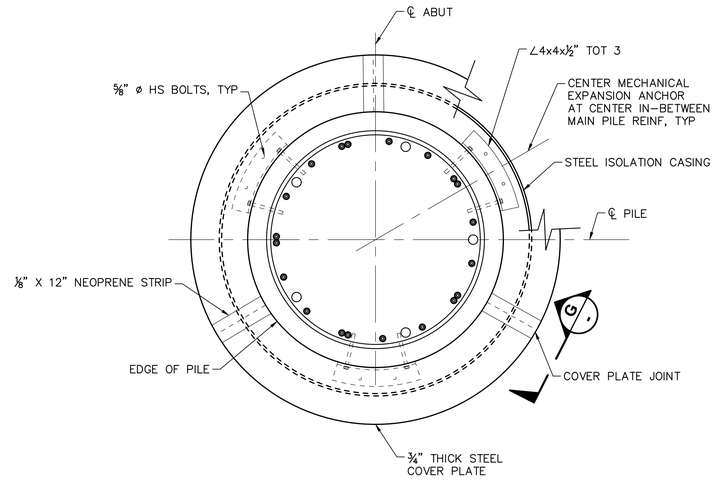
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REVIEWED BY:	DATE:		REVIEWED BY:	DATE:
CONSTRUCTION			SURVEY	
MAINTENANCE			TRAFFIC	
REAL ESTATE			ENVIRONMENTAL	



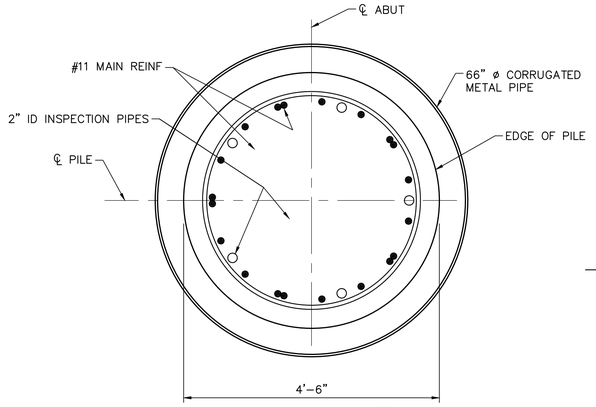
54" Ø CIDH PILE

SCALE: 3/4"=1'-0"



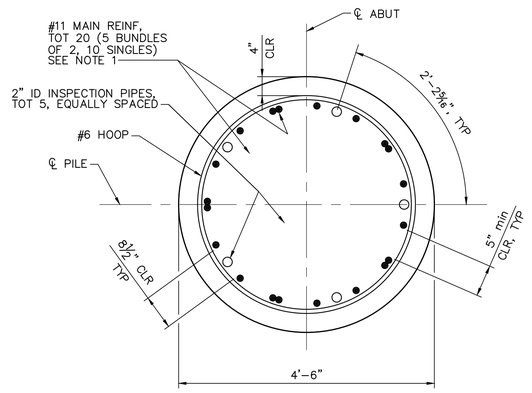
SECTION D -

SCALE: 3/4" = 1'-0"
FOR INFORMATION NOT SHOWN, SEE SECTION F-F



SECTION E -

SCALE: 3/4" = 1'-0"
FOR INFORMATION NOT SHOWN, SEE SECTION F-F

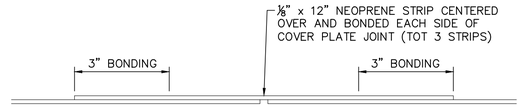


SECTION F -

SCALE: 3/4" = 1'-0"

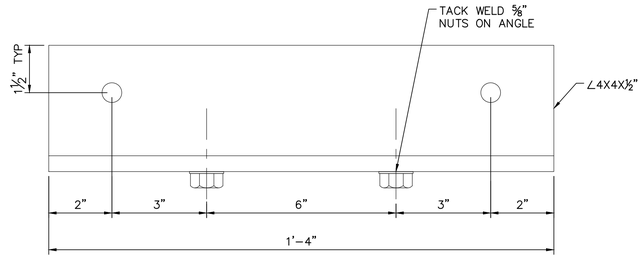
NOTES

1. LONGITUDINAL PILE REINFORCEMENT MUST BE ULTIMATE BUTT SPLICED OUTSIDE THE NO SPLICE ZONES SHOWN.
2. ALL PILE HOOP REINFORCEMENT MUST BE ULTIMATE BUTT SPLICED.
3. COVER PLATE, ANGLES AND ALL HARDWARE SHALL BE GALVANIZED.



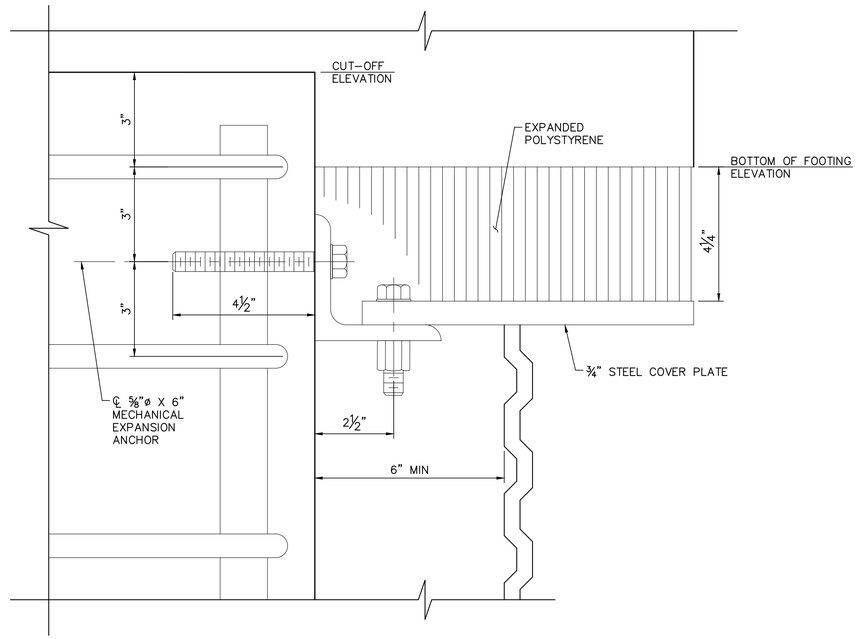
VIEW G -

NO SCALE



ANGLE BRACKET DEVELOPED ELEVATION

NO SCALE



DETAIL 1 -

NO SCALE

FOR REDUCED ENGLISH PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

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REVISIONS

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
2				
3				
4				
5				

PROFESSIONAL ENGINEER — Jennifer Grant-Martinez — No. 77367 — EXP. 6/30/2025 — CIVIL — STATE OF CALIFORNIA
APPROVED: APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST, BLDG. 100-B TEL 916.341.7760
SACRAMENTO, CA 95816 FAX 916.341.7767

DRAWN: A. SANCHEZ
DESIGNED: L. GRANT-MARTINEZ
CHECKED: J. HAMILTON
APPROVED: C. HODGE

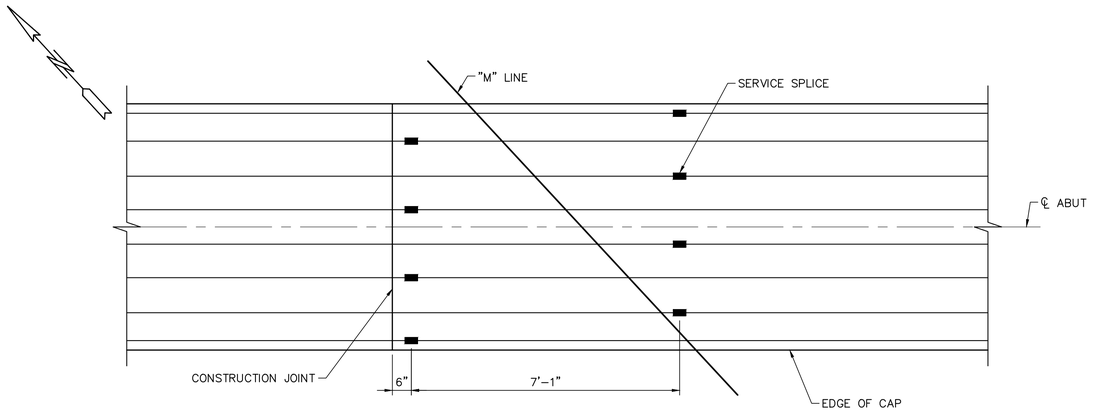
COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

REVIEWED:
REVIEWED:
APPROVAL RECOMMENDED:

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

ABUTMENT DETAILS NO. 2

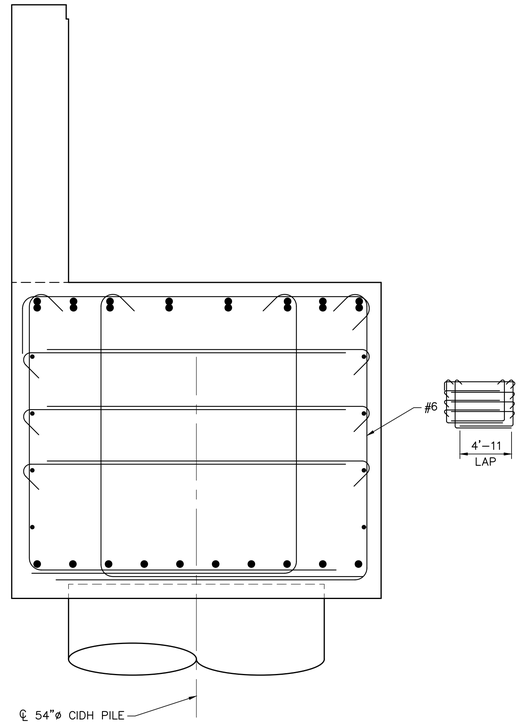
DATE: JUNE 2023
SCALE: AS NOTED
WORK ORDER NO.: R32114
SPECIFICATION NO.: 2329
SHEET NO.: 76 OF 99
FILE NO.: U-157-8



CONSTRUCTION JOINT DETAILS

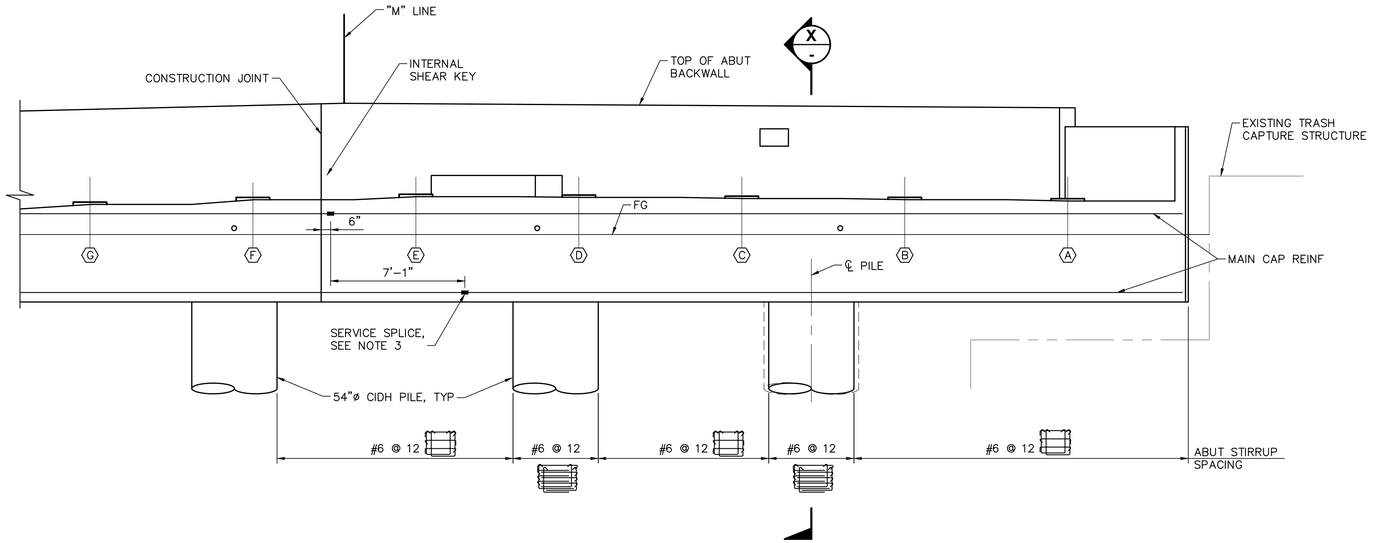
SCALE: 1/2"=1'–0"

ABUTMENT 2 SHOWN, ABUTMENT 1 SIMILAR



SECTION X

SCALE: 3/4" = 1'–0"



PART ELEVATION

SCALE: 1/4"=1'–0"

ABUTMENT 1 SHOWN, ABUTMENT 2 SIMILAR

NOTES

1. MAIN PILE CAP REINFORCEMENT MUST BE SERVICE SPLICED IN THE LOCATIONS SHOWN.
2. ALTERNATE LOCATION OF SERVICE SPLICES IN SAME LAYER.

REVISIONS			
NO.	DESCRIPTION	BY	DATE APPV'D
1			
2			
3			
4			
5			

	REVIEWED BY:	DATE:		REVIEWED BY:	DATE:
CONSTRUCTION			SURVEY		
MAINTENANCE			TRAFFIC		
REAL ESTATE			ENVIRONMENTAL		

APPROVED: Jennifer Grant-Martinez, No. 77367, EXP. 6/30/2025, CIVIL, STATE OF CALIFORNIA, REGISTERED PROFESSIONAL ENGINEER — APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
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SACRAMENTO, CA 95816 FAX 916.341.7767

DRAWN: A. SANCHEZ | CHECKED: J. HAMILTON | DESIGNED: J. GRANT-MARTINEZ | APPROVED: C. HODGE

REVIEWED: | REVIEWED: | APPROVAL RECOMMENDED:

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

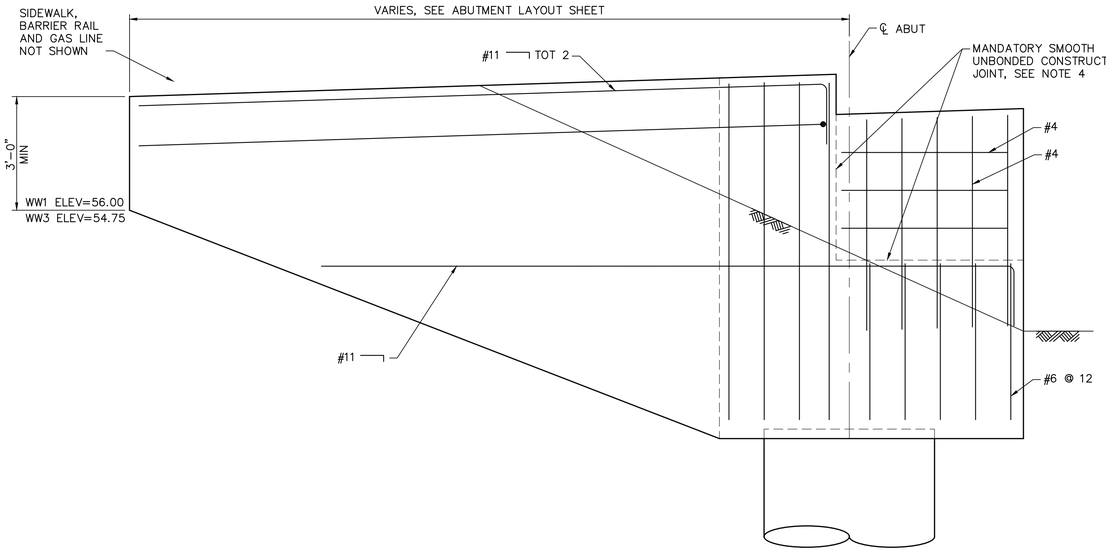
THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

ABUTMENT DETAILS NO. 3

DATE: JUNE 2023	SCALE: AS NOTED
WORK ORDER NO.: R32114	
SPECIFICATION NO.: 2329	
SHEET NO.: 77 OF 99	
FILE NO.: U-157-8	

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

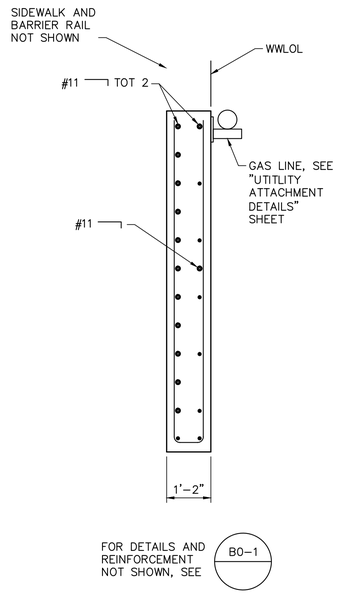
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WINGWALL ELEVATION B0-1

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

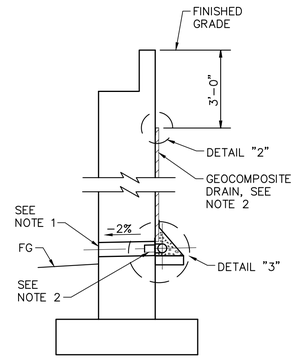
WINGWALL 1 SHOWN, WINGWALL 3 SIMILAR



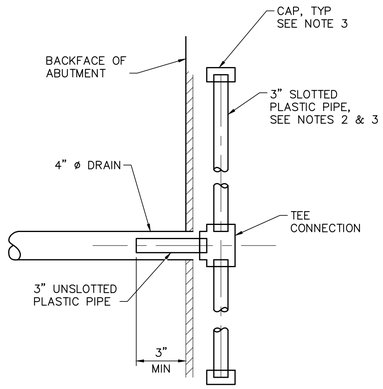
FOR DETAILS AND REINFORCEMENT NOT SHOWN, SEE B0-1

WINGWALL SECTION

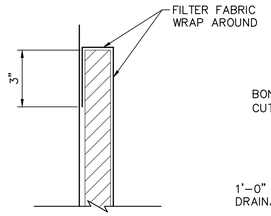
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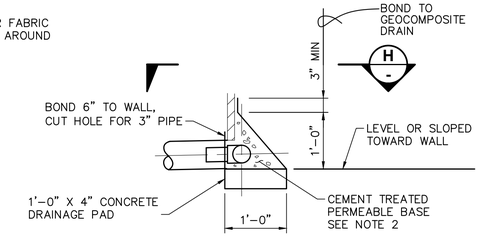
WALL SECTION



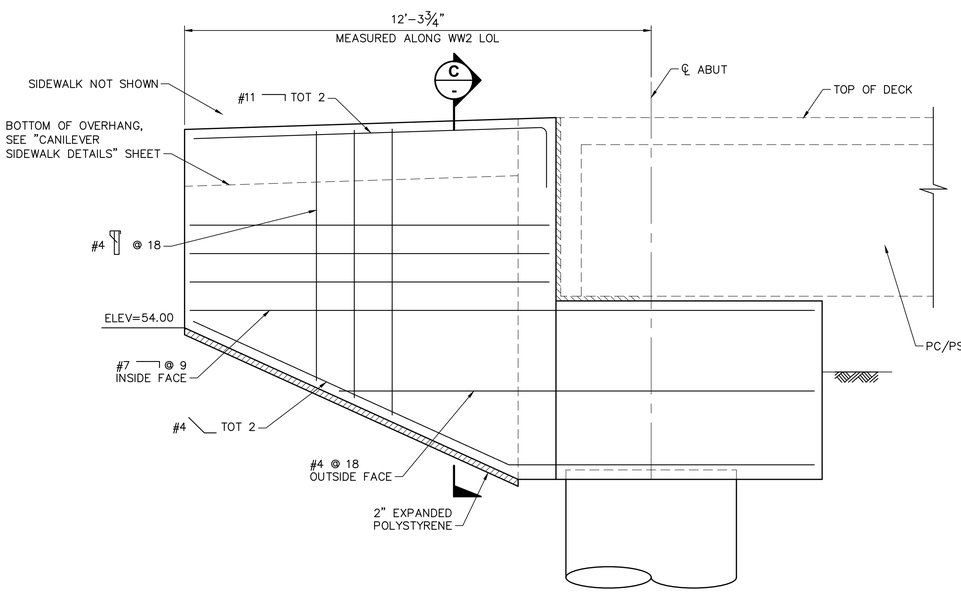
SECTION H -



DETAIL "2"

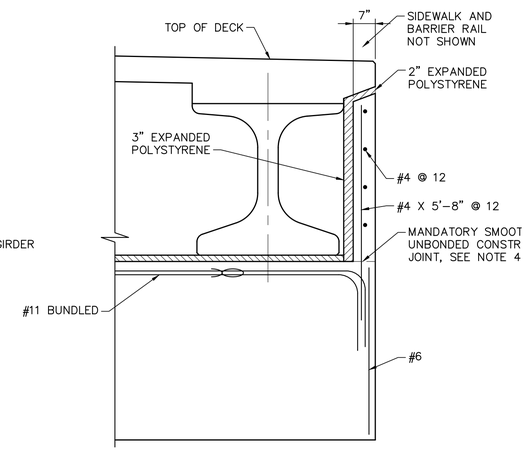


DETAIL "3"



WINGWALL 2 ELEVATION

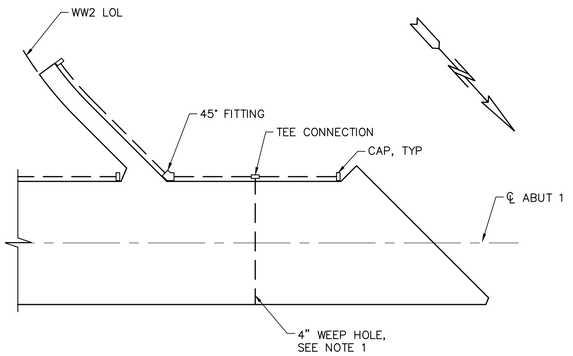
SCALE: 1/2"=1'-0"



SIDE WALL ELEVATION

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

ALTERNATIVE TO BRIDGE DETAIL B0-3 3-1



PARTIAL PLAN - ABUTMENT 1

WEEP HOLE AND GEOCOMPOSITE DRAIN DETAIL

NO SCALE

NOTES:

1. 4" ø DRAINS AT INTERMEDIATE SAG POINTS AND AT 25' MAX CENTER TO CENTER. EXPOSED WALL DRAINS SHALL BE LOCATED 3"± ABOVE FINISHED GRADE.
2. GEOCOMPOSITE DRAIN, CEMENT TREATED PERMEABLE BASE, AND 3" ø SLOTTED PLASTIC PIPE CONTINUOUS BEHIND ABUTMENT. CAP ENDS OF PIPE. PROVIDE "TEE" CONNECTION AT EACH 4" ø DRAIN.
3. CONNECT THE LOW END OF PLASTIC PIPE TO THE MAIN OUTLET PIPE AS APPLICABLE.
4. CONSTRUCTION JOINT MUST BE LINED WITH BOND BREAKER. FORM OIL IS NOT PERMITTED FOR USE AS BOND BREAKER.
5. FOR SECTION C-C SEE "CANTILEVER SIDEWALK DETAILS"

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY	
MAINTENANCE		TRAFFIC	
REAL ESTATE		ENVIRONMENTAL	

NO.	DESCRIPTION	BY	DATE	APPV'D
5				
4				
3				
2				
1				

REVISIONS

REGISTERED PROFESSIONAL ENGINEER Jennifer Grant-Martinez No. 77367 EXP. 6/30/2025 CIVIL STATE OF CALIFORNIA

APPROVED: APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST, BLDG. 100-B TEL 916.341.7760
SACRAMENTO, CA 95816 FAX 916.341.7767

CHECKED: J. HAMILTON
APPROVED: C. HODGE
DRAWN: A. SANCHEZ
DESIGNED: J. GRANT-MARTINEZ
APPROVAL RECOMMENDED:
REVIEWED:
REVIEWED:

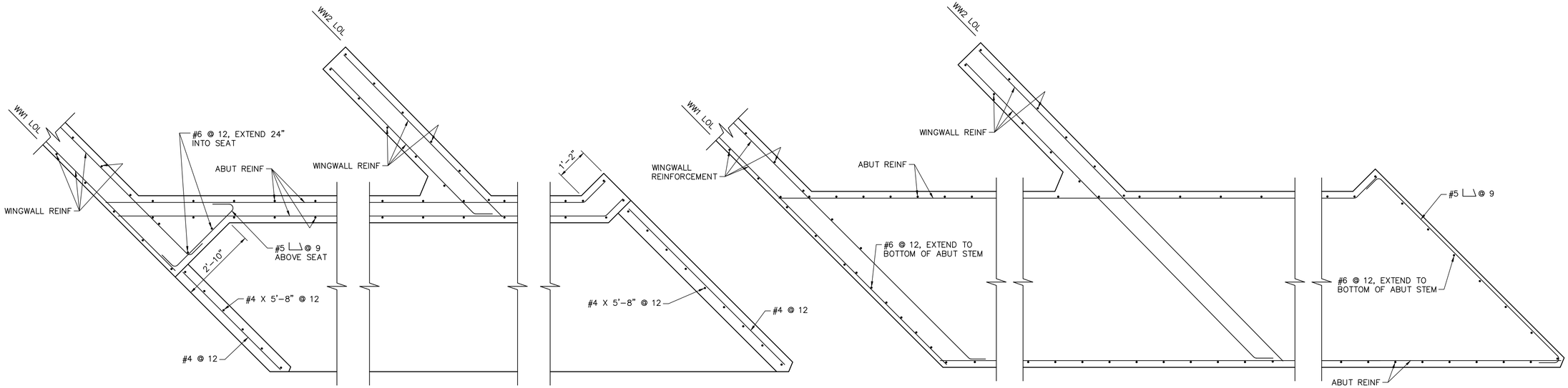
COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

ABUTMENT DETAILS NO. 4

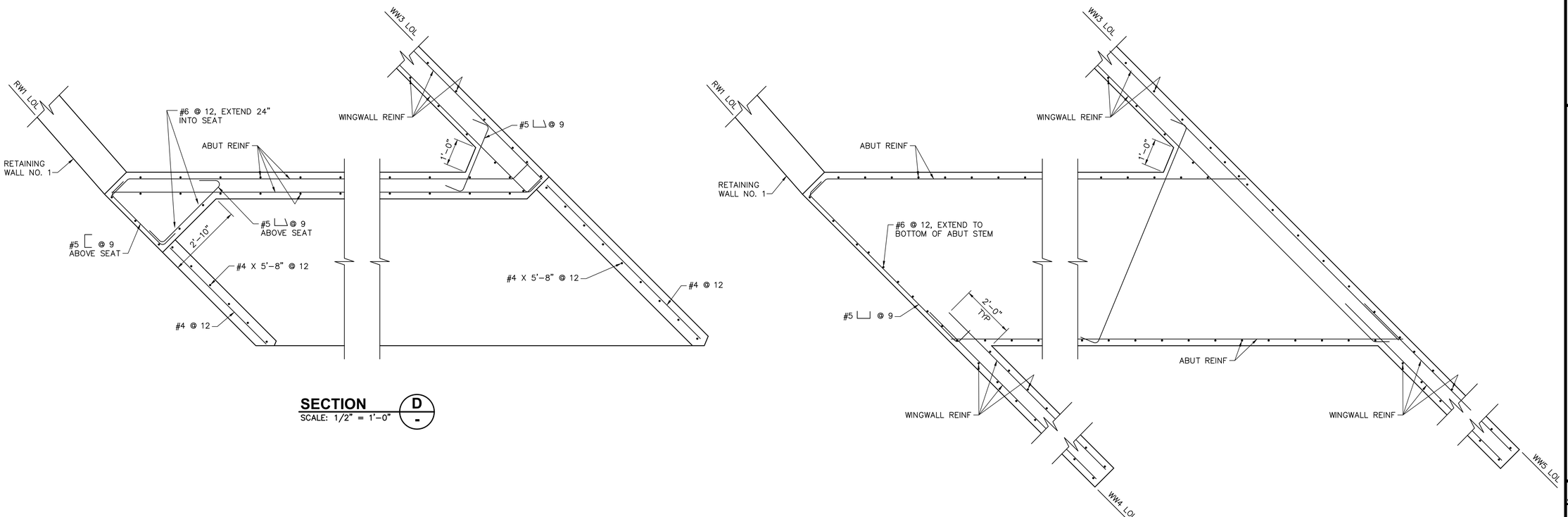
DATE	JUNE 2023
SCALE	AS NOTED
WORK ORDER NO.	R32114
SPECIFICATION NO.	2329
SHEET NO.	78 OF 99
FILE NO.	U-157-8

C:\projects\1030(Wood Rodgers)\010 (Alameda County)\02 (Meekland Ave Br)\8781.004-1-a001.DWG 6-30-23 09:37:10 AM AI



SECTION B (-)
SCALE: 1/2" = 1'-0"

SECTION C (-)
SCALE: 1/2" = 1'-0"



SECTION D (-)
SCALE: 1/2" = 1'-0"

SECTION E (-)
SCALE: 1/2" = 1'-0"

REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY	
MAINTENANCE		TRAFFIC	
REAL ESTATE		ENVIRONMENTAL	

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
2				
3				
4				
5				

REVISIONS

APPROVED — REGISTERED PROFESSIONAL ENGINEER — Jennifer Grant-Martinez — No. 77367 — EXP. 6/30/2025 — CIVIL — STATE OF CALIFORNIA — APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST, BLDG. 100-B TEL 916.341.7760
SACRAMENTO, CA 95816 FAX 916.341.7767

DRAWN: A. SANCHEZ
DESIGNED: J. GRANT-MARTINEZ
CHECKED: J. HAMILTON
APPROVED: C. HODGE
APPROVAL RECOMMENDED: —
REVIEWED: —
REVIEWED: —

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

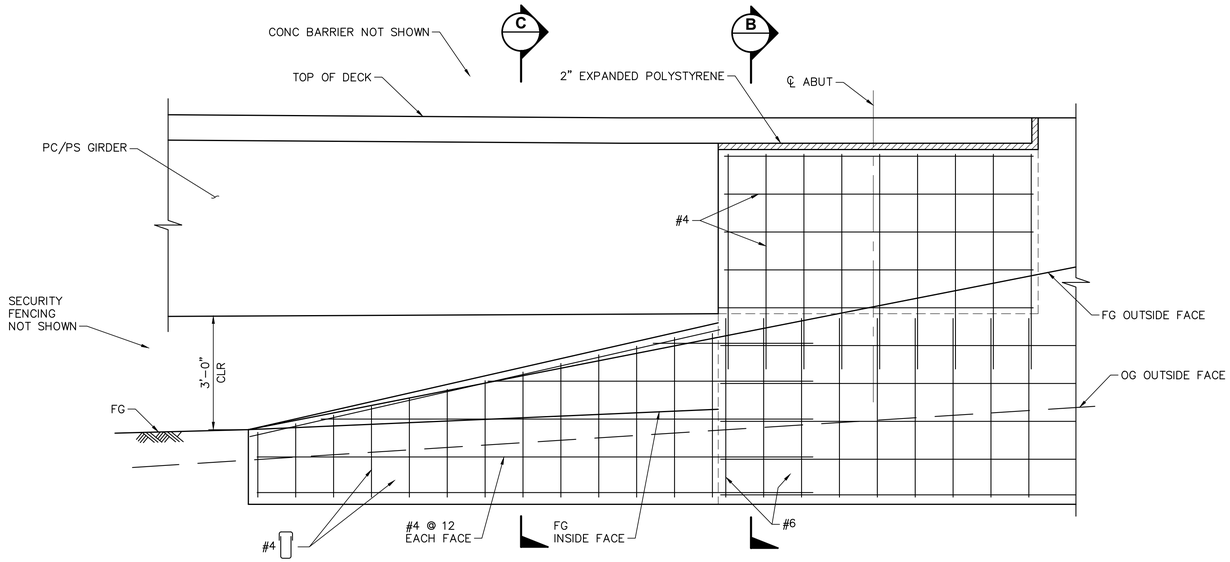
ABUTMENT DETAILS NO. 5

DATE	SCALE
JUNE 2023	AS NOTED

WORK ORDER NO. R32114
SPECIFICATION NO. 2329
SHEET NO. 79 OF 99
FILE NO. U-157-8

FOR REDUCED ENGLISH PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

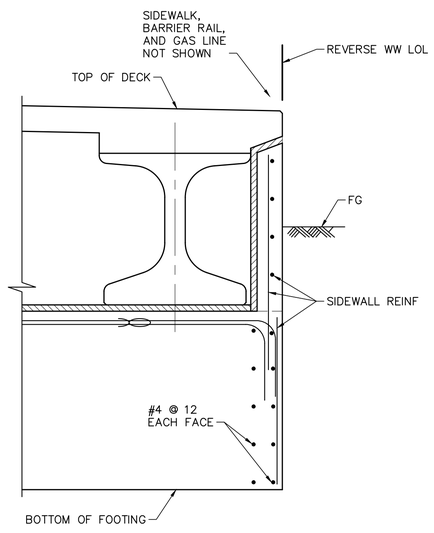
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TYPICAL REVERSE WINGWALL AT ABUTMENT 2

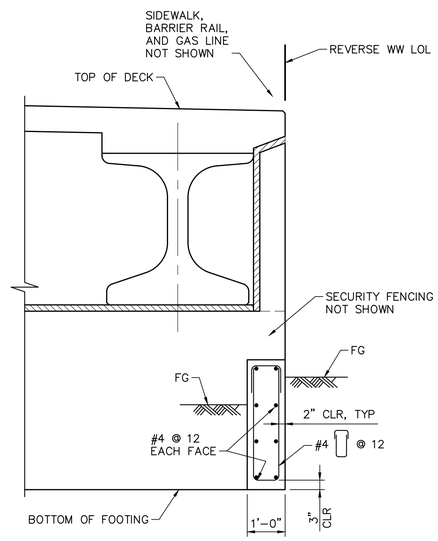
SCALE: 1/2"=1'-0"

REVERSE WINGWALL 5 SHOWN,
REVERSE WINGWALL 4 SIMILAR



SECTION B

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



SECTION C

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

	REVIEWED BY:	DATE:
CONSTRUCTION		
MAINTENANCE		
REAL ESTATE		

	REVIEWED BY:	DATE:
SURVEY		
TRAFFIC		
ENVIRONMENTAL		

NO.	DESCRIPTION	BY	DATE	APPV'D
5				
4				
3				
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1				

REVISIONS

APPROVED — REGISTERED PROFESSIONAL ENGINEER — Jennifer Grant-Martinez — No. 77367 — EXP. 6/30/2025 — CIVIL — STATE OF CALIFORNIA — APPROVAL DATE:

WOOD RODGERS
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DESIGNED: J. GRANT-MARTINEZ
DRAWN: A. SANCHEZ
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APPROVED: C. HODGE
APPROVAL RECOMMENDED:
REVIEWED:
REVIEWED:

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

ABUTMENT DETAILS NO. 6

DATE	SCALE
JUNE 2023	AS NOTED

WORK ORDER NO: R32114

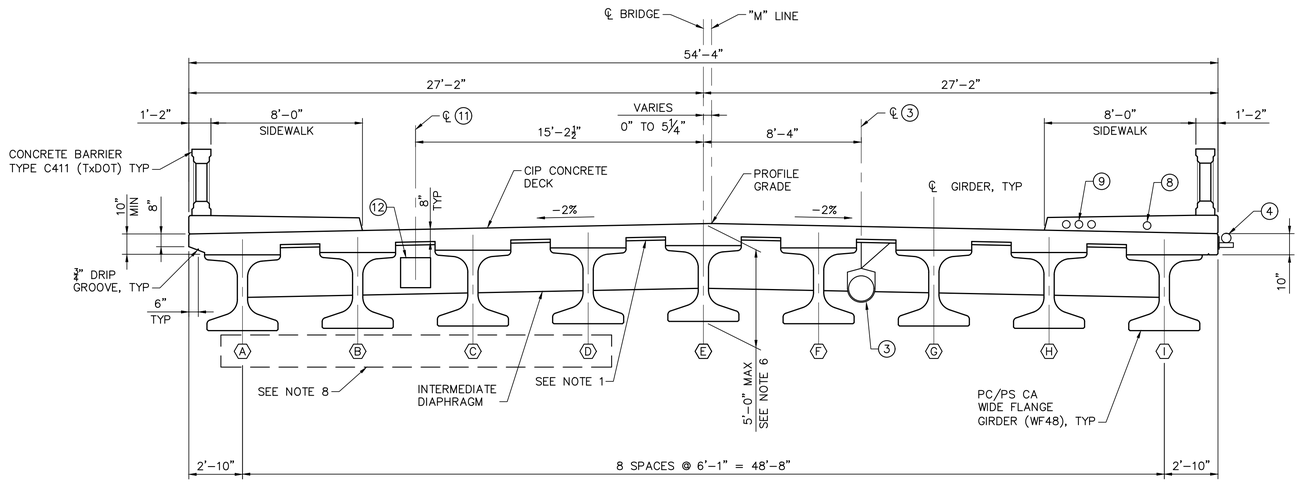
SPECIFICATION NO: 2329

SHEET NO: 80 OF 99

FILE NO: U-157-8

FOR REDUCED ENGLISH PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

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TYPICAL SECTION

SCALE: 1/4"=1'–0"

NOTES

1. PERMANENT STEEL DECK FORM. TOP FLANGE OF PERMANENT DECK FORMS MUST ACCOMMODATE UTILITY HANGER ATTACHMENTS AND BRACES.
2. FOR BARRIER DETAILS, SEE "BARRIER DETAILS" SHEET.
3. CLEARANCE FROM TOP OF CONCRETE DECK TO TOP TRANSVERSE REINFORCEMENT.
4. GIRDER HAUNCH THICKNESS VARIES TO ACCOMMODATE TOP OF DECK PROFILE GRADE.
5. STIRRUPS MAY BE ELIMINATED WHERE HAUNCH THICKNESS IS LESS THAN 3", AS APPROVED BY THE ENGINEER.
6. STRUCTURE DEPTH – 4'–10½" @ ℄ BRG.
7. AS AN AID IN SUPPORTING REINFORCEMENT, ADDITIONAL LONGITUDINAL BARS MAY BE USED IN THE SLAB WITH THE APPROVAL OF THE ENGINEER. SUCH BARS MUST BE FURNISHED AT THE CONTRACTOR'S EXPENSE.
8. GIRDERS (E) (F) (G) (H) (I) TO PLACED DURING STAGE 1 CONSTRUCTION. GIRDERS (A) (B) (C) (D) TO BE PLACED DURING STAGE 2 CONSTRUCTION. SEE "FOUNDATION PLAN" FOR CONSTRUCTION SEQUENCE.

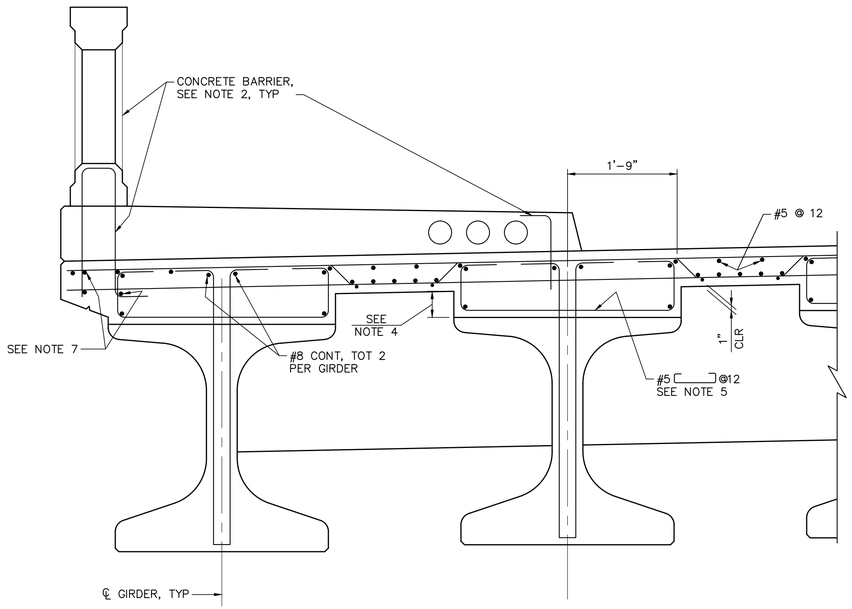
LEGEND

(X) GIRDER IDENTIFICATION LETTER

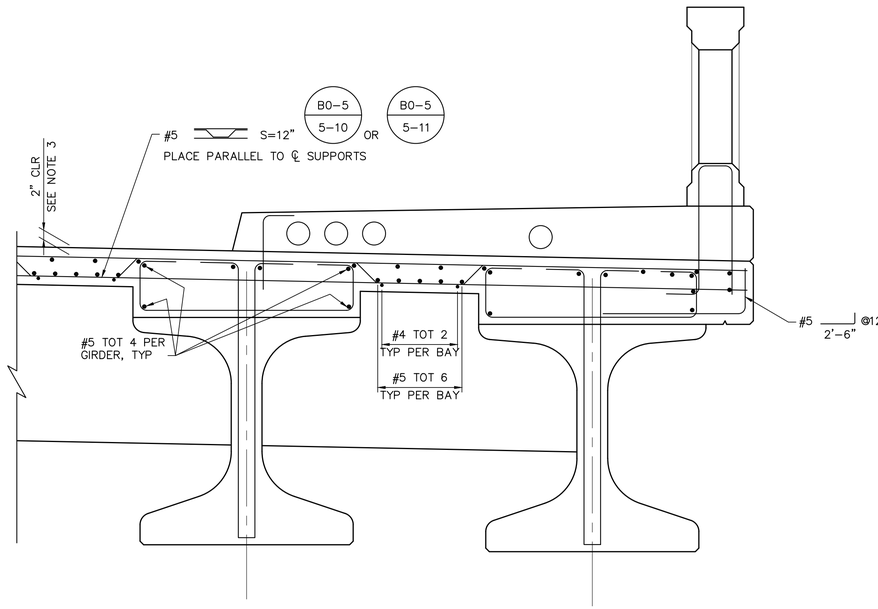
UTILITY DATA TABLE

LOCATION	UTILITY	DESCRIPTION	DIAPHRAGM OPENING	BACKWALL OPENING
(3)	EBMUD	8" HDPE WATER LINE IN 12" CASING*	20" DIAMETER	20" DIAMETER
(4)	PG&E	4" STEEL GAS LINE*	N/A	N/A
(8)	FUTURE FIBER OPTIC	3" CONDUIT WITH PULL WIRE	N/A	N/A
(9)	FUTURE UTILITY CONDUITS	MINIMUM TWO AND MAXIMUM OF FOUR 4" CONDUITS	N/A	N/A
(12)	AT&T	TWO 4" CONDUITS	1'–6" X 11"	1'–6" X 11"

* FOR SUPPORT DETAILS, SEE UTILITY DETAILS SHEETS



NEAR SUPPORTS



MID-SPAN

PART TYPICAL SECTION

SCALE: 3/4"=1'–0"

–40 0 20 40 80 160

(IN FEET)
1"=20'

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

REVISIONS

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
2				
3				
4				
5				

PROFESSIONAL ENGINEER — Jennifer Grant-Martinez — No. 77367 — EXP. 6/30/2025 — CIVIL — STATE OF CALIFORNIA
APPROVED: APPROVAL DATE:

WOOD RODGERS
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3301 C ST. BLDG. 100-B TEL 916.341.7760
SACRAMENTO, CA 95816 FAX 916.341.7767

DESIGNED: J. GRANT-MARTINEZ
DRAWN: A. SANCHEZ
CHECKED: J. HAMILTON
APPROVED: C. HODGE

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

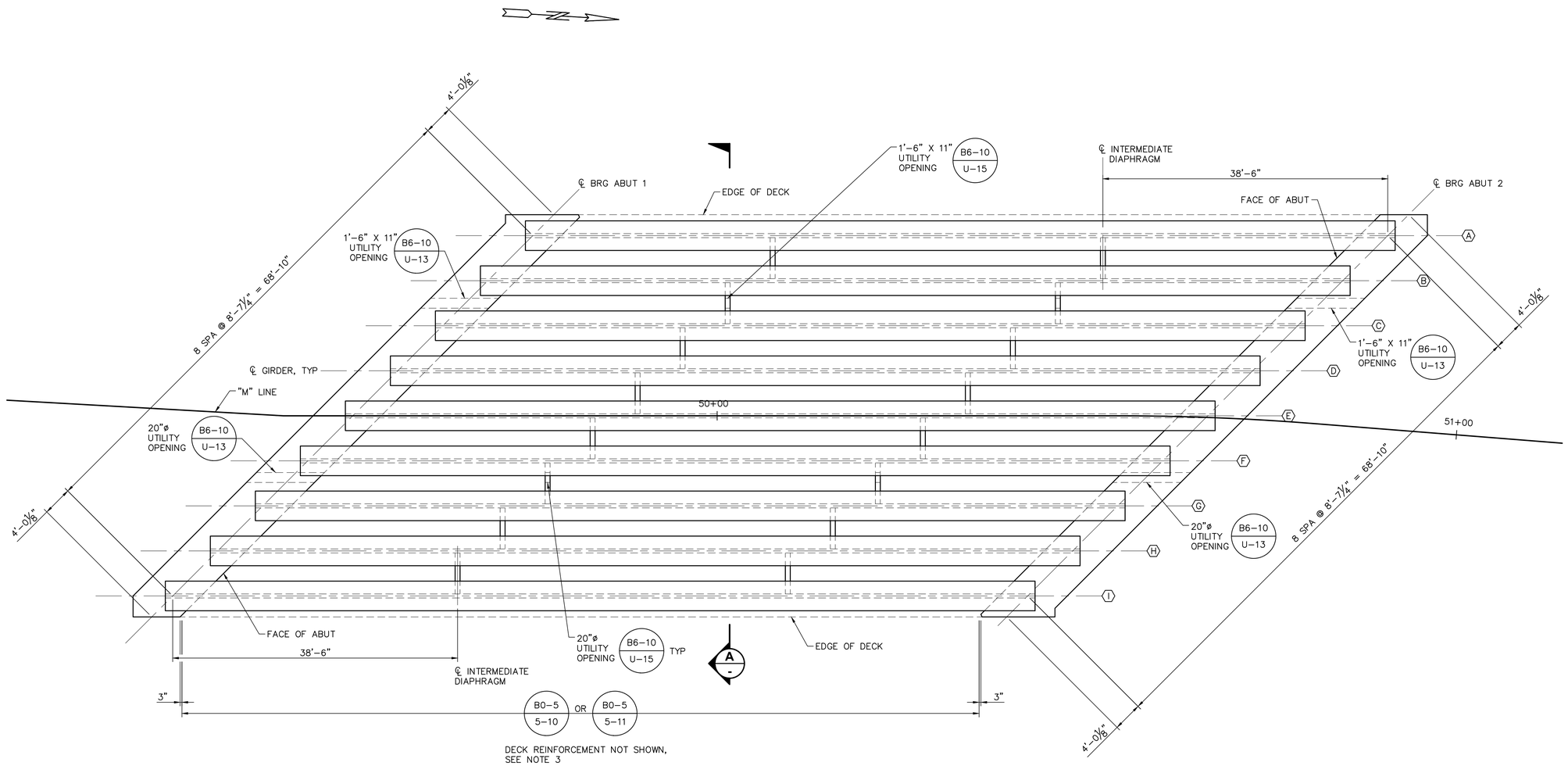
TYPICAL SECTION

REVIEWED: RECOMMENDED: APPROVAL:

DATE: JUNE 2023
SCALE: AS NOTED
WORK ORDER NO. R32114
SPECIFICATION NO. 2329
SHEET NO. 81 OF 99
FILE NO. U-157-8

REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY	
MAINTENANCE		TRAFFIC	
REAL ESTATE		ENVIRONMENTAL	

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GIRDER LAYOUT

SCALE: 1/8"=1'-0"

LEGEND

(X) GIRDER IDENTIFICATION LETTER

NOTES

1. ALL GIRDERS PLACED LONGITUDINALLY ALONG BEARING OF N 03°32'49" W.
2. FOR SECTION A–A, SEE "GIRDER DETAILS NO. 2" SHEET.
3. FOR DECK REINFORCEMENT DETAILS SEE "DECK DETAILS NO. 1" SHEET.

REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY	
MAINTENANCE		TRAFFIC	
REAL ESTATE		ENVIRONMENTAL	

REVISIONS

NO.	DESCRIPTION	BY	DATE	APPV'D
5				
4				
3				
2				
1				

REGISTERED PROFESSIONAL ENGINEER — Jennifer Grant-Martinez — No. 77367 — EXP. 6/30/2025 — CIVIL — STATE OF CALIFORNIA

APPROVED — APPROVAL DATE

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST, Bldg. 100-B Tel 916.341.7760
SACRAMENTO, CA 95816 FAX 916.341.7767

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APPROVAL RECOMMENDED:
REVIEWED:
REVIEWED:

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

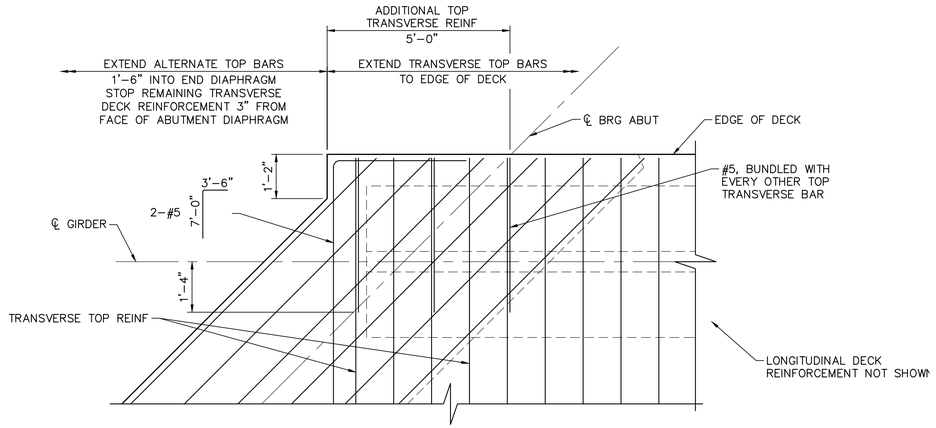
THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD
GIRDER LAYOUT

DATE	SCALE
JUNE 2023	AS NOTED

WORK ORDER NO. R32114
SPECIFICATION NO. 2329
SHEET NO. 82 OF 99
FILE NO. U-157-8

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

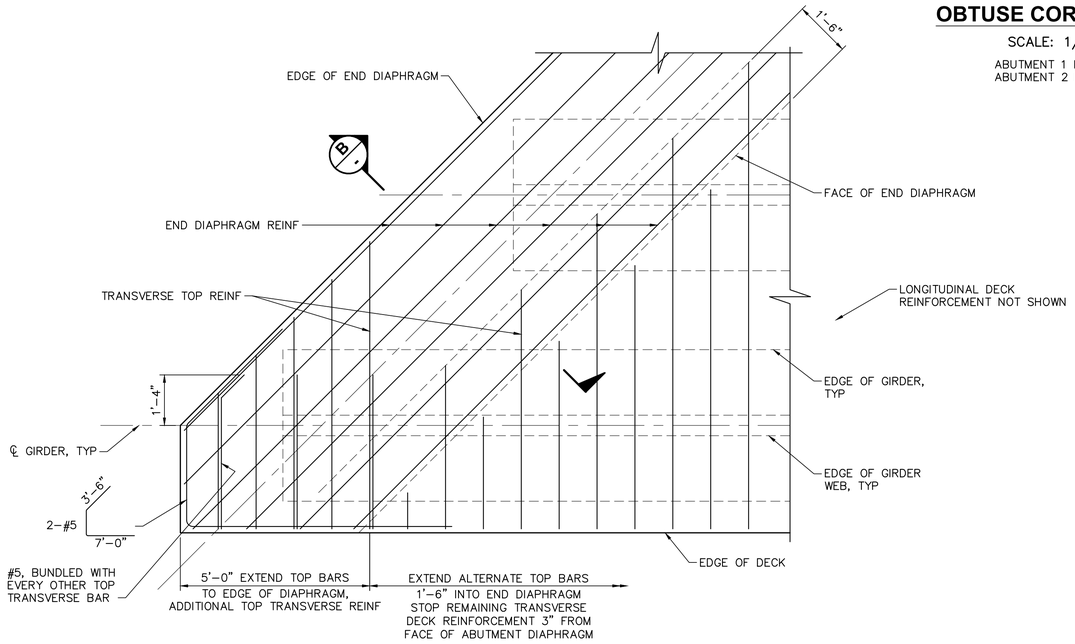
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OBTUSE CORNER DETAILS

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

ABUTMENT 1 LEFT SHOWN,
ABUTMENT 2 RIGHT SIMILAR



ACUTE CORNER DETAILS

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

ABUTMENT 1 RIGHT SHOWN,
ABUTMENT 2 LEFT SIMILAR

NOTES

1. FOR SECTION B-B "DECK DETAILS NO. 2" SHEET.

	REVIEWED BY:	DATE:
CONSTRUCTION		
MAINTENANCE		
REAL ESTATE		

	REVIEWED BY:	DATE:
SURVEY		
TRAFFIC		
ENVIRONMENTAL		

NO.	DESCRIPTION	BY	DATE APPV'D
1			
2			
3			
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REVISIONS

APPROVED: Jennifer Grant-Martinez, No. 77367, EXP. 6/30/2025, CIVIL, STATE OF CALIFORNIA — APPROVAL DATE:

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3301 C ST. BLDG. 100-B SACRAMENTO, CA 95816 TEL 916.341.7760 FAX 916.341.7767

DRAWN: A. SANCHEZ
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COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

REVIEWED:
REVIEWED:
APPROVAL RECOMMENDED::

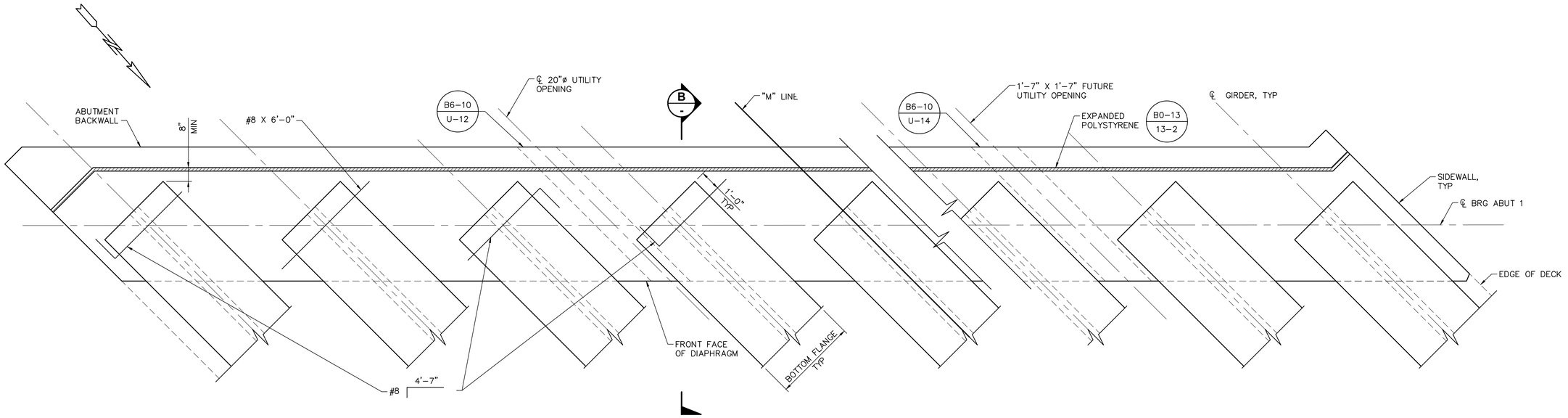
THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

DECK DETAILS NO. 1

DATE	JUNE 2023
SCALE	AS NOTED
WORK ORDER NO.	R32114
SPECIFICATION NO.	2329
SHEET NO.	83 OF 99
FILE NO.	U-157-8

FOR REDUCED ENGLISH PLANS
ORIGINAL SCALE IS IN INCHES
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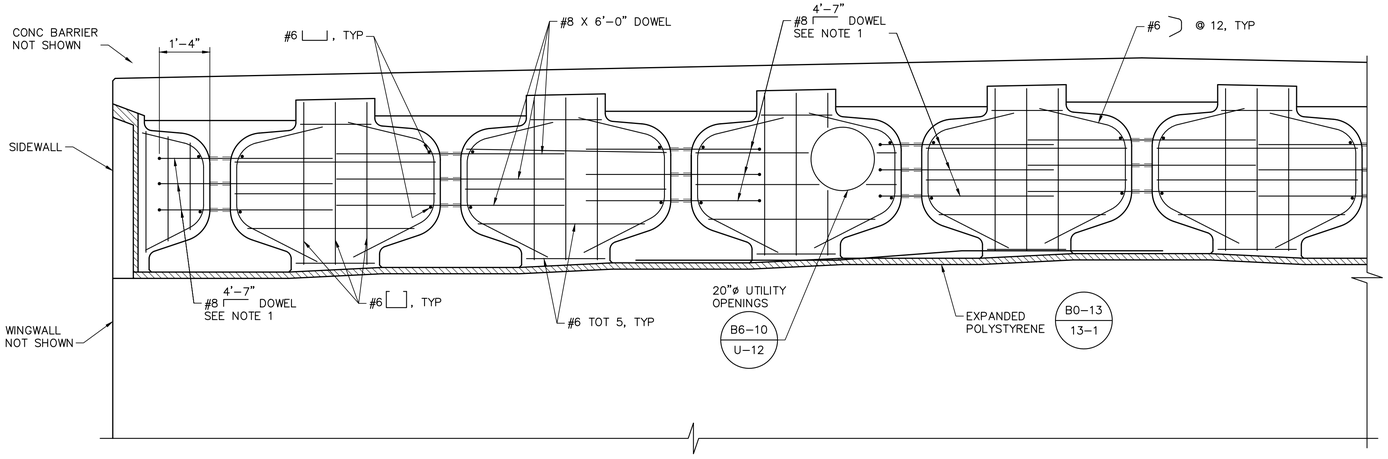
ABUTMENT END DIAPHRAGM - PART PLAN

SCALE: 3/8"=1'-0"

ABUTMENT 1 SHOWN, ABUTMENT 2 SIMILAR

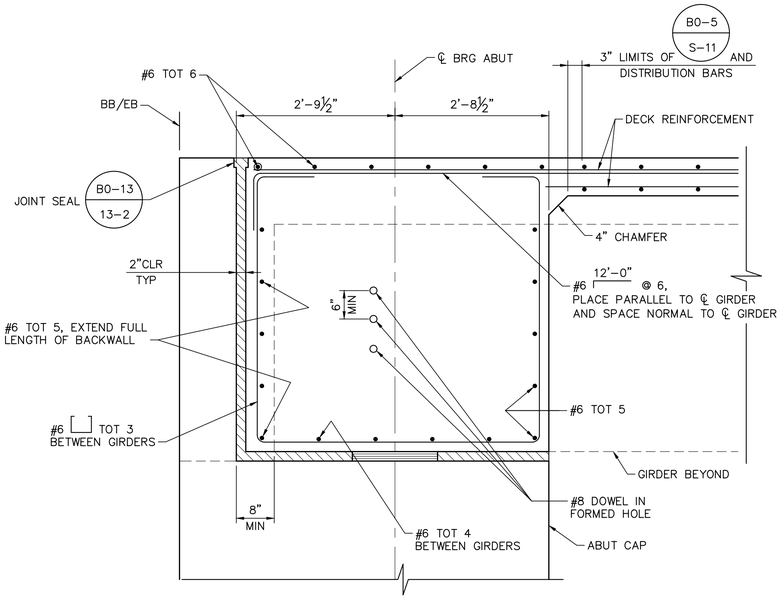
NOTES

1. USE #8 HOOKED DOWELS AT BAYS WITH UTILITY OPENINGS



SECTION A

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



SECTION B

SCALE: 3/4" = 1'-0"

REVISIONS			
NO.	DESCRIPTION	BY	DATE APPV'D
1			
2			
3			
4			
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REVIEWED BY:	DATE:
CONSTRUCTION	
MAINTENANCE	
REAL ESTATE	

REVIEWED BY:	DATE:
SURVEY	
TRAFFIC	
ENVIRONMENTAL	

APPROVED: Jennifer Grant-Martinez, PROFESSIONAL ENGINEER, No. 77367, EXP. 6/30/2025, CIVIL, STATE OF CALIFORNIA — APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST, BLDG. 100-B SACRAMENTO, CA 95816
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APPROVAL RECOMMENDED:

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

DECK DETAILS NO. 2

DATE	SCALE
JUNE 2023	AS NOTED

WORK ORDER NO. R32114

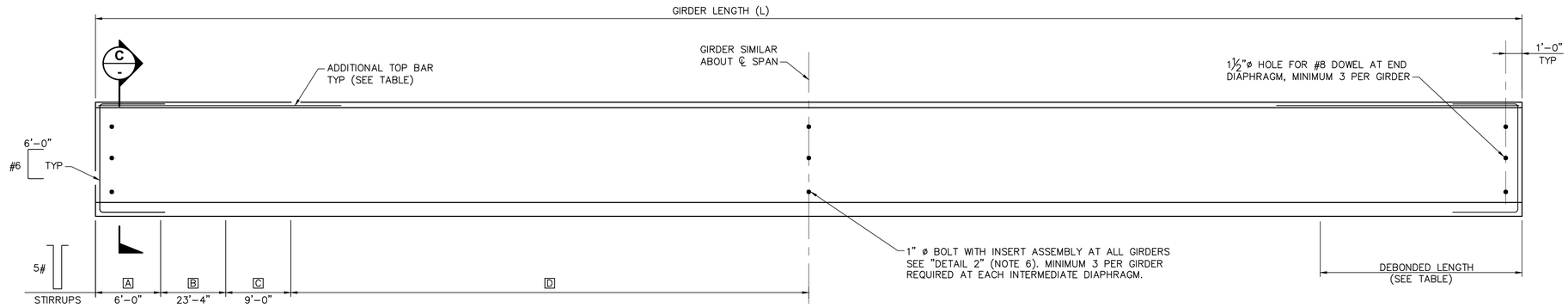
SPECIFICATION NO. 2329

SHEET NO. 84 OF 99

FILE NO. U-157-8

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

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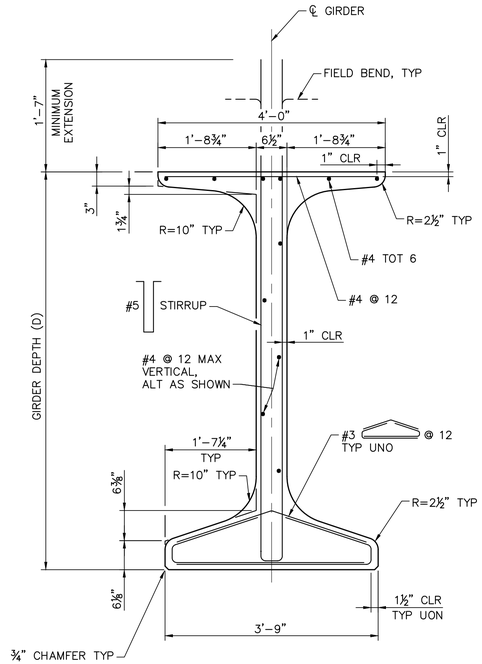
ELEVATION

LOCATION	A	B	C	D
GIRDERS A THRU I	#5 @ 3	#5 @ 5	#5 @ 12	#5 @ 15

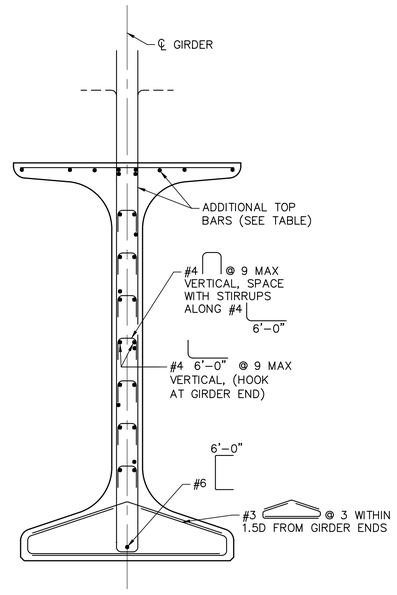
LOCATION	GIRDER LENGTH (L)	GIRDER DEPTH (D)	NUMBER OF 0.6"ø STRANDS	JACKING FORCE (P)	CONCRETE STRENGTH (ksi)		MIDSPAN DEAD LOAD DEFLECTION (FT)		ADDITIONAL TOP BAR (EACH END)
					f'ci	f'c	DECK	RAIL	
GIRDERS A THRU I	117'-6¾"	4'-0"	44	1936 kips (44 kips/STRAND)	5.0	7.0	0.21'	0.03'	#5X6'-0" TOT 2

NOTES

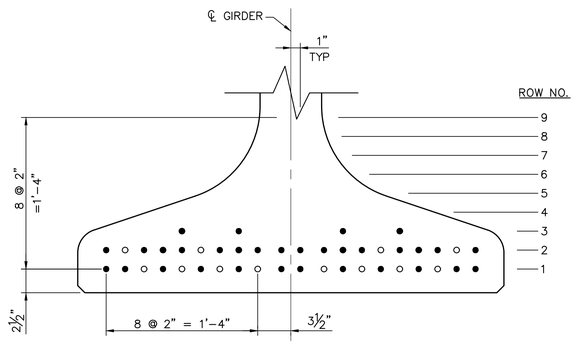
1. THE JACKING FORCE (P) IS THE FORCE REQUIRED AT THE CENTER OF THE SPAN BEFORE ALL DESIGN LOSSES. THE JACKING FORCE DOES NOT INCLUDE ANY FABRICATION SPECIFIC LOSSES.
2. CONCRETE STRENGTH:
   f'ci IS AT TIME OF INITIAL STRESSING
   f'c IS AT 28 DAY COMPRESSION STRENGTH
3. DEFLECTION COMPONENTS WILL BE USED TO SET SCREED LINE ELEVATIONS.
4. SCREED LINE ELEVATIONS FOR DECK CONCRETE WILL BE DETERMINED BY THE ENGINEER.
5. PRESTRESSING STRAND SHALL BE 270 ksi LOW RELAXATION.
6. FOR "DETAIL 2" SEE "GIRDER DETAILS NO. 2" SHEET.



TYPICAL GIRDER SECTION



SECTION C -



STRAND TEMPLATE & DEBONDING PATTERN

GIRDER A, B, C			
ROW NO.	TOTAL NO. OF STRANDS	NO. OF DEBONDED STRANDS	DEBONDED LENGTH
9			
8			
7			
6			
5			
4			
3	4		
2	20	4	12'-0"
1	20	8	36'-0"

STRAND TEMPLATE NOTES

1. STRANDS SHALL BE PLACED AS LOW AS POSSIBLE IN THE STRAND TEMPLATE AND SYMMETRICALLY ABOUT ℄ OF GIRDER.
2. NO MORE THAN 33% OF THE TOTAL NUMBER OF STRANDS AND 50% OF THE STANDS PER HORIZONTAL ROW MAY BE DEBONDED.

LEGEND

- ● CONTINUOUSLY BONDED STRAND LOCATION
- ○ PERMISSIBLE DEBONDED STRAND LOCATION

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

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REVIEWED BY: DATE: CONSTRUCTION MAINTENANCE REAL ESTATE SURVEY TRAFFIC ENVIRONMENTAL

REVISIONS

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
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REGISTERED PROFESSIONAL ENGINEER — Jennifer Grant-Martinez — No. 77367 — EXP. 6/30/2025 — CIVIL — STATE OF CALIFORNIA — APPROVED — APPROVAL DATE:

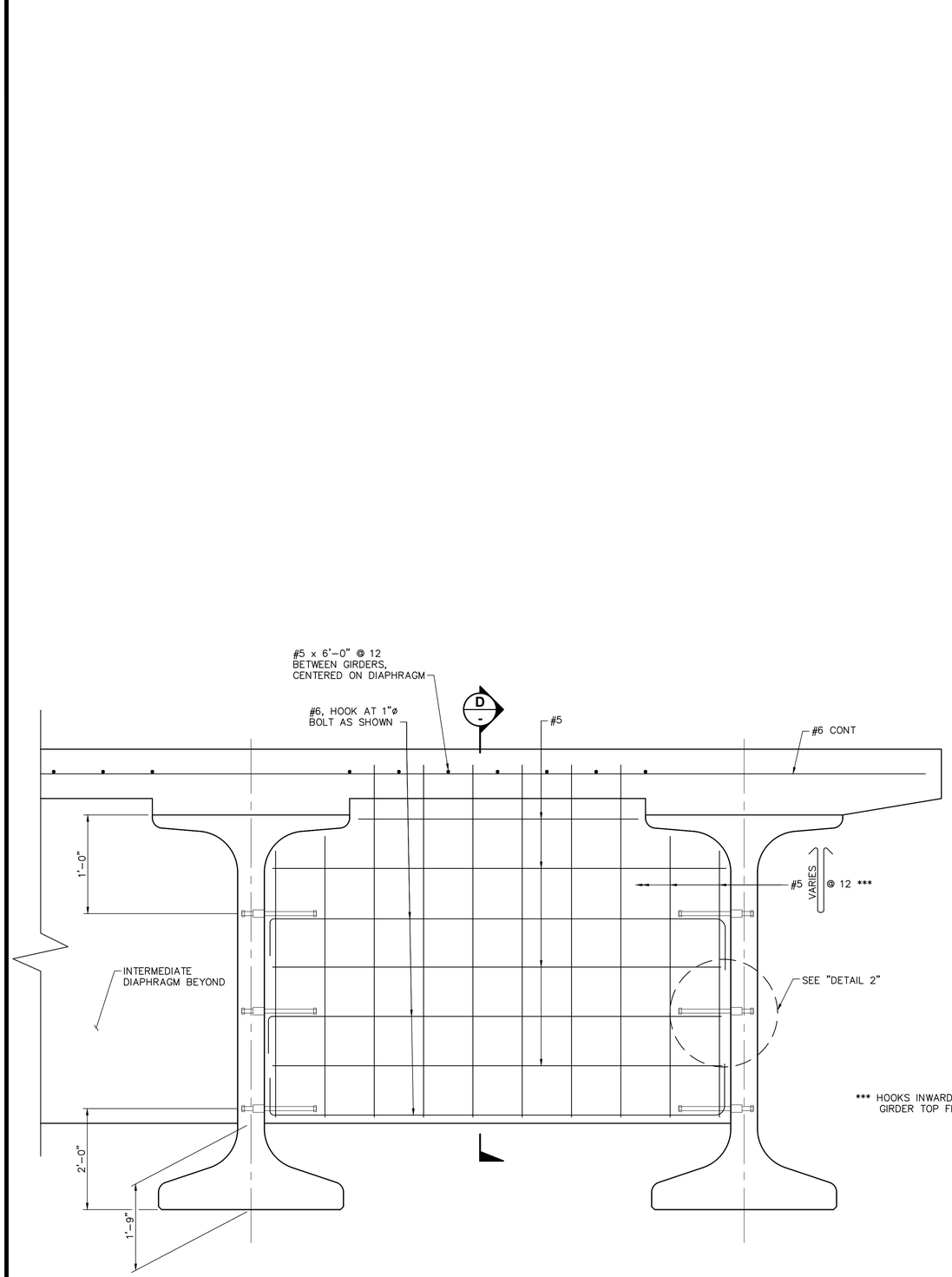
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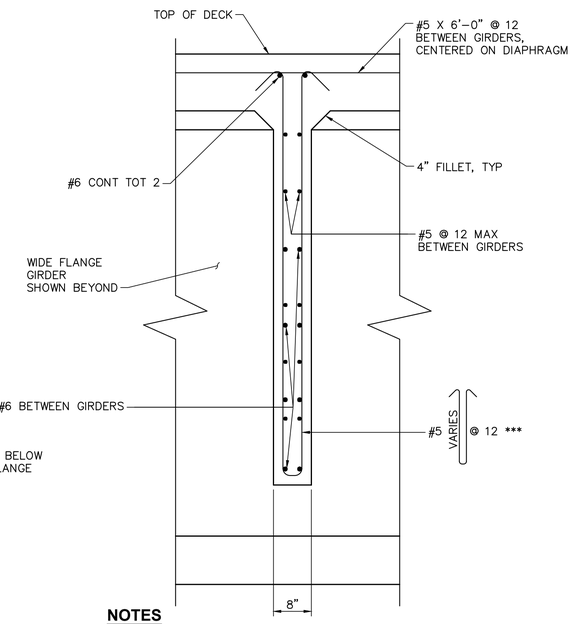
COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY
REVIEWED:
REVIEWED:
APPROVAL RECOMMENDED::
THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD
GIRDER DETAILS NO. 1

DATE: JUNE 2023
SCALE:
WORK ORDER NO.: R32114
SPECIFICATION NO.: 2329
SHEET NO.: 85 OF 99
FILE NO.: U-157-8

	REVIEWED BY:	DATE:		REVIEWED BY:	DATE:
CONSTRUCTION			SURVEY		
MAINTENANCE			TRAFFIC		
REAL ESTATE			ENVIRONMENTAL		



INTERMEDIATE DIAPHRAGM

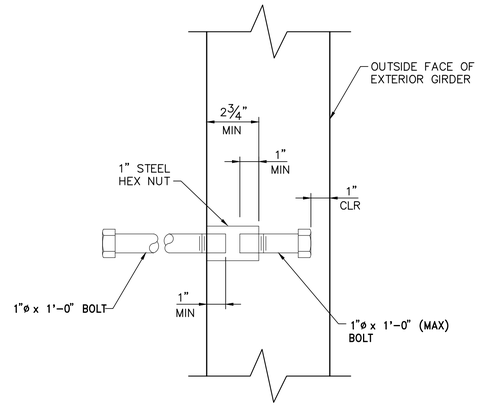


*** HOOKS INWARD BELOW GIRDER TOP FLANGE

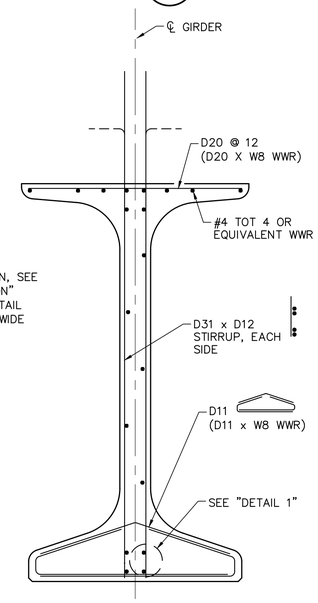
NOTES

DIAPHRAGM MAY BE VERTICAL OR NORMAL TO DECK GRADE.

SECTION D -



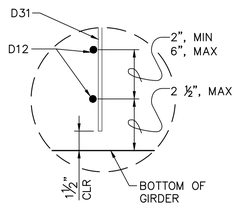
DETAIL 2 -



NOTES

1. FOR DETAILS NOT SHOWN, SEE "TYPICAL GIRDER SECTION" AND "SECTION A–A" DETAIL ON "PC/PRETENSIONED WIDE FLANGE GIRDER" SHEET
2. W8 WWR NOT SHOWN.

WELDED WIRE REINFORCEMENT (WWR) ALTERNATIVE



NOTES

1. BOTTOM OF STIRRUP WWR DETAIL SHOWN, TOP SIMILAR.
2. LONGITUDINAL WIRE AREA SHALL BE 40% OR GREATER OF VERTICAL DEFORMED WIRE'S AREA.

DETAIL 1 -

FOR REDUCED ENGLISH PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

NO.	DESCRIPTION	BY	DATE	APPV'D
5				
4				
3				
2				
1				

REVISIONS

APPROVED: Jennifer Grant-Martinez
No. 77467
EXP. 6/30/2025
CIVIL
STATE OF CALIFORNIA
REGISTERED PROFESSIONAL ENGINEER
APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST, Bldg. 100-B SACRAMENTO, CA 95816
TEL 916.341.7760 FAX 916.341.7767

DRAWN: A. SANCHEZ
DESIGNED: J. GRANT-MARTINEZ
CHECKED: J. HAMILTON
APPROVED: C. HODGE

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

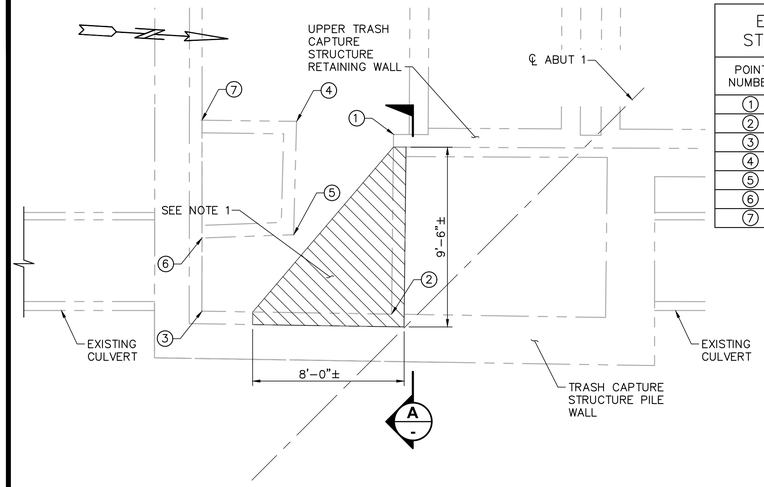
GIRDER DETAILS NO. 2

REVIEWED:
REVIEWED:
APPROVAL RECOMMENDED:

DATE: JUNE 2023
SCALE:
WORK ORDER NO.: R32114
SPECIFICATION NO.: 2329
SHEET NO.: 86 OF 99
FILE NO.: U-157-8

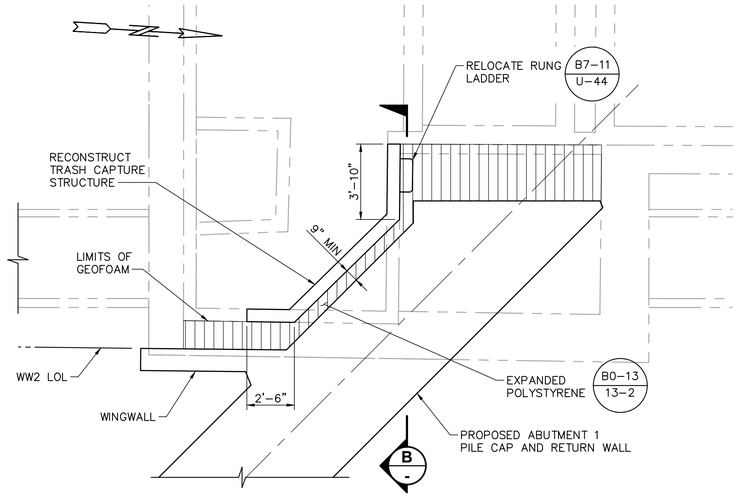
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REVIEWED BY:	DATE:		REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY		
MAINTENANCE		TRAFFIC		
REAL ESTATE		ENVIRONMENTAL		



REMOVE TRASH CAPTURE STRUCTURE

EXISTING TRASH CAPTURE STRUCTURE ELEVATION DATA		
POINT NUMBER	DESCRIPTION	ELEVATION
①	NW TCS Corner	56.72±
②	NE TCS Corner	57.82±
③	SE TCS Corner	57.83±
④	NW Access Hatch Corner	57.64±
⑤	NE Access Hatch Corner	57.69±
⑥	SE Access Hatch Corner	57.67±
⑦	SW Access Hatch Corner	57.65±



RECONSTRUCT TRASH CAPTURE STRUCTURE

SEE NOTE 3

LEGEND

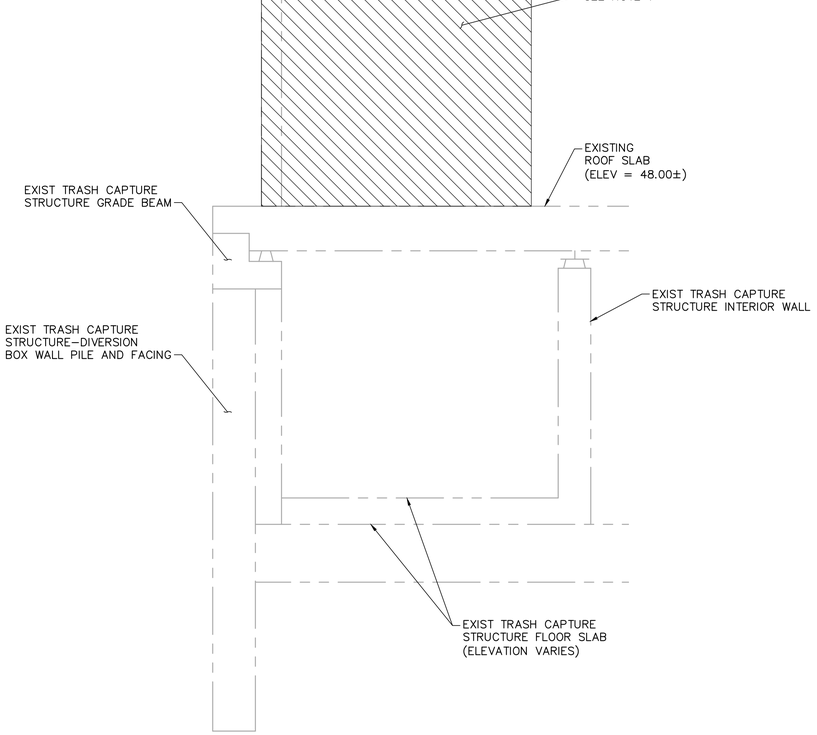
REMOVE TRASH CAPTURE STRUCTURE (PORTION)

NOTES:

1. REMOVE TRASH CAPTURE STRUCTURE WALL, FENCE, LADDER, AND GEOFOAM NO LOWER THAN THE ROOF SLAB OF THE TRASH CAPTURE STRUCTURE.
2. VEHICLE NOT PERMITTED ON THE TRASH CAPTURE STRUCTURE UNTIL RECONSTRUCTED TRASH CAPTURE STRUCTURE WALL FORMS ARE STRIPPED.
3. MODIFICATION TO THE TRASH CAPTURE STRUCTURE DETAILS SHOWN MUST BE APPROVED BY THE ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT.
4. FOR TEMPORARY CONSTRUCTION LOADS SEE "TRASH CAPTURE STRUCTURE MODIFICATION DETAILS NO. 2" SHEET.

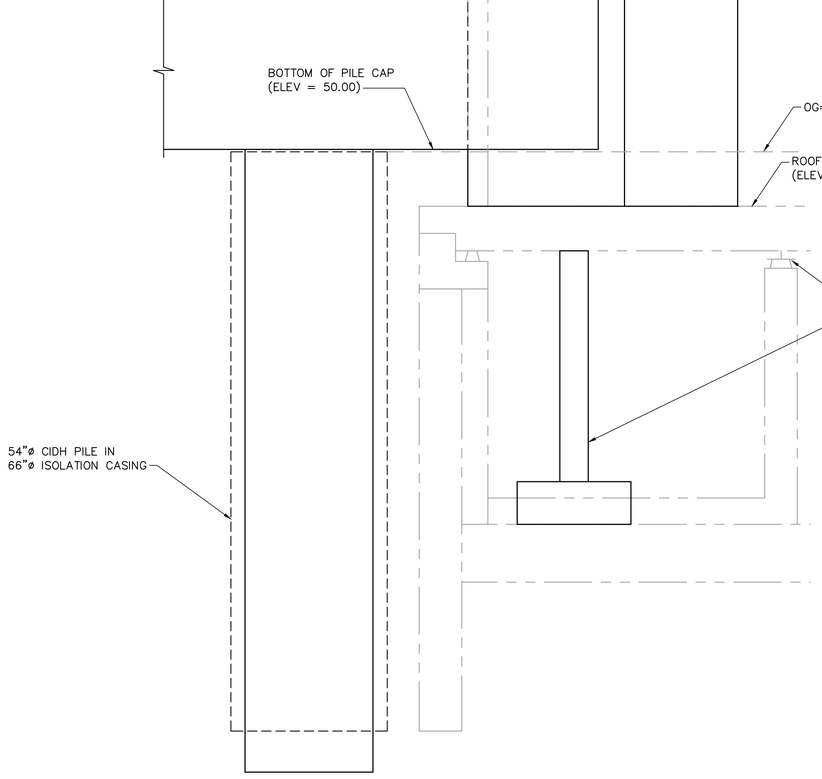
PLAN

SCALE: 1/4"=1'-0"



SECTION A

SCALE: 3/8" = 1'-0"



SECTION B

SCALE: 3/8" = 1'-0"

FOR DETAILS NOT SHOWN SEE SECTION A

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

REVISIONS			
NO.	DESCRIPTION	BY	DATE APPV'D
1			
2			
3			
4			
5			

REGISTERED PROFESSIONAL ENGINEER — Jennifer Grant-Martinez — No. 77567 — EXP. 6/30/2025 — CIVIL — STATE OF CALIFORNIA — APPROVED — APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST. BLDG. 100-B TEL 916.341.7760
SACRAMENTO, CA 95816 FAX 916.341.7767

DRAWN: A. SANCHEZ
DESIGNED: J. GRANT-MARTINEZ
CHECKED: J. HAMILTON
APPROVED: C. HODGE

APPROVAL RECOMMENDED:
REVIEWED:
REVIEWED:

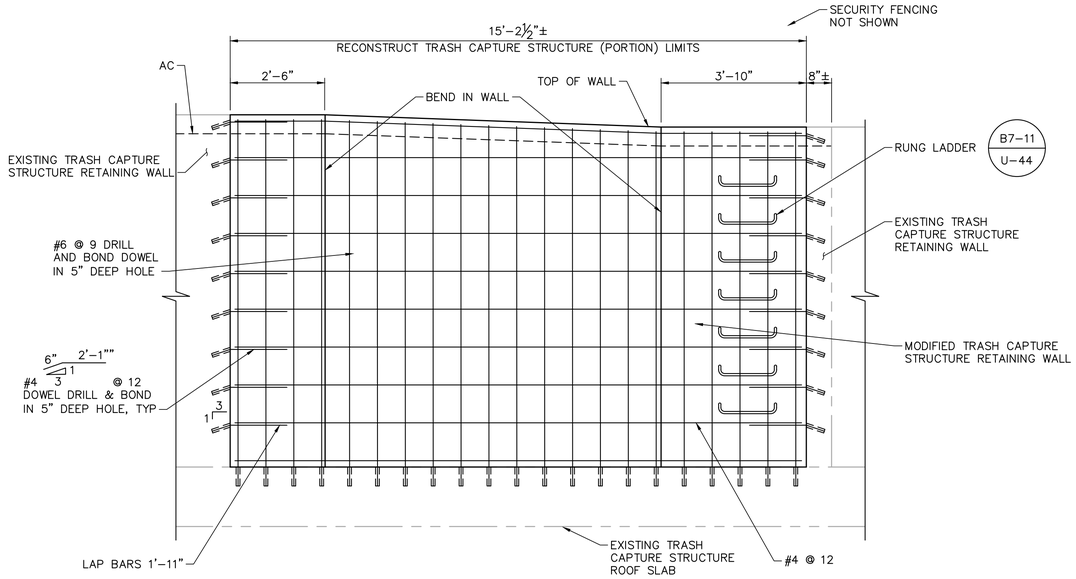
COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

TRASH CAPTURE MODIFICATION DETAILS NO. 1

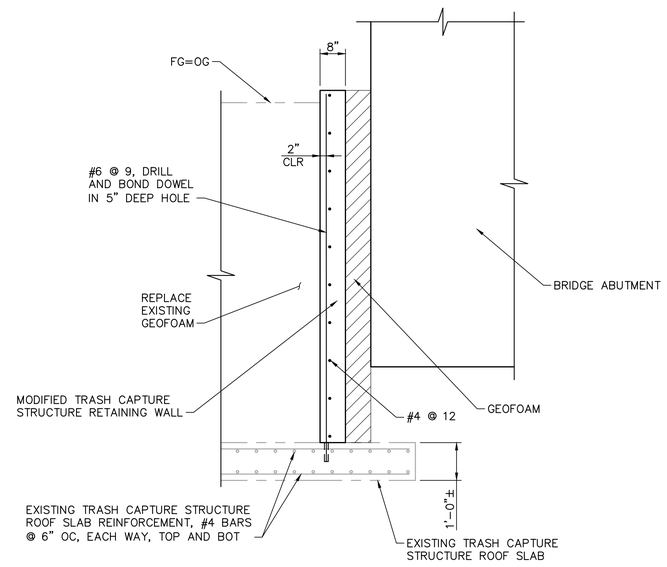
DATE: JUNE 2023	SCALE: AS NOTED
WORK ORDER NO.: R32114	
SPECIFICATION NO.: 2329	
SHEET NO.: 87 OF 99	
FILE NO.: U-157-8	

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RECONSTRUCT TRASH CAPTURE STRUCTURE (PORTION) DEVELOPED ELEVATION

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

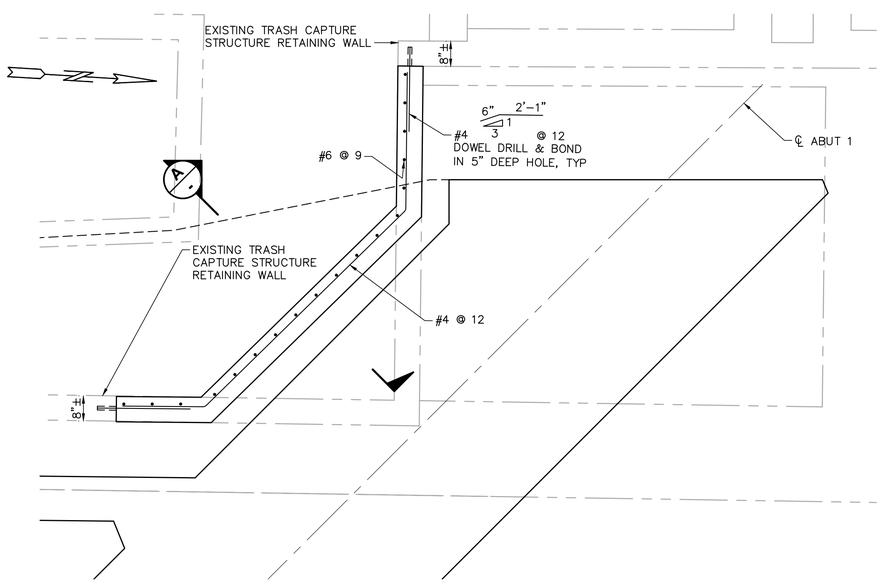


SECTION A

SCALE: 1/2 = 1'-0"

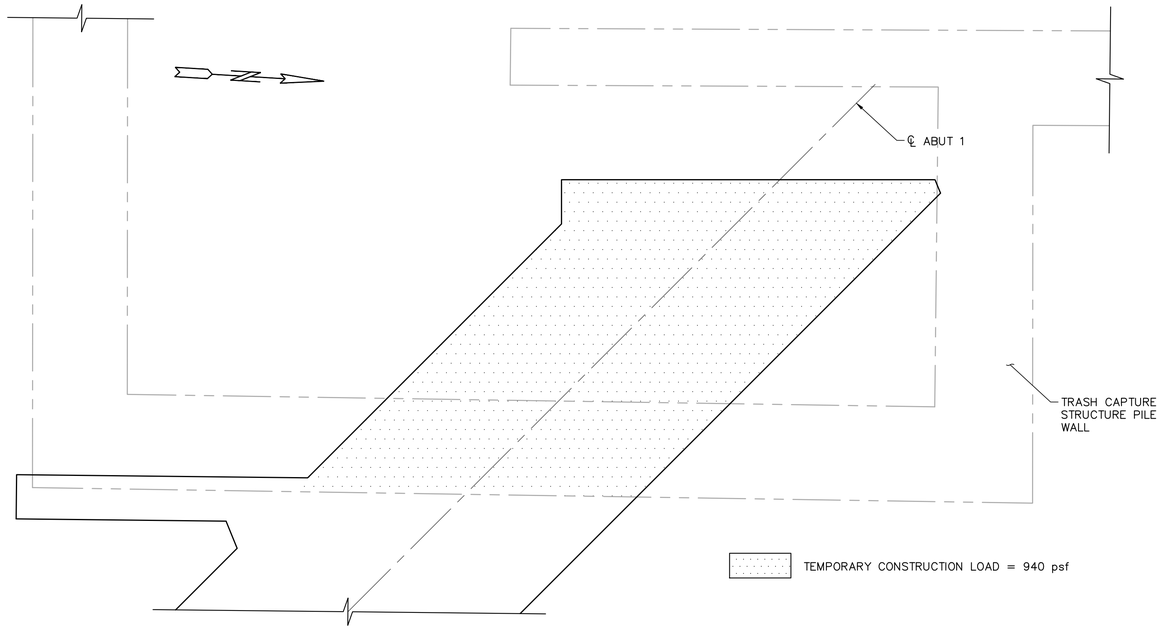
NOTES

1. AVOID EXISTING REINFORCEMENT WHEN DRILLING
2. MODIFICATION TO THE TRASH CAPTURE STRUCTURE DETAILS SHOWN MUST BE APPROVED BY THE ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT.
3. TRASH CAPTURE STRUCTURE TEMPORARY LOADING AND SUPPORTS MAY BE MODIFIED AT THE APPROVAL OF THE ENGINEER. SUBMIT PROPOSED MODIFICATIONS AND SUPPLEMENTAL CALCULATIONS SEALED AND SIGNED BY AN ENGINEER WHO IS REGISTERED AS A CIVIL ENGINEER IN THE STATE. SUBMITTAL DOES NOT GUARANTEE APPROVAL FOR USE.



RECONSTRUCT TRASH CAPTURE STRUCTURE (PORTION) PLAN

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



TEMPORARY CONSTRUCTION LOAD

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

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY	
MAINTENANCE		TRAFFIC	
REAL ESTATE		ENVIRONMENTAL	

NO.	DESCRIPTION	BY	DATE	APPV'D
5				
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2				
1				

REVISIONS

APPROVED: Jennifer Grant-Martinez, No. 77367, EXP. 6/30/2025, CIVIL, STATE OF CALIFORNIA, PROFESSIONAL ENGINEER — APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST, BLDG. 100-B SACRAMENTO, CA 95816 TEL 916.341.7760 FAX 916.341.7767

CHECKED: J. HAMILTON
APPROVED: C. HODGE
DRAWN: A. SANCHEZ
DESIGNED: L. GRANT-MARTINEZ

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

REVIEWED:
REVIEWED:
APPROVAL RECOMMENDED:

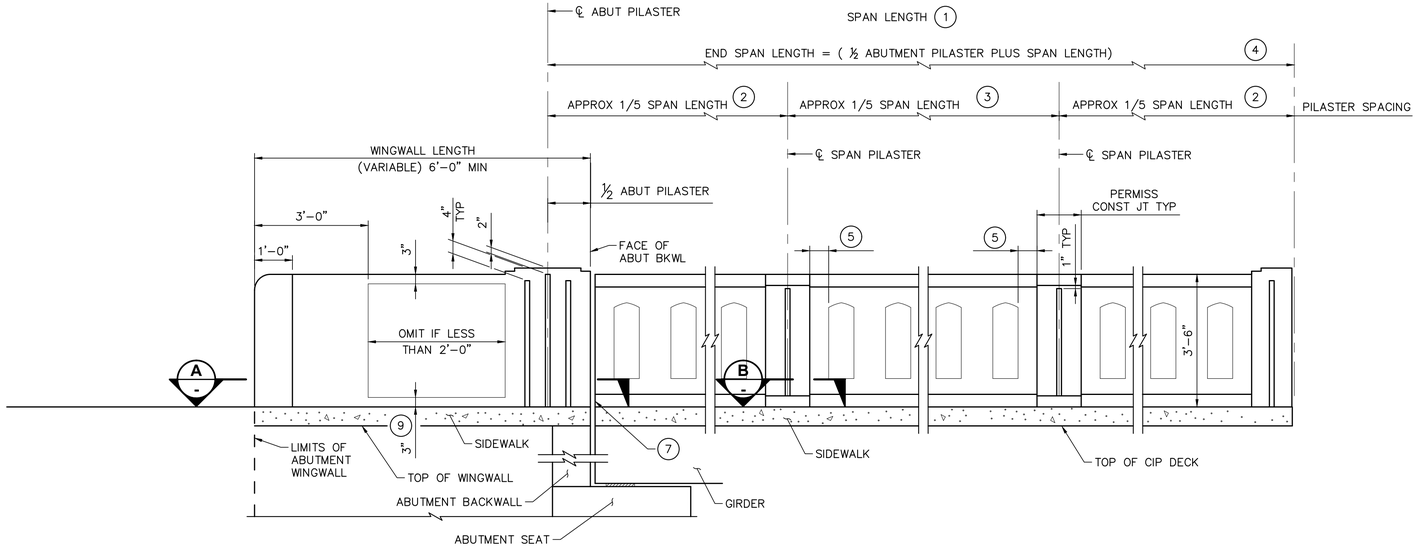
THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

TRASH CAPTURE MODIFICATION DETAILS NO. 2

DATE: JUNE 2023
SCALE: AS NOTED
WORK ORDER NO.: R32114
SPECIFICATION NO.: 2329
SHEET NO.: 88 OF 99
FILE NO.: U-157-8

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REVIEWED BY:	DATE:		REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY		
MAINTENANCE		TRAFFIC		
REAL ESTATE		ENVIRONMENTAL		



ABUTMENT PILASTER

ROADWAY ELEVATION OF RAIL

(1) SPAN LENGTH MEASURED BETWEEN ℄ ABUT PILASTERS

(2) NUMBER OF WINDOWS IN EXTERIOR BAYS ARE EQUAL.

(3) NUMBER OF WINDOWS IN INTERIOR BAY(S) ARE NOT LESS THAN THE AMOUNT IN EXTERIOR BAYS (NOTE 2).

(4) SPACE SPAN PILASTERS AT 1/3 SPAN LENGTH (APPROX) WHEN SPANS ARE 100 FT AND LESS, AS SHOWN. SPACE SPAN PILASTERS AT 1/5 SPAN LENGTH (APPROX) FOR SPANS GREATER THAN 100 FT.

(5) DIMENSION IS THE SAME FOR ALL POSTS ADJACENT TO SPAN PILASTERS IN A SPAN. DIMENSION MAY VARY FROM SPAN TO SPAN, MIN = 3", MAX = 7 ½".

(6) MIN = 6", MAX = 1'-3".

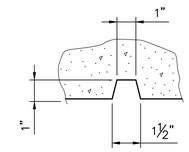
(7) PROVIDE RAIL JOINTS AT ENDS OF ALL SPANS THE SAME WIDTH AS SLAB JOINT OPENING, EXCEPT THAT RAIL JOINTS OVER CONSTRUCTION JOINTS MUST BE ¼" MIN TO ¾" MAX IN WIDTH. JOINTS MUST BE OPEN IF SLAB JOINT OPENING IS NOT SEALED. JOINTS OVER CONSTRUCTION JOINTS AND OVER SEALED DECK JOINTS MUST BE PLUGGED. FORMING MATERIAL USED IN JOINTS MAY BE LEFT IN PLACE IF IT IS LIGHT IN COLOR AND COMPRESSIBLE, SUCH AS THE FOLLOWING MATERIALS: POLYSTYRENE, MOLDED CORK GRANULES, SPONGE RUBBER SHEET, ETC. IF FORMING MATERIAL IS NOT LEFT IN PLACE, PLUG THE BOTTOM 6" WITH SLAB JOINT SEALING COMPOUND TO PREVENT DRAINAGE AND STAINING.

(8) RESERVED

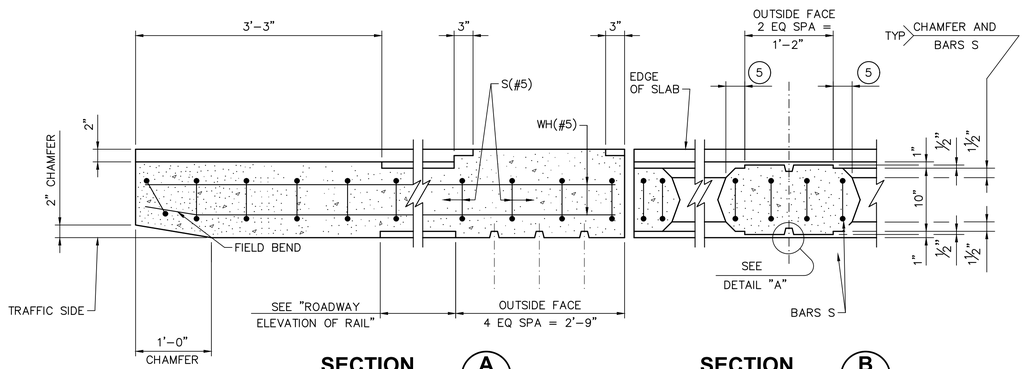
(9) INCREASE 2" FOR STRUCTURES WITH OVERLAY.

(10) RESERVED

(11) RESERVED

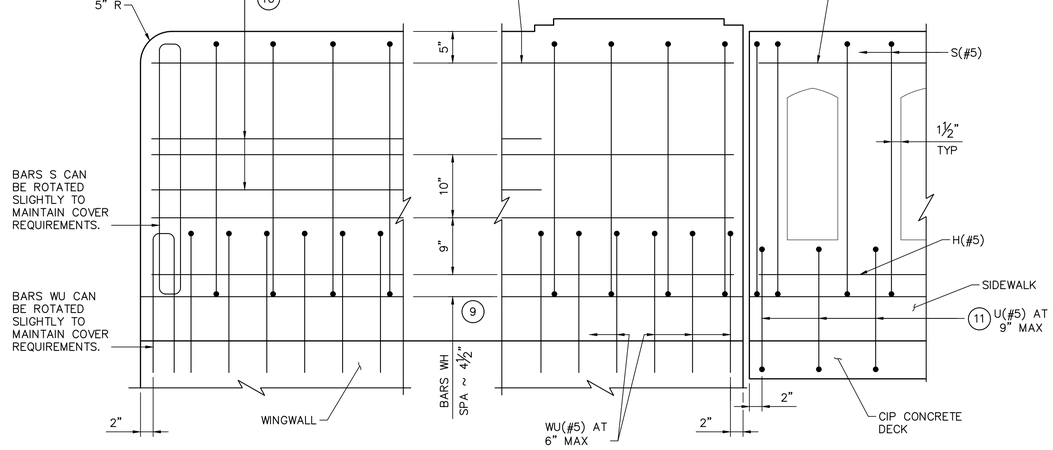


DETAIL A -



SECTION A -

SECTION B -



ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

The use of this railing is restricted to speeds of 45 mph or less.

NO.	DESCRIPTION	BY	DATE	APPV'D
5				
4				
3				
2				
1				

REVISIONS

PROFESSIONAL ENGINEER — Jennifer Grant-Martinez — No. 77367 — EXP. 6/30/2025 — CIVIL — STATE OF CALIFORNIA
APPROVED — APPROVAL DATE:

WOOD RODGERS
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APPROVAL RECOMMENDED::
REVIEWED:
REVIEWED:

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

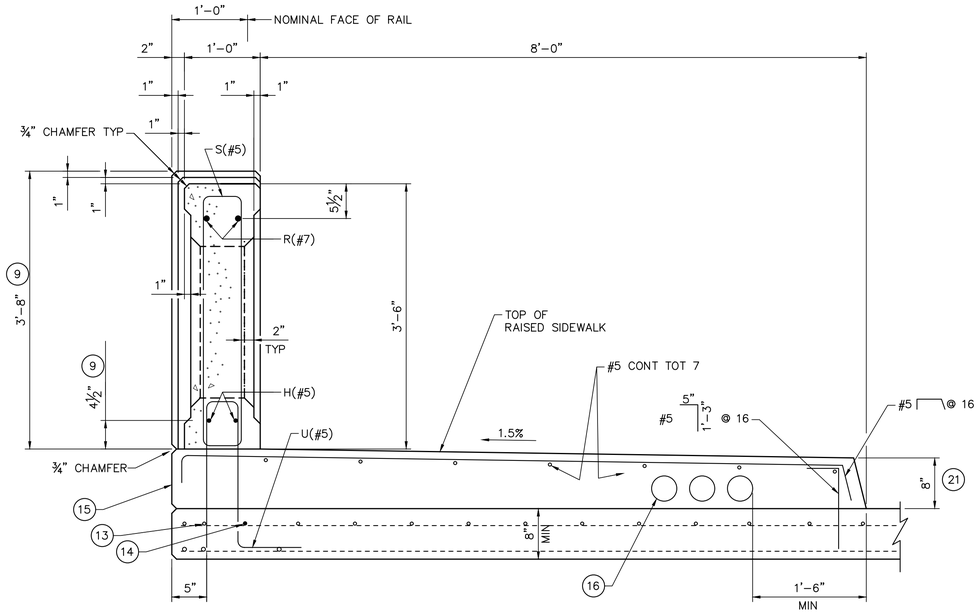
THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

CONCRETE BARRIER DETAILS NO. 1

DATE: JUNE 2023
SCALE: AS NOTED
WORK ORDER NO.: R32114
SPECIFICATION NO.: 2329
SHEET NO.: 89 OF 99
FILE NO.: U-157-8

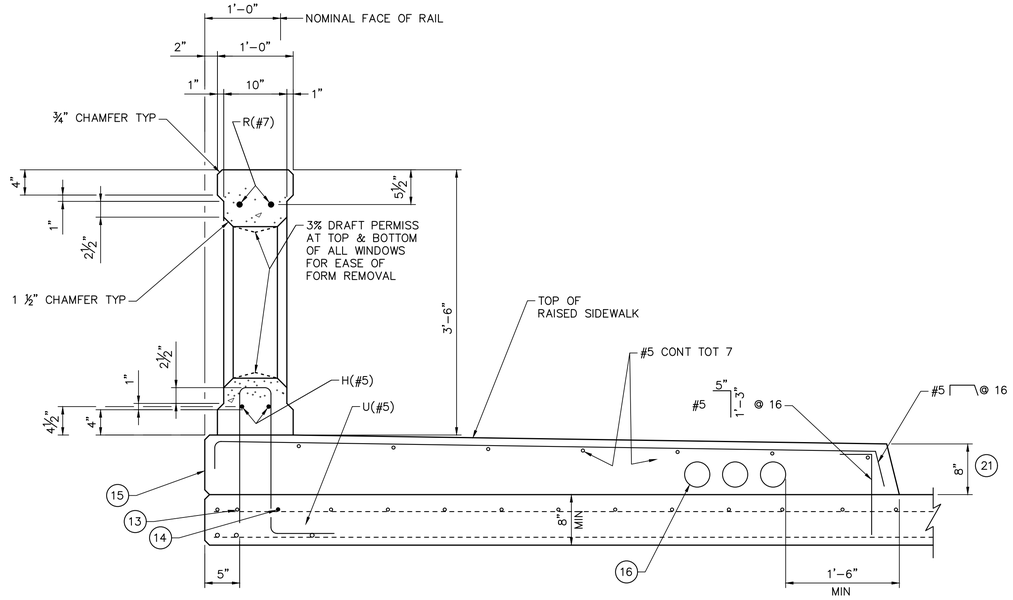
FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

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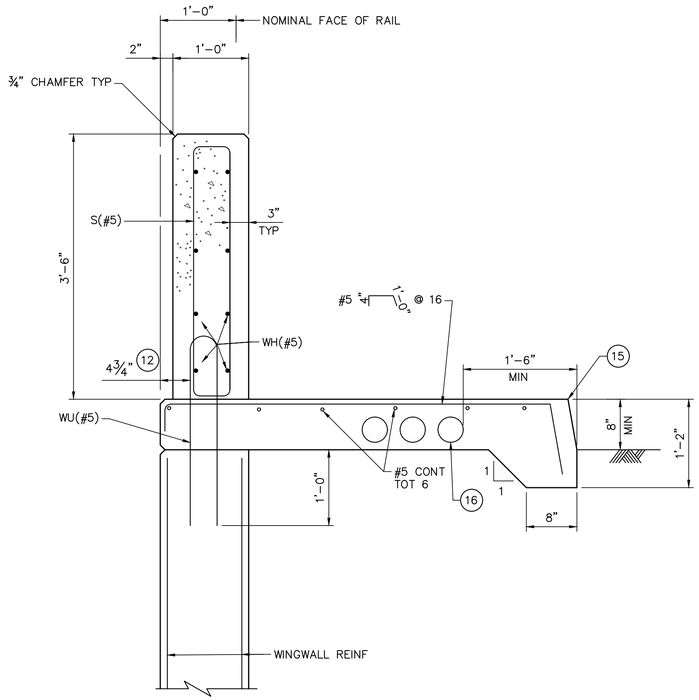


SECTION THRU POST ON BRIDGE SLAB

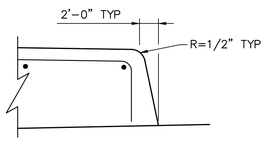
(SHOWING PILASTER)



SECTION THRU WINDOW ON BRIDGE SLAB



ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS



TYPICAL CURB DETAIL

NO SCALE

(9) INCREASE 2" FOR STRUCTURES WITH OVERLAY.

(12) 5¼" WHEN VERTICAL REINFORCING HAS CLOSER CLEAR COVER OVER HORIZONTAL REINFORCING IN ABUTMENT WINGWALLS OR RETAINING WALLS ON TRAFFIC SIDE OF WALL.

(13) AS AN AID IN SUPPORTING REINFORCEMENT, ADDITIONAL LONGITUDINAL BARS MAY BE USED IN THE SLAB WITH THE APPROVAL OF THE ENGINEER. SUCH BARS MUST BE FURNISHED AT THE CONTRACTOR'S EXPENSE.

(14) TOP LONGITUDINAL SLAB BAR MAY BE ADJUSTED LATERALLY 3" PLUS OR MINUS TO TIE REINFORCING.

(15) RAISED SIDEWALK

(16) A MAXIMUM OF FOUR – 4" AND A MINIMUM OF TWO – 4" ROUND OPENINGS FOR FUTURE UTILITIES. OPENINGS ARE TO BE SEALED AT ENDS AND EXTENDED 8" MINIMUM PAST END OF SIDEWALK IF NOT USED. DUCT FORMS ARE TO BE TIED DOWN. MINIMUM OF 6" FORM FACE OF RAIL TO UTILITY OPENING. SEE STANDARD PLAN B14–3 FOR MINIMUM SPACING BETWEEN CONDUITS AND FOR CONDUIT DETAILS AT JOINTS.

(17) WALLS ARE TO BE BACKFILLED BEFORE RAILING IS PLACED.

(19) TERMINATE ALL LONGITUDINAL CURB, SIDEWALK, AND DECK REINFORCEMENT IN STANDARD 90° HOOKS.

(20) DIMENSIONS WILL VARY WITH CROSS SLOPE AND WITH CERTAIN THICKNESS OF SURFACING.

(21) EXPANSION JOINT TO MATCH DECK JOINT.

	REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION			SURVEY	
MAINTENANCE			TRAFFIC	
REAL ESTATE			ENVIRONMENTAL	

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
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APPROVED: Jennifer Grant-Martinez, No. 77367, EXP. 6/30/2025, PROFESSIONAL ENGINEER, CIVIL, STATE OF CALIFORNIA — APPROVAL DATE:

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COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

CONCRETE BARRIER DETAILS NO. 2

DATE	SCALE
JUNE 2023	AS NOTED

WORK ORDER NO. R32114

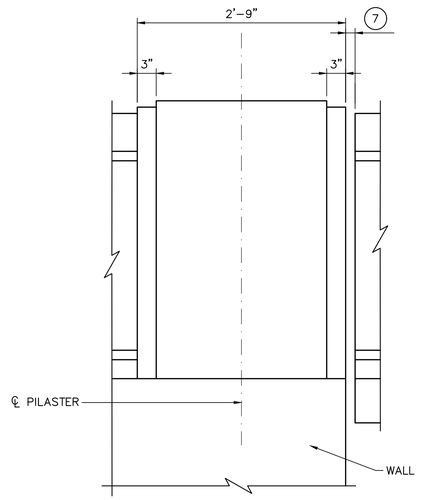
SPECIFICATION NO. 2329

SHEET NO. 90 OF 99

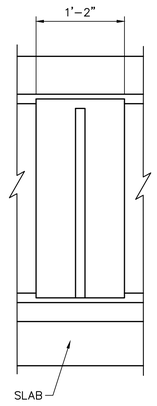
FILE NO. U-157-8

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

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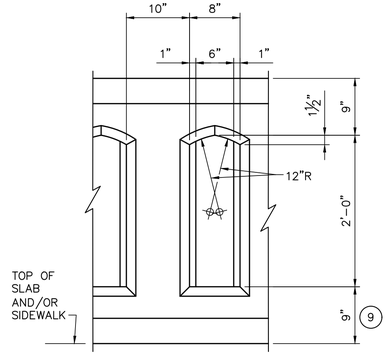
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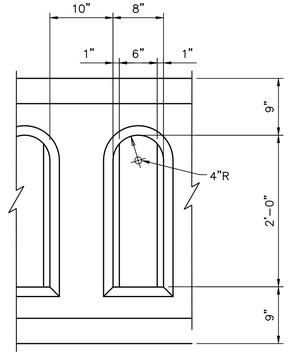
SPAN

EXTERIOR PILASTER ELEVATIONS

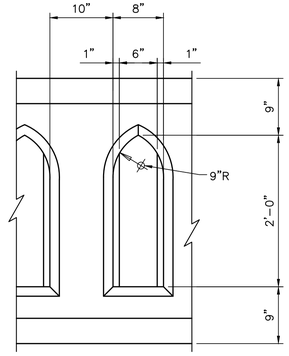
(Showing without raised sidewalk)



TYPE A



TYPE B

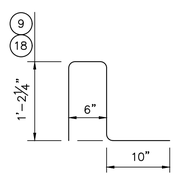


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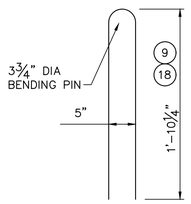
WINDOW TYPES

NOTE:

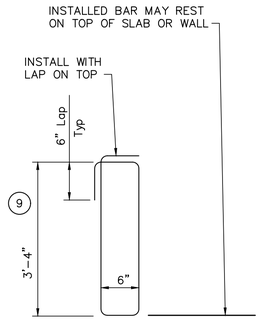
1. FACE OF RAIL AND PILASTERS, PARAPET MUST BE PLUMB UNLESS OTHERWISE APPROVED BY THE ENGINEER.



BARS U (#5)



BARS WU (#5)



BARS S (#5)

(7) PROVIDE RAIL JOINTS AT ENDS OF ALL SPANS THE SAME WIDTH AS SLAB JOINT OPENING, EXCEPT THAT RAIL JOINTS OVER CONSTRUCTION JOINTS MUST BE ¼" MIN TO ¾" MAX IN WIDTH. JOINTS MUST BE OPEN IF SLAB JOINT OPENING IS NOT SEALED. JOINTS OVER CONSTRUCTION JOINTS AND OVER SEALED DECK JOINTS MUST BE PLUGGED. FORMING MATERIAL USED IN JOINTS MAY BE LEFT IN PLACE IF IT IS LIGHT IN COLOR AND COMPRESSIBLE, SUCH AS THE FOLLOWING MATERIALS: POLYSTYRENE MOLDED CORK GRANULES, SPONGE RUBBER SHEET, ETC. IF FORMING MATERIAL IS NOT LEFT IN PLACE, PLUG THE BOTTOM 6" WITH SLAB JOINT SEALING COMPOUND TO PREVENT DRAINAGE AND STAINING.

(9) INCREASE 2" FOR STRUCTURES WITH OVERLAY.

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

	REVIEWED BY:	DATE:		REVIEWED BY:	DATE:
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MAINTENANCE			TRAFFIC		
REAL ESTATE			ENVIRONMENTAL		

NO.	DESCRIPTION	BY	DATE	APPV'D
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APPROVED: Jennifer Grant-Martinez, PROFESSIONAL ENGINEER, No. 77367, EXP. 6/30/2025, CIVIL, STATE OF CALIFORNIA — APPROVAL DATE:

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DESIGNED: J. GRANT-MARTINEZ
APPROVAL RECOMMENDED::
REVIEWED:
REVIEWED:

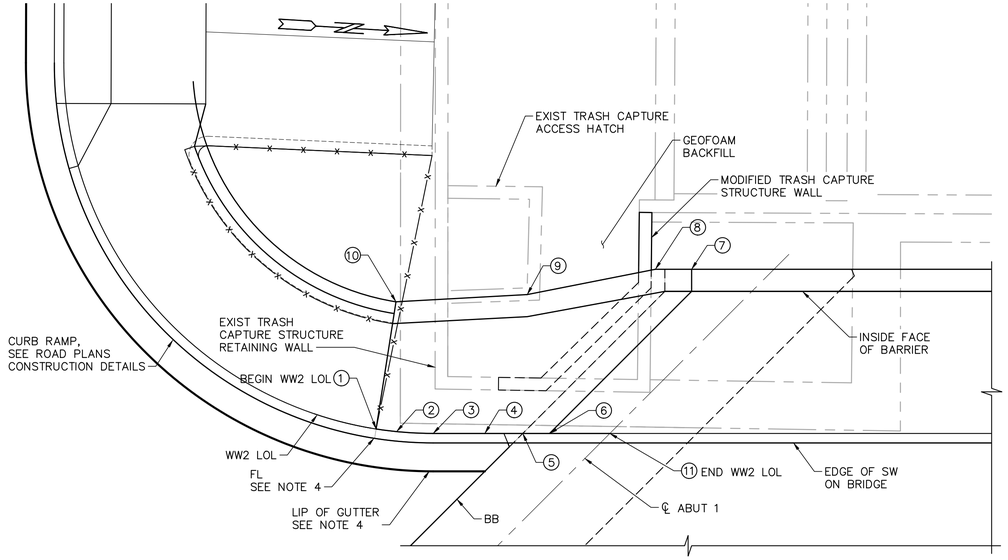
COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

CONCRETE BARRIER DETAILS NO. 3

DATE: JUNE 2023
SCALE: AS NOTED
WORK ORDER NO.: R32114
SPECIFICATION NO.: 2329
SHEET NO.: 91 OF 99
FILE NO.: U-157-8

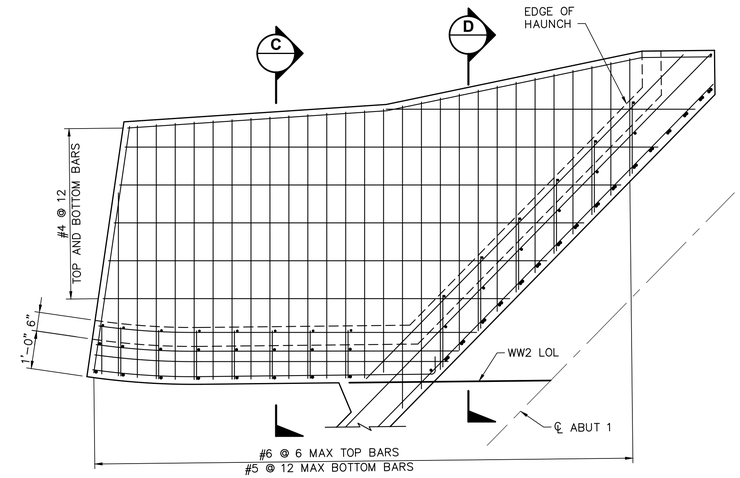
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PLAN

SCALE: 1/4"=1'-0"

TOP OF WW SLAB			
POINT NUMBER	STATION	OFFSET	ELEVATION
1	STA 49+56.15	18.73' LT	60.17'
2	STA 49+57.23	18.60' LT	60.20'
3	STA 49+59.16	18.50' LT	60.26'
4	STA 49+61.89	18.50' LT	60.32'
5	STA 49+63.89	18.50' LT	60.36'
6	STA 49+65.31	18.50' LT	60.37'
7	STA 49+72.81	27.17' LT	60.26'
8	STA 49+70.89	27.17' LT	--
9	STA 49+64.13	25.83' LT	--
10	STA 49+57.20	25.45' LT	--
11	STA 49+68.49	18.50' LT	--

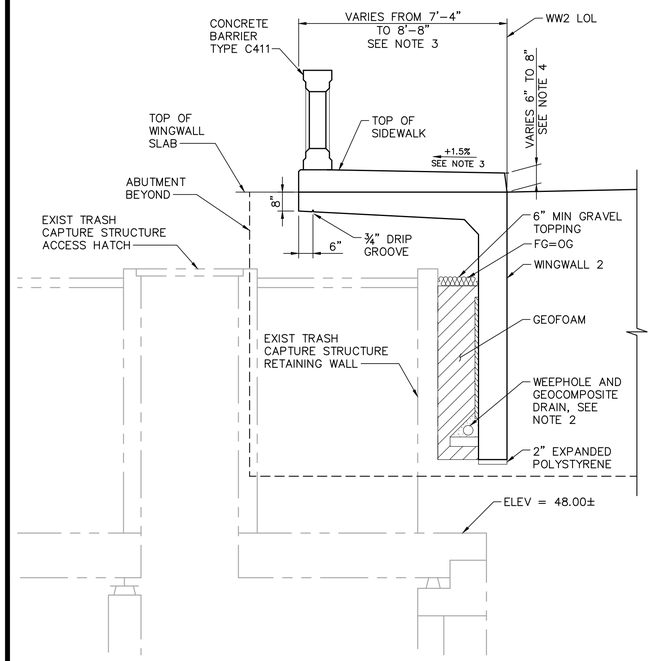


OVERHANG REINFORCEMENT DETAILS

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

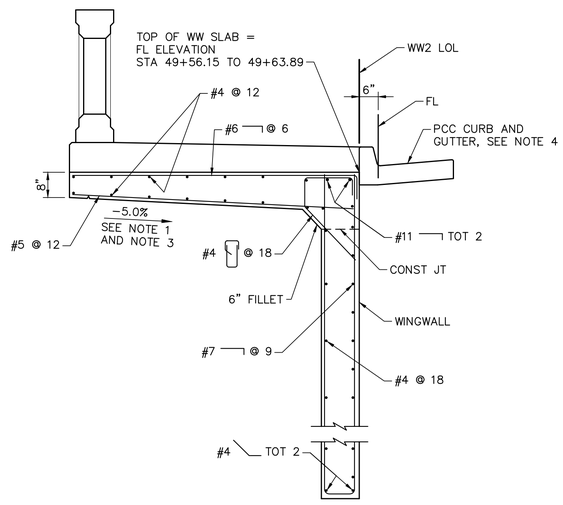
NOTES

1. THE SLOPE AT BOTTOM OF OVERHANG MUST BE CONSTANT AT 5%
2. CONNECT TO ABUTMENT WEEPHOLE AND GEOCOMPOSITE DRAIN.
3. MEASURED NORMAL TO WW LOL.
4. SEE ROAD PLANS FOR DETAILS.



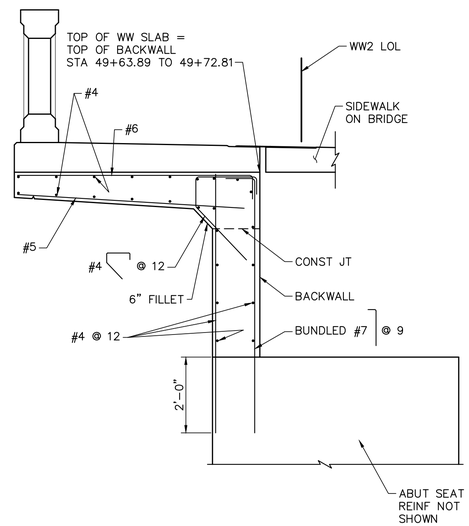
TYPICAL SECTION

SCALE: 3/8"=1'-0"



SECTION C

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



SECTION D

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

FOR ADDITIONAL REINFORCEMENT DETAILS SEE SECTION C

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES

0 1 2 3

REVISIONS			
NO.	DESCRIPTION	BY	DATE APPV'D
1			
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REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY	
MAINTENANCE		TRAFFIC	
REAL ESTATE		ENVIRONMENTAL	

APPROVED: Jennifer Grant-Martinez, PROFESSIONAL ENGINEER, No. 77367, EXP. 6/30/2025, CIVIL, STATE OF CALIFORNIA — APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST, BLDG. 100-B SACRAMENTO, CA 95816
TEL 916.341.7760 FAX 916.341.7767

CHECKED: J. HAMILTON
APPROVED: C. HODGE
DRAWN: A. SANCHEZ
DESIGNED: J. GRANT-MARTINEZ

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

REVIEWED:
REVIEWED:
APPROVAL RECOMMENDED:

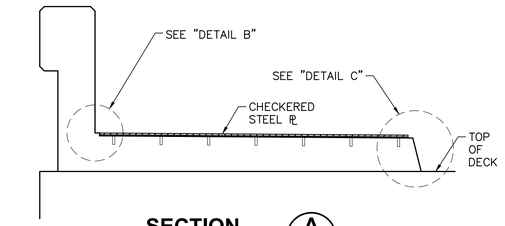
THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

CANTILEVER SIDEWALK DETAILS

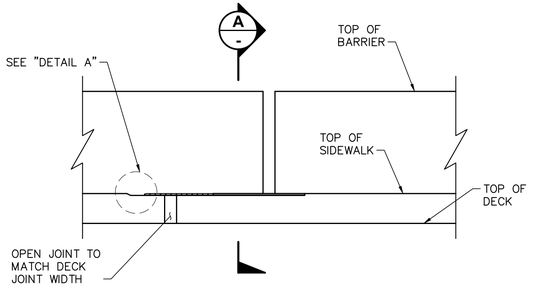
DATE	SCALE
JUNE 2023	AS NOTED

WORK ORDER NO. R32114
SPECIFICATION NO. 2329
SHEET NO. 92 OF 99
FILE NO. U-157-8

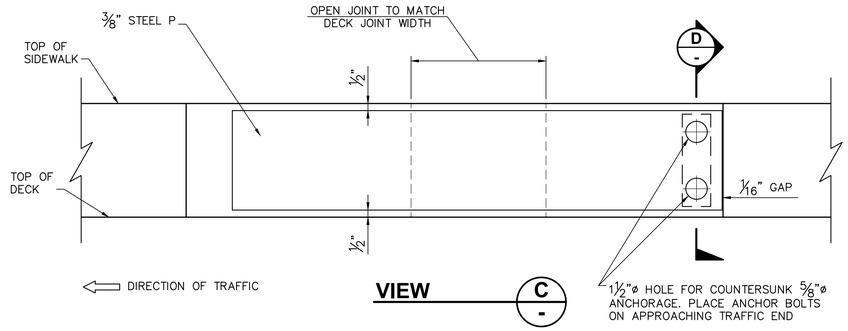
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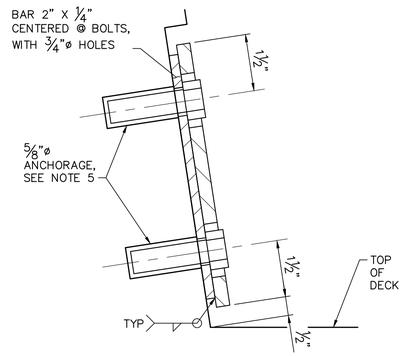
SECTION A -



ELEVATION



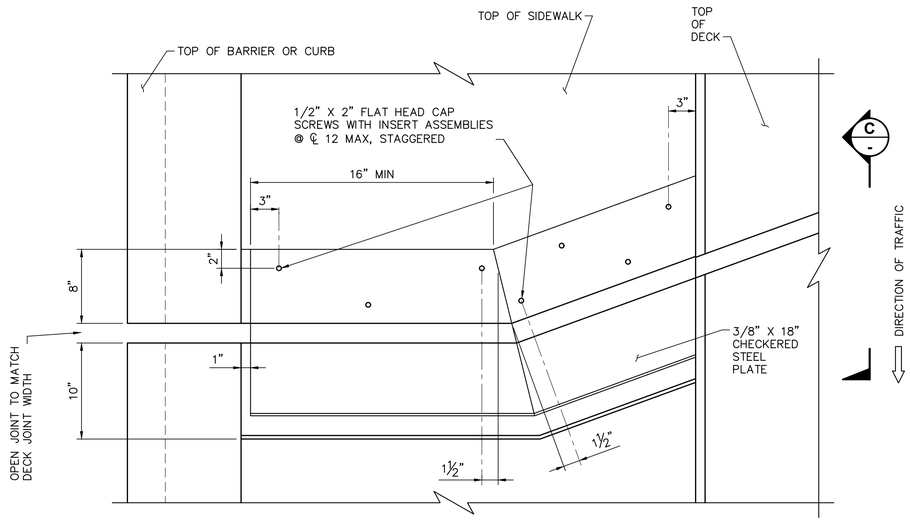
VIEW C -



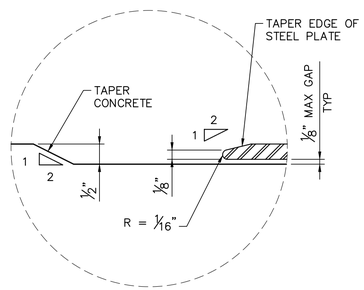
SECTION D -

NOTES

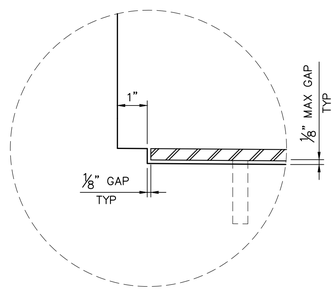
1. UTILITY OPENINGS AND EXPANSION JOINTS NOT SHOWN FOR CLARITY
2. RECESS CONCRETE 1/2" FOR PLATES
3. PLATES TO BE GALVANIZED
4. ARCHITECTURAL TREATMENT NOT SHOWN
5. INSERT ASSEMBLY OR EXPANSION ANCHORAGE FOR ⅝" X 1¾" BOLTS. USE INSTALLATION BOLTS EXTENDED ½" MINIMUM PAST NUT AND COAT WITH BOND BREAKER. AFTER CONCRETE HAS CURED, REMOVE INSTALLATION BOLTS, INSTALL HS BOLTS



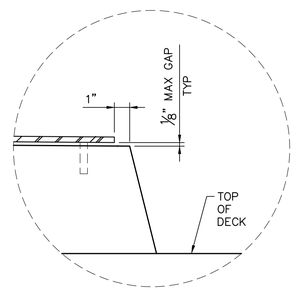
PLAN SKEW > 20°



DETAIL A -



DETAIL B -



DETAIL C -

NO SCALE

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

	REVIEWED BY:	DATE:
CONSTRUCTION		
MAINTENANCE		
REAL ESTATE		

	REVIEWED BY:	DATE:
SURVEY		
TRAFFIC		
ENVIRONMENTAL		

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
2				
3				
4				
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REVISIONS

APPROVED — REGISTERED PROFESSIONAL ENGINEER — Jennifer Grant-Martinez — No. 77367 — EXP. 6/30/2025 — CIVIL — STATE OF CALIFORNIA — APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST. BLDG. 100-B TEL 916.341.7760
SACRAMENTO, CA 95816 FAX 916.341.7767

DRAWN: A. SANCHEZ
DESIGNED: J. GRANT-MARTINEZ
CHECKED: J. HAMILTON
APPROVED: C. HODGE
APPROVAL RECOMMENDED:
REVIEWED:
REVIEWED:

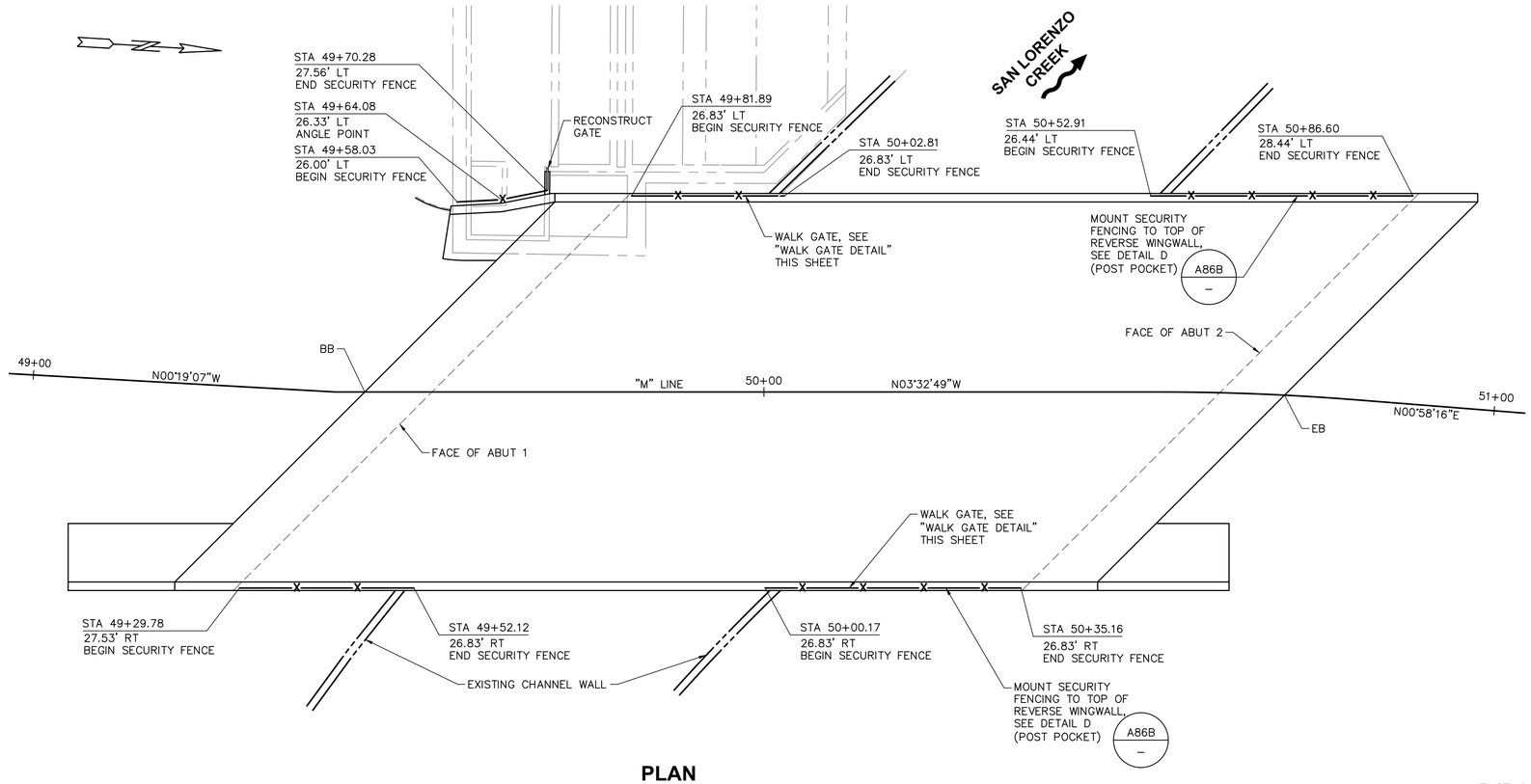
COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

JOINT ARMOR FOR PEDESTRIAN WALKWAYS

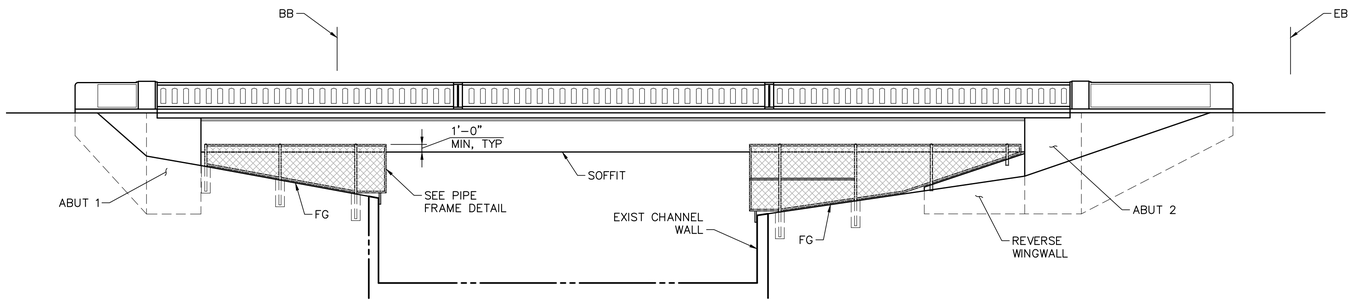
DATE: JUNE 2023
SCALE: AS NOTED
WORK ORDER NO.: R32114
SPECIFICATION NO.: 2329
SHEET NO.: 93 OF 99
FILE NO.: U-157-8

C:\projects\1030(Wood Rodgers)\010 (Alameda County)\02 (Meekland Ave Br)\8781.004-t-brd13_ja.DWG 6-30-23 09:38:32 AM AI



PLAN

SCALE: 1"=10'



ELEVATION

SCALE: 1"=10'

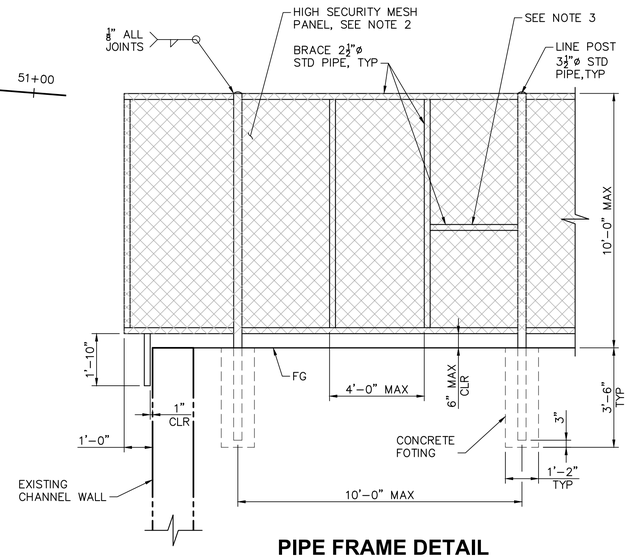
RIGHT EDGE OF DECK SHOWN, LEFT EDGE OF DECK SIMILAR

NOTES

1. LINE POSTS MOUNTED IN CONCRETE FOOTINGS UNLESS OTHERWISE NOTED.
2. HIGH SECURITY MESH PANEL TACK WELDED TO PIPE FRAMING AT 12" INTERVALS.
3. PROVIDE HORIZONTAL BRACE AT SEAMS OF HIGH SECURITY MESH PANEL.

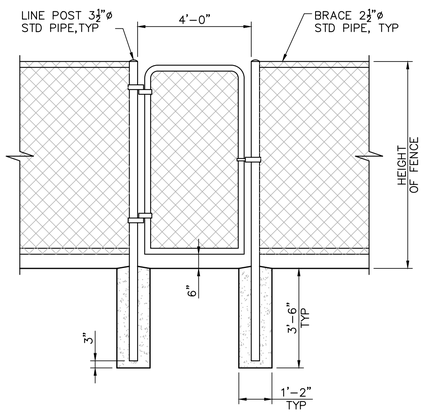
LEGEND

—x— INDICATES SECURITY FENCE



PIPE FRAME DETAIL

SCALE: 3/8"=1'-0"



WALK GATE DETAIL

SCALE: 3/8"=1'-0"

FOR DETAILS NOT SHOWN SEE "PIPE FRAME DETAIL"

-40 0 20 40 80 160

(IN FEET)
1"=20'

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY	
MAINTENANCE		TRAFFIC	
REAL ESTATE		ENVIRONMENTAL	

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
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REVISIONS

APPROVED — PROFESSIONAL ENGINEER — Jennifer Grant-Martinez — No. 77567 — EXP. 6/30/2025 — CIVIL — STATE OF CALIFORNIA — APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST, BLDG. 100-B SACRAMENTO, CA 95816 TEL 916.341.7760 FAX 916.341.7767

CHECKED: J. HAMILTON
APPROVED: C. HODGE
DRAWN: A. SANCHEZ
DESIGNED: J. GRANT-MARTINEZ
REVIEWED:
REVIEWED:
APPROVAL RECOMMENDED:

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

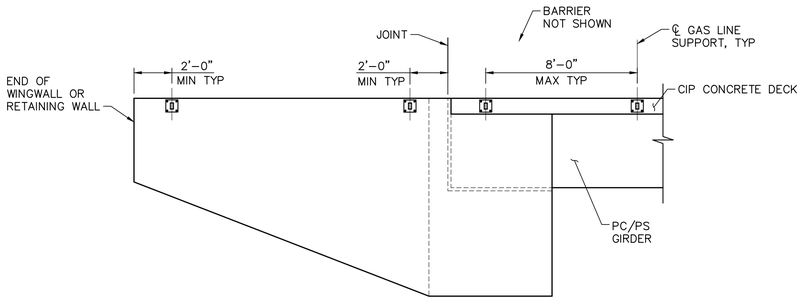
THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

SECURITY FENCE DETAILS

DATE	SCALE
JUNE 2023	AS NOTED

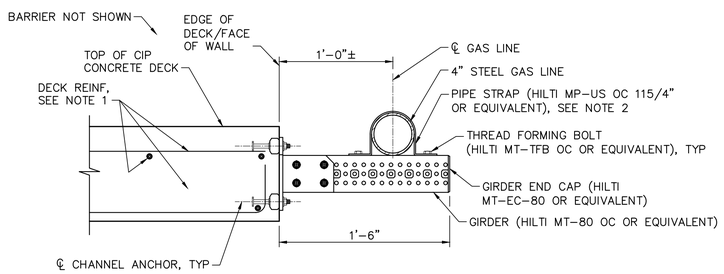
WORK ORDER NO. R32114
SPECIFICATION NO. 2329
SHEET NO. 94 OF 99
FILE NO. U-157-8

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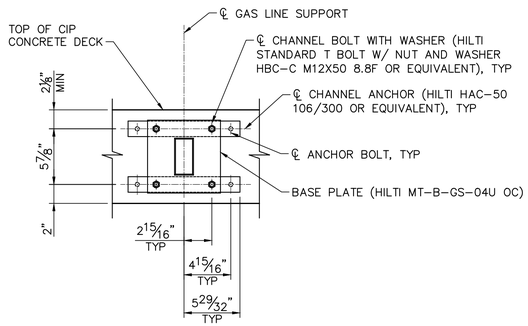


GAS LINE LONGITUDINAL SECTION AT ABUTMENT

SCALE: 1/4"=1'–0"



GAS LINE TYPICAL SECTION



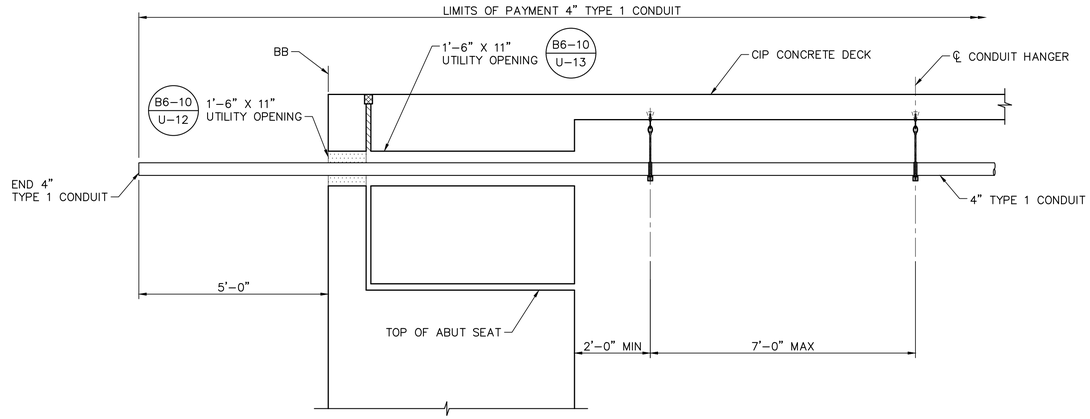
GAS LINE ELEVATION

GAS LINE SUPPORT DETAILS (PG&E)

SCALE: 1 1/2" = 1'–0"

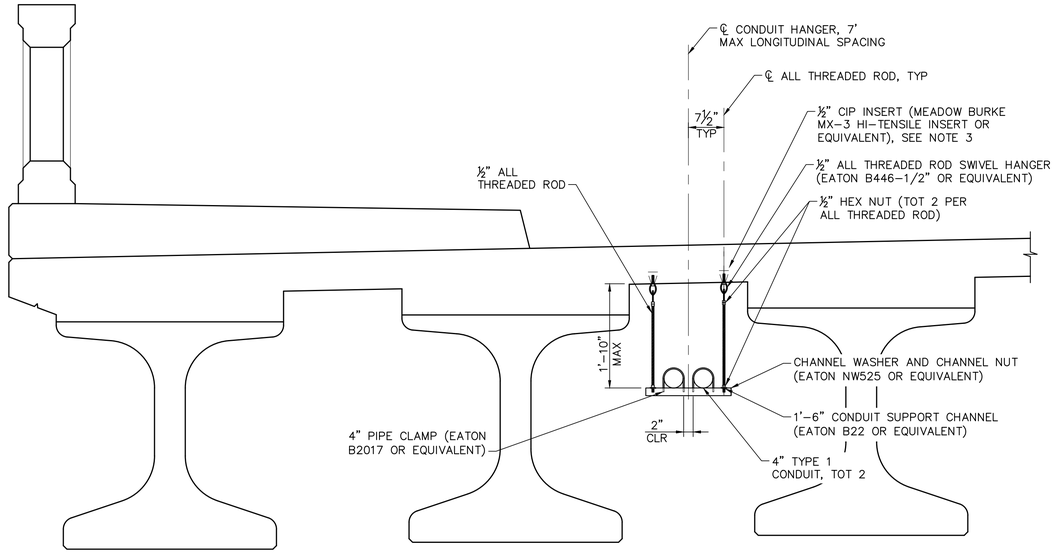
NOTES

1. DECK OR WALL REINFORCEMENT MAY BE ADJUSTED TO MISS ANCHOR CHANNEL.
2. IF PIPE WRAP IS TO BE USED, PIPE CLAMP SIZE MUST BE INCREASED ACCORDINGLY.
3. INSERT MUST BE PLACED ON TOP FLANGE OF PERMANENT STEEL DECK FORM.
4. ATTACHMENTS MUST BE HOT DIP GALVANIZED.
5. MODIFICATION OF ATTACHMENT DETAILS SHOWN MUST BE APPROVED BY UTILITY OWNER.



CONDUIT HANGER LONGITUDINAL SECTION AT ABUTMENT

SCALE: 1/2"=1'–0"
(ABUT 1 SHOWN, ABUT 2 SIMILAR)
FOR DETAILS NOT SHOWN SEE "TYPICAL SECTION"



CONDUIT HANGER TYPICAL SECTION

SCALE: 3/4"=1'–0"

CONDUIT HANGER DETAILS (AT&T)

SCALE AS SHOWN

FOR REDUCED ENGLISH PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

REVISIONS			
NO.	DESCRIPTION	BY	DATE APPV'D
1			
2			
3			
4			
5			

REGISTERED PROFESSIONAL ENGINEER
Jennifer Grant-Martinez
No. 77367
EXP. 6/30/2025
CIVIL
STATE OF CALIFORNIA
APPROVED: APPROVAL DATE:

REVIEWED BY:	DATE:		REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY		
MAINTENANCE		TRAFFIC		
REAL ESTATE		ENVIRONMENTAL		

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST, BLDG. 100-B TEL 916.341.7760
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CHECKED: J. HAMILTON
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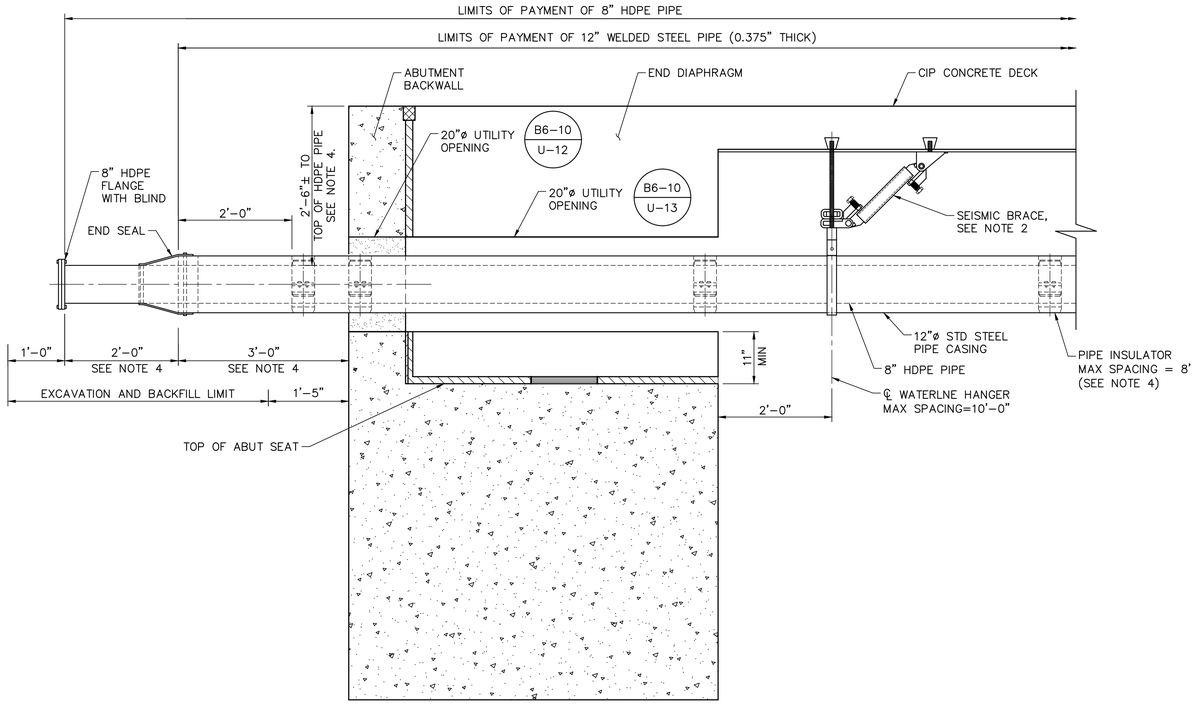
COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

UTILITY ATTACHMENT DETAILS

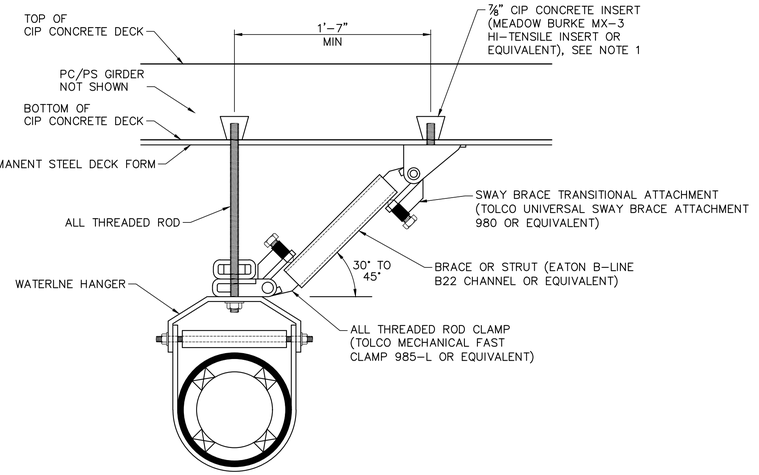
DATE	SCALE
JUNE 2023	AS NOTED
WORK ORDER NO.	R32114
SPECIFICATION NO.	2329
SHEET NO.	95 OF 99
FILE NO.	U-157-8

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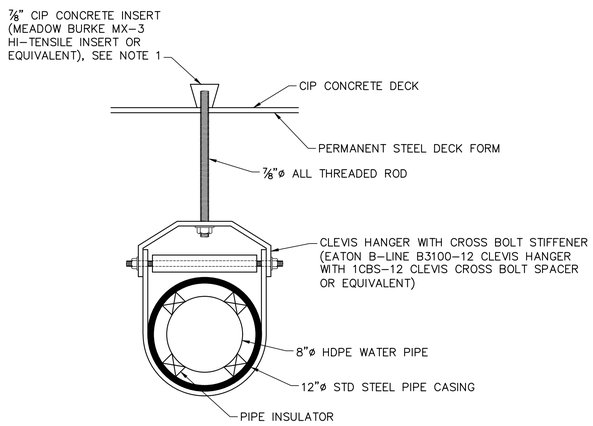
WATERLINE LONGITUDINAL SECTION AT ABUTMENT

SCALE: 3/4"=1'-0"
(ABUT 1 SHOWN, ABUT 2 SIMILAR)



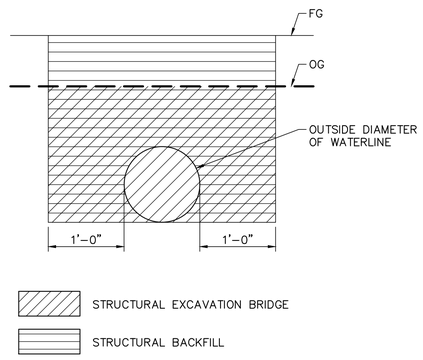
TRANSVERSE SEISMIC BRACE DETAIL

SCALE: 1-1/2"=1'-0"
(FOR DETAILS NOT SHOWN, SEE WATER LINE HANGER DETAIL)



WATERLINE HANGER DETAIL

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

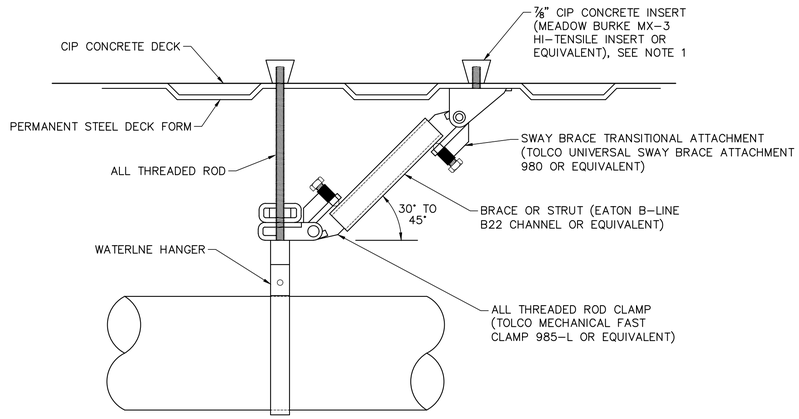


LIMITS OF PAYMENT FOR EXCAVATION AND BACKFILL

NTS

NOTES

1. INSERT MUST BE PLACED ON TOP FLANGE OF PERMANENT STEEL DECK FORM.
2. SEISMIC BRACING MUST BE PROVIDED AT EVERY WATER LINE HANGER.
3. ATTACHMENTS MUST BE GALVANIZED.
4. DIMENSION TO BE VERIFIED BY ENGINEER.
5. MODIFICATION OF ATTACHMENT DETAILS SHOWN MUST BE APPROVED BY EAST BAY MUNICIPAL UTILITY DISTRICT.



LONGITUDINAL SEISMIC BRACE DETAIL

SCALE: 1-1/2"=1'-0"
(FOR DETAILS NOT SHOWN, SEE WATER LINE HANGER DETAIL)

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY	
MAINTENANCE		TRAFFIC	
REAL ESTATE		ENVIRONMENTAL	

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
2				
3				
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REVISIONS

PROFESSIONAL ENGINEER — REGISTERED — Jennifer Grant-Martinez — No. 77567 — EXP. 6/30/2025 — CIVIL — STATE OF CALIFORNIA — APPROVED — APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST, BLDG. 100-B TEL 916.341.7760
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DESIGNED: J. GRANT-MARTINEZ

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

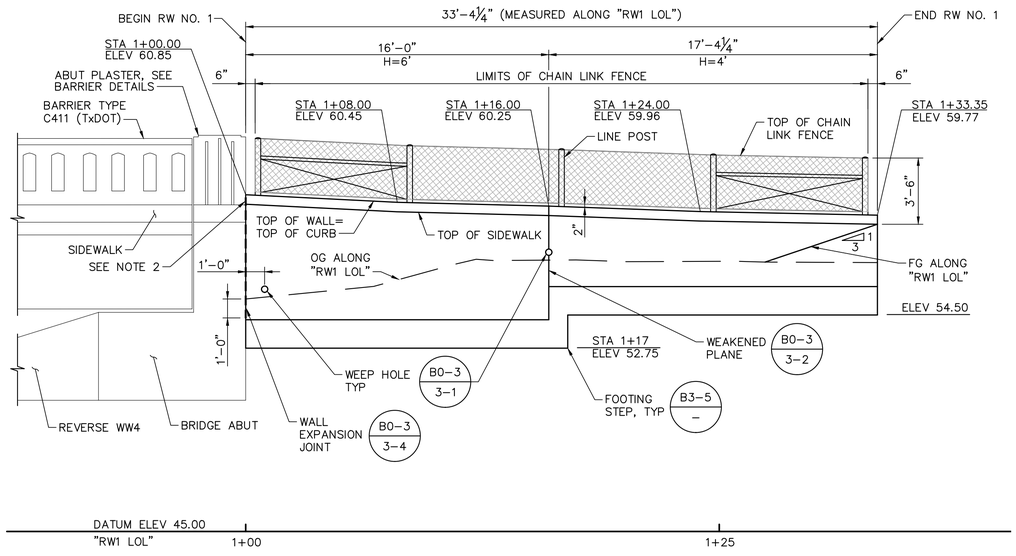
REVIEWED:
REVIEWED:
APPROVAL RECOMMENDED:

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

WATERLINE DETAILS

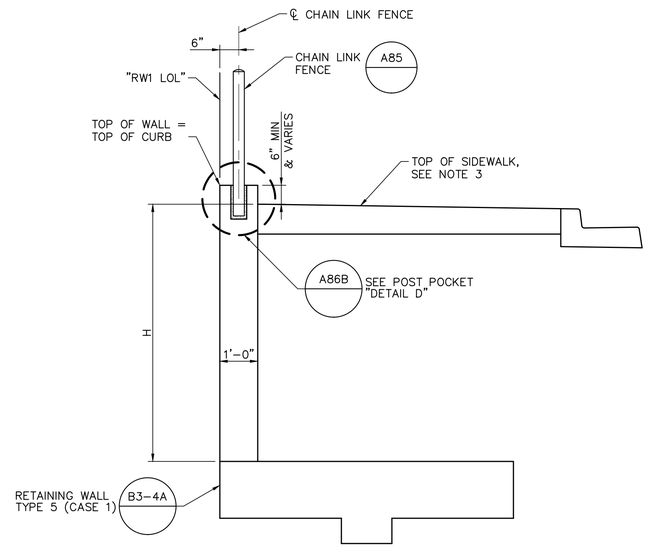
DATE: JUNE 2023
SCALE: AS NOTED
WORK ORDER NO.: R32114
SPECIFICATION NO.: 2329
SHEET NO.: 96 OF 99
FILE NO.: U-157-8

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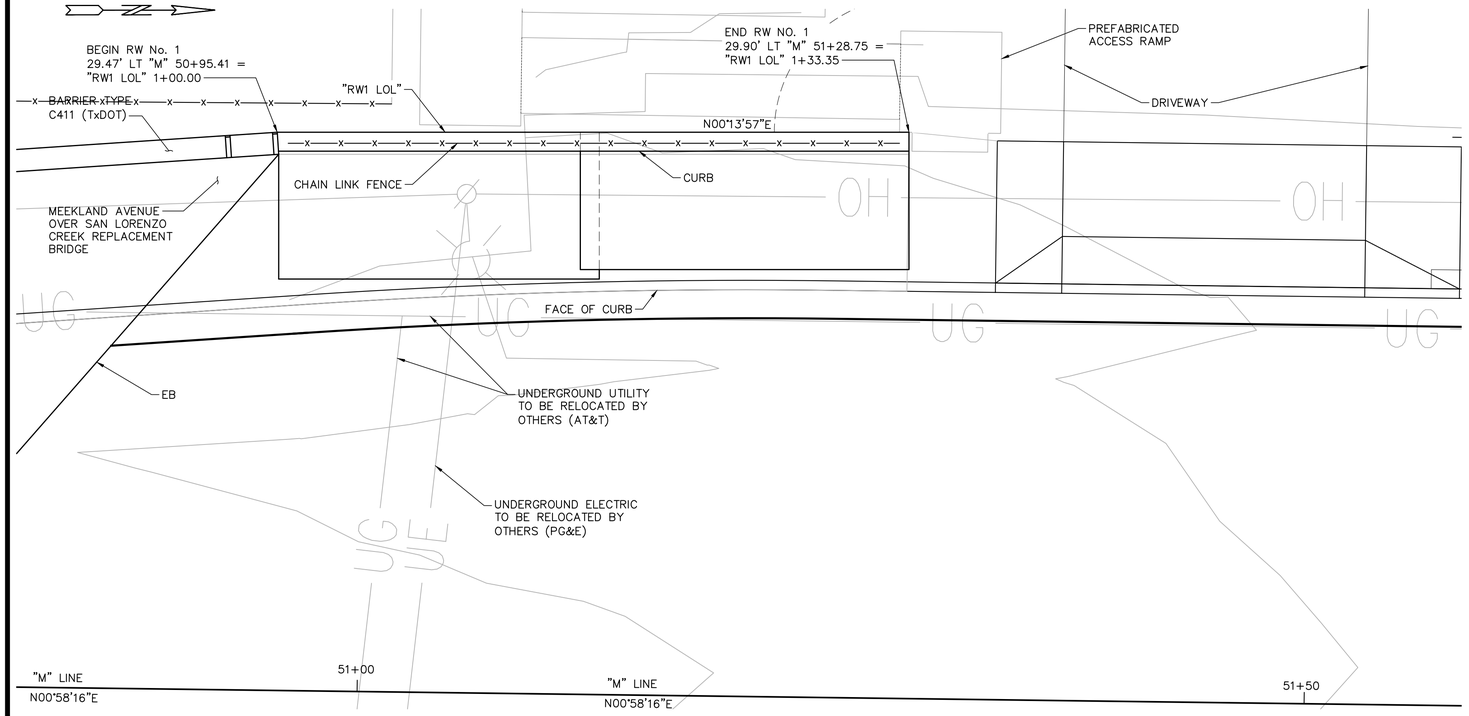
MIRRORED ELEVATION

SCALE: 1/4"=1'-0"



TYPICAL SECTION

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



PLAN

SCALE: 1/4"=1'-0"

NOTES

1. FOR BARRIER AND SIDEWALK DETAILS, SEE "CONCRETE BARRIER DETAILS" SHEETS.
2. EXTEND WATERSTOP 6" INTO CONCRETE BARRIER OR CURB.
3. FOR SIDEWALK DETAILS SEE "ROAD PLANS".
4. FOR DETAILS AND NOTES NOT SHOWN SEE "RETAINING WALL TYPE 5 (CASE 1). B3-4A
5. VERIFY THE PRESUMPTIVE SOIL PARAMETERS AND FACTORED BEARING RESISTANCE OF UNDERLYING SOILS ARE GREATER THAN THE BEARING STRESS DEMANDS SHOWN ON B3-4A. SUBMIT VERIFICATION CALCULATION SEALED AND SIGNED BY AN ENGINEER WHO IS REGISTERED AS A CIVIL ENGINEER IN THE STATE.

REVIEWED BY: CONSTRUCTION, MAINTENANCE, REAL ESTATE | DATE: | REVIEWED BY: SURVEY, TRAFFIC, ENVIRONMENTAL | DATE:

REVISIONS

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
2				
3				
4				
5				

PROFESSIONAL ENGINEER — Jennifer Grant-Martinez — No. 77567 — EXP. 6/30/2025 — CIVIL — STATE OF CALIFORNIA
APPROVED: APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST., BLDG. 100-B TEL 916.341.7760
SACRAMENTO, CA 95816 FAX 916.341.7767

DRAWN: A. SANCHEZ | DESIGNED: J. GRANT-MARTINEZ | CHECKED: J. HAMILTON | APPROVED: C. HODGE

REVIEWED: | APPROVAL RECOMMENDED:

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

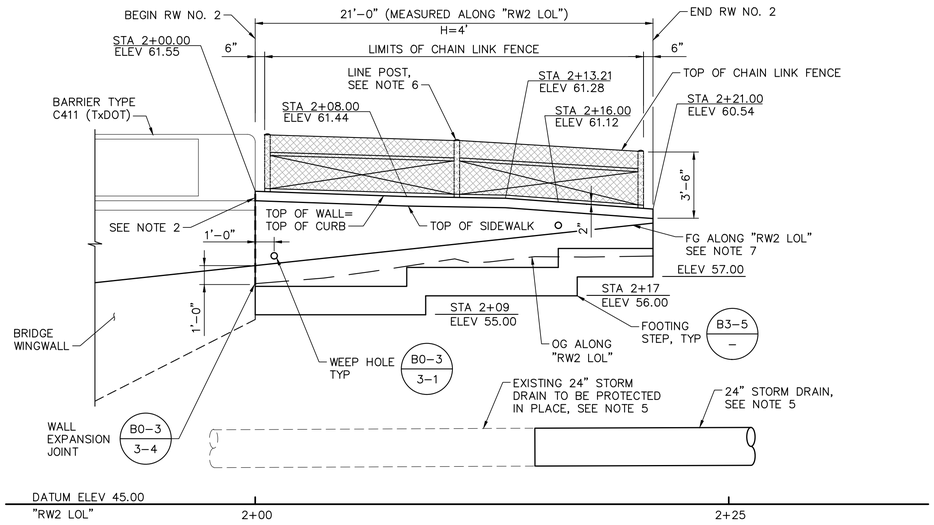
THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

RETAINING WALL 1 LAYOUT

DATE	JUNE 2023
SCALE	AS NOTED
WORK ORDER NO.	R32114
SPECIFICATION NO.	2329
SHEET NO.	97 OF 99
FILE NO.	U-157-8

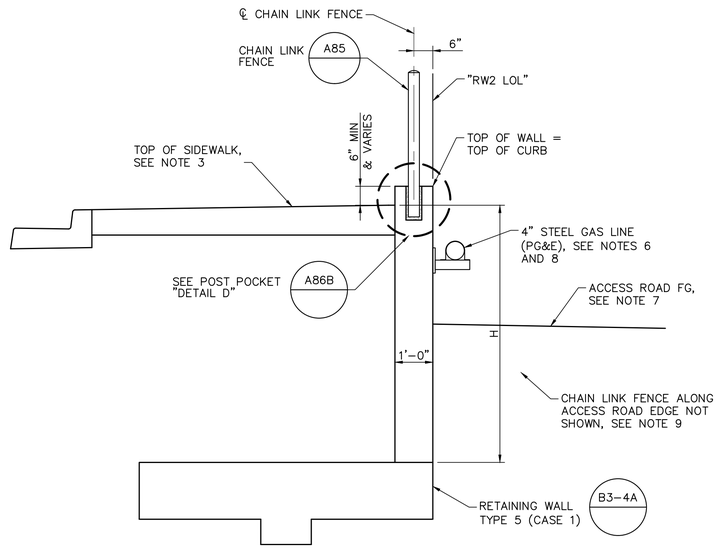
FOR REDUCED ENGLISH PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

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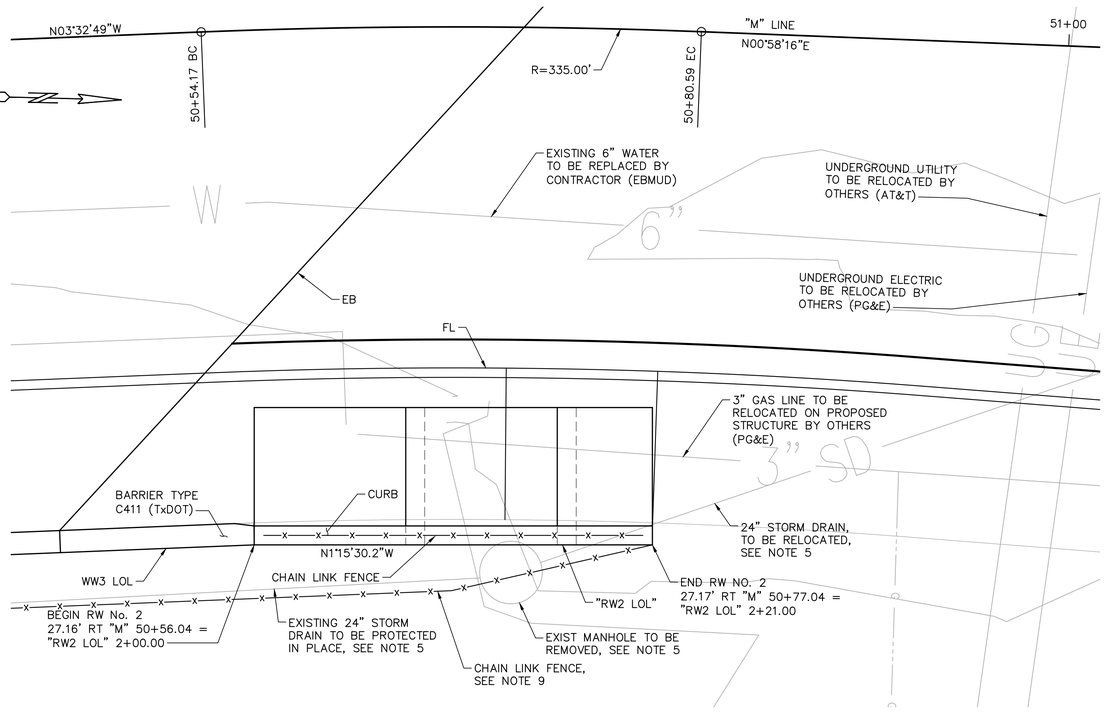
ELEVATION

SCALE: 1/4"=1'-0"



TYPICAL SECTION

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



PLAN

SCALE: 1/4"=1'-0"

CURVE DATA

R = 335.00'
Δ = 4°31'05"
T = 13.22'
L = 26.42'

NOTES

1. FOR BARRIER AND SIDEWALK DETAILS, SEE "CONCRETE BARRIER DETAILS" SHEETS.
2. EXTEND WATERSTOP 6" INTO CONCRETE BARRIER OR CURB.
3. FOR SIDEWALK DETAILS SEE "ROAD PLANS".
4. FOR DETAILS AND NOTES NOT SHOWN SEE "RETAINING WALL TYPE 5 (CASE 1). (B3-4A)
5. FOR DRAINAGE DETAILS SEE ROAD PLANS.
6. LINE POSTS MUST BE LOCATED 2'-6" FROM GAS LINE CHANNEL ANCHOR BOLTS.
7. FOR FG REFER DRIVEWAY "DE-43" LAYOUT AND CONSTRUCTION DETAILS OF "ROAD PLANS".
8. FOR GAS LINE ATTACHMENT DETAILS SEE "UTILITY ATTACHMENT DETAILS" SHEET.
9. FOR CHAIN LINK FENCE LAYOUT AND DETAILS SEE ROAD PLANS.
10. VERIFY THE PRESUMPTIVE SOIL PARAMETERS AND FACTORED BEARING RESISTANCE OF UNDERLYING SOILS ARE GREATER THAN THE BEARING STRESS DEMANDS SHOWN ON B3-4A. SUBMIT VERIFICATION CALCULATION SEALED AND SIGNED BY AN ENGINEER WHO IS REGISTERED AS A CIVIL ENGINEER IN THE STATE.

REVISIONS

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
2				
3				
4				
5				

REGISTERED PROFESSIONAL ENGINEER
Jennifer Grant-Martinez
No. 77567
EXP. 6/30/2025
CIVIL
STATE OF CALIFORNIA
APPROVED: APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST, BLDG. 100-B TEL 916.341.7760
SACRAMENTO, CA 95816 FAX 916.341.7767

DESIGNED: J. GRANT-MARTINEZ
DRAWN: A. SANCHEZ
CHECKED: J. HAMILTON
APPROVED: C. HODGE
APPROVAL RECOMMENDED:
REVIEWED:
REVIEWED:

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

RETAINING WALL 2 LAYOUT

DATE: JUNE 2023	SCALE: AS NOTED
WORK ORDER NO.: R32114	
SPECIFICATION NO.: 2329	
SHEET NO.: 98 OF 99	
FILE NO.: U-157-8	

REVIEWED BY:	DATE:	REVIEWED BY:	DATE:
CONSTRUCTION		SURVEY	
MAINTENANCE		TRAFFIC	
REAL ESTATE		ENVIRONMENTAL	

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FOR REDUCED ENGLISH PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

	REVIEWED BY:	DATE:
CONSTRUCTION		
MAINTENANCE		
REAL ESTATE		

	REVIEWED BY:	DATE:
SURVEY		
TRAFFIC		
ENVIRONMENTAL		

BORING LOGS ARE INCLUDED IN "DRAFT PRELIMINARY FOUNDATION REPORT" DATED JUNE 2021. FINAL LOG OF TEST BORINGS TO BE INCLUDED UPON COMPLETION OF FINAL FOUNDATION REPORT

C:\projects\1030(Wood Rodgers)\010 (Alameda County)\02 (Meekland Ave Br)\8781.004-z-lotb01.DWG 6-30-23 09:39:08 AM AI

FOR REDUCED ENGLISH PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

REVISIONS

NO.	DESCRIPTION	BY	DATE	APPV'D
1				
2				
3				
4				
5				

APPROVED: REGISTERED PROFESSIONAL ENGINEER Jennifer Grant-Martinez No. 77367 Exp. 6/30/2025 CIVIL STATE OF CALIFORNIA APPROVAL DATE:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST, Bldg. 100-B Tel 916.341.7760
SACRAMENTO, CA 95816 Fax 916.341.7767

DRAWN: A. SANCHEZ
DESIGNED: J. GRANT-MARTINEZ
CHECKED: J. HAMILTON
APPROVED: C. HODGE
APPROVAL RECOMMENDED:
REVIEWED:
REVIEWED:

COUNTY OF ALAMEDA ☆ PUBLIC WORKS AGENCY

THE IMPROVEMENTS OF MEEKLAND AVE
BLOSSOM WAY
TO LEWELLING BLVD

LOG OF TEST BORING

DATE: JUNE 2023
SCALE: AS NOTED
WORK ORDER NO.: R32114
SPECIFICATION NO.: 2329
SHEET NO.: 99 OF 99
FILE NO.: U-157-8

Appendix VI. Calculations and Analysis

ARS Online V3.0.2

Using the tool: Specify latitude and longitude in decimal degrees in the input boxes below. Alternatively, **Google Maps** can be used to find the site location. Specify the time-averaged shear-wave velocity in the upper 30m (Vs30) in the input box. After submitting the data, the USGS 2014 hazard data for a 975-year return period will be reported along with adjustment factors required by Caltrans Seismic Design Criteria (SDC) V2.0.

Latitude: 37.685949 **Longitude:** -122.100238 **Vs30 (m/s):** 205 Submit

Caltrans Design Spectrum (5% damping)

Period(s)	Sa_{2008}(g)	Sa_{2014}(g)	$Basin_{2008}$	$Basin_{2014}$	Near Fault Amp	Design Sa_{2008}(g)	Design Sa_{2014}(g)
PGA	0.73	0.8	1	1	1	0.73	0.8
0.10	1.16	1.22	1	1	1	1.16	1.22
0.20	1.5	1.63	1	1	1	1.5	1.63
0.30	1.57	1.93	1	1	1	1.57	1.93
0.50	1.54	2.07	1	1	1	1.54	2.07
0.75	1.37	1.84	1	1	1.1	1.51	2.02
1.0	1.2	1.65	1	1	1.2	1.43	1.99
2.0	0.76	1.02	1	1	1.2	0.91	1.23
3.0	0.48	0.66	1	1	1.2	0.58	0.8
4.0	0.34	0.44	1	1	1.2	0.41	0.53
5.0	0.27	0.32	1	1	1.2	0.32	0.38

Copy table

Deaggregation (based on 2014 hazard)

mean magnitude (for PGA)	6.85
mean site-source distance (km, for Sa at 1s)	6.3

Option: recalculate Near Fault amplification with user specified distance

Site-source distance (km): 6.3 Update

Shear Wave Velocity (Vs)

Project: **Meekland Avenue**
Job No: **P20101**
Date: **2021 04 01**
Boring: **R-21-001**

R-21-001
Meekland Avenue

Hammer Energy (ER): 101 %

Sample Number	Depth (feet)	Depth to Bottom of Layer (feet)	Layer Thickness (feet)	Sample D_i (inches)	Soil Type	Undrained Shear Strength S_u (psf)	Rock *	Field N (bpf)	N_{SPT} (bpf) **	N_{60}	σ'_v (ksf)	σ'_v (kPa)	d Layer Thickness in upper 30 m (m)	Granular Soil Vs SAND (m/sec)	Granular Soil Vs SILT (m/sec)	Cohesive Soil Vs Cohesive[1] (m/sec)	Cohesive Soil Vs Cohesive[2] (m/sec)	Sedimentary Rock Vs (m/sec)	Profile Vs (m/sec)	Profile D/Vs (sec)
S3	5.0	6.5	6.5	1.4	CL	1250		5	5	8	0.62	29.69	1.98			160	151		160	0.012
S4	10.0	11.5	5.0	2.4	CL	1600		11	7	12	1.24	59.37	1.52			179	185		179	0.009
S5	15.0	16.5	5.0	2.4	SC	3750		25	16	27	1.86	89.22	1.52	226					226	0.007
S6	20.0	21.5	5.0	2.4	CL	2500		19	12	21	2.49	118.98	1.52			219	235		219	0.007
S7	25.0	26.5	5.0	2.4	CL	1350		13	8	14	3.10	148.33	1.52			165	222		165	0.009
S8	30.0	31.5	5.0	2.4	CL	2000		23	15	25	3.61	172.74	1.52			198	260		198	0.008
S9	35.0	36.5	5.0	2.4	CL	600		12	8	13	3.92	187.68	1.52			114	227		114	0.013
S10	40.0	41.5	5.0	2.4	CL	2300		17	11	19	4.24	203.19	1.52			211	251		211	0.007
S11	45.0	46.5	5.0	2.4	ML	1170		14	9	15	4.57	218.63	1.52		247	155			247	0.006
S12	50.0	51.5	5.0	2.4	CL	1300		22	14	24	4.88	233.52	1.52			162	270		162	0.009
S13	55.0	56.5	5.0	1.4	CL	2450		16	16	27	5.19	248.27	1.52			217	280		217	0.007
S14	60.0	61.5	5.0	1.4	SM	450		55	55	93	5.52	264.19	1.52	329					329	0.005
S15	65.0	66.5	5.0	1.4	CL	1100		13	13	22	5.84	279.44	1.52			151	273		151	0.010
S16	70.0	71.5	5.0	1.4	CL	3500		24	24	40	6.14	294.18	1.52			255	310		255	0.006
S17	75.0	76.5	5.0	1.4	CL	4100		29	29	49	6.45	308.93	1.52			275	310		275	0.006
S18	80.0	81.5	5.0	1.4	CL	1500		14	14	24	6.76	323.68	1.52			173	285		173	0.009
													24.84						205	0.130

* Enter "rock" for Tertiary Age (<70 million years) Sedimentary Rocks. Alternatively, their "Tertiary Sand/Clay" correlation may be used.

** Corrected for sample diameter

Shear Wave Velocity for Upper 30 m (Vs_{30})

Vs_{30} = [1.45 - (0.015*d)]*Vs(d)

d (m)	24.84
Vs(d) (m/sec)	191
V_{S30} (m/sec)	**206**

Soil Profile Type

'D' (180 m/s < Vs < 360 m/s)

Shear Wave Velocity Correlations

Sand: $Vs = \exp[4.045 + 0.096(\ln(N_{60})) + 0.236(\ln(\sigma'_v))]$, valid for range of 100 to 380 m/sec

Silt: $Vs = \exp[3.738 + 0.178(\ln(N_{60})) + 0.231(\ln(\sigma'_v))]$, valid for range of 100 to 380 m/sec

Cohesive[1]: $Vs = 203(S_u/P_a)^{0.475} \leq 310$ m/sec, valid for range of 100 to 310 m/sec

Cohesive[2]: $Vs = \exp[3.996 + 0.230(\ln(N_{60})) + 0.164(\ln(\sigma'_v))]$, valid for range of 100 to 310 m/sec & $N_{60} \geq 3$

Young Sedimentary Rock (Tertiary Deposits): $Vs = 109(N_{60})^{0.319} \leq 560$/m/sec

P_a = Atmospheric Pressure = 2116.2 psf

Notes: 1) The calculated Vs value assumes that no significant changes in the subsurface will occur to the extrapolated depth of 100 feet.

2) In the absence of in-situ measurements, limit Vs_{30} to 760 m/sec for competent rock in California.

3) The shear wave velocity (Vs) for SAND and SILT based on SPT correlations are valid where $N_{60} \leq 100$ and $\sigma'_v \leq 506$ kPa.

4) Undrained Shear Strength (S_u) based on 0.5(Pocket Penetrometer) in psf.

Reference: Caltrans "Methodology for Developing Design Response Spectrum for Use in Seismic Design Recommendations", Appendix A, pgs 15-18, November 2012.

Shear Wave Velocity (Vs)

Project: **Meekland Avenue**
Job No: **P20101**
Date: **2021 04 02**
Boring: **R-21-002**

R-21-002
Meekland Avenue

Hammer Energy (ER): 101 %

Sample Number	Depth (feet)	Depth to Bottom of Layer (feet)	Layer Thickness (feet)	Sample D_i (inches)	Soil Type	Undrained Shear Strength S_u (psf)	Rock *	Field N (bpf)	N_{SPT} (bpf) **	N_{60}	σ'_v (ksf)	σ'_v (kPa)	d Layer Thickness in upper 30 m (m)	Granular Soil Vs SAND (m/sec)	Granular Soil Vs SILT (m/sec)	Cohesive Soil Vs Cohesive[1] (m/sec)	Cohesive Soil Vs Cohesive[2] (m/sec)	Sedimentary Rock Vs (m/sec)	Profile Vs (m/sec)	Profile D/Vs (sec)
S2	5.0	6.5	6.5	1.4	CL	2250		7	7	12	0.62	29.69	1.98			209	166		209	0.009
S3	10.0	11.5	5.0	1.4	CL	1600		10	10	17	1.24	59.37	1.52			179	201		179	0.009
S4	15.0	16.5	5.0	1.4	CL	2100		9	9	15	1.87	89.56	1.52			202	208		202	0.008
S5	20.0	21.5	5.0	1.4	CL	1250		9	9	15	2.49	119.13	1.52			160	218		160	0.010
S6	25.0	26.5	5.0	1.4	CL	850		5	5	8	3.10	148.33	1.52			134	195		134	0.011
S7	30.0	31.5	5.0	1.4	CL	2750		17	17	29	3.73	178.71	1.52			229	270		229	0.007
S8	35.0	36.5	5.0	1.4	CL	2750		12	12	20	4.29	205.60	1.52			229	254		229	0.007
S9	40.0	41.5	5.0	1.4	CL	1100		7	7	12	4.60	220.11	1.52			151	228		151	0.010
S10	45.0	46.5	5.0	1.4	SM	800		19	19	32	4.91	234.95	1.52	289					289	0.005
S11	50.0	51.5	5.0	1.4	CL	1050		9	9	15	5.22	249.77	1.52			147	245		147	0.010
S12	55.0	56.5	5.0	1.4	CL	2700		17	17	29	5.52	264.52	1.52			227	288		227	0.007
S13	60.0	61.5	5.0	1.4	CL	2000		16	16	27	5.83	279.26	1.52			198	286		198	0.008
S14	70.0	71.5	10.0	1.4	CL	2400		20	20	34	6.45	308.76	3.05			215	306		215	0.014
													21.79						197	0.114

* Enter "rock" for Tertiary Age (<70 million years) Sedimentary Rocks. Alternatively, their "Tertiary Sand/Clay" correlation may be used.
** Corrected for sample diameter

Shear Wave Velocity for Upper 30 m (V_{S30})

Vs_{30} = [1.45 - (0.015*d)]*Vs(d)

d (m)	21.79
Vs(d) (m/sec)	191
V_{S30} (m/sec)	**214**

Soil Profile Type

'D' (180 m/s < Vs < 360 m/s)

Shear Wave Velocity Correlations

Sand: $Vs = \exp[4.045 + 0.096(\ln(N_{60})) + 0.236(\ln(\sigma'_v))]$, valid for range of 100 to 380 m/sec
Silt: $Vs = \exp[3.738 + 0.178(\ln(N_{60})) + 0.231(\ln(\sigma'_v))]$, valid for range of 100 to 380 m/sec
Cohesive[1]: $Vs = 203(S_u/P_a)^{0.475} \leq 310$ m/sec, valid for range of 100 to 310 m/sec
Cohesive[2]: $Vs = \exp[3.996 + 0.230(\ln(N_{60})) + 0.164(\ln(\sigma'_v))]$, valid for range of 100 to 310 m/sec & $N_{60} \geq 3$
Young Sedimentary Rock (Tertiary Deposits): $Vs = 109(N_{60})^{0.319} \leq 560$/m/sec
P_a = Atmospheric Pressure = 2116.2 psf

Notes: 1) The calculated Vs value assumes that no significant changes in the subsurface will occur to the extrapolated depth of 100 feet.
2) In the absence of in-situ measurements, limit Vs_{30} to 760 m/sec for competent rock in California.
3) The shear wave velocity (Vs) for SAND and SILT based on SPT correlations are valid where $N_{60} \leq 100$ and $\sigma'_v \leq 506$ kPa.
4) Undrained Shear Strength (S_u) based on 0.5(Pocket Penetrometer) in psf.

Reference: Caltrans "Methodology for Developing Design Response Spectrum for Use in Seismic Design Recommendations", Appendix A, pgs 15-18, November 2012.

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=========================================================================

                 SHAFT for Windows, Version 2017.8.10

                  Serial Number :  226375637

               VERTICALLY LOADED DRILLED SHAFT ANALYSIS
                (c) Copyright ENSOFT, Inc., 1987-2017
                      All Rights Reserved

=========================================================================

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Corr\Calculations\Geotech\CIDH\piles 6 30 2023\
     Name of input data file     : isol 54 IN Meekland Abut 1.sf8d
     Name of output file         : isol 54 IN Meekland Abut 1.sf8o
     Name of plot output file    : isol 54 IN Meekland Abut 1.sf8p
     Name of runtime file        : isol 54 IN Meekland Abut 1.sf8r


     -------------------------------------------------------------------------
                          Time and Date of Analysis
     -------------------------------------------------------------------------

               Date:  July 03, 2023     Time:  11:50:45

     Meekland Abut 1 top elev. 50, 54 in CIDH isol


     TOTAL LOAD =     434.0 TONS
     ------------


     NUMBER OF LAYERS =    3
     ------------------


     WATER TABLE DEPTH =      15.0 FT.
     -------------------



     SOIL INFORMATION
     ---------------

     LAYER NO  1----CLAY

       AT THE TOP

       STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00  (*)
       END BEARING COEFFICIENT-Nc                        = 0.600E+01  (*)
       UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.150E+04
       BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
       SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
       MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
       DEPTH, FT                                         = 0.000E+00


       AT THE BOTTOM

       STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00  (*)
       END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
       UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.150E+04
       BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
       SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
       MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
       DEPTH, FT                                         = 0.140E+02


       LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
       LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.100E-03


     LAYER NO  2----CLAY

       AT THE TOP

       STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00  (*)
       END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
```

```
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.170E+04
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.140E+02


  AT THE BOTTOM

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00  (*)
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.170E+04
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.360E+02


  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.100E-03

LAYER NO  3----CLAY

  AT THE TOP

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00  (*)
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.250E+04
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.360E+02


  AT THE BOTTOM

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00  (*)
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.250E+04
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.150E+03


  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.100E-03


(*) ESTIMATED BY THE PROGRAM BASED ON OTHER PARAMETERS


INPUT DRILLED SHAFT INFORMATION
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 MINIMUM SHAFT DIAMETER    =    4.500  FT.
 MAXIMUM SHAFT DIAMETER    =    4.500  FT.
 RATIO BASE/SHAFT DIAMETER =    0.000  FT.
 ANGLE OF BELL             =    0.000  DEG.
 IGNORED TOP PORTION       =   21.000  FT.
 IGNORED BOTTOM PORTION    =    0.000  FT.
 ELASTIC MODULUS, Ec       = 0.360E+07 LB/SQ IN




COMPUTATION RESULTS
-------------------


- CASE ANALYZED      :     1
  VARIATION LENGTH   :     1
  VARIATION DIAMETER :     1
```

DRILLED SHAFT INFORMATION

DIAMETER OF STEM	=	4.500	FT.
DIAMETER OF BASE	=	4.500	FT.
END OF STEM TO BASE	=	0.000	FT.
ANGLE OF BELL	=	0.000	DEG.
IGNORED TOP PORTION	=	21.000	FT.
IGNORED BOTTOM PORTION	=	0.000	FT.
AREA OF ONE PERCENT STEEL	=	22.905	SQ.IN.
ELASTIC MODULUS, Ec	=	0.360E+07	LB/SQ IN
VOLUME OF UNDERREAM	=	0.000	CU.YDS.

PREDICTED RESULTS

QS = ULTIMATE SIDE RESISTANCE;
QB = ULTIMATE BASE RESISTANCE;
WT = WEIGHT OF DRILLED SHAFT (UPLIFT CAPACITY ONLY);
QU = TOTAL ULTIMATE RESISTANCE;
LRFD QS = TOTAL SIDE FRICTION USING LRFD RESISTANCE FACTOR TO THE ULTIMATE SIDE RESISTANCE;
LRFD QB = TOTAL BASE BEARING USING LRFD RESISTANCE FACTOR TO THE ULTIMATE BASE RESISTANCE
LRFD QU = TOTAL CAPACITY WITH LRFD RESISTANCE FACTOR.

LENGTH (FT)	VOLUME (CU.YDS)	QS (TONS)	QB (TONS)	QU (TONS)	LRFD QS (TONS)	LRFD QB (TONS)	LRFD QU (TONS)
22.0	12.96	6.61	121.68	128.29	4.63	0.01	4.64
23.0	13.55	13.22	121.68	134.90	9.25	0.01	9.27
24.0	14.14	19.83	121.68	141.51	13.88	0.01	13.89
25.0	14.73	26.44	121.68	148.12	18.51	0.01	18.52
26.0	15.32	33.05	121.68	154.73	23.13	0.01	23.15
27.0	15.91	39.66	121.68	161.34	27.76	0.01	27.77
28.0	16.50	46.27	129.22	175.49	32.39	0.01	32.40
29.0	17.08	52.88	137.51	190.39	37.02	0.01	37.03
30.0	17.67	59.49	146.55	206.04	41.64	0.01	41.66
31.0	18.26	66.10	156.34	222.44	46.27	0.02	46.29
32.0	18.85	72.71	165.38	238.09	50.90	0.02	50.91
33.0	19.44	79.32	172.17	251.49	55.52	0.02	55.54
34.0	20.03	85.93	176.69	262.62	60.15	0.02	60.17
35.0	20.62	92.54	178.95	271.49	64.78	0.02	64.80
36.0	21.21	99.15	178.95	278.10	69.40	0.02	69.42
37.0	21.80	108.87	178.95	287.82	76.21	0.02	76.23
38.0	22.39	118.59	178.95	297.54	83.01	0.02	83.03
39.0	22.98	128.31	178.95	307.26	89.82	0.02	89.84
40.0	23.57	138.03	178.95	316.98	96.62	0.02	96.64
41.0	24.15	147.75	178.95	326.70	103.43	0.02	103.44
42.0	24.74	157.47	178.95	336.42	110.23	0.02	110.25
43.0	25.33	167.19	178.95	346.14	117.04	0.02	117.05
44.0	25.92	176.91	178.95	355.86	123.84	0.02	123.86
45.0	26.51	186.63	178.95	365.58	130.64	0.02	130.66
46.0	27.10	196.36	178.95	375.30	137.45	0.02	137.47
47.0	27.69	206.08	178.95	385.02	144.25	0.02	144.27
48.0	28.28	215.80	178.95	394.74	151.06	0.02	151.08
49.0	28.87	225.52	178.95	404.46	157.86	0.02	157.88
50.0	29.46	235.24	178.95	414.18	164.67	0.02	164.68
51.0	30.05	244.96	178.95	423.90	171.47	0.02	171.49
52.0	30.63	254.68	178.95	433.63	178.28	0.02	178.29
53.0	31.22	264.40	178.95	443.35	185.08	0.02	185.10
54.0	31.81	274.12	178.95	453.07	191.88	0.02	191.90
55.0	32.40	283.84	178.95	462.79	198.69	0.02	198.71
56.0	32.99	293.56	178.95	472.51	205.49	0.02	205.51
57.0	33.58	303.28	178.95	482.23	212.30	0.02	212.32
58.0	34.17	313.00	178.95	491.95	219.10	0.02	219.12
59.0	34.76	322.72	178.95	501.67	225.91	0.02	225.92
60.0	35.35	332.44	178.95	511.39	232.71	0.02	232.73
61.0	35.94	342.16	178.95	521.11	239.51	0.02	239.53
62.0	36.53	351.88	178.95	530.83	246.32	0.02	246.34
63.0	37.11	361.60	178.95	540.55	253.12	0.02	253.14
64.0	37.70	371.33	178.95	550.27	259.93	0.02	259.95
65.0	38.29	381.05	178.95	559.99	266.73	0.02	266.75
66.0	38.88	390.77	178.95	569.71	273.54	0.02	273.55
67.0	39.47	400.49	178.95	579.43	280.34	0.02	280.36
68.0	40.06	410.21	178.95	589.15	287.15	0.02	287.16
69.0	40.65	419.93	178.95	598.87	293.95	0.02	293.97
70.0	41.24	429.65	178.95	608.60	300.75	0.02	300.77
71.0	41.83	439.37	178.95	618.32	307.56	0.02	307.58

72.0	42.42	449.09	178.95	628.04	314.36	0.02	314.38
73.0	43.01	458.81	178.95	637.76	321.17	0.02	321.19
74.0	43.60	468.53	178.95	647.48	327.97	0.02	327.99
75.0	44.18	478.25	178.95	657.20	334.78	0.02	334.79
76.0	44.77	487.97	178.95	666.92	341.58	0.02	341.60
77.0	45.36	497.69	178.95	676.64	348.38	0.02	348.40
78.0	45.95	507.41	178.95	686.36	355.19	0.02	355.21
79.0	46.54	517.13	178.95	696.08	361.99	0.02	362.01
80.0	47.13	526.85	178.95	705.80	368.80	0.02	368.82
81.0	47.72	536.57	178.95	715.52	375.60	0.02	375.62
82.0	48.31	546.30	178.95	725.24	382.41	0.02	382.42
83.0	48.90	556.02	178.95	734.96	389.21	0.02	389.23
84.0	49.49	565.74	178.95	744.68	396.02	0.02	396.03
85.0	50.08	575.46	178.95	754.40	402.82	0.02	402.84
86.0	50.66	585.18	178.95	764.12	409.62	0.02	409.64
87.0	51.25	594.90	178.95	773.85	416.43	0.02	416.45
88.0	51.84	604.62	178.95	783.57	423.23	0.02	423.25
89.0	52.43	614.34	178.95	793.29	430.04	0.02	430.06
90.0	53.02	624.06	178.95	803.01	436.84	0.02	436.86

AXIAL LOAD VS SETTLEMENT CURVES

RESULT FROM TREND (AVERAGED) LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.7428E-01	0.2206E-04	0.2618E-02	0.1000E-04
0.3714E+00	0.1103E-03	0.1309E-01	0.5000E-04
0.7428E+00	0.2206E-03	0.2618E-01	0.1000E-03
0.3735E+02	0.1106E-01	0.1309E+01	0.5000E-02
0.5602E+02	0.1659E-01	0.1963E+01	0.7500E-02
0.7470E+02	0.2211E-01	0.2618E+01	0.1000E-01
0.1868E+03	0.5529E-01	0.6545E+01	0.2500E-01
0.3447E+03	0.1075E+00	0.1309E+02	0.5000E-01
0.4214E+03	0.1459E+00	0.1963E+02	0.7500E-01
0.4913E+03	0.1831E+00	0.2618E+02	0.1000E+00
0.6425E+03	0.3636E+00	0.6545E+02	0.2500E+00
0.6816E+03	0.6234E+00	0.9584E+02	0.5000E+00
0.6825E+03	0.6640E+00	0.1002E+03	0.5400E+00
0.6742E+03	0.1478E+01	0.1548E+03	0.1350E+01
0.6930E+03	0.2833E+01	0.1736E+03	0.2700E+01

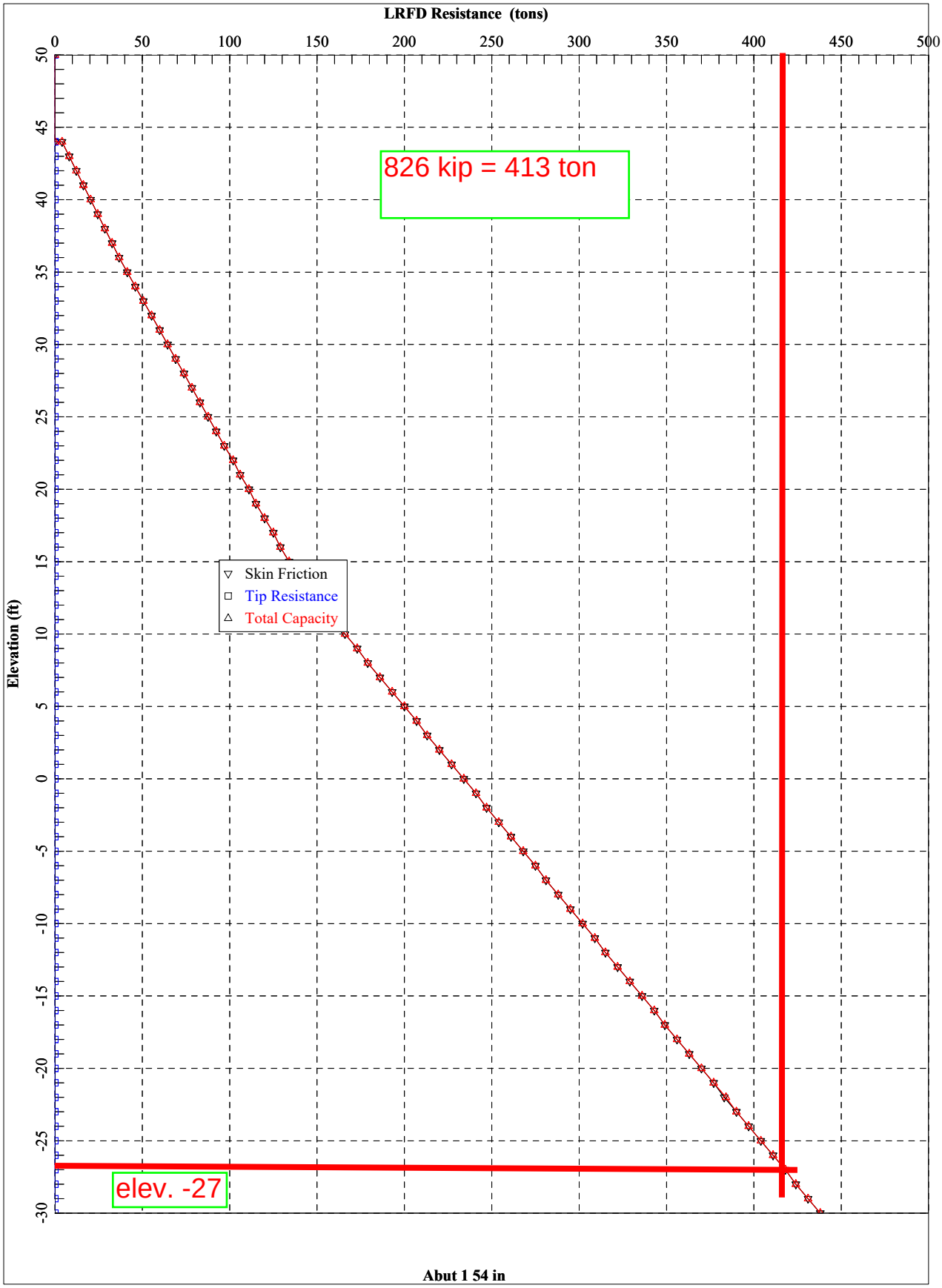
RESULT FROM UPPER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.1172E+00	0.2861E-04	0.3910E-02	0.1000E-04
0.5858E+00	0.1430E-03	0.1955E-01	0.5000E-04
0.1172E+01	0.2861E-03	0.3910E-01	0.1000E-03
0.5906E+02	0.1437E-01	0.1955E+01	0.5000E-02
0.8860E+02	0.2155E-01	0.2933E+01	0.7500E-02
0.1181E+03	0.2873E-01	0.3910E+01	0.1000E-01
0.2953E+03	0.7184E-01	0.9776E+01	0.2500E-01
0.5011E+03	0.1339E+00	0.1955E+02	0.5000E-01
0.5690E+03	0.1716E+00	0.2933E+02	0.7500E-01
0.6169E+03	0.2063E+00	0.3910E+02	0.1000E+00
0.7264E+03	0.3808E+00	0.9776E+02	0.2500E+00
0.7587E+03	0.6395E+00	0.1300E+03	0.5000E+00
0.7606E+03	0.6802E+00	0.1342E+03	0.5400E+00
0.7441E+03	0.1491E+01	0.1718E+03	0.1350E+01
0.7503E+03	0.2843E+01	0.1781E+03	0.2700E+01

RESULT FROM LOWER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.3875E-01	0.1642E-04	0.1326E-02	0.1000E-04
0.1938E+00	0.8211E-04	0.6628E-02	0.5000E-04
0.3875E+00	0.1642E-03	0.1326E-01	0.1000E-03
0.1943E+02	0.8219E-02	0.6628E+00	0.5000E-02
0.2915E+02	0.1233E-01	0.9941E+00	0.7500E-02
0.3887E+02	0.1644E-01	0.1326E+01	0.1000E-01
0.9719E+02	0.4110E-01	0.3314E+01	0.2500E-01
0.1920E+03	0.8196E-01	0.6628E+01	0.5000E-01

0.2692E+03	0.1199E+00	0.9941E+01	0.7500E-01
0.3420E+03	0.1574E+00	0.1326E+02	0.1000E+00
0.5521E+03	0.3452E+00	0.3314E+02	0.2500E+00
0.6048E+03	0.6073E+00	0.6170E+02	0.5000E+00
0.6047E+03	0.6477E+00	0.6621E+02	0.5400E+00
0.6043E+03	0.1464E+01	0.1378E+03	0.1350E+01
0.6348E+03	0.2822E+01	0.1682E+03	0.2700E+01


LRFD Resistance (tons)
0
50
100
150
200
250
300
350
400
450
500
50
45
40
35
30
25
20
15
10
5
0
-5
-10
-15
-20
-25
-30
Elevation (ft)
826 kip = 413 ton
Skin Friction
Tip Resistance
Total Capacity
elev. -27
Abut 1 54 in

```
=========================================================================

                 SHAFT for Windows, Version 2017.8.10

                  Serial Number :  226375637

               VERTICALLY LOADED DRILLED SHAFT ANALYSIS
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                     All Rights Reserved

=========================================================================

     Path to file locations      : G:\Projects\Y2020\P20101 ALA Civ Env RW\TO 01 Meekland Ave
Corr\Calculations\Geotech\CIDH\piles 6 30 2023\
     Name of input data file     : 54 IN Meekland Abut 1.sf8d
     Name of output file         : 54 IN Meekland Abut 1.sf8o
     Name of plot output file    : 54 IN Meekland Abut 1.sf8p
     Name of runtime file        : 54 IN Meekland Abut 1.sf8r


     -------------------------------------------------------------------------
                          Time and Date of Analysis
     -------------------------------------------------------------------------

               Date:  July 03, 2023     Time:  11:39:14

     Meekland Abut 1 top elev. 50, 54 in CIDH, STElev -28


     TOTAL LOAD =     434.0 TONS
     ------------


     NUMBER OF LAYERS =    3
     ------------------


     WATER TABLE DEPTH =      15.0 FT.
     -------------------




     SOIL INFORMATION
     ---------------

     LAYER NO  1----CLAY

       AT THE TOP

       STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00  (*)
       END BEARING COEFFICIENT-Nc                        = 0.600E+01  (*)
       UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.150E+04
       BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
       SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
       MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
       DEPTH, FT                                         = 0.000E+00


       AT THE BOTTOM

       STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00  (*)
       END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
       UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.150E+04
       BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
       SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
       MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
       DEPTH, FT                                         = 0.140E+02


       LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
       LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.100E-03


     LAYER NO  2----CLAY
```

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	(*)
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.170E+04	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.125E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.140E+02	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	(*)
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.170E+04	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.125E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.360E+02	

LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.700E+00
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E-03

LAYER NO 3----CLAY

AT THE TOP

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	(*)
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.250E+04	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.125E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.360E+02	

AT THE BOTTOM

STRENGTH REDUCTION FACTOR-ALPHA	= 0.550E+00	(*)
END BEARING COEFFICIENT-Nc	= 0.900E+01	(*)
UNDRAINED SHEAR STRENGTH, LB/SQ FT	= 0.250E+04	
BLOWS PER FOOT FROM STANDARD PENETRATION TEST	= 0.000E+00	
SOIL UNIT WEIGHT, LB/CU FT	= 0.125E+03	
MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT	= 0.100E+11	
DEPTH, FT	= 0.150E+03	

LRFD RESISTANCE FACTOR (SIDE FRICTION)	= 0.700E+00
LRFD RESISTANCE FACTOR (TIP RESISTANCE)	= 0.100E-03

(*) ESTIMATED BY THE PROGRAM BASED ON OTHER PARAMETERS

INPUT DRILLED SHAFT INFORMATION

MINIMUM SHAFT DIAMETER	= 4.500	FT.
MAXIMUM SHAFT DIAMETER	= 4.500	FT.
RATIO BASE/SHAFT DIAMETER	= 0.000	FT.
ANGLE OF BELL	= 0.000	DEG.
IGNORED TOP PORTION	= 5.000	FT.
IGNORED BOTTOM PORTION	= 0.000	FT.
ELASTIC MODULUS, Ec	= 0.360E+07	LB/SQ IN

COMPUTATION RESULTS

- CASE ANALYZED : 1
  VARIATION LENGTH : 1
  VARIATION DIAMETER : 1

DRILLED SHAFT INFORMATION

DIAMETER OF STEM	= 4.500	FT.
DIAMETER OF BASE	= 4.500	FT.
END OF STEM TO BASE	= 0.000	FT.
ANGLE OF BELL	= 0.000	DEG.
IGNORED TOP PORTION	= 5.000	FT.
IGNORED BOTTOM PORTION	= 0.000	FT.
AREA OF ONE PERCENT STEEL	= 22.905	SQ.IN.
ELASTIC MODULUS, Ec	= 0.360E+07	LB/SQ IN
VOLUME OF UNDERREAM	= 0.000	CU.YDS.

PREDICTED RESULTS

QS = ULTIMATE SIDE RESISTANCE;
QB = ULTIMATE BASE RESISTANCE;
WT = WEIGHT OF DRILLED SHAFT (UPLIFT CAPACITY ONLY);
QU = TOTAL ULTIMATE RESISTANCE;
LRFD QS = TOTAL SIDE FRICTION USING LRFD RESISTANCE FACTOR TO THE ULTIMATE SIDE RESISTANCE;
LRFD QB = TOTAL BASE BEARING USING LRFD RESISTANCE FACTOR TO THE ULTIMATE BASE RESISTANCE
LRFD QU = TOTAL CAPACITY WITH LRFD RESISTANCE FACTOR.

LENGTH (FT)	VOLUME (CU.YDS)	QS (TONS)	QB (TONS)	QU (TONS)	LRFD QS (TONS)	LRFD QB (TONS)	LRFD QU (TONS)
6.0	3.53	5.83	107.68	113.51	4.08	0.01	4.09
7.0	4.12	11.66	110.63	122.30	8.17	0.01	8.18
8.0	4.71	17.50	113.36	130.86	12.25	0.01	12.26
9.0	5.30	23.33	116.00	139.33	16.33	0.01	16.34
10.0	5.89	29.16	118.29	147.45	20.41	0.01	20.43
11.0	6.48	34.99	119.99	154.98	24.50	0.01	24.51
12.0	7.07	40.83	121.12	161.95	28.58	0.01	28.59
13.0	7.66	46.66	121.68	168.34	32.66	0.01	32.67
14.0	8.25	52.49	121.68	174.17	36.74	0.01	36.76
15.0	8.84	59.10	121.68	180.78	41.37	0.01	41.38
16.0	9.43	65.71	121.68	187.39	46.00	0.01	46.01
17.0	10.02	72.32	121.68	194.00	50.62	0.01	50.64
18.0	10.60	78.93	121.68	200.61	55.25	0.01	55.26
19.0	11.19	85.54	121.68	207.22	59.88	0.01	59.89
20.0	11.78	92.15	121.68	213.83	64.51	0.01	64.52
21.0	12.37	98.76	121.68	220.44	69.13	0.01	69.14
22.0	12.96	105.37	121.68	227.05	73.76	0.01	73.77
23.0	13.55	111.98	121.68	233.66	78.39	0.01	78.40
24.0	14.14	118.59	121.68	240.27	83.01	0.01	83.03
25.0	14.73	125.20	121.68	246.88	87.64	0.01	87.65
26.0	15.32	131.81	121.68	253.49	92.27	0.01	92.28
27.0	15.91	138.42	121.68	260.10	96.89	0.01	96.91
28.0	16.50	145.03	129.22	274.25	101.52	0.01	101.53
29.0	17.08	151.64	137.51	289.15	106.15	0.01	106.16
30.0	17.67	158.25	146.55	304.80	110.78	0.01	110.79
31.0	18.26	164.86	156.34	321.20	115.40	0.02	115.42
32.0	18.85	171.47	165.38	336.86	120.03	0.02	120.05
33.0	19.44	178.08	172.17	350.25	124.66	0.02	124.67
34.0	20.03	184.69	176.69	361.38	129.28	0.02	129.30
35.0	20.62	191.30	178.95	370.25	133.91	0.02	133.93
36.0	21.21	197.91	178.95	376.86	138.54	0.02	138.56
37.0	21.80	207.63	178.95	386.58	145.34	0.02	145.36
38.0	22.39	217.35	178.95	396.30	152.15	0.02	152.16
39.0	22.98	227.07	178.95	406.02	158.95	0.02	158.97
40.0	23.57	236.79	178.95	415.74	165.75	0.02	165.77

41.0	24.15	246.51	178.95	425.46	172.56	0.02	172.58
42.0	24.74	256.23	178.95	435.18	179.36	0.02	179.38
43.0	25.33	265.95	178.95	444.90	186.17	0.02	186.19
44.0	25.92	275.68	178.95	454.62	192.97	0.02	192.99
45.0	26.51	285.40	178.95	464.34	199.78	0.02	199.79
46.0	27.10	295.12	178.95	474.06	206.58	0.02	206.60
47.0	27.69	304.84	178.95	483.78	213.39	0.02	213.40
48.0	28.28	314.56	178.95	493.50	220.19	0.02	220.21
49.0	28.87	324.28	178.95	503.22	226.99	0.02	227.01
50.0	29.46	334.00	178.95	512.95	233.80	0.02	233.82
51.0	30.05	343.72	178.95	522.67	240.60	0.02	240.62
52.0	30.63	353.44	178.95	532.39	247.41	0.02	247.43
53.0	31.22	363.16	178.95	542.11	254.21	0.02	254.23
54.0	31.81	372.88	178.95	551.83	261.02	0.02	261.03
55.0	32.40	382.60	178.95	561.55	267.82	0.02	267.84
56.0	32.99	392.32	178.95	571.27	274.63	0.02	274.64
57.0	33.58	402.04	178.95	580.99	281.43	0.02	281.45
58.0	34.17	411.76	178.95	590.71	288.23	0.02	288.25
59.0	34.76	421.48	178.95	600.43	295.04	0.02	295.06
60.0	35.35	431.20	178.95	610.15	301.84	0.02	301.86
61.0	35.94	440.92	178.95	619.87	308.65	0.02	308.67
62.0	36.53	450.65	178.95	629.59	315.45	0.02	315.47
63.0	37.11	460.37	178.95	639.31	322.26	0.02	322.27
64.0	37.70	470.09	178.95	649.03	329.06	0.02	329.08
65.0	38.29	479.81	178.95	658.75	335.86	0.02	335.88
66.0	38.88	489.53	178.95	668.47	342.67	0.02	342.69
67.0	39.47	499.25	178.95	678.19	349.47	0.02	349.49
68.0	40.06	508.97	178.95	687.92	356.28	0.02	356.30
69.0	40.65	518.69	178.95	697.64	363.08	0.02	363.10
70.0	41.24	528.41	178.95	707.36	369.89	0.02	369.90
71.0	41.83	538.13	178.95	717.08	376.69	0.02	376.71
72.0	42.42	547.85	178.95	726.80	383.50	0.02	383.51
73.0	43.01	557.57	178.95	736.52	390.30	0.02	390.32
74.0	43.60	567.29	178.95	746.24	397.10	0.02	397.12
75.0	44.18	577.01	178.95	755.96	403.91	0.02	403.93
76.0	44.77	586.73	178.95	765.68	410.71	0.02	410.73
77.0	45.36	596.45	178.95	775.40	417.52	0.02	417.54
78.0	45.95	606.17	178.95	785.12	424.32	0.02	424.34
79.0	46.54	615.89	178.95	794.84	431.13	0.02	431.14
80.0	47.13	625.62	178.95	804.56	437.93	0.02	437.95

AXIAL LOAD VS SETTLEMENT CURVES

RESULT FROM TREND (AVERAGED) LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.7535E-01	0.1965E-04	0.2618E-02	0.1000E-04
0.3767E+00	0.9824E-04	0.1309E-01	0.5000E-04
0.7535E+00	0.1965E-03	0.2618E-01	0.1000E-03
0.3784E+02	0.9840E-02	0.1309E+01	0.5000E-02
0.5677E+02	0.1476E-01	0.1963E+01	0.7500E-02
0.7570E+02	0.1968E-01	0.2618E+01	0.1000E-01
0.1893E+03	0.4921E-01	0.6545E+01	0.2500E-01
0.3465E+03	0.9629E-01	0.1309E+02	0.5000E-01
0.4234E+03	0.1322E+00	0.1963E+02	0.7500E-01
0.4935E+03	0.1672E+00	0.2618E+02	0.1000E+00
0.6423E+03	0.3430E+00	0.6545E+02	0.2500E+00
0.6810E+03	0.6016E+00	0.9584E+02	0.5000E+00
0.6819E+03	0.6421E+00	0.1002E+03	0.5400E+00
0.6738E+03	0.1456E+01	0.1548E+03	0.1350E+01
0.6926E+03	0.2811E+01	0.1736E+03	0.2700E+01

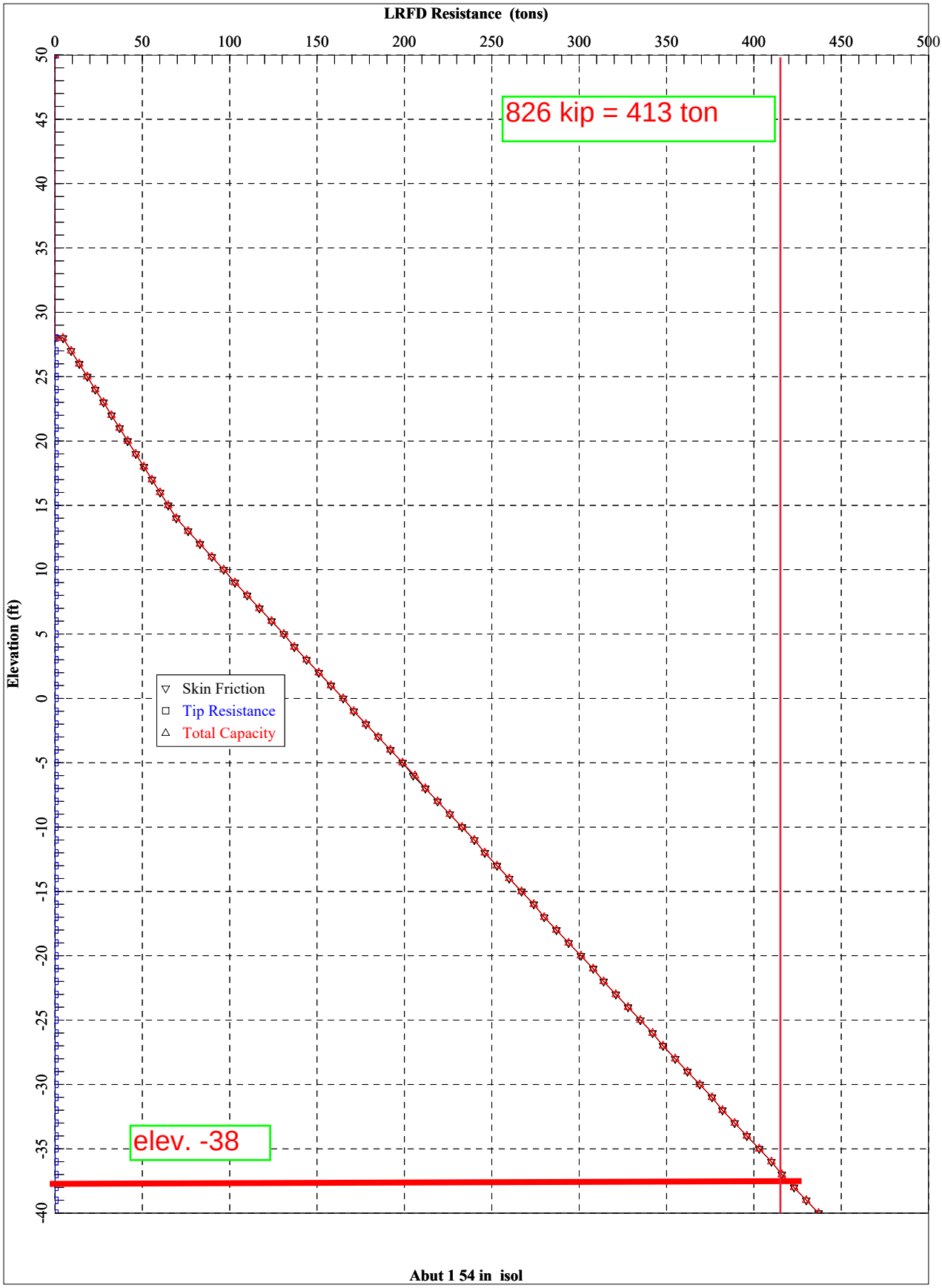
RESULT FROM UPPER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.1196E+00	0.2481E-04	0.3910E-02	0.1000E-04
0.5979E+00	0.1240E-03	0.1955E-01	0.5000E-04
0.1196E+01	0.2481E-03	0.3910E-01	0.1000E-03

0.6019E+02	0.1244E-01	0.1955E+01	0.5000E-02
0.9030E+02	0.1866E-01	0.2933E+01	0.7500E-02
0.1204E+03	0.2488E-01	0.3910E+01	0.1000E-01
0.3006E+03	0.6220E-01	0.9776E+01	0.2500E-01
0.5033E+03	0.1176E+00	0.1955E+02	0.5000E-01
0.5696E+03	0.1531E+00	0.2933E+02	0.7500E-01
0.6172E+03	0.1864E+00	0.3910E+02	0.1000E+00
0.7261E+03	0.3575E+00	0.9776E+02	0.2500E+00
0.7581E+03	0.6153E+00	0.1300E+03	0.5000E+00
0.7600E+03	0.6560E+00	0.1342E+03	0.5400E+00
0.7436E+03	0.1467E+01	0.1718E+03	0.1350E+01
0.7499E+03	0.2819E+01	0.1781E+03	0.2700E+01

RESULT FROM LOWER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.3906E-01	0.1517E-04	0.1326E-02	0.1000E-04
0.1953E+00	0.7583E-04	0.6628E-02	0.5000E-04
0.3906E+00	0.1517E-03	0.1326E-01	0.1000E-03
0.1958E+02	0.7586E-02	0.6628E+00	0.5000E-02
0.2937E+02	0.1138E-01	0.9941E+00	0.7500E-02
0.3916E+02	0.1517E-01	0.1326E+01	0.1000E-01
0.9792E+02	0.3794E-01	0.3314E+01	0.2500E-01
0.1931E+03	0.7572E-01	0.6628E+01	0.5000E-01
0.2708E+03	0.1112E+00	0.9941E+01	0.7500E-01
0.3435E+03	0.1463E+00	0.1326E+02	0.1000E+00
0.5521E+03	0.3273E+00	0.3314E+02	0.2500E+00
0.6042E+03	0.5879E+00	0.6170E+02	0.5000E+00
0.6041E+03	0.6283E+00	0.6621E+02	0.5400E+00
0.6040E+03	0.1445E+01	0.1378E+03	0.1350E+01
0.6344E+03	0.2802E+01	0.1682E+03	0.2700E+01


LRFD Resistance (tons)
0
50
100
150
200
250
300
350
400
450
500
826 kip = 413 ton
Elevation (ft)
50
45
40
35
30
25
20
15
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
Skin Friction
Tip Resistance
Total Capacity
elev. -38
Abut 1 54 in isol

```
     ==========================================================================

                     SHAFT for Windows, Version 2017.8.10

                      Serial Number :  226375637

                   VERTICALLY LOADED DRILLED SHAFT ANALYSIS
                    (c) Copyright ENSOFT, Inc., 1987-2017
                          All Rights Reserved

     ==========================================================================


     Path to file locations      : G:\Projects\Y2020\P20101 ALA Civ Env RW\TO 01 Meekland Ave
Corr\Calculations\Geotech\CIDH\piles 6 30 2023\
     Name of input data file     : 54 IN Meekland Abut 2a.sf8d
     Name of output file         : 54 IN Meekland Abut 2a.sf8o
     Name of plot output file    : 54 IN Meekland Abut 2a.sf8p
     Name of runtime file        : 54 IN Meekland Abut 2a.sf8r


     --------------------------------------------------------------------------
                          Time and Date of Analysis
     --------------------------------------------------------------------------

               Date:  July 03, 2023     Time:  11:45:57

     Meekland Abut 2 top elev. 50, 54 in CIDH


     PROPOSED DEPTH =     110.0 FT
     ----------------


     NUMBER OF LAYERS =    3
     ------------------


     WATER TABLE DEPTH =      15.0 FT.
     -------------------




     SOIL INFORMATION
     ---------------

     LAYER NO  1----CLAY

       AT THE TOP

       STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00  (*)
       END BEARING COEFFICIENT-Nc                        = 0.600E+01  (*)
       UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.150E+04
       BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
       SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
       MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
       DEPTH, FT                                         = 0.000E+00


       AT THE BOTTOM

       STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00  (*)
       END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
       UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.150E+04
       BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
       SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
       MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
       DEPTH, FT                                         = 0.140E+02


       LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
       LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.100E-03


     LAYER NO  2----CLAY

       AT THE TOP

       STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00  (*)
       END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
```

```
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.170E+04
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.140E+02


  AT THE BOTTOM

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00  (*)
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.170E+04
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.360E+02


  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.100E-03

LAYER NO  3----CLAY

  AT THE TOP

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00  (*)
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.250E+04
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.360E+02


  AT THE BOTTOM

  STRENGTH REDUCTION FACTOR-ALPHA                   = 0.550E+00  (*)
  END BEARING COEFFICIENT-Nc                        = 0.900E+01  (*)
  UNDRAINED SHEAR STRENGTH, LB/SQ FT                = 0.250E+04
  BLOWS PER FOOT FROM STANDARD PENETRATION TEST     = 0.000E+00
  SOIL UNIT WEIGHT, LB/CU FT                        = 0.125E+03
  MAXIMUM LOAD TRANSFER FOR SOIL, LB/SQ FT          = 0.100E+11
  DEPTH, FT                                         = 0.150E+03


  LRFD RESISTANCE FACTOR (SIDE FRICTION)            = 0.700E+00
  LRFD RESISTANCE FACTOR (TIP RESISTANCE)           = 0.100E-03


(*) ESTIMATED BY THE PROGRAM BASED ON OTHER PARAMETERS


INPUT DRILLED SHAFT INFORMATION
-------------------------------

 MINIMUM SHAFT DIAMETER    =    4.500  FT.
 MAXIMUM SHAFT DIAMETER    =    4.500  FT.
 RATIO BASE/SHAFT DIAMETER =    0.000  FT.
 ANGLE OF BELL             =    0.000  DEG.
 IGNORED TOP PORTION       =    5.000  FT.
 IGNORED BOTTOM PORTION    =    0.000  FT.
 ELASTIC MODULUS, Ec       = 0.360E+07 LB/SQ IN




COMPUTATION RESULTS
-------------------


- CASE ANALYZED      :     1
  VARIATION LENGTH   :     1
  VARIATION DIAMETER :     1
```

DRILLED SHAFT INFORMATION

DIAMETER OF STEM	=	4.500	FT.
DIAMETER OF BASE	=	4.500	FT.
END OF STEM TO BASE	=	0.000	FT.
ANGLE OF BELL	=	0.000	DEG.
IGNORED TOP PORTION	=	5.000	FT.
IGNORED BOTTOM PORTION	=	0.000	FT.
AREA OF ONE PERCENT STEEL	=	22.905	SQ.IN.
ELASTIC MODULUS, Ec	=	0.360E+07	LB/SQ IN
VOLUME OF UNDERREAM	=	0.000	CU.YDS.
SHAFT LENGTH	=	110.000	FT.

PREDICTED RESULTS

QS = ULTIMATE SIDE RESISTANCE;
QB = ULTIMATE BASE RESISTANCE;
WT = WEIGHT OF DRILLED SHAFT (UPLIFT CAPACITY ONLY);
QU = TOTAL ULTIMATE RESISTANCE;
LRFD QS = TOTAL SIDE FRICTION USING LRFD RESISTANCE FACTOR TO THE ULTIMATE SIDE RESISTANCE;
LRFD QB = TOTAL BASE BEARING USING LRFD RESISTANCE FACTOR TO THE ULTIMATE BASE RESISTANCE
LRFD QU = TOTAL CAPACITY WITH LRFD RESISTANCE FACTOR.

LENGTH (FT)	VOLUME (CU.YDS)	QS (TONS)	QB (TONS)	QU (TONS)	LRFD QS (TONS)	LRFD QB (TONS)	LRFD QU (TONS)
6.0	3.53	5.83	107.68	113.51	4.08	0.01	4.09
7.0	4.12	11.66	110.63	122.30	8.17	0.01	8.18
8.0	4.71	17.50	113.36	130.86	12.25	0.01	12.26
9.0	5.30	23.33	116.00	139.33	16.33	0.01	16.34
10.0	5.89	29.16	118.29	147.45	20.41	0.01	20.43
11.0	6.48	34.99	119.99	154.98	24.50	0.01	24.51
12.0	7.07	40.83	121.12	161.95	28.58	0.01	28.59
13.0	7.66	46.66	121.68	168.34	32.66	0.01	32.67
14.0	8.25	52.49	121.68	174.17	36.74	0.01	36.76
15.0	8.84	59.10	121.68	180.78	41.37	0.01	41.38
16.0	9.43	65.71	121.68	187.39	46.00	0.01	46.01
17.0	10.02	72.32	121.68	194.00	50.62	0.01	50.64
18.0	10.60	78.93	121.68	200.61	55.25	0.01	55.26
19.0	11.19	85.54	121.68	207.22	59.88	0.01	59.89
20.0	11.78	92.15	121.68	213.83	64.51	0.01	64.52
21.0	12.37	98.76	121.68	220.44	69.13	0.01	69.14
22.0	12.96	105.37	121.68	227.05	73.76	0.01	73.77
23.0	13.55	111.98	121.68	233.66	78.39	0.01	78.40
24.0	14.14	118.59	121.68	240.27	83.01	0.01	83.03
25.0	14.73	125.20	121.68	246.88	87.64	0.01	87.65
26.0	15.32	131.81	121.68	253.49	92.27	0.01	92.28
27.0	15.91	138.42	121.68	260.10	96.89	0.01	96.91
28.0	16.50	145.03	129.22	274.25	101.52	0.01	101.53
29.0	17.08	151.64	137.51	289.15	106.15	0.01	106.16
30.0	17.67	158.25	146.55	304.80	110.78	0.01	110.79
31.0	18.26	164.86	156.34	321.20	115.40	0.02	115.42
32.0	18.85	171.47	165.38	336.86	120.03	0.02	120.05
33.0	19.44	178.08	172.17	350.25	124.66	0.02	124.67
34.0	20.03	184.69	176.69	361.38	129.28	0.02	129.30
35.0	20.62	191.30	178.95	370.25	133.91	0.02	133.93
36.0	21.21	197.91	178.95	376.86	138.54	0.02	138.56
37.0	21.80	207.63	178.95	386.58	145.34	0.02	145.36
38.0	22.39	217.35	178.95	396.30	152.15	0.02	152.16
39.0	22.98	227.07	178.95	406.02	158.95	0.02	158.97
40.0	23.57	236.79	178.95	415.74	165.75	0.02	165.77
41.0	24.15	246.51	178.95	425.46	172.56	0.02	172.58
42.0	24.74	256.23	178.95	435.18	179.36	0.02	179.38
43.0	25.33	265.95	178.95	444.90	186.17	0.02	186.19
44.0	25.92	275.68	178.95	454.62	192.97	0.02	192.99
45.0	26.51	285.40	178.95	464.34	199.78	0.02	199.79
46.0	27.10	295.12	178.95	474.06	206.58	0.02	206.60
47.0	27.69	304.84	178.95	483.78	213.39	0.02	213.40
48.0	28.28	314.56	178.95	493.50	220.19	0.02	220.21
49.0	28.87	324.28	178.95	503.22	226.99	0.02	227.01
50.0	29.46	334.00	178.95	512.95	233.80	0.02	233.82
51.0	30.05	343.72	178.95	522.67	240.60	0.02	240.62
52.0	30.63	353.44	178.95	532.39	247.41	0.02	247.43
53.0	31.22	363.16	178.95	542.11	254.21	0.02	254.23
54.0	31.81	372.88	178.95	551.83	261.02	0.02	261.03

55.0	32.40	382.60	178.95	561.55	267.82	0.02	267.84
56.0	32.99	392.32	178.95	571.27	274.63	0.02	274.64
57.0	33.58	402.04	178.95	580.99	281.43	0.02	281.45
58.0	34.17	411.76	178.95	590.71	288.23	0.02	288.25
59.0	34.76	421.48	178.95	600.43	295.04	0.02	295.06
60.0	35.35	431.20	178.95	610.15	301.84	0.02	301.86
61.0	35.94	440.92	178.95	619.87	308.65	0.02	308.67
62.0	36.53	450.65	178.95	629.59	315.45	0.02	315.47
63.0	37.11	460.37	178.95	639.31	322.26	0.02	322.27
64.0	37.70	470.09	178.95	649.03	329.06	0.02	329.08
65.0	38.29	479.81	178.95	658.75	335.86	0.02	335.88
66.0	38.88	489.53	178.95	668.47	342.67	0.02	342.69
67.0	39.47	499.25	178.95	678.19	349.47	0.02	349.49
68.0	40.06	508.97	178.95	687.92	356.28	0.02	356.30
69.0	40.65	518.69	178.95	697.64	363.08	0.02	363.10
70.0	41.24	528.41	178.95	707.36	369.89	0.02	369.90
71.0	41.83	538.13	178.95	717.08	376.69	0.02	376.71
72.0	42.42	547.85	178.95	726.80	383.50	0.02	383.51
73.0	43.01	557.57	178.95	736.52	390.30	0.02	390.32
74.0	43.60	567.29	178.95	746.24	397.10	0.02	397.12
75.0	44.18	577.01	178.95	755.96	403.91	0.02	403.93
76.0	44.77	586.73	178.95	765.68	410.71	0.02	410.73
77.0	45.36	596.45	178.95	775.40	417.52	0.02	417.54
78.0	45.95	606.17	178.95	785.12	424.32	0.02	424.34
79.0	46.54	615.89	178.95	794.84	431.13	0.02	431.14
80.0	47.13	625.62	178.95	804.56	437.93	0.02	437.95
81.0	47.72	635.34	178.95	814.28	444.73	0.02	444.75
82.0	48.31	645.06	178.95	824.00	451.54	0.02	451.56
83.0	48.90	654.78	178.95	833.72	458.34	0.02	458.36
84.0	49.49	664.50	178.95	843.44	465.15	0.02	465.17
85.0	50.08	674.22	178.95	853.16	471.95	0.02	471.97
86.0	50.66	683.94	178.95	862.89	478.76	0.02	478.77
87.0	51.25	693.66	178.95	872.61	485.56	0.02	485.58
88.0	51.84	703.38	178.95	882.33	492.37	0.02	492.38
89.0	52.43	713.10	178.95	892.05	499.17	0.02	499.19
90.0	53.02	722.82	178.95	901.77	505.97	0.02	505.99
91.0	53.61	732.54	178.95	911.49	512.78	0.02	512.80
92.0	54.20	742.26	178.95	921.21	519.58	0.02	519.60
93.0	54.79	751.98	178.95	930.93	526.39	0.02	526.41
94.0	55.38	761.70	178.95	940.65	533.19	0.02	533.21
95.0	55.97	771.42	178.95	950.37	540.00	0.02	540.01
96.0	56.56	781.14	178.95	960.09	546.80	0.02	546.82
97.0	57.15	790.87	178.95	969.81	553.60	0.02	553.62
98.0	57.73	800.59	178.95	979.53	560.41	0.02	560.43
99.0	58.32	810.31	178.95	989.25	567.21	0.02	567.23
100.0	58.91	820.03	178.95	998.97	574.02	0.02	574.04
101.0	59.50	829.75	178.95	1008.69	580.82	0.02	580.84
102.0	60.09	839.47	178.95	1018.41	587.63	0.02	587.64
103.0	60.68	849.19	178.95	1028.14	594.43	0.02	594.45
104.0	61.27	858.91	178.95	1037.86	601.24	0.02	601.25
105.0	61.86	868.63	178.95	1047.58	608.04	0.02	608.06
106.0	62.45	878.35	178.95	1057.30	614.84	0.02	614.86
107.0	63.04	888.07	178.95	1067.02	621.65	0.02	621.67
108.0	63.63	897.79	178.95	1076.74	628.45	0.02	628.47
109.0	64.21	907.51	178.95	1086.46	635.26	0.02	635.28
110.0	64.80	917.23	178.95	1096.18	642.06	0.02	642.08

AXIAL LOAD VS SETTLEMENT CURVES

RESULT FROM TREND (AVERAGED) LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.1328E+00	0.3084E-04	0.2618E-02	0.1000E-04
0.6638E+00	0.1542E-03	0.1309E-01	0.5000E-04
0.1328E+01	0.3084E-03	0.2618E-01	0.1000E-03
0.6681E+02	0.1547E-01	0.1309E+01	0.5000E-02
0.1002E+03	0.2321E-01	0.1963E+01	0.7500E-02
0.1336E+03	0.3094E-01	0.2618E+01	0.1000E-01
0.3279E+03	0.7714E-01	0.6545E+01	0.2500E-01
0.5484E+03	0.1438E+00	0.1309E+02	0.5000E-01
0.6614E+03	0.1896E+00	0.1963E+02	0.7500E-01
0.7512E+03	0.2330E+00	0.2618E+02	0.1000E+00
0.9185E+03	0.4239E+00	0.6545E+02	0.2500E+00
0.9526E+03	0.6856E+00	0.9584E+02	0.5000E+00
0.9520E+03	0.7261E+00	0.1002E+03	0.5400E+00

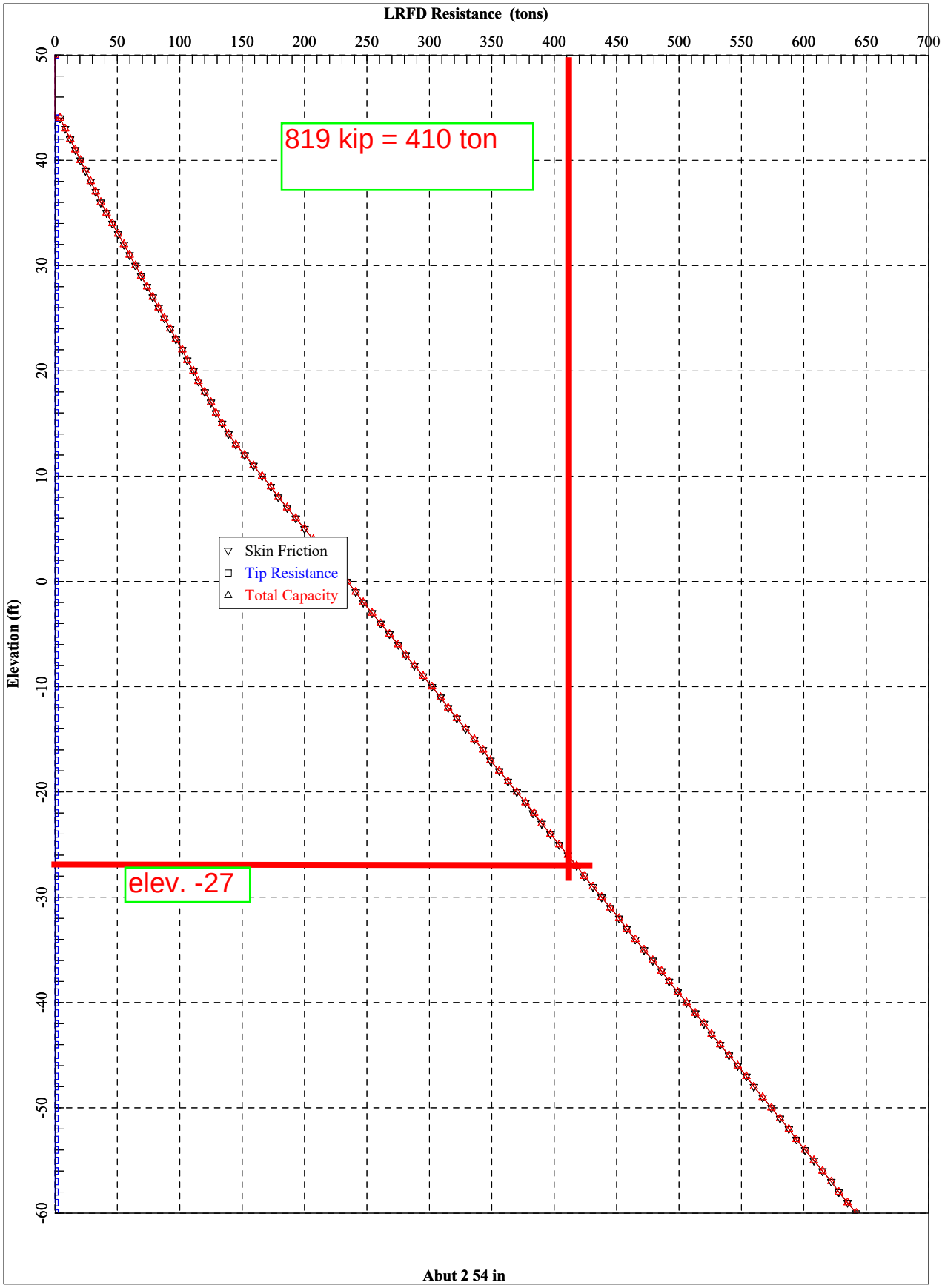
0.9175E+03	0.1537E+01	0.1548E+03	0.1350E+01
0.9363E+03	0.2893E+01	0.1736E+03	0.2700E+01

RESULT FROM UPPER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.2273E+00	0.4363E-04	0.3910E-02	0.1000E-04
0.1136E+01	0.2181E-03	0.1955E-01	0.5000E-04
0.2273E+01	0.4363E-03	0.3910E-01	0.1000E-03
0.1147E+03	0.2194E-01	0.1955E+01	0.5000E-02
0.1721E+03	0.3291E-01	0.2933E+01	0.7500E-02
0.2295E+03	0.4388E-01	0.3910E+01	0.1000E-01
0.5231E+03	0.1071E+00	0.9776E+01	0.2500E-01
0.7726E+03	0.1852E+00	0.1955E+02	0.5000E-01
0.8502E+03	0.2279E+00	0.2933E+02	0.7500E-01
0.9033E+03	0.2659E+00	0.3910E+02	0.1000E+00
0.1024E+04	0.4477E+00	0.9776E+02	0.2500E+00
0.1050E+04	0.7079E+00	0.1300E+03	0.5000E+00
0.1051E+04	0.7486E+00	0.1342E+03	0.5400E+00
0.1012E+04	0.1556E+01	0.1718E+03	0.1350E+01
0.1018E+04	0.2908E+01	0.1781E+03	0.2700E+01

RESULT FROM LOWER-BOUND LINE

TOP LOAD TON	TOP MOVEMENT IN.	TIP LOAD TON	TIP MOVEMENT IN.
0.6367E-01	0.2063E-04	0.1326E-02	0.1000E-04
0.3184E+00	0.1032E-03	0.6628E-02	0.5000E-04
0.6367E+00	0.2063E-03	0.1326E-01	0.1000E-03
0.3195E+02	0.1033E-01	0.6628E+00	0.5000E-02
0.4793E+02	0.1550E-01	0.9941E+00	0.7500E-02
0.6391E+02	0.2066E-01	0.1326E+01	0.1000E-01
0.1598E+03	0.5166E-01	0.3314E+01	0.2500E-01
0.3084E+03	0.1023E+00	0.6628E+01	0.5000E-01
0.4287E+03	0.1483E+00	0.9941E+01	0.7500E-01
0.5353E+03	0.1928E+00	0.1326E+02	0.1000E+00
0.8058E+03	0.3983E+00	0.3314E+02	0.2500E+00
0.8552E+03	0.6634E+00	0.6170E+02	0.5000E+00
0.8528E+03	0.7036E+00	0.6621E+02	0.5400E+00
0.8229E+03	0.1518E+01	0.1378E+03	0.1350E+01
0.8533E+03	0.2877E+01	0.1682E+03	0.2700E+01


LRFD Resistance (tons)
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
Elevation (ft)
819 kip = 410 ton
Skin Friction
Tip Resistance
Total Capacity
elev. -27
Abut 2 54 in

P20101 TO 1
Wood Rodgers

San Lorenzo Creek/Meekland Ave

Elev.	p-y Curve	γ_{wet}	ϕ	c psf	k psi	ε50
58						
	Stiff w/o Free Water	65	XX	1450	1000	0.005
36						
	Stiff w/o Free Water	65	XX	1700	1000	0.005
14						
	Stiff w/o Free Water	65	XX	2550	2000	0.004
-23						

FT
4/12/2022

San Lorenzo Creek/Meekland Ave - Isolation Casing

Elev.	p-y Curve	γ_{wet}	ϕ	c psf	k psi	ε50
58						
	Isolation Casing	65	XX	XX	XX	XX
29						
	Stiff w/o Free Water	65	XX	1700	1000	0.005
14						
	Stiff w/o Free Water	65	XX	2550	2000	0.004
-23						

Settlement

Foundation Design Data - Meekland Avenue over San Lorenzo Creek Bridge

General Foundation Design Information

Support Location	Pile Type	Finished Grade [1]	Cut-off Elevation	Pile Cap Size		Permissible Settlement under Service Load	No. Piles per Support	Tip Elev.	Relativey Rigid Pile Cap					Service-I Limit State	
				B	L				2/3D elev.	B' ft		L' ft		Permamnent Loads per Support - k	Q/(B'$_{el-2}$*L'$_{el-2}$)
										elev. 50	elev. -2	elev. 50	elev. -2		ksf
Abut 1	54" CIDH Concrete Pile	53.11 ft	50.25 ft	6.50 ft	76.83 ft	2.00 in	3	-28	-2	4.5	30.7	51.9	78.1	1915	0.798
Abut 1	54" CIDH Concrete Pile in 66" Isolation Casing	53.11 ft					1	-37	-8						
Abut 2	54" CIDH Concrete Pile	53.05 ft	50.25 ft	6.50 ft	76.83 ft	2.00 in	4	-27	-2	4.5	30.4	72.0	97.9	1922	0.646

Notes:

1. Minimum anticipated FG Elevation at edge of the Pile Cap

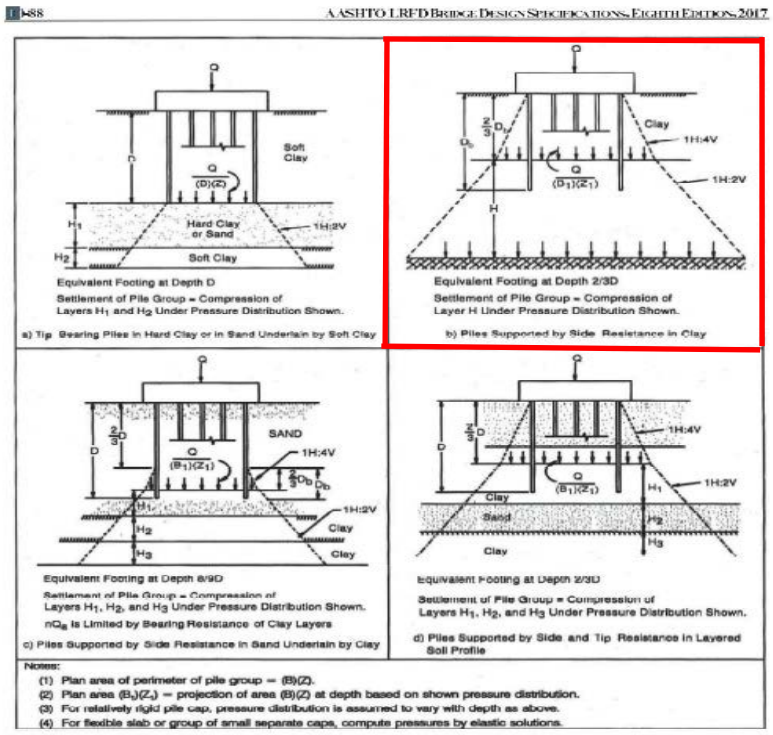


Figure 10.7.2.3.1-1—Stress Distribution Below Equivalent Footing for Pile Group after Hannigan et al. (2006)

10.7.2.3.2-Pile Groups in Cohesive Soil
Shallow foundation settlement estimation procedures shall be used to estimate the settlement of a pile group, using the equivalent footing location specified in Figure 10. 7.2.3.1-1 or Figure 10. 7.2.3 .1-2.

:

	Using SPT:		∂ = qIVB/N160		
Abut 1	in which:				
	I=1-(0.125*D'/B')≥0.5	=	-0.444444		
	q=	0.80	ksf		
	B=	4.5	ft	√B=	2.121320344
	D'=	52	ft		
	N160=	21			
	∂=	-0.43	in		

P20101 Meekland Ave at San Lorenzo Creek Crossing
Retaining Wall H=6'

DESIGNED BY: FPT
DATE: 6/27/2022
CHECKED BY:
DATE:

BEARING CAPACITY ANALYSIS

SOIL BORING R-21-001

B.O.F. Elevation =Sandy Silt, Lean Clay with Sand, Clayey Sand, stiff/medum dense,

Foundation Soil Properties:		
Unit Weight of Soil	110	pounds per cubic foot
Internal Angle of Friction	0	degrees
Cohesion	1930	pounds per square foot
Nc	5.14	
Nq	1	
Nγ	0	
Depth of Embedment (D)	2	foot

Note: Bearing capacity factors from AASHTO, 2012, LRFD Table 10.6.3.1.2a-1

Extreme 1 Bearing Capacity Check

Gross Bearing Pressure (from Designer)	2.2	kips per square foot
Effective Footing width, B' (from Designer)	4.1	feet
Extreme Event Phi Factor for Bearing Capacity	1.00	
Bearing Capacity =	10.14	kips per square foot

IF 10.14 > 2.20 SAY OK

Extreme II Bearing Capacity Check

Gross Bearing Pressure (from Designer)	3.0	kips per square foot
Effective Footing width, B' (from Designer)	3.1	feet
Extreme Event Phi Factor for Bearing Capacity	1.00	
Bearing Capacity =	10.14	kips per square foot

IF 10.14 > 3.00 SAY OK

Bearing Capacity Eqtn = ϕ ($cN_c+\gamma$ D Nq+1/2 γ B' Nγ)

Maximum allowable concrete bearing stress = 0.3 f'c per Section 10.6.2.6.2 of reference AASHTO (2012)
For typical 4000 psi compressive strength concrete maximum allowable bearing stress is 172.8 kips per square foot

References:

(a) NAVFAC, 1986. Ultimate Bearing Capacity of Shallow Foortings with Concentric Loads, 7.2-131. Naval Facilites Engineering Command,
(b) AASHTO, 2018. AASHTO LRFD Bridge Design Specifications, with Caltrans Amendments, 8th Edition.

P20101 Meekland Ave at San Lorenzo Creek Crossing
Retaining Wall H=6'

DESIGNED BY: FPT
DATE: 6/27/2022
CHECKED BY:
DATE:

BEARING CAPACITY ANALYSIS
SOIL BORING R-21-001

B.O.F. Elevation =Sandy Silt, Lean Clay with Sand, Clayey Sand, stiff/medum dense,

Foundation Soil Properties:

Unit Weight of Soil	110	pounds per cubic foot
Internal Angle of Friction	0	degrees
Cohesion	1930	pounds per square foot
Nc	5.14	
Nq	1	
Nγ	0	
Depth of Embedment (D)	2	foot

Note: Bearing capacity factors from AASHTO, 2012, LRFD Table 10.6.3.1.2a-1

Service Bearing Capacity Check

Gross Bearing Pressure (from Designer)	1.8	kips per square foot
Effective Footing width, B' (from Designer)	6.1	feet
Service Phi Factor for Bearing Capacity	0.45	
Bearing Capacity =	4.56	kips per square foot

IF 4.56 > 1.80 SAY OK

Strength Bearing Capacity Check

Gross Bearing Pressure (from Designer)	2.9	kips per square foot
Effective Footing width, B' (from Designer)	6.1	feet
Strength Event Phi Factor for Bearing Capacity	0.45	
Bearing Capacity =	4.56	kips per square foot

IF 4.56 > 2.90 SAY OK

Bearing Capacity Eqtn = ϕ ($cN_c+\gamma$ D Nq+1/2 γ B' Nγ)

Maximum allowable concrete bearing stress = 0.3 f'c per Section 10.6.2.6.2 of reference AASHTO (2012)
For typical 4000 psi compressive strength concrete maximum allowable bearing stress is 172.8 kips per square foot

References:

(a) NAVFAC, 1986. Ultimate Bearing Capacity of Shallow Foortings with Concentric Loads, 7.2-131. Naval Facilites Engineering Command,
(b) AASHTO, 2018. AASHTO LRFD Bridge Design Specifications, with Caltrans Amendments, 8th Edition.

P20101 Meekland Ave at San Lorenzo Creek Crossing
Retaining Wall H=4'

DESIGNED BY: FPT
DATE: 6/27/2022
CHECKED BY:
DATE:

BEARING CAPACITY ANALYSIS
SOIL BORING R-21-001

B.O.F. Elevation =Sandy Silt, Lean Clay with Sand, Clayey Sand, stiff/medum dense,

Foundation Soil Properties:

Unit Weight of Soil	110	pounds per cubic foot
Internal Angle of Friction	0	degrees
Cohesion	1930	pounds per square foot
Nc	5.14	
Nq	1	
Nγ	0	
Depth of Embedment (D)	2	foot

Note: Bearing capacity factors from AASHTO, 2012, LRFD Table 10.6.3.1.2a-1

Extreme 1 Bearing Capacity Check

Gross Bearing Pressure (from Designer)	1.5	kips per square foot
Effective Footing width, B' (from Designer)	4.4	feet
Extreme Event Phi Factor for Bearing Capacity	1.00	
Bearing Capacity =	10.14	kips per square foot

IF 10.14 > 1.50 SAY OK

Extreme II Bearing Capacity Check

Gross Bearing Pressure (from Designer)	2.7	kips per square foot	
Effective Footing width, B' (from Designer)	3.5	feet	10.1
Extreme Event Phi Factor for Bearing Capacity	1.00		
Bearing Capacity =	10.14	kips per square foot	

IF 10.14 > 2.70 SAY OK

Bearing Capacity Eqtn = ϕ ($cN_c+\gamma$ D Nq+1/2 γ B' Nγ)

Maximum allowable concrete bearing stress = 0.3 f'c per Section 10.6.2.6.2 of reference AASHTO (2012)
For typical 4000 psi compressive strength concrete maximum allowable bearing stress is 172.8 kips per square foot

References:

(a) NAVFAC, 1986. Ultimate Bearing Capacity of Shallow Foortings with Concentric Loads, 7.2-131. Naval Facilites Engineering Command,
(b) AASHTO, 2018. AASHTO LRFD Bridge Design Specifications, with Caltrans Amendments, 8th Edition.

P20101 Meekland Ave at San Lorenzo Creek Crossing
Retaining Wall H=4'

DESIGNED BY: FPT
DATE: 6/27/2022
CHECKED BY:
DATE:

BEARING CAPACITY ANALYSIS
SOIL BORING R-21-001

B.O.F. Elevation =Sandy Silt, Lean Clay with Sand, Clayey Sand, stiff/medum dense,

Foundation Soil Properties:

Unit Weight of Soil	110	pounds per cubic foot
Internal Angle of Friction	0	degrees
Cohesion	1930	pounds per square foot
Nc	5.14	
Nq	1	
Nγ	0	
Depth of Embedment (D)	2	foot

Note: Bearing capacity factors from AASHTO, 2012, LRFD Table 10.6.3.1.2a-1

Service Bearing Capacity Check

Gross Bearing Pressure (from Designer)	1.4	kips per square foot
Effective Footing width, B' (from Designer)	6.2	feet
Service Phi Factor for Bearing Capacity	0.45	
Bearing Capacity =	4.56	kips per square foot

IF 4.56 > 1.40 SAY OK

Strength Bearing Capacity Check

Gross Bearing Pressure (from Designer)	2.4	kips per square foot
Effective Footing width, B' (from Designer)	6.2	feet
Strength Event Phi Factor for Bearing Capacity	0.45	
Bearing Capacity =	4.56	kips per square foot

IF 4.56 > 2.40 SAY OK

Bearing Capacity Eqtn = ϕ ($cN_c+\gamma$ D Nq+1/2 γ B' Nγ)

Maximum allowable concrete bearing stress = 0.3 f'c per Section 10.6.2.6.2 of reference AASHTO (2012)
For typical 4000 psi compressive strength concrete maximum allowable bearing stress is 172.8 kips per square foot

References:

(a) NAVFAC, 1986. Ultimate Bearing Capacity of Shallow Foortings with Concentric Loads, 7.2-131. Naval Facilites Engineering Command,
(b) AASHTO, 2018. AASHTO LRFD Bridge Design Specifications, with Caltrans Amendments, 8th Edition.

CLIENT: Alameda County
TO 1 Meekland Ave
PROJECT NO.: P20101
TITLE: Settlement at Elevation 54

STRUCTURE NO.: RW 1
'Silty Sand Mediunm Dense 2 ft/ Loose/Soft Silty Sand/Clay

COMPUTED BY: FPT
DATE: 06/30/2022
CHECKED BY: _____
DATE: _____
PAGE: 2 of 2

SETTLEMENT OF STRIP FOOTINGS ON GRANULAR SOILS (SCHMERTMANN, FHWA-TS-78-209, PGS 49-54)

EQUATIONS: Izp max = 0.5 + 0.1*(DELTA P / SIGMA V')^0.5 ; DELTA P = P - Po'

B, FOOTING WIDTH (FT.)	P, LOAD (KSF)	DEPTH TO FOOTING BASE (FT.)	Po ' (KSF)	DELTA P (KSF)	B (FT.)	SIGMA V ' (KSF)	Izp (MAX)
			(VALUES FOR Po' AND SIGMA V ' COMPUTED BELOW)				
6.1	1.8	6.8	0	1.8	6.1	1.522	0.609

NOTE: STRATA DEPTH START AT GROUND SURFACE AND EXTEND TO D + 4B
ONE STRATA BREAK AT WATER TABLE, USE BOUYANT UNIT WEIGHTS BELOW WATER TABLE

WATER TABLE DEPTH (FT.)	STRATA DEPTH FROM (FT.)	STRATA DEPTH TO (FT.)	UNIT WEIGHT (KCF)	P ZERO DEPTH (FT.)	P ZERO (KSF)	Izp DEPTH (FT.)	SIGMA V (KSF)
7	0	7	0.118	6.8	0.000	12.9	0.826
7	8	50	0.118		0.000		0.696

INFLUENCE VALUES & BOUNDARY CONDITIONS
6.8 FT = D, FIRST LAYER MUST START AT DEPTH D
12.9 FT = D+B, ONE LAYER BOUNDARY MUST OCCUR AT Izp @ D+B
31.2 FT = D+4B, BOTTOM OF LAST LAYER MUST END AT D + 4B

LAYER DEPTH FROM (FT.)	LAYER DEPTH TO (FT.)	LAYER THICKNESS (FT.)	LAYER MID-THICK DEPTH, FT	E (KSF)	Iz	Iz*D/Es
-	-	-	-	-	-	-
6.8	8.8	2	7.8	800	0.267	0.00067
8.1	12.9	4.8	10.5	130	0.448	0.01654
12.9	31.2	18.3	22.05	130	0.304	0.04285
44						
SUMMATION, Iz*D/Es =						0.06005

SETTLEMENT COMPUTATION:

EQUATIONS: C1 = 1.0-0.5*(P zero/DELTA P)
C2 = 1.0+0.2*LOG(TIME,YRS/0.1)
S = DELTA P*C1*C2*(SUM(Iz*D/Es)

DELTA P	C1	TIME (YRS)	C2	Iz*D/Es	SETTLEMENT (FT.)	SETTLEMENT (IN.)
1.8	1.00	50	1.54	0.0601	0.1664	**2.00**

* If such pre-loading has occurred (i.e. rock), tentatively use ½ the above predicted settlement as probably still conservative.
(SCHMERTMANN, FHWA-TS-78-209, PGS 49-54)

0.399463 0.2*2 = 0.4
Thus, <1 inch

OWNER: Alameda County
PROJECT: TO 1 Meekland Ave
LOCATION: Retaining Wall No. 1
PROJECT NO.: P20101

'Silty Sand Mediunm Dense 2 ft/
Loose/Soft Silty Sand/Clay

COMPUTED BY: FT
DATE: 09/9/2022
CHECKED BY:
DATE: _____

B.O.F. = 54 **feet** **F. G. Elev =** 60.8 **feet**

SETTLEMENT OF SQUARE FOOTINGS (SCHMERTMANN, FHWA-TS-78-209, PGS 49-54)

EQUATIONS: Izp max = 0.5 + 0.1*(DELTA P / SIGMA V')^0.5 ; DELTA P = P - Po'

B FOOTING WIDTH (FT.)	P LOAD (KSF)	DEPTH TO FOOTING BASE (FT.)	Po ' (KSF)	DELTA P (KSF)	B/2 (FT.)	SIGMA V ' (KSF)
			(VALUES FOR Po' AND SIGMA V ' COMPUTED BELO			
6.1	1.8	6.8	0.8024	0.9976	3.05	1.162

NOTE: STRATA DEPTH START AT GROUND SURFACE = 0 FT. AND EXTEND TO D + 2B =
ONE STRATA BREAK AT WATER TABLE, USE BUOYANT UNIT WEIGHTS BELOW WATER TABLE

WATER TABLE	STRATA DEPTH		UNIT	P ZERO		Izp	
DEPTH	FROM	TO	WEIGHT	DEPTH	P ZERO	DEPTH	SIGMA V
(FT.)	(FT.)	(FT.)	(KCF)	(FT.)	(KSF)	(FT.)	(KSF)
7	0	7.0	0.118	6.8	0.802	9.85	0.826
7	7.0	60	0.118		0.000		0.336

INFLUENCE VALUES & BOUNDARY CONDITIONS:
6.8 FT = D, FIRST LAYER MUST START AT DEPTH D
9.85 FT = D+B/2, ONE LAYER BOUNDARY MUST OCCUR AT Izp @ D+B/
19 FT = D+2B, BOTTOM OF LAST LAYER MUST END AT D + 2B

LAYER DEPTH FROM (FT.)	LAYER DEPTH TO (FT.)	LAYER THICKNESS (FT.)	LAYER MID-THICK DEPTH, FT	E (KSF)	Iz	Iz*D/Es
0	6.8	6.8	3.4	800	0.211	0.00180
6.8	8.6	1.8	7.7	800	0.070	0.00016
8.6	9.85	1.25	9.225	180	0.020	0.00014
9.85	19	9.15	14.425	180	0.000	0.00000
19						

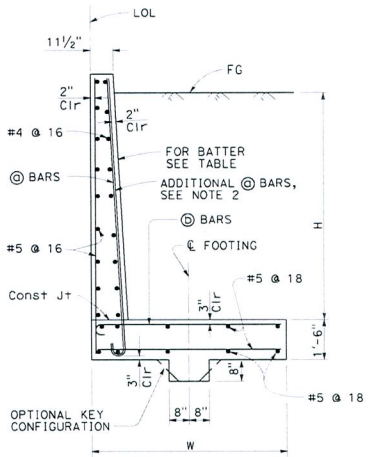
SUMMATION, Iz*D/Es =	0.00210

SETTLEMENT COMPUTATION EQUATIONS

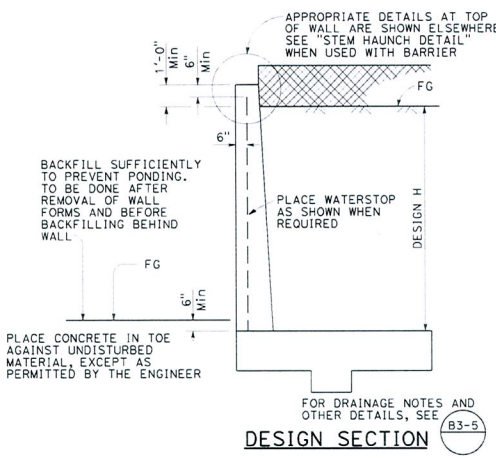
C1 = 1.0-0.5*(Po'/DELTA P)
C2 = 1.0+0.2*LOG(TIME,YRS/0.1)
S = DELTA P*C1*C2*(SUM(Iz*D/Es)

DELTA P	C1	TIME (YRS)	C2	Iz*D/Es		SETTLEMENT (FT.)	SETTLEMENT (IN.)
0.9976	0.598	50	1.540	0.0021		**0.0019**	**0.02**

* If such pre-loading has occurred (i.e. rock), tentatively use ½ the above predicted settlement as probably still conservative. **(SCHMERTMANN, FHWA-TS-78-209, PGS 49-54)**

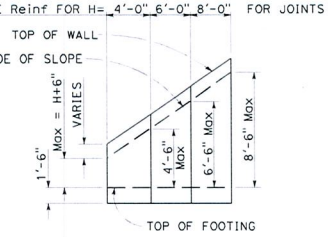


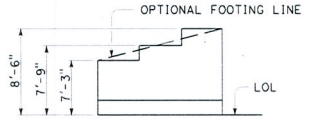
SPREAD FOOTING SECTION



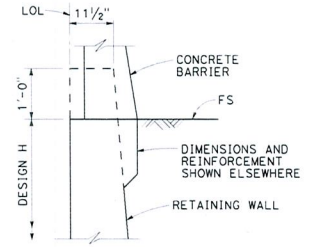
DESIGN SECTION

USE Reinf FOR H= 4'-0" 6'-0" 8'-0" FOR JOINTS REQUIRED, SEE B0-3 3-3 & B0-3 3-4

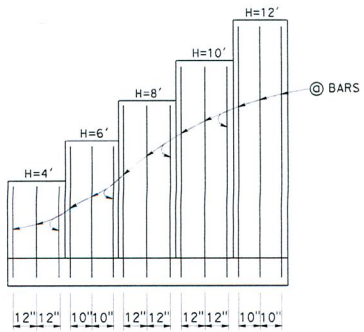




TYPICAL LAYOUT EXAMPLE



STEM HAUNCH DETAIL



ELEVATION

SYMBOLS:

Ser - service limit state I
Str - strength limit state I
Ext I - extreme event limit state I
Ext II - extreme event limit state II
B' - effective footing width (ft)
q_o - net bearing stress (ksf), OG assumed to be FG at toe
q_o - gross uniform bearing stress (ksf)

TABLE OF REINFORCING STEEL, DIMENSIONS AND DATA

DESIGN H	4'	6'	8'	10'	12'
W	7'-3"	7'-9"	8'-6"	9'-6"	10'-6"
BATTER	NONE	NONE	100 : 2	100 : 3	100 : 4
ⓐ BARS	#7 @ 12	#7 @ 10	#7 @ 12	#7 @ 12	#7 @ 10
ⓑ BARS	#7 @ 12	#7 @ 10	#8 @ 12	#9 @ 12	#10 @ 10
Ser: B', q_o	6.2, 1.4	6.1, 1.8	6.4, 2.1	7.0, 2.5	7.7, 2.8
Str: B', q_o	6.2, 2.4	6.1, 2.9	5.3, 3.0	6.0, 3.5	6.6, 4.0
Ext I: B', q_o	4.4, 1.5	4.1, 2.2	4.0, 3.1	4.1, 3.9	4.2, 4.8
Ext II: B', q_o	2.5, 2.7	3.1, 3.0	3.8, 3.2	4.9, 3.3	5.8, 3.5

DIST | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET NO. | TOTAL SHEETS

REGISTERED CIVIL ENGINEER

May 31, 2018
PLANS APPROVAL DATE

Gary Wang No. C58298 Exp. 6-30-18 CIVIL

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

DESIGN CONDITIONS:

Design H may be exceeded by 6" before going to the next size. Special footing design is required where foundation material is incapable of supporting bearing stress listed in the table.

DESIGN NOTES:

DESIGN: AASHTO LRFD Bridge Design Specifications, 4th Edition with California Amendments

LS: Varied surcharge on level ground surface

DC: Stem Architectural Treatment of thickness up to 6" of concrete (75 psf) considered

CT: 54 kip transverse force applied at He = 32", distributed over 10 feet at the top of wall and 1 : 1 distribution down and outward. Distribution below footing taken no less than 40'.

SEISMIC: k_h = 0.2
k_v = 0.0

SOIL: ø = 34°
γ = 120 pcf

REINFORCED CONCRETE: f'c = 3,600 psi
fy = 60,000 psi

LOAD COMBINATIONS AND LIMIT STATES:

Service I	Q = 1.00DC+1.00EV+1.00EH+1.00LS
Strength I	Q = αDC+βEV+ηEH+1.75LS
Extreme I	Q = 1.00DC+1.00EV+1.00EH+1.00EQD+1.00EQE
Extreme II	Q = 1.00DC+1.00EV+1.00EH+1.00CT

Where:

Q:	Force Effects
α:	1.25 or 0.90, Whichever Controls Design
β:	1.35 or 1.00, Whichever Controls Design
η:	1.50 or 0.90, Whichever Controls Design
DC:	Dead Load of Structure Components
EH:	Horizontal Earth Fill Pressure
EV:	Vertical Earth Pressure from Earth Fill Weight
LS:	Live Load Surcharge
EQE:	Seismic Earth Pressure
EQD:	Soil and Structural and Nonstructural Components Inertia
CT:	Vehicular Collision Force

NOTES:

1. At ⓐ bars:
   H ≤ 6', no splices are allowed within 1'-8" above the top of footing.
   H > 6', no splices are allowed within H/4 above the top of footing.

2. Provide #6 @ 8" ⓐ bars in addition to tabulated ⓐ bars over a distance of 8'-0" measured from all expansion joints, begin wall and end wall locations.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

RETAINING WALL TYPE 5 (CASE 1)

NO SCALE

B3-4A

2018 STANDARD PLAN B3-4A

Return to Table of Contents

Appendix VII. Cellular Concrete Light Weight Embankment Material

Replace "Reserved" in section 19-10 with:

19-10 CELLULAR CONCRETE LIGHTWEIGHT EMBANKMENT MATERIAL

19-10.01 GENERAL

19-10.01A Summary

Section 19–10 includes specifications for placing cellular concrete lightweight embankment material to the lines, grades and dimensions shown.

Cellular concrete is designated on the plans as Class I through Class VI as shown in the following table:

Cellular Concrete Class	Cast Density Pcf	Minimum Compressive Strength at 28 days* psi
I	24-29	10
II	30-35	40
III	36-41	80
IV	42-49	120
V	50-79	160
VI	80-90	300

*Compressive Strength determined using ASTM C 495 as modified herein

19-10.01B Submittals

19-10.01B(1) Mix Design

Submit a mix design that will produce a cast density at point of placement and a minimum compressive strength for the class described. Include laboratory data using the mix design verifying cast density and strength requirements.

Field qualification test reports must be certified with a signature by an official in responsible charge of the laboratory performing the tests.

19-10.01B(2) Quality Control and Placement Plan

Submit a cellular concrete quality control and placement plan 10 working days before placement of embankment material. Placement of cellular concrete shall be in accordance with the information provided in the quality control plan.

The submitted plan shall provide, as a minimum, the following elements:

1. An organization chart including names, telephone numbers, current certifications and/or titles, and roles and responsibilities of all those involved in the quality control program.
2. The process of communication by which quality control information will be disseminated to the appropriate persons, including materials suppliers.
3. Written evidence that cellular concrete installer is certified by and approved by the foam agent manufacturer
4. Location of equipment and batching areas.
5. Proposed construction sequence and schedule.
6. Type of equipment and tools to be used.
7. Material list of items and manufacturer's specifications
8. A copy of the AASHTO accreditation for your laboratory conducting the testing for compressive strength testing of cellular concrete cylinders.

19-10.02 MATERIALS

19-10.02A General

All materials shall be delivered, stored and handled per recommendations of cellular concrete manufacturer.

19-10.02B Admixtures

Admixtures for accelerating the set time may be used under the manufacturer's recommendations. A foaming agent must be used and tested in accordance with ASTM C 796.

19-10.02B Water

Mixing water shall be potable and free of deleterious amounts of acids, alkali, salts, oils, and organic materials in accordance with Section 90-1.02D.

19-10.02C Portland cement

Portland cement must comply with ASTM C 150, Types II/ V. Pozzolans and other cementitious materials may be used when approved by the manufacturer of the foaming agent. Fly ash and natural pozzolans must comply with ASTM C 618. Ground granulated blast furnace slag must comply with ASTM C 989, grade 100 or 120.

19-10.03 CONSTRUCTION

19-10.03 (A) Specialized Batching, Mixing, and Placing Equipment

Batching, mixing and placing equipment shall be capable of producing material that meets the requirements of this Section. Cement and water may be premixed and delivered to the site. Foam shall be added and mixed at the site using aforementioned equipment.

19-10.03 (B) Personnel Requirements

The cellular concrete installer shall be certified and approved in writing by the foam agent manufacturer. The installer's foreman shall have a minimum of 2 years experience in this work and shall have worked on at least three successful cellular concrete projects.

The installer shall use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are familiar with the specified requirements and the methods needed for proper performance of the work.

The Contractor's Representative shall be experienced in the placement of cellular concrete and shall be on site full-time during placement.

19-10.03 (C) Quality Control and Quality Assurance Testing

19-10.03 C(1) Cast Density

During placement of the initial batch, the installer shall check the density and adjust the mix as required to obtain the manufacturer's specified cast density at point of placement.

At the point of placement, the density must comply with the specified cast density. A single cast density test must represent the lesser of 100 cy or 2 hours production.

19-10.03 C(2) Compressive Strength

The compressive strength must be tested under ASTM C 495 except as follows:

1. Furnish a sufficient quantity of molded and cured cylinders specimens. Unless otherwise approved, the specimens must be 3 x 6 inch cylinders. During molding, place the concrete in 2 equal layers and raise and drop the cylinders 1 inch, 3 times on a hard surface or lightly tap the side or bottom of the cylinder to close any accidental entrained air. No rodding is allowed.
2. At a minimum, prepare a set of 4 test cylinders for each 400 CY of cellular concrete placed or a minimum of 2 sets of 4 cylinders each per day (whichever is greater). Specimens must be covered and protected immediately after casting to prevent damage and loss of moisture. Specimens should be cured in the molds for up to 7 days and then removed from the mold and moist cured. Stop moist curing specimens from 24 to 72 hours before the 28 day compressive strength test and allow to air dry. Specimens must not be oven dried.

19-10.03 C(3) Acceptance Testing

At a minimum, provide 3 test cylinders for each 400 CY of cellular concrete placed or a minimum of 2 sets of 4 cylinders each per day (whichever is greater) to Engineer. Specimens must be covered and protected immediately after casting to prevent damage and loss of moisture.

19-10.03 (D) Site Preparation

Subgrade to receive embankment material must be free of all loose and extraneous material. Subgrade must be uniformly moist, and any excess water standing on the surface must be removed before placing embankment material.

19-10.03 (E) Placement

Cellular concrete shall be a homogeneous mixture and all materials shall be approved prior to use.

Cellular concrete must be job site mixed with foaming agent and placed with equipment specialized for cellular concrete lightweight material. Cement and water may be premixed and delivered to the job site and foaming agent added on site. Once mixed, the cellular concrete shall be conveyed promptly to the location of placement without excessive handling.

Cellular concrete lift thicknesses must not exceed 3 feet. After curing for 12 hours, any crumbling area on the surface must be removed and scarified before the next layer is placed. Surface stepping to achieve grade and super elevation under the pavement must not be less than 5 inches nor more than 6 inches in thickness.

A minimum 12 hour curing period between lifts is required. If ambient temperatures are anticipated to be below 32 degrees F within 8 hours after cellular concrete placement, mixing water must either be heated as approved by foaming agent the manufacturer or placement must be prohibited. Cellular concrete must not be placed on frozen ground. Cellular concrete shall not be placed in wet ground condition. Dewatering is necessary where groundwater is present.

Any material that does not meet the minimum specified strength within 28 days shall be removed and replaced by the Contractor at no additional cost.

Paving machines, heavy construction equipment shall not be permitted on cellular concrete until it has attained the specified 28 days compressive strength.

19-10.03 (G) Acceptance

The contractor shall rectify any cellular concrete material rejected by the Engineer that does not meet the minimum required material properties or is not installed in accordance with this specification. Corrective measures are subject to the approval of the Engineer. Accepted corrected measures will be performed by the contractor at no additional cost to the State or extension of the contract time. This includes removal and replacement of rejected cellular concrete material not meeting the minimum material requirements or installed in accordance with this specification.

19-10.04 PAYMENT

The quantity of Cellular Concrete Lightweight Embankment Material for which payment will be made will be the quantity shown on the contract documents that is acceptably placed. The total volume of the respective classes of cellular concrete embankment placed will be verified in CY by the Engineer from dimensions shown in the contract documents, plus or minus the changes that have been made in accordance with a written order from the Engineer.

The net volume of Concrete Lightweight Embankment Material, verified as specified above, will be paid for at the contract unit price per CY for each respective class of cellular concrete.

Payment shall be full compensation for preparation of written submittals, material testing, coordination of and scheduling of cellular concrete placement, specialized equipment to mix, transport and place cellular concrete, groundwater control and temporary shoring, and include all associated costs such as materials, labor, equipment and incidentals necessary to complete the contract.