GEOTECHNICAL DESIGN AND MATERIALS REPORT

SAN FRANCISCO BAY TRAIL AT POINT MOLATE
(ALONG FORMER RICHMOND BELT RAILROAD TRACKS, FROM RICHMOND-SAN RAFAEL BRIDGE TO INTERSECTION OF STENMARK DRIVE AND PETROLITE STREET)
RICHMOND, CALIFORNIA

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TABLES

FIGURES

APPENDICES

1.0 INTRODUCTION

The San Francisco Bay Trail at Point Molate is a planned 2.4 mile long multi-use trail to be constructed along the San Pablo Peninsula on the eastern shore of the San Francisco Bay in Richmond, Contra Costa County, California (Figure 1). The completed trail will become part of the San Francisco Bay Trail system which, when complete, will encircle San Francisco and San Pablo Bays with a continuous, 500-mile network of bicycling and hiking trails connecting the shorelines of all nine Bay Area counties, linking 47 cities, and crossing the major toll bridges in the region. The planned Point Molate segment will provide a link between existing trail segments and improved access to Point Molate Beach Park. The trail segment will eventually be owned, operated, and maintained by the East Bay Regional Park District (EBRPD).

This Geotechnical Design and Materials Report (GDMR) was prepared for NCE, Inc. to support the design of the planned trail being designed by NCE on behalf of the EBRPD. Cal Engineering & Geology is a sub-consultant of NCE for this project. The GDMR follows the general format and guidance presented in the Caltrans Guidelines for Preparing Geotechnical Design Reports, Version 1.3, dated December 2006. Information and recommendations presented in this report were developed based on:

- Review of published data and information relevant to the project and project area;
- Review of available unpublished information relevant to the project and project area;
- Site reconnaissance and geologic mapping;
- Subsurface exploration including soil borings along the trail;
- Laboratory testing of samples recovered from the site borings; and
- Geologic and Engineering evaluations.

The purpose of the GDMR is to document subsurface geotechnical conditions, provide analyses of anticipated site conditions as they pertain to the project described herein, and to recommend geotechnical design and construction recommendations for the project. This report also establishes a geotechnical baseline that may be used to assess changed conditions that may be encountered during construction. This report was prepared by Professional Geotechnical Engineers and Certified Engineering Geologists licensed to practice in the State of California. The GDMR is intended for use by NCE project design engineers, bidders, contractors, and EBRPD design and maintenance personnel. Project stationing referenced in this report was established by NCE in June 2016. The stationing is based on 35 percent plans which have been

included in Appendix A. All elevations in this report correspond to the North American Vertical Datum of 1988 (NAVD88).

2.0 EXISTING FACILITIES AND PLANNED IMPROVEMENTS

2.1 EXISTING FACILITIES

The 2.4 mile long trail will be located along the abandoned Richmond Belt Railroad corridor. The southern portion of the trail (Segment A) will traverse through 0.9 miles of Chevron property from Stenmark Drive at the Richmond-San Rafael Bridge to the City of Richmond's Point Molate Beach Park property. The northern portion of the trail (Segment B) will traverse through 1.4 miles of City of Richmond property from Point Molate Beach Park to the north end of the former Naval Fuel Supply Depot at Point Molate.

The abandoned Richmond Belt Railroad corridor is a single track railroad that was constructed in the early 1900's, along Richmond's western waterfront and around Point San Pablo. The railroad was originally constructed to connect the dozens of factories and docks in the area that existed at that time including the Standard Oil Long Wharf, a whale oil processing plant, an oil can factory, a brick factory, two rock quarries, the former Winehaven winery, the Point San Pablo ship terminal, and the Richmond-San Rafael Ferry (Bastin, 2003).

Segment A is 0.9 mile long and extends from Stenmark Drive to the southern edge of Point Molate Beach Park (Station 10+00 to 56+73). The southern portion of this segment has been improved with a gravel road that provides access from Stenmark Drive to a Caltrans staging area (Station 10+00 to 19+00) and a privately owned parcel at Point Castro (Station 38+00). The gravel road is located adjacent to a bedrock cut slope between the Caltrans staging area and Point Castro (Station 19+00 to 44+00). Between Point Castro and Point Molate Beach Park, the railroad tracks have either been removed or left in place and covered with a thin layer of earth fill. Several wetlands were identified along this segment by NCE's environmental consultant (Stations 31+00, 49+00, 51+00, and 52+00).

Segment B is 1.5 miles long and extends from the southern edge of Point Molate Beach Park to the north end of the former Naval Fuel Supply Depot at Point Molate (Station 56+73 to 135+44). An asphalt concrete paved access road intersects Stenmark Drive just north of Point Molate Beach Park (Station 71+50). The road parallels the abandoned railroad corridor and provides coastal access from Stenmark Drive to Point Molate. North of Point Molate, evidence of the abandoned railroad corridor is non-existent due to a recent environmental cleanup project between Point Molate and the former Winehaven winery (Stations 114+00 to 125+00). The railroad tracks adjacent at the Winehaven winery have been improved with asphalt concrete pavement (Station 125+00 to 129+50). The northern most end of the railroad corridor within Segment B consists of exposed railroad ballast, ties, and tracks that have become overgrown with grasses and mature Eucalyptus trees.

2.2 PLANNED IMPROVEMENTS

The objective of the San Francisco Bay Trail at Point Molate project is to construct a paved multi-use trail along the abandoned Richmond Belt Railroad corridor. Development of the trail will require removal of railroad tracks, construction of asphalt concrete overlays, new pavement structural sections, and boardwalks to cross wetland areas.

3.0 PERTINENT REPORTS AND INVESTIGATIONS

Several pertinent investigation reports were obtained and reviewed in preparation of this report. The investigations and reports were completed on the adjacent property that are currently owned and operated by Chevron. Principal documents that were reviewed included:

- A Geologic Reconnaissance prepared by Dames & Moore (1964) for the Standard Oil Company of California (today known as Chevron) for the Proposed High Hill Tank Field and Former Blake Bros. Quarry.

- A Foundation Investigation prepared by Dames & Moore (1971) for the Standard Oil Company of California (today known as Chevron) for the proposed tank sites, impounding wall and impounding basin.

- A Site Inspection prepared by Dames & Moore (1973) for the Standard Oil Company of California (today known as Chevron) for the Proposed Tank 5 Area.

- A Foundation Investigation prepared by Dames & Moore (1977) for the Standard Oil Company of California (today known as Chevron) for the planned Quarry Tanks Nos. 3108, 3109, 3110 and 3111.

In addition to these documents, other published soils, geologic, and geotechnical data sources were used to support the information, conclusions, and recommendations presented in this report. As applicable, these data sources are referenced throughout this report (a reference list follows the main body of text).

4.0 PHYSICAL SETTING

4.1 CLIMATE

The project is located in an area with a Mediterranean climate characterized by mild to moderately cold and wet winters, and hot, dry summers. Winds in the area are generally controlled by marine circulation into the Central Valley (located east of the area) and may be very strong in the regional area.

Average monthly temperatures typically range between lows of 43 degrees Fahrenheit in January and highs of 74 degrees Fahrenheit in September. Temperature extremes in the area include a low of 24 degrees Fahrenheit in December 1990 and a high of 107 degrees Fahrenheit in September, 1971 (Weather.com, 2016). In general, sub-freezing temperatures occur in short episodes of several days duration. As a result, freeze-thaw conditions are not expected to have a significant influence on the long-term performance of the pavement.

The mean annual precipitation in the area over the past 96 years was 20.0 inches (CCCPWD, 1977).

4.2 TOPOGRAPHY AND DRAINAGE

At the project site, the railroad corridor descends from about the 40 foot elevation at the south end (Station 10+00) to the private access road to about the 20 foot elevation at the end of the Caltrans Staging area. The remainder of the railroad corridor profile varies between the 15 foot and 20 foot elevation. The maximum grade is approximately 3.5 percent.

There are no significant drainage features along the railroad corridor. In general surface water sheet flows toward the San Francisco Bay without the aid of ditches and culverts.

4.3 MAN-MADE AND NATURAL FEATURES OF ENGINEERING AND CONSTRUCTION SIGNIFICANCE

4.3.1 Richmond Belt Railroad Tracks

The railroad tracks, ties, and ballast from the abandoned Richmond Belt Railroad will be encountered during construction. Abandoned Richmond Belt Railroad tracks are visible adjacent to the planned trail alignment from approximately Station 61+75 to 78+30, Station 95+90 to 97+40, and Station 109+00 to 112+40. Abandoned railroad tracks are visible on top of the planned trail alignment from approximately Station 124+40 to 128+75 and Station 131+15 to Station 134+82. Locations of visible railroad tracks can also be found in Table 1 following the text of this report. The railroad ballast varies in thickness from 3 inches to 2 feet 5 inches at

locations where encountered. The presence of the tracks in some areas may not be evident until uncovered during initial grading during construction.

4.4 REGIONAL GEOLOGY AND SEISMICITY

4.4.1 Geologic Setting

The project site is situated within the Coast Ranges Geomorphic Province (Page, 1992). The Coast Ranges Geomorphic Province is comprised of a complex sequence of Mesozoic and Cenozoic age volcanic and sedimentary bedrock materials. The bedrock materials in the greater Richmond area have been folded and faulted as a result of regional tectonic forces. As a consequence, geologic relationships are often complex, and individual bedrock units are locally tightly folded, faulted, sheared, and overturned.

The generalized geology of the Richmond area has been mapped by several geologists (Nilsen, 1975) (Graymer R.W., 2006). Maps by these geologists suggest that the property is underlain by Cretaceous age sedimentary bedrock materials belonging to the Franciscan Complex and artificial fill (Figure 2). A landslide is shown at approximately Station 45+00 by Nielsen.

4.4.2 Seismic Setting

The project site is located within the greater San Francisco Bay Area which is recognized as one of the more seismically active regions of California. The seismic activity of the greater Bay Area results from the complex movements along the transform boundary between the Pacific Plate and the North American Plate. Studies have shown that the Pacific Plate is slowly moving to the northwest relative to the more stable North American Plate at an average rate of about 49 mm/yr (Page, 1992). The differential movements between the two crustal plates caused the formation of a series of active fault systems within the transform boundary. The transform boundary between the two plates extends across a broad zone of the North American Plate within which right lateral strike slip faulting predominates. In this broad zone, the San Andreas Fault accommodates less than half of the average total relative plate motion. Much of the remainder in the greater San Francisco Bay Area is distributed across the Calaveras, Hayward, Greenville, Concord-Green Valley, and Rodgers Creek fault zones.

The California Division of Mines and Geology has not produced an Alquist-Priolo map for the San Quentin quadrangle. However, it should be noted that the Hayward fault system has been mapped approximately 7.5 kilometers east of the project area (CDMG, 1998). Some of the other nearby active fault systems which could induce strong ground shaking at the site include the San Andreas, San Gregorio, and Rodgers Creek faults.

A large magnitude earthquake on any of these fault systems has the potential to cause significant ground shaking at the site. The intensity of ground shaking that is likely to occur at the site will be generally dependent upon the magnitude of the earthquake and the distance to the epicenter. In general, the greater the distance to the epicenter, the lesser the intensity of the ground shaking that is anticipated to occur at the site.

4.5 SOIL SURVEY MAPPING

The surface soils within the project site have been mapped by the USDA National Resources Conservation Service as belonging to the Millsholm loam and Urban Land (NRCS, 2010). Soils of the Millsholm loam are present throughout the majority of the project area.

Soils of the Millsholm loam for 20 to 60 percent slopes classify as a loam, clay loam and silt loam. These soils reportedly have a Liquid Limit ranging from 30 to 40 percent and a Plasticity Index between 15 and 16 percent within the upper 60 inches. These types of soils are generally considered to have a moderate to low expansion potential. Urban Land soils have not been classified or rated. This mapping is consistent with our site observations and the materials encountered in the exploratory borings drilled at the site.

5.0 FIELD EXPLORATION

The field exploration program for the project included geologic mapping and drilling and sampling geotechnical test borings at select locations along the alignment.

Information and data developed from these phases of work are included in the appendices to this report and summary information is presented below.

5.1 GEOLOGIC MAPPING

The published geologic maps for the area were reviewed to assist with the development of a site map. Field mapping of the exposed surface geologic features was completed along a portion of Segment A on 11 February 2016. The purpose of this work was to map geologic conditions exposed in the bedrock cut slope between the Caltrans staging area and Point Castro (Station 19+00 to 44+00) for use in evaluating bedrock cut slope stability.

Geologic mapping of the exposed bedrock revealed Franciscan sandstone and shale that is brown and brown gray, moderately hard to hard and slightly to moderately fractured. The southern section (closer to the bridge) and isolated sections elsewhere had well-defined bedding that dips steeply to the south and southwest. Joint sets were observed that dipped steeply in various directions. A few sections of bedrock were observed where bedrock, especially in the shale, was observed to be folded and the bedrock mass had greater fracturing. The mass was still tight and intact. The sandstone bedrock is locally very hard, but is generally jointed or fractured so that a maximum intact size is less than 12 inches in the longest dimension. The shale fractures into pieces generally less than 6 inches in the longest dimension.

It does not appear as though any large, deep-seated slope failures have developed along the existing cut slope. Failures that have occurred appear to be shallow. Two failures types were observed. Shallow slumps were observed in some areas where the rock was more fractured. The rock may also be shales that were more deeply weathered. The slump areas were located at or near more heavily vegetated areas of slope where obvious bedrock outcrops were not present.

The second and more common surficial failure observed was structure-controlled failures either along a single joint face (planar) or along an intersection of joints and/or a bedding plane. Due to the steepness of the joints and beds in most locations, there are few locations where the bed or joints are daylighted in the cut slope. Slope failure debris presents as cones of talus at the toe of the steep cut slope. Taller cut slopes generally had larger piles of talus at the toe, but there was no evidence of deep-seated slope instability.

5.2 SUBSURFACE EXPLORATION

A total of 95 test borings were advanced and sampled between 8 March and 1 June 2016. The majority of the borings were for NCE's environmental sampling and testing program. Thirteen of the borings were advanced solely for this Geotechnical Design and Materials Report. The geotechnical borings were drilled to depths ranging between 2.5 and 4.0 feet below existing grade.

The borings and sampling were completed by California Geotech, Inc. of Livermore and Confluence Environmental of Rio Linda, under subcontract to NCE, Inc. Borings were drilled with a truck-mounted Mobile B-24 drill rig equipped with continuous solid flight augers. Supplemental environmental borings completed by Confluence Environmental were dilled with a direct push rig. Upon completion of drilling activities, borings within paved areas were backfilled with grout and capped with asphalt cold patch. Borings in unpaved areas were backfilled to the ground surface with drilling spoils.

All drilling operations were observed in the field by CE&G personnel. Logging, classification, and storage of soil and bedrock samples were completed in general conformance with the guidelines and procedures presented in the ASTM D2488, "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)," and ASTM D2487, "Standard Practice for Classification of Soils for Engineering Purposes - Unified Soil Classification System (USCS)." Boring logs are included in Appendix B.

Samples were primarily collected with a Standard Penetration Test or Modified California samplers that were driven into the subsurface materials at the bottom of the boring at select intervals using a 140 lb safety hammer with a free-fall of 30 inches. The blow counts required to embed the sampler in intervals of 6 inches (or less) were recorded on the field exploratory test boring logs.

6.0 GEOTECHNICAL TESTING

6.1 IN SITU TESTING

In situ geotechnical testing performed for this study consisted of Standard Penetration Testing (SPT) (ASTM D1586) during soil boring operations. Results of the testing are included on the logs of test borings in Appendix B.

6.2 LABORATORY TESTING

Laboratory tests were performed on selected samples recovered from the borings. Laboratory tests included moisture-density (ASTM D2216), Atterberg limits (ASTM D4318), and R-Values (ASTM D2844). Complete laboratory tests results are presented in Appendix C.

6.2.1 Index Properties

Index tests completed included moisture-density and Atterberg limits evaluations. The artificial fill samples tested had in place dry densities between 107 pcf and 123 pcf and moisture contents between 4 and 16 percent. The bedrock material sampled tested had in place dry densities between 118 pcf and 124 pcf and moisture contents between 11 and 13 percent.

6.2.2 R-Value Testing

R-value tests were performed on four bulk samples obtained from borings B-4, B-15, B-25, and B-27. The test results are summarized below.

Boring	Approx. Station	Depth (ft)	R-Value
B-04	19+65	2.0	72
B-15	64+71	1.5	22
B-25	104+22	1.0	25
B-27	109+08	2.0	77

7.0 GEOTECHNICAL CONDITIONS

7.1 SITE GEOLOGY

Geology of the project site is shown on Figure 2. Bedrock exposed along the cut along the southern portion of Segment A includes Franciscan Complex sedimentary rocks consisting mostly of sandstone and shale. Surficial soils consist of primarily of artificial fill over marine and marsh deposits of varying thickness. Lithologic features and quaternary deposits are summarized below.

7.1.1 Lithology

The geologic setting in the vicinity of the trail alignment consist Franciscan Complex sedimentary rock that is Cretaceous in age, which has been uplifted and folded. The bedrock mapped in the exposed cuts consists principally of weathered sandstone that is moderately hard to hard and slightly to moderately fractured with thin interbeds of shale. Where encountered in the exploratory borings, the sandstone was generally severely weathered and matched what was exposed on the cut slopes. Little discernible structure was noted in the exploratory borings. In the borings where bedrock was encountered, the depth to bedrock ranged from 3 inches to 1 foot 7 inches.

7.1.2 Quaternary Deposits

Quaternary deposits consist of artificial fill over marine and marsh deposits. The artificial fill is generally composed of sand and gravel with bedrock fragments and crushed rock ballast that were placed as part of railroad construction. Based on our observations of the material encountered in the exploratory borings, soft sediments were encountered below the existing artificial fill at various locations throughout the project site and should not affect the performance of the trail pavement. The underlying marsh deposits consist of lean and fat clays.

7.2 LANDSLIDES

Geologic mapping completed by Nielson 1975 shows a landslide at approximately Station 45+00 on the east side of the planned trail. However, during field exploration this landslide was not observed and does not present a potential impact to the trail.

Shallow failures were observed along the bedrock cut slope within the trail alignments. The resulting talus cones were only a few feet tall and it is judged that the talus will not affect the performance or maintenance of the trail which will be approximately 20 feet from the toe of the cut slope.

7.3 SOIL CONDITIONS

The subsurface soil conditions vary along the project alignment depending on the underlying bedrock lithology and past and present geologic features. Generally, the exploratory borings encountered predominately granular soils. The soils encountered in the borings were generally moist with dry layers closer to bedrock outcrops and wet layers near Point Molate Beach Park.

The fine-grained soils were predominately clay with varying silt contents. These soils ranged from lean clay (CL) to elastic silt (MH) having low to medium plasticity. The soils varied significantly in consistency with hard layers near the ground surface and soft layers below. Some fine-grained soils were encountered along the southern portion of Segment B in the vicinity of Point Molate Beach Park. Fine-grained sediments were encountered in borings where existing areas of increased sedimentation have occurred. The sediments consist of inter-fingering of the Holocene age Young Bay Mud deposits and the Quaternary age native alluvial deposits generated from the erosion of the surrounding hillsides to the east of the project area. It is likely that these areas consisted of shoreline beaches and marshlands prior to the development and construction of the existing improvements. In our opinion, the sediments have been normally consolidated due to the placement of the artificial fill to produce the desired grades with the existing trail and railroad improvements.

The granular soils encountered during drilling consisted of aggregate base and railroad ballast, mostly from artificial fill used during the construction of the old Richmond Belt Railroad.

The wetland area delineated on the 35 percent plans at approximately Station 51+06 is underlain by silts, clays with gravel, and sandstone bedrock, and the wetland area delineated on the 35 percent plans at approximately Station 57+54 is underlain by silty sands and clay to the depths explored.

Where present along the trail, asphalt concrete thickness ranges between 1 inch and 3 inches, aggregate base (AB) thickness ranges between 3 inches and 1 foot 6 inches, and railroad ballast ranges in thickness from 3 inches to 2 feet 5 inches. Fill material thicknesses are not known due to the limited depths of exploratory borings.

A summary of anticipated subgrade material and consistency/density is provided in Table 1 following the text of this report. Descriptions of the materials encountered in the borings are included on boring logs in Appendix B.

7.4 WATER

7.4.1 Surface Erosion

The surface erosion within the railroad cuts is shallow in nature and consists of raveling of the bedrock. The severity of erosion is primarily dependent upon the weathering profile of the exposed bedrock and the inclination of the cuts. Erosion was primarily observed in the weathered bedrock along the southern portion of Segment A (Station 19+00 to 44+00) in areas of sandy shale to silty sandstone on slopes that were steeper than a 1H:1V (horizontal: vertical). The height of the cut slopes varied, but generally erosion of these slopes was noted up to the top of the excavation.

7.4.2 Ground Water Conditions

A detailed groundwater investigation was beyond the scope of this study. Groundwater was only encountered in boring B-15 at a depth of approximately 2 feet. Groundwater was not encountered during the drilling of the other exploratory borings. It should be noted that groundwater levels can fluctuate seasonally and over a period of years. In addition, elevated groundwater conditions may be encountered in areas in close proximity to San Francisco Bay. Therefore, it is possible that elevated or perched groundwater conditions may be encountered during construction.

7.5 PROJECT SITE SEISMICITY

7.5.1 7.4.2 Design Ground Motions

Deterministic and probabilistic acceleration response spectra (ARS) were generated using Caltrans ARS Online (Caltrans, 2016). The Caltrans ARS Online website describes how this web-based tool calculates spectra based on the criteria provided in Appendix B of Caltrans Seismic Design Criteria:

> *The deterministic spectrum is determined as the average of median response spectra calculated using the Campbell-Bozorgnia (2008) and Chiou-Youngs (2008) ground motion prediction equations developed under the "Next Generation Attenuation" project coordinated through the PEER-Lifelines program. These equations are applied to all faults considered to be active in the last 750,000 years (late-Quaternary age) that are capable of producing a moment magnitude earthquake of 6.0 or greater. The probabilistic spectrum is obtained from the USGS (2008) National Hazard Map for 5% probability of exceedance in 50 years. Caltrans design spectrum is based on the larger of the deterministic and probabilistic spectral values. Both the deterministic and probabilistic spectra account for soil effects through incorporation of the parameter Vs30, the average shear wave velocity in the upper 30 meters of the soil profile.*

Shear wave velocities in the upper 30 meters of the soil profile (V_{s30}) were estimated using mapping published by the National Earthquake Hazard Reduction Program (NEHRP). The NEHRP mapping indicates that the trail alignment is underlain by the following two soil types:

- NEHRP A, B (750 m/s) in Bedrock
- NEHRP E (< 250 m/s) in Qaf

The shear wave velocities and site location were then input into the Caltrans ARS Online website to arrive at the controlling deterministic scenario (CDS) and the ground motions for each soil type. Since NEHRP soil type E does not have published values, a seismic shear wave velocity of 225 m/s was assumed. The results of the analyses are summarized in the table below.

Controlling Deterministic Scenario and Ground Motions											
Fault Parameters						Site Parameters					
CDS	FID	Style	Dip (deg)	$M_{M(max)}$	RRUP (km)	V_{s30} (m/s)	PGA (g)	NFF	BAF	$Z_{1.0}$ (m)	$Z_{2.5}$ (km)
Hayward (North)	123	SS	90	7.3	5.8	760	0.88	1	1	0	0
						225	0.71				

Probabilistic peak ground accelerations were determined using 2008 USGS Seismic Hazard Map and a 975 year return period. The results of the analyses are summarized in the table below.

Probabilistic Ground Motions	
V_{s30} (m/s)	PGA (g)
760	1.54
225	1.40

7.5.2 Ground Rupture

The Hayward Fault is located approximately 6 kilometers to the east of the site. The potential for ground rupture due to primary faulting is considered to be low.

8.0 CONSTRUCTION CONSIDERATIONS

8.1 CONSTRUCTION ADVISORIES

The current investigation at the site revealed that the subgrade conditions in some areas along the trail alignment consist of aggregate base, crushed rock railroad ballast with timber ties and steel rails, and asphalt concrete pavement.

The possible presence of buried railroad ties and rails should be considered in designing the pavement structural section and grading and should be considered during construction when excavations are made or scarifying is completed to prepare the subgrade for the trail.

8.2 CONSTRUCTION CONSIDERATIONS THAT INFLUENCE DESIGN

The crushed rock railroad ballast is an open graded material that contains significant voids that will need to be filled prior to use as subgrade for the pavement structural section. It will be critical to ensure that all of the voids between the rocks are filled to reduce the potential for long term localized settlement of the pavement structural section.

The trail alignment will conflict with several existing railroad tracks adjacent to the Winehaven winery. The railroad tracks from Station 124+50 to 129+50 are located within asphalt concrete pavement. The railroad tracks from Station 131+00 to 134+82 are located on ballast. Reflective cracking through new pavement structural sections and pavement overlays can occur due to the difference in stiffness between the rigid steel rails and adjacent flexible pavement. The potential for reflective cracking should be considered when making decisions regarding the treatment of the rails and existing pavement.

8.3 CONSTRUCTION CONSIDERATIONS THAT INFLUENCE SPECIFICATIONS

Compaction testing of the infilled railroad ballast will be impractical given the relatively large aggregate size of the crushed rock and the high variability of voids. Railroad ballast infilling will require that the specifications incorporate observations by the geotechnical engineer or their representative during construction to confirm that the infilling has reduced the potential for voids to the extent practical.

9.0 RECOMMENDATIONS AND SPECIFICATIONS

9.1 RECOMMENDED SUBGRADE PREPARATION

The planned trail will be constructed on top of the existing ground surface with only minor modifications made to the existing elevations. The existing subgrade material and improvements vary along the alignment of the trail. The subgrade preparation required will depend on the type of material encountered and the nature of improvements. Based on existing and final grades in the 35 percent design plans from NCE and recommended clearing and grubbing depth, the anticipated subgrade material along the trail alignment is summarized in Table 1 following the text of this report. Recommendations for subgrade preparation are as follows.

9.1.1 Clearing and Grubbing

All objectionable material (vegetation, asphalt concrete, concrete, masonry, etc.) within the limits of grading should be cleared and grubbed to a depth of 6 inches for proper subgrade preparation

9.1.2 Remove Existing Railroad Tracks

All railroad tracks (steel rails) in conflict with the new trail should be removed unless determined to be unfeasible due to environmental considerations. For railroad ties left in place, a minimum 6 inches of compacted Caltrans Class 2 Aggregate base should be placed above the top of remaining railroad ties.

9.1.3 Remove and Replace Unsuitable Subgrade Material

In areas where unsuitable subgrade materials (i.e. wet, soft, and/or expansive soil) are encountered, the material should be removed and replaced with structure backfill.

9.1.4 Infill Existing Railroad Ballast

The remaining railroad ballast should be infilled with well graded sand. Should additional trail width be required, engineered fill consisting of Caltrans Class 2 Aggregate base should be placed and compacted adjacent to the existing railroad ballast.

9.1.5 Scarify Existing Aggregate Base and Engineered Fill

Areas that consist of aggregate base and engineered fill that are free from railroad tracks based on visual observations should be scarified 2 inches, moisture conditioned, and compacted. If it is determined during construction that scarification results in the disturbance of unanticipated buried railroad tracks, the scarification should be omitted in those areas.

9.1.6 Scarify Bedrock

Based on subsurface exploration borings in which bedrock was encountered, the depth to bedrock ranged from 3 inches to 1 foot 7 inches. In areas where excavation for subgrade preperation encounters bedrock, the bedrock should be scarified 2 inches before placement of compacted fill. Areas where bedrock may be encountered and approximate depths are summarized in Table 1 following the text of this report.

9.2 BOARDWALK FOUNDATIONS

The boardwalks from Station 47+80 to 53+40 and Station 54+90 to 58+50 should be founded on cast-in-drilled-hole (CIDH) piles in order to minimize construction footprint in the wetland areas. All CIDH piles should have a minimum diameter of 12 inches and should be embedded in bedrock a minimum of 2 feet. Design parameters are outlined in the following table.

Recommended CIDH Pile Design Parameters		
Minimum Diameter (in)	Minimum Embedment into Bedrock (ft)	Allowable Vertical Bearing Capacity (psf)
12	2	5,000

Depending on the depth to bedrock, the piles can range between 4 and 10 feet in depth. The bearing value indicated above is for the total of dead and frequently applied live loads and may be increased by one third for short duration loading, which includes the effects of wind, water, or seismic forces. The weight of the footing should be included for the purposes of bearing capacity calculations.

9.3 SPECIFICATIONS

9.3.1 Earthwork

Earthwork for this project is likely to consist of minor infilling of open graded railroad ballast and minor fills required to establish the required subgrade elevations for the pavement structural section. All earthwork should be completed in accordance with Section 19, “Earthwork” of the Caltrans Standard Specifications, 2010 edition.

9.3.1.1 Fill Materials

Fill material for embankments may be generated from all onsite excavations and shall conform to the provisions of Section 19-2.03D, “Selected Material,” of the Caltrans Standard Specifications, 2010 edition.

It is not anticipated that imported embankment fill will be required for this project, however, should it become necessary, all potential imported fill should conform to the provisions of Section 19-3.02B, "Structure Backfill," of the Caltrans Standard Specifications, 2010 edition.

Fill material for filling voids within the open graded railroad ballast should consist of sand conforming to the following gradation:

Recommended Sand Gradation	
Sieve Size	Percent Passing
No. 8	100
No 16	95-100
No. 30	90-100
No. 50	30-80
No. 100	0-5
No. 200	0-1

9.3.1.2 Fill Placement

All areas of prepared subgrade should be proof-rolled to identify isolated unstable areas. The contractor should furnish a pneumatic-tire roller for this purpose having an average weight per wheel of 2,000 lb. Unstable areas should be excavated and replaced with engineered fill.

The subgrade soils should be treated with a soil sterilant in accordance with the manufacturer's specifications.

All fill should be placed as engineered fill and compacted to a minimum relative compaction of 90 percent as determined by the Caltrans Test 216 test procedure (or ASTM D1557) at a moisture content of approximately 3 percent above optimum.

Fill within 12 inches below the pavement structural section aggregate base rock should be compacted to a relative compaction of no less than 95 percent as determined by the Caltrans Test 216 test procedure (or ASTM D1557) at a moisture content of approximately 1 percent above optimum.

Aggregate base rock should be compacted to a relative compaction of no less than 95 percent as determined by the Caltrans Test 216 test procedure (or ASTM D1557) at a moisture content of approximately 1 percent above optimum.

Fill materials which do not meet the specified relative compaction shall be ripped, moisture conditioned, and re-compacted until the required relative compaction and moisture content are attained.

9.3.2 Erosion Control

Permanent erosion control measures should consist of appropriate vegetation which requires little if any irrigation. Soil chemistry should be considered in the selection of plants and vegetation. Temporary erosion control should be designed to minimize rutting and rilling of the slope before maturation of the permanent vegetation and plants. The design of all temporary erosion control measures should be based on best management practices.

10.0 LIMITATIONS

The conclusions and recommendations presented in this report are based on the information provided regarding the planned construction, and the results of the geologic mapping, subsurface exploration, and testing, combined with interpolation of the subsurface conditions between boring locations. This information notwithstanding, the nature and extent of subsurface variations between borings may not become evident until construction. It is recommended that Cal Engineering & Geology be retained to observe the earthwork operations to confirm the subsurface conditions between the exploratory borings are as estimated. If variations are encountered during construction, Cal Engineering & Geology should be notified promptly so that conditions can be reviewed and recommendations reconsidered, as appropriate.

This report presents the results of a geotechnical and geologic investigation only and should not be construed as an environmental audit or study. The conclusions and recommendations contained in this report are valid only for the project described in this report. We have employed accepted geotechnical engineering procedures, and our professional opinions and conclusions are made in accordance with generally accepted geotechnical engineering principles and practices. This standard is in lieu of all other warranties, either expressed or implied.

The findings of this report should be considered valid for period of three years unless the conditions of the site change. After a period of three years, we should be contacted to review the site conditions and prepare a letter regarding the applicability of this report.

Cal Engineering & Geology, Inc. should be accorded the opportunity to review the final plans and specifications to determine if the recommendations of this report have been implemented in those documents. The recommendations of this report are contingent upon this stipulation.

It is the owner's responsibility to ensure that the recommendations contained in this report are brought to the attention of the architect, engineers, and contractors working on the project. Furthermore, it is the owner's responsibility to make sure that these recommendations are carried out during the design and construction phases of the project.

11.0 REFERENCES

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Table 1A. Trail Alignment Summary

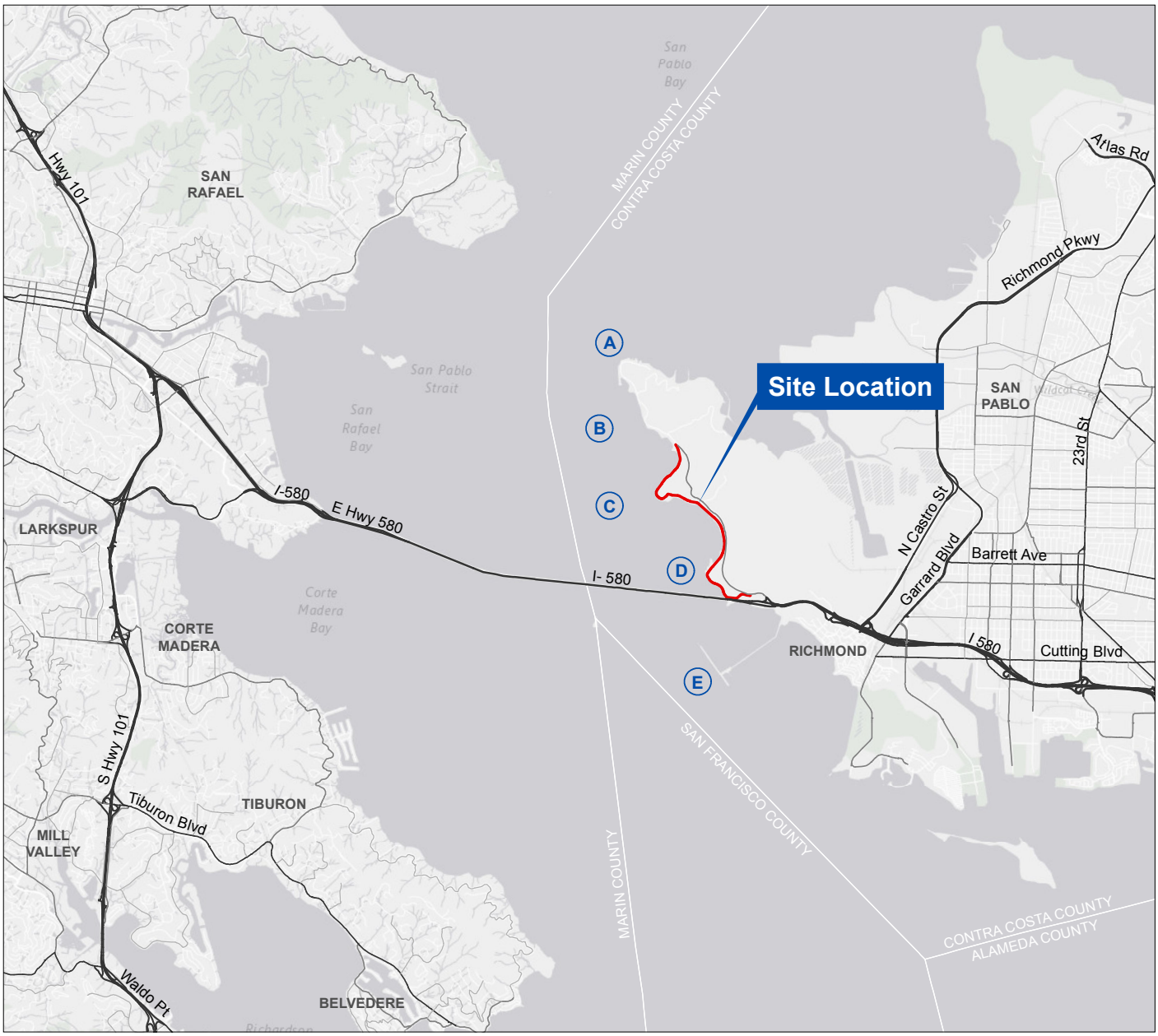
Segment	Approx. Start (Sta)	Approx. End (Sta)	Approx. Interval Length (ft)	Average Excavation Depth[1] (ft)	Anticipated Material at Excavation Depth[2]	Consistency/Density	Unit	Average Depth to Bedrock (ft)	Notes	Recommendations [See Section 9.0]
A	9+98	12+50	257	1.25	Sandy Silt	Loose	Fill	-	Potential encounter of loose soils	Clear and grub
	12+50	15+00	250	1.25	Sandy Silt	Medium Dense	Fill	-		Clear and grub
	15+00	17+50	250	0.75	Sandy Silt	Very Dense	Fill	-		Clear and grub
	17+50	21+50	400	1.0	Sandy Silt	Medium Dense	Fill	-		Clear and grub
	21+50	25+50	400	0.75	Sandstone	-	Bedrock	0.75	Shallow bedrock	Scarify bedrock
	25+50	29+00	350	0.5	Sandstone	-	Bedrock	0.5	Shallow bedrock	Scarify bedrock
	29+00	39+00	1000	0.75	Sandstone	-	Bedrock	0.5	Shallow bedrock	Scarify bedrock
	39+00	47+80	880	0.5	Silty Gravel/Clay	Very Stiff	Fill	-	Potential encounter of railroad ballast	Clear and grub; Infill existing railroad ballast
	47+80	53+40	560	Piles	Sandstone	-	Bedrock	1.5	Boardwalk over wetland area	CIDH piles
	53+40	54+90	150	0.5	Silty Gravel	Medium Dense	Fill	0.8	Potential encounter of railroad ballast	Clear and grub; Infill existing railroad ballast
	54+90	58+50	360	Piles	Silt/Clay	Stiff	Fill	-	Boardwalk over wetland area	CIDH piles

[1] Approximated average depth excavated based on 35% plans provided by NCE
[2] Material anticipated at approximated excavation depth, the material may vary within each interval

Table 1B. Trail Alignment Summary

Segment	Approx. Start (Sta)	Approx. End (Sta)	Approx. Interval Length (ft)	Average Excavation Depth[1] (ft)	Anticipated Material at Excavation Depth[2]	Consistency/Density	Unit	Average Depth to Bedrock (ft)	Notes	Recommendations (See Section 9.0)
B	58+50	62+00	350	0.5	Silty Gravel	-	Fill	-	Potential encounter of railroad ballast	Clear and grub; Infill existing railroad ballast
	62+00	70+00	800	0.75	Silty Gravel/Fat Clay	Very Stiff	Fill	-	Potential encounter of railroad ballast; Railroad tracks adjacent to trail	Clear and grub; Infill existing railroad ballast
	70+00	74+50	450	1.75	Silt/Clay	Hard	Fill	-	Railroad tracks adjacent to trail	Clear and grub; Infill existing railroad ballast
	74+50	79+00	450	0.5	Silt/Clay	Hard[3]	Fill	-	Railroad tracks adjacent to trail	Clear and grub; Infill existing railroad ballast
	79+00	82+00	300	0.5	Silt/Clay	Hard[3]	Fill	-		Clear and grub
	82+00	86+20	420	0.75	Silt/Clay	Hard	Fill	-		Clear and grub
	86+20	89+70	350	1.5	Silty Gravel/Clay	Hard	Fill	-		Clear and grub
	89+70	93+00	330	0.75	Silt/Clay	Hard	Fill	1.0		Clear and grub
	93+00	98+00	500	0.75	Silty Gravel	Dense	Fill	-	Potential encounter of railroad ballast	Clear and grub; Infill existing railroad ballast
	98+00	103+00	500	0.75	Sandstone	-	Bedrock	0.45		Scarify bedrock
	103+00	105+00	200	0.75	Silty Gravel	Dense	Fill	-	Potential encounter of railroad ballast	Clear and grub; Infill existing railroad ballast
	105+00	116+00	1100	0.75	Silty Gravel	Medium Dense	Fill	1.0	Potential encounter of railroad ballast	Clear and grub; Infill existing railroad ballast
	116+00	124+00	800	0.5	Silty Gravel	Medium Dense[3]	Fill	-	Potential encounter of railroad ballast	Clear and grub; Infill existing railroad ballast
	124+00	128+75	475	0.75	Silty Gravel	Medium Dense	Fill	-	Railroad tracks with AC pavement on trail	Clear and grub; Remove existing railroad tracks; Scarify existing aggregate base
	128+75	131+00	225	1.0	Bedrock	-	Bedrock	1.0		Scarify bedrock
	131+00	134+82	382	0.75	Clayey Gravel	Medium Dense	Fill	1.5	Railroad tracks on trail	Clear and grub; Remove existing railroad tracks, Infill existing railroad ballast

[1] Approximated average depth excavated based on 35% plans provided by NCE
[2] Material anticipated at approximated excavation depth, the material may vary within each interval
[3] Assumed consistency/density based on adjacent borings



BASEMAP REFERENCE

1. BASEMAP FROM ESRI, 2016.
2. STREET CENTERLINES FROM CALTRANS GIS DATA, 2016.

0 0.75 1.5 3
MILES

N

LEGEND

- (A) POINT SAN PABLO
- (B) POINT ORIENT
- (C) POINT MOLATE
- (D) POINT CASTRO
- (E) CHEVRON LONG WHARF

CE&G
CAL ENGINEERING & GEOLOGY

1870 Olympic Blvd.
Suite 100
Walnut Creek, CA 94596
Phone: (925) 935-9771

GEOTECHNICAL DESIGN AND MATERIALS REPORT
SAN FRANCISCO BAY TRAIL AT POINT MOLATE
CONTRA COSTA COUNTY, CALIFORNIA

SITE LOCATION MAP

151190	JULY 2016	FIGURE 1

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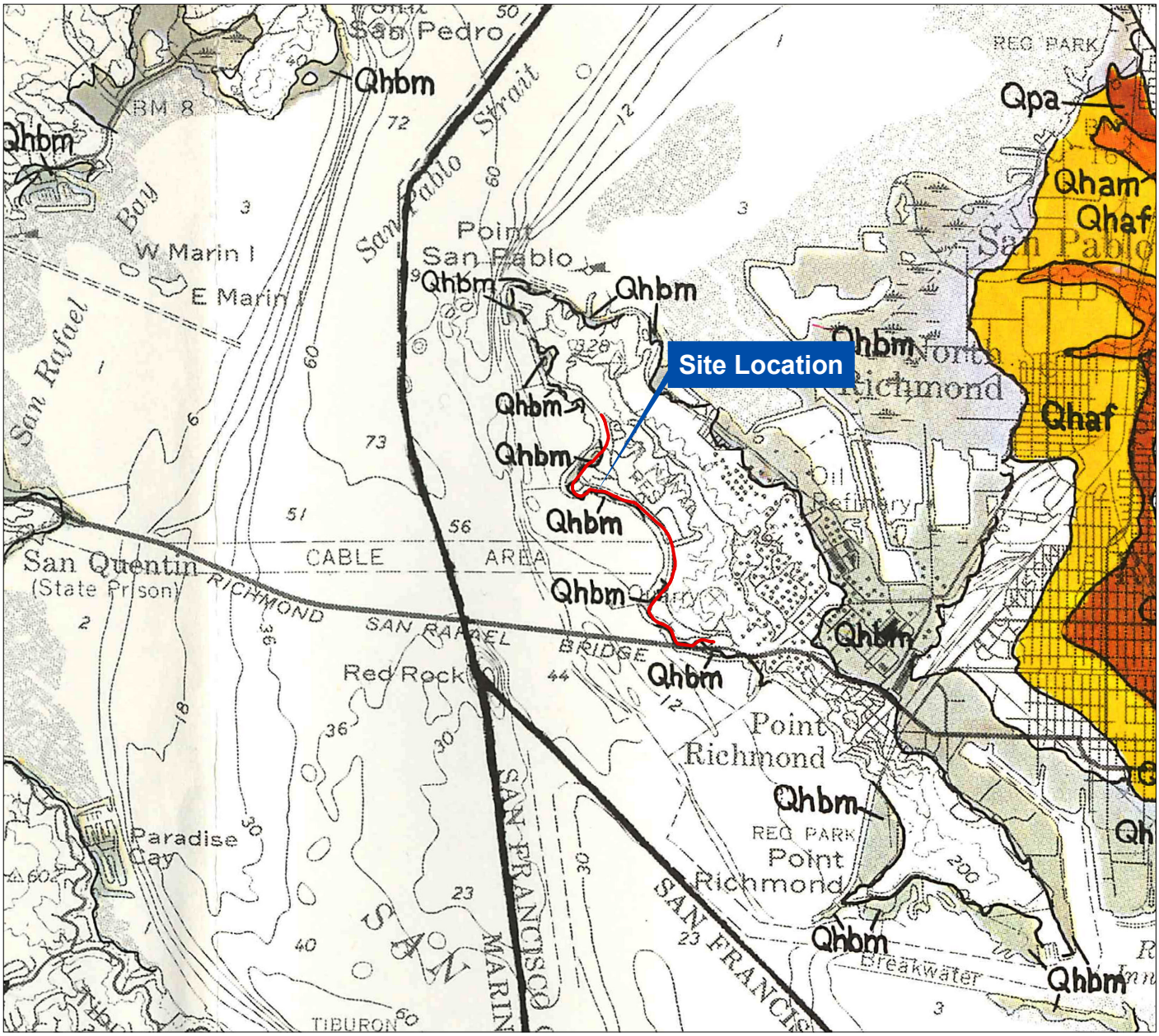

BASEMAP REFERENCE

1. REGIONAL GEOLOGY FROM E. J. HELLEY AND K. R. LAJOIE, 1979

0 0.5 1 2
MILES

N

DESCRIPTION OF MAP UNITS

Qhac	COARSE-GRAINED ALLUVIUM	Qhafs	FINE-GRAINED SALT-AFFECTED ALLUVIUM
Qham	MEDIUM-GRAINED ALLUVIUM	Qhbm	BAY MUD
Qhaf	FINE-GRAINED ALLUVIUM	Qpa	LATE PLEISTOCENE ALLUVIUM

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GEOTECHNICAL DESIGN AND MATERIALS REPORT
SAN FRANCISCO BAY TRAIL AT POINT MOLATE
CONTRA COSTA COUNTY, CALIFORNIA

REGIONAL GEOLOGY

151190	JULY 2016	FIGURE 2

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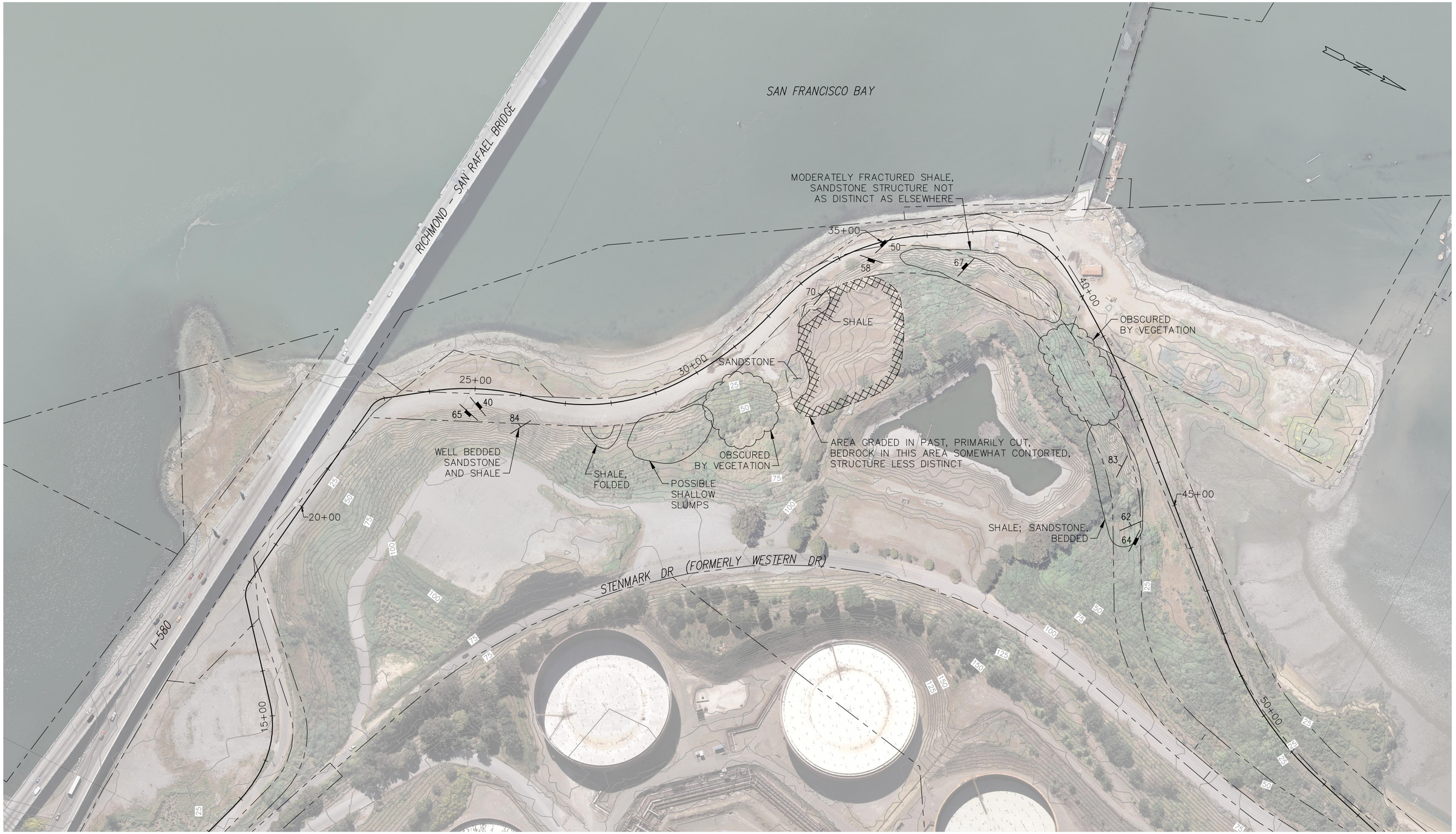

BASEMAP REFERENCE

1. TOPOGRAPHIC BASEMAP DEVELOPED FROM CONTRA COSTA COUNTY GIS, LiDAR, AND ORTHOPHOTO DATABASES DOWNLOADED ON 27 SEPTEMBER 2010.

LEGEND

60 JOINT

80 BEDDING

TRAIL ALIGNMENT (NCE, 03/22/2016)

100 0 100 200
SCALE FEET

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GEOTECHNICAL DESIGN AND MATERIALS REPORT

SAN FRANCISCO BAY TRAIL AT POINT MOLATE
CONTRA COSTA COUNTY, CALIFORNIA

PARTIAL GEOLOGIC MAP

151190	JULY 2016	FIGURE 3

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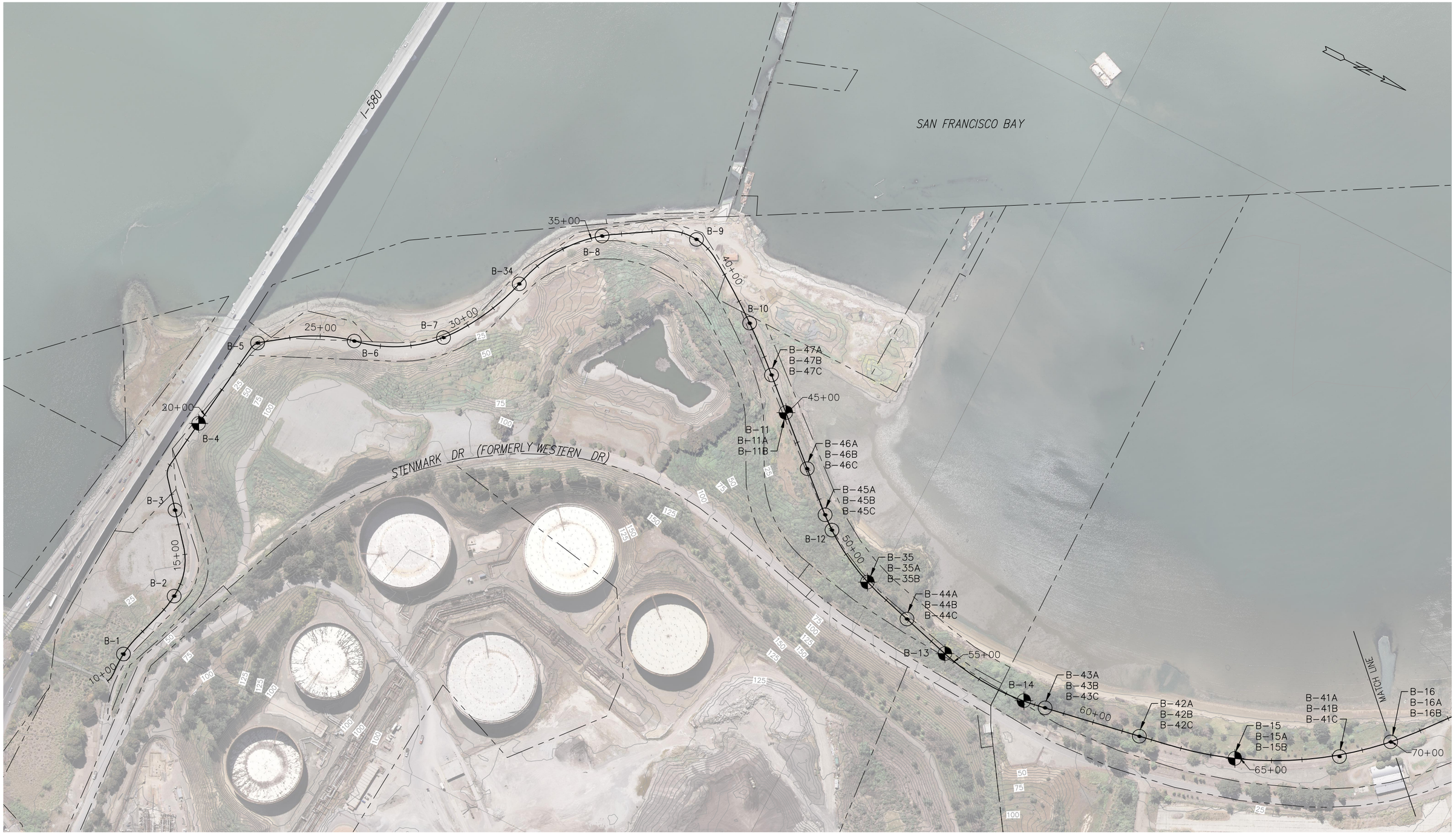

BASEMAP REFERENCE

1. TOPOGRAPHIC BASEMAP DEVELOPED FROM CONTRA COSTA COUNTY GIS, LiDAR, AND ORTHOPHOTO DATABASES DOWNLOADED ON 27 SEPTEMBER 2010.

LEGEND

- ENVIRONMENTAL BORING (NCE, 2016)
- GEOTECHNICAL BORING (CE&G, 2016)
- TRAIL ALIGNMENT (NCE, 03/22/2016)

150 0 150 300
SCALE FEET

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GEOTECHNICAL DESIGN AND MATERIALS REPORT

SAN FRANCISCO BAY TRAIL AT POINT MOLATE
CONTRA COSTA COUNTY, CALIFORNIA

BORING LOCATION MAP

151190	JULY 2016	FIGURE 4A

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BASEMAP REFERENCE

1. TOPOGRAPHIC BASEMAP DEVELOPED FROM CONTRA COSTA COUNTY GIS, LiDAR, AND ORTHOPHOTO DATABASES DOWNLOADED ON 27 SEPTEMBER 2010.

LEGEND

- ENVIRONMENTAL BORING (NCE, 2016)
- GEOTECHNICAL BORING (CE&G, 2016)
- TRAIL ALIGNMENT (NCE, 03/22/2016)

150 0 150 300
SCALE FEET

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GEOTECHNICAL DESIGN AND MATERIALS REPORT

SAN FRANCISCO BAY TRAIL AT POINT MOLATE
CONTRA COSTA COUNTY, CALIFORNIA

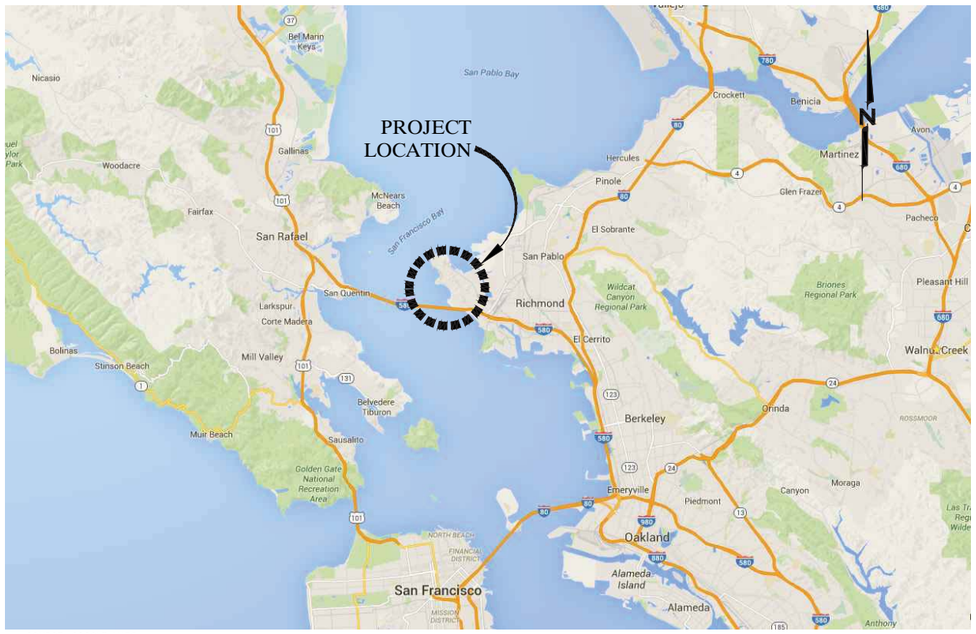
BORING LOCATION MAP

151190	JULY 2016	FIGURE 4B

M:\2015\151190 NCE-EBRPD SF Bay Trail @ Point Molate\AutoCAD\Sheets\151190_Fig4_Boring_Location_Map.dwg 7-22-16 03:57:08 PM kdrozynska

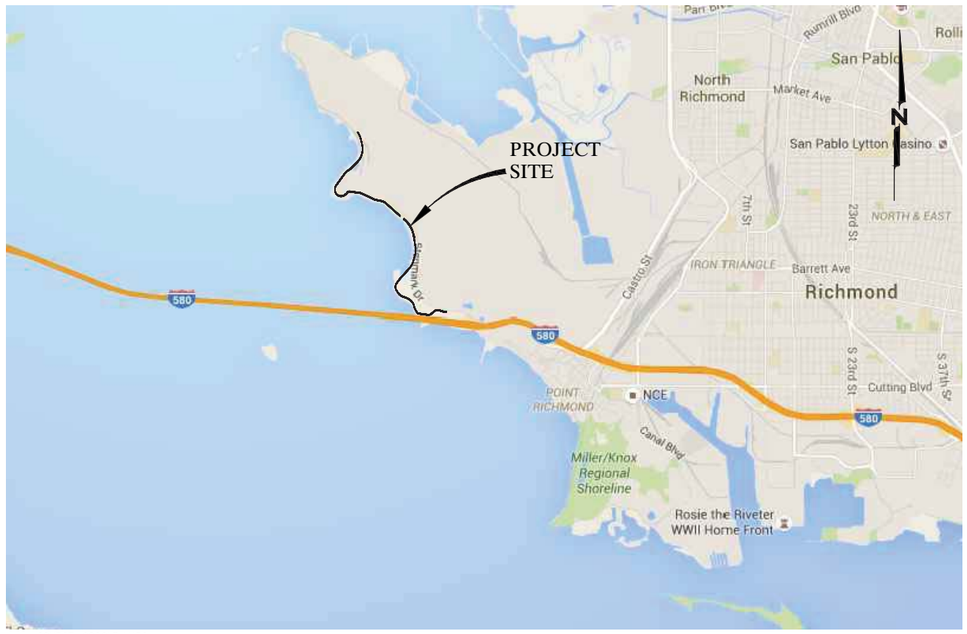
APPENDIX A. 35 PERCENT DESIGN PLANS

EAST BAY REGIONAL PARK DISTRICT
SAN FRANCISCO BAY TRAIL
AT POINT MOLATE
RICHMOND, CALIFORNIA



SOURCE: GOOGLE MAPS

LOCATION MAP
NOT TO SCALE



SOURCE: GOOGLE MAPS

VICINITY MAP
NOT TO SCALE

PREPARED UNDER
THE DIRECTION OF:

FRANZ HAIDINGER, P.E.
ENGINEERING MANAGER, NCE — DATE

APPROVED
BY:

EAST BAY REGIONAL PARK DISTRICT
-- — DATE

APPROVED
BY:

CITY OF RICHMOND
-- — DATE

SHEET LIST

SHEET NUMBER	DRAWING	SHEET TITLE
1	G1	TITLE SHEET
2	G2	NOTES, LEGEND, AND ABBREVIATIONS
3	G3	KEY MAP
4	G4	HORIZONTAL AND SURVEY CONTROL
5	C1	IMPROVEMENT PLAN "B" 10+00 TO "B" 13+50
6	C2	IMPROVEMENT PLAN "B" 13+50 TO "B" 18+50
7	C3	IMPROVEMENT PLAN "B" 18+50 TO "B" 23+50
8	C4	IMPROVEMENT PLAN "B" 23+50 TO "B" 28+50
9	C5	IMPROVEMENT PLAN "B" 28+50 TO "B" 33+50
10	C6	IMPROVEMENT PLAN "B" 33+50 TO "B" 38+50
11	C7	IMPROVEMENT PLAN "B" 38+50 TO "B" 43+50
12	C8	IMPROVEMENT PLAN "B" 43+50 TO "B" 48+50
13	C9	IMPROVEMENT PLAN "B" 48+50 TO "B" 53+50
14	C10	IMPROVEMENT PLAN "B" 53+50 TO "B" 58+50
15	C11	IMPROVEMENT PLAN "B" 58+50 TO "B" 63+50
16	C12	IMPROVEMENT PLAN "B" 63+50 TO "B" 68+50
17	C13	IMPROVEMENT PLAN "B" 68+50 TO "B" 73+50
18	C14	IMPROVEMENT PLAN "B" 73+50 TO "B" 78+50

SHEET LIST

SHEET NUMBER	DRAWING	SHEET TITLE
19	C15	IMPROVEMENT PLAN "B" 78+50 TO "B" 83+50
20	C16	IMPROVEMENT PLAN "B" 83+50 TO "B" 88+50
21	C17	IMPROVEMENT PLAN "B" 88+50 TO "B" 93+50
22	C18	IMPROVEMENT PLAN "B" 93+50 TO "B" 98+50
23	C19	IMPROVEMENT PLAN "B" 98+50 TO "B" 103+50
24	C20	IMPROVEMENT PLAN "B" 103+50 TO "B" 108+50
25	C21	IMPROVEMENT PLAN "B" 108+50 TO "B" 113+50
26	C22	IMPROVEMENT PLAN "B" 113+50 TO "B" 118+50
27	C23	IMPROVEMENT PLAN "B" 118+50 TO "B" 123+50
28	C24	IMPROVEMENT PLAN "B" 123+50 TO "B" 128+50
29	C25	IMPROVEMENT PLAN "B" 128+50 TO "B" 133+50
30	C26	IMPROVEMENT PLAN "B" 133+50 TO "B" 136+00
31	S1	STRIPING AND SIGNAGE PLAN "B" 9+50 TO "B" 35+50
32	S2	STRIPING AND SIGNAGE PLAN "B" 35+50 TO "B" 61+50
33	S3	STRIPING AND SIGNAGE PLAN "B" 61+50 TO "B" 87+00
34	S4	STRIPING AND SIGNAGE PLAN "B" 87+00 TO "B" 108+00
35	S5	STRIPING AND SIGNAGE PLAN "B" 108+00 TO "B" 135+00
36	D1	PAVEMENT DETAILS
37	D2	FENCING DETAILS

SHEET LIST

SHEET NUMBER	DRAWING	SHEET TITLE
38	D3	BOARDWALK DETAILS
39	D4	UTILITY DETAILS
40	D5	CURB RAMP DETAILS
41	SD1	SIGNAGE AND STRIPING DETAILS

35% SUBMITTAL
PRELIMINARY
FOR REVIEW
NOT FOR CONSTRUCTION
DATE: JUL 1, 2016

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Richmond, Ca. 94804
(510) 215-3620 * Fax (510) 215-2898

REGISTERED PROFESSIONAL ENGINEER
FRANZ G. HAIDINGER
No. C 64725
EXP. 06/30/17
CIVIL
STATE OF CALIFORNIA

SAN FRANCISCO
BAY TRAIL
AT
POINT MOLATE

OWNER

East Bay Regional Park District

EAST BAY REGIONAL
PARK DISTRICT
2950 PERALTA OAKS CT,
OAKLAND, CA 94605

NO.	DATE	DESCRIPTION

PROJECT NO: 567.04.55
DESIGNED BY: J.B.
DRAWN BY: A.P., K.H., M.G.
CHECKED BY: FGH DATE: 06/23/2016
DATE: 07/01/2016

SHEET TITLE

TITLE SHEET

DRAWING
G1

SHEET 1 OF 41

File: P:\active projects\east bay regional park dist - 567\567.04.55 - bay trail segment a & b\CAD\Sheets\G1-G4 TITLE NLA.dwg | Layout: G1 | Printed Jul 07, 2016 @ 3:24pm | ID:AP-20.0s (LMS Tech)

GENERAL NOTES

1. ALL DRAWINGS AND SPECIFICATIONS ARE CONSIDERED PART OF THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEW AND COORDINATION OF ALL DRAWINGS AND SPECIFICATIONS PRIOR TO START OF CONSTRUCTION. ANY DISCREPANCIES THAT OCCUR SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE START OF CONSTRUCTION SO THAT A CLARIFICATION MAY BE ISSUED. WORK NOT CONFORMING TO THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO EXPENSE TO THE CITY.
2. DRAWING BASE MAP IS BASED ON AERIAL SURVEY AND SUPPLEMENTAL GROUND SURVEY. SEE SHEET G4 FOR SURVEY GENERAL NOTES, DATUM, AND CONTROL POINT TABLE.
3. SPECIFIC NOTES AND DETAILS TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS.
4. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY LOCATIONS OF EXISTING FACILITIES AND TO IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY FIELD CONFLICTS.
5. ALL MATERIALS AND WORKMANSHIP SHALL FULLY CONFORM WITH THE SPECIFICATIONS, STANDARDS, AND ORDINANCES OF THE CITY OF CAPITOLA, THE LATEST SANTA CRUZ COUNTY STANDARD PLANS, AND THE CALTRANS STANDARD SPECIFICATIONS (LATEST REVISION). STANDARD PLANS ARE AVAILABLE AT THE OFFICE OF THE ENGINEER.
6. CONTRACTOR SHALL MEET WITH THE CITY PRIOR TO START OF CONSTRUCTION. 48 HOURS NOTICE TO THE ENGINEER IS REQUIRED ON ALL INSPECTIONS.
7. CONTRACTOR IS RESPONSIBLE TO MAKE ALL ARRANGEMENTS FOR SITE INSPECTIONS AND ENSURE THAT ALL CURRENT STANDARDS FOR THE CITY OF RICHMOND, CONTRA COSTA COUNTY AND CALTRANS ARE FOLLOWED PRIOR TO BEGINNING ANY PHASE OF CONSTRUCTION WORK.
8. CONTRACTOR SHALL VERIFY DIMENSIONS PRIOR TO START OF CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCIES OR INCONSISTENCIES.
9. CONSTRUCTION SHALL BE LIMITED TO BETWEEN THE HOURS OF 8:00 A.M. AND 4:30 P.M., MONDAY THROUGH FRIDAY AND INSPECTION REQUESTS SHALL BE LIMITED TO NORMAL CITY BUSINESS HOURS: 8:30 A.M. TO 5:00 P.M., MONDAY THROUGH FRIDAY. ARRANGEMENTS FOR ANY OVERTIME INSPECTION SERVICES AND PAYMENTS OF FEES FOR SAME SHOULD BE MADE 48 HOURS IN ADVANCE AND ARE SUBJECT TO INSPECTION AVAILABILITY AND APPROVAL BY THE ENGINEER.
10. THE CITY IS RESPONSIBLE FOR ARRANGEMENTS TO PAY FOR ALL MATERIAL TESTING REQUIRED FOR QUALITY ASSURANCE/ACCEPTANCE OF THIS PROJECT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE TO IT THAT ALL MATERIAL TESTING REQUIRED BY THE ENGINEER AND QUALITY CONTROL TESTING, PER THE SPECIAL PROVISIONS, IS PERFORMED. ENGINEER WILL ONLY PERFORM QUALITY ASSURANCE TESTING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE ENGINEER 24 HOURS IN ADVANCE OF QUALITY ASSURANCE TESTING TO ALLOW THE ENGINEER TO SCHEDULE MATERIAL TESTING LAB SAMPLING OR TESTING.
11. DUST CONTROL DURING ALL PHASES OF CONSTRUCTION IS THE RESPONSIBILITY OF THE CONTRACTOR. IT IS ALSO THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN GOOD HOUSEKEEPING WITHIN THE CONSTRUCTION AREA AND STAGING AREA.
12. WATER FOR DUST CONTROL AND USE FOR COMPACTION MAY BE PURCHASED FROM THE APPROPRIATE AGENCY PRIOR TO THE START OF ANY WORK, AND IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PAY FOR ANY FEES OR DEPOSITS.
13. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT FOR APPROVAL THE PROPOSED ROUTE(S) FOR ALL CONSTRUCTION TRAFFIC RELATED TO THE PROJECT. UPON APPROVAL, THE CONTRACTOR SHALL STRICTLY ADHERE TO THAT ROUTE(S) ONLY, UNLESS WRITTEN PERMISSION IS OBTAINED TO CHANGE THE ROUTE(S). IN ADDITION TO THE CONTRACTOR'S PROPOSED ROUTE(S), A DETOUR PLAN SHALL BE SUBMITTED FOR APPROVAL BY THE ENGINEER.
14. CONTRACTOR SHOULD NOTE THE PRESENCE OF OVERHEAD UTILITIES IN THE WORK AREA. AS PART OF THEIR PRE-BID INSPECTION, CONTRACTOR SHALL NOTE THE TYPE AND LOCATION OF OVERHEAD UTILITIES IN THE PROPOSED WORK AREA. CONTRACTOR'S PRICE SHALL INCLUDE PROVISIONS FOR WORKING IN AREAS WHERE UTILITIES EXIST AT THE TIME OF BIDDING, AND NO ADDITIONAL COMPENSATION IS ALLOWED.
15. THE CONTRACTOR SHALL MAINTAIN ACCESS TO RESIDENCES AND BUSINESSES AFFECTED BY THE PROJECT THROUGHOUT THE LIFE OF THE CONTRACT AS SPECIFIED IN THE SPECIAL PROVISIONS.
16. LOCATIONS OF EXISTING MONUMENTS, MANHOLES, WATER VALVES, ETC. ARE APPROXIMATED BASED ON FIELD OBSERVATIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES.
17. CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICES ALERT (U.S.A.) 800-227-2600 (OR DIAL 811), TWO (2) WORKING DAYS PRIOR TO START OF ANY EXCAVATION OR DEMOLITION OF IMPROVEMENTS.
18. ANY DAMAGE TO THE EXISTING FACILITIES INCLUDING TREES, LANDSCAPING, IRRIGATION, FENCES, WALLS, SIDEWALK, MAILBOXES, UTILITIES, AND OTHER PAVEMENT SURFACES SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE. CONTRACTOR SHALL RESTORE ANY AND ALL PAVEMENT AND OTHER FACILITIES OUTSIDE LIMITS OF WORK AFFECTED BY THE CONSTRUCTION OPERATIONS AT NO ADDITIONAL COST. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VIDEOTAPE OR DOCUMENT EXISTING CONDITIONS PRIOR TO START OF WORK TO SUBSTANTIATE ANY PREVIOUS DAMAGE, ETC.; COPIES OF WHICH SHALL BE PROVIDED TO THE ENGINEER.
19. ALL SURVEY MONUMENTS SHALL ONLY BE RESET BY A REGISTERED CIVIL ENGINEER OR LICENSED LAND SURVEYOR AT THE DIRECTION OF THE ENGINEER.
20. ALL STRIPING AND MARKINGS SHALL BE THERMOPLASTIC. ALL BLUE REFLECTIVE FIRE HYDRANT MARKERS SHALL BE SET 6" OFF THE STREET CENTERLINE OR CENTERLINE STRIPING.
21. TRAFFIC CONTROL DURING CONSTRUCTION SHALL BE THE CONTRACTOR'S RESPONSIBILITY AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAGMEN, AND OTHER DEVICES TO PROVIDE FOR SAFE PASSAGE OF PUBLIC VEHICULAR AND PEDESTRIAN TRAFFIC IN ACCORDANCE WITH CA MUTCD.
22. TYPICAL DETAILS REFERRED TO ON THESE DRAWINGS ARE FROM THE LATEST VERSIONS OF THE CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) STANDARD PLANS, AND CONTRA COSTA COUNTY STANDARD PLANS.
23. CONTRACTOR SHALL POSSESS A VALID CLASS 'A' LICENSE AT THE TIME OF AWARD OF THE CONTRACT.

LEGEND

PROPOSED FEATURES

- LIMITS OF PAVEMENT WORK
- LIMITS OF AB SHOULDER
- LIMITS OF DG SHOULDER
- WOODEN BOARDWALK
- TRAIL ALIGNMENT
- EP
- ES
- 1 / D1 — DETAIL IDENTIFICATION NUMBER / DRAWING NUMBER ON WHICH DETAIL IS DRAWN
- 21 | 50' — CALTRANS STRIPING DETAIL NUMBER (SEE DRAWING SD1 FOR DETAIL); LENGTH OR QUANTITY OF STRIPE/SYMBOL MEASURED BETWEEN MATCH LINES
- HALF HEIGHT FENCE / SPLIT RAIL FENCE
- X — CHAIN LINK FENCE
- SECURITY FENCE
- CUT
- FILL

EXISTING FEATURES

- CITY LIMIT
- PROPERTY LINE
- ROW
- BUILDING OVERHANG
- DIRT ROAD
- EDGE OF PAVEMENT
- W — EDGE OF WATERLINE (AT TIME OF AERIAL)
- MHHW — MEAN HIGHER HIGH WATERLINE
- X — FENCELINE
- GUARD RAIL
- TREE / SHRUB DRIPLINE
- RETAINING WALL
- AERIAL CONTROL POINT
- FIRE HYDRANT
- SIGN
- 14"† — TREE TRUNK / SIZE
- UTILITY MANHOLE - TYPE UNKNOWN
- UTILITY POLE
- UTILITY POLE W/ELECTROLIER
- W — WATER UTILITY BOX
- CORE LOCATIONS
- Boring # — AVOID AREA
- SENSITIVE AREA
- WETLAND AREA

LEGEND - PAVING DETAIL SHEETS

PROPOSED FEATURES

- HMA
- AB
- DG

EXISTING FEATURES

- PCC
- EXISTING AC
- EXISTING AB
- EXISTING SUBGRADE OR BASE MATERIAL

ABBREVIATIONS

NOT ALL ABBREVIATIONS LISTED ARE USED IN THESE PLANS

AB	AGGREGATE BASE
AC	ASPHALT CONCRETE
@	AT
APPROX	APPROXIMATE
AVG.	AVERAGE
BCDC	BAY CONSERVATION DEVELOPMENT COMMISSION
BMP	BEST MANAGEMENT PRACTICES
CA	CALIFORNIA
CATV	CABLE/TELEVISION
C&G	CURB AND GUTTER
CB	CATCH BASIN
CF	CUBIC FEET
CIR	COLD IN-PLACE RECYCLING
CL OR ℄	CENTERLINE
CLR	CLEAR
COMM	COMMUNICATION
CONC	CONCRETE
CONST	CONSTRUCT
CY	CUBIC YARD
° OR DEG	DEGREE(S)
DG	DECOMPOSED GRANITE
DI	DROP INLET
ø OR DIA.	DIAMETER
DIR	DIRECTION
DWG	DRAWING
DWS	DETECTABLE WARNING SURFACE
DW, DWY	DRIVEWAY
E	EAST
EA	EACH
EB	EASTBOUND, ELECTRICAL BOX
EG	EXISTING GRADE
ELEC	ELECTRIC
EP	EDGE OF PAVEMENT
EL	ELEVATION
(E)	EXISTING
ES	EDGE OF SHOULDER
ETW	EDGE OF TRAVELED WAY
FG	FINISH GRADE
FH	FIRE HYDRANT
FFC	FRONT FACE CURB
FL	FLOWLINE
FT or '	FOOT, FEET
G	GAS
GV	GATE VALVE
GB	GRADE BREAK
HMA	HOT MIX ASPHALT
IN or "	INCH
INT	INTERSECTION
ISA	INTERNATIONAL SYMBOL OF ACCESSIBILITY
LEN	LENGTH
LF	LINEAR FEET
LP	LIGHT POLE
LS	LUMP SUM
MH	MANHOLE
MAX	MAXIMUM
MDD	MAXIMUM DRY DENSITY
MIN	MINIMUM
MISC	MISCELLANEOUS
MON	MONUMENT
MUTCD	MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES
N	NORTH
(N)	NEW
N/O	NORTH OF
NIC	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
# OR NO.	NUMBER
OC	ON CENTER
OD	OUTER DIAMETER
±	PLUS OR MINUS
(P)	PROPOSED
PG&E	PACIFIC GAS & ELECTRIC
PT	POINT
PCC	PORTLAND CEMENT CONCRETE
PVMT	PAVEMENT
PSI	POUNDS PER SQUARE INCH
PL	PROPERTY LINE
PP	POWER POLE
PVC	POLYVINYL CHLORIDE
R	RADIUS
RC	RELATIVE COMPACTION
RHMA	RUBBERIZED HOT MIX ASPHALT
ROW	RIGHT-OF-WAY
S	SLOPE, SOUTH
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SF	SQUARE FOOT/FEET
SSMH	SANITARY SEWER MANHOLE
SSCO	SANITARY SEWER CLEAN OUT
STD	STANDARD
STA	STATION
SW	SIDEWALK
SY	SQUARE YARD
TBX	TELECOMMUNICATIONS BOX
TC	TOP OF CURB
TEMP	TEMPORARY
TP	THERMO-PLASTIC
TSB	TRAFFIC SIGNAL BOX
TYP	TYPICAL
U/G	UNDERGROUND
VG	VALLEY GUTTER
W	WATER, WEST
WL	WATERLINE
W/	WITH
WM	WATER METER
WV	WATER VALVE
WB	WESTBOUND

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REGISTERED PROFESSIONAL ENGINEER — FRANK G. HADDIGER — No. C 64725 — EXP. 06/30/17 — CIVIL — STATE OF CALIFORNIA

SAN FRANCISCO BAY TRAIL AT POINT MOLATE

OWNER

East Bay Regional Park District

EAST BAY REGIONAL PARK DISTRICT
2950 PERALTA OAKS CT,
OAKLAND, CA 94605

NO.	DATE	DESCRIPTION

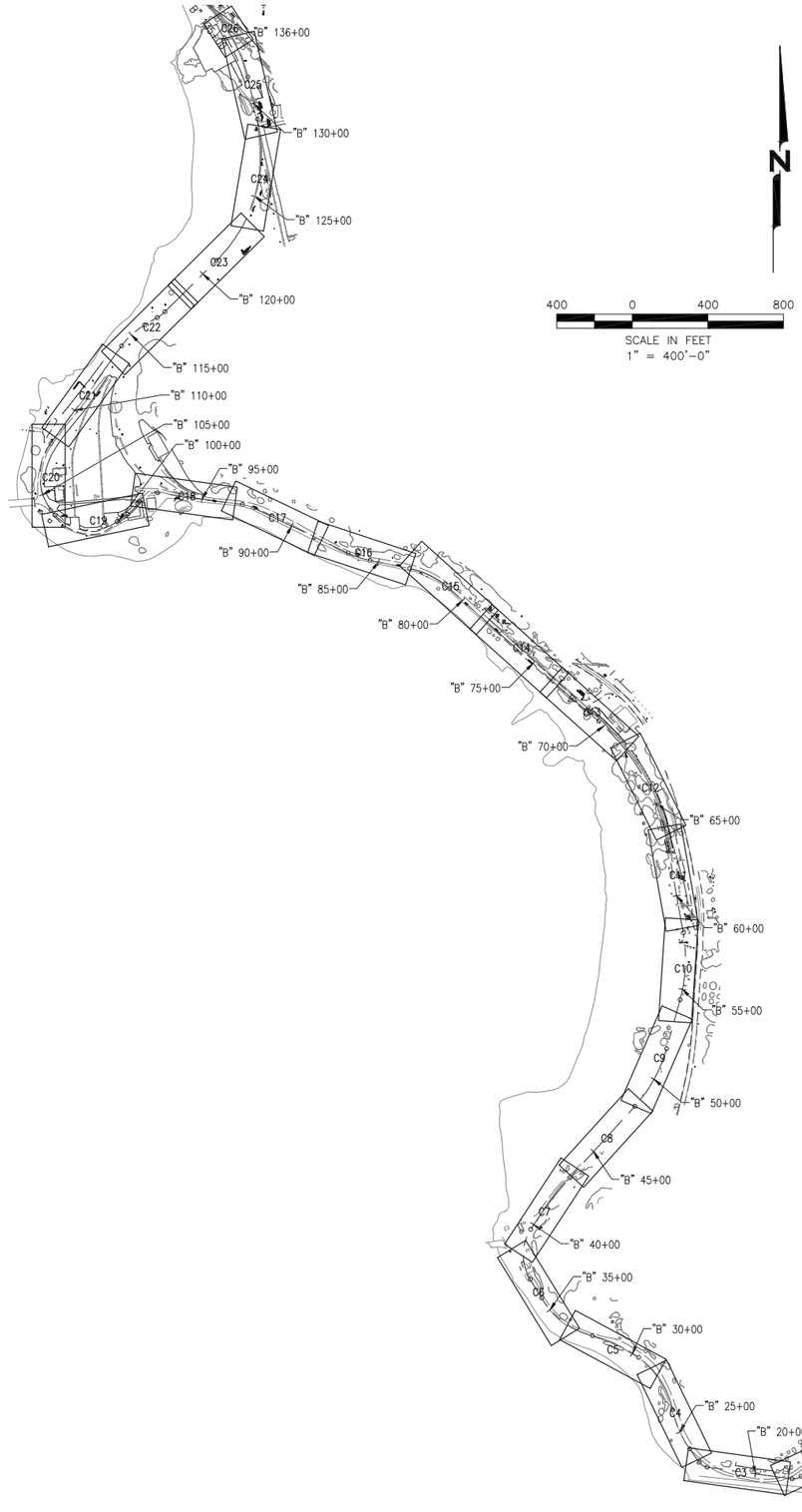
PROJECT NO: 567.04.55
DESIGNED BY: J.B.
DRAWN BY: A.P., K.H., M.C.
CHECKED BY: FGH DATE: 06/23/2016
DATE: 07/01/2016

SHEET TITLE

NOTES, LEGEND, AND ABBREVIATIONS

DRAWING G2

SHEET 2 OF 41



DRAWING LIST		
DRAWING	SHEET NUMBER	SHEET TITLE
C1	5	SEGMENT A (SOUTH SEGMENT) "B" 10+00 TO "B" 13+50
C2	6	SEGMENT A (SOUTH SEGMENT) "B" 13+50 TO "B" 18+50
C3	7	SEGMENT A (SOUTH SEGMENT) "B" 18+50 TO "B" 23+50
C4	8	SEGMENT A (SOUTH SEGMENT) "B" 23+50 TO "B" 28+50
C5	9	SEGMENT A (SOUTH SEGMENT) "B" 28+50 TO "B" 33+50
C6	10	SEGMENT A (SOUTH SEGMENT) "B" 33+50 TO "B" 38+50
C7	11	SEGMENT A (SOUTH SEGMENT) "B" 38+50 TO "B" 43+50
C8	12	SEGMENT A (SOUTH SEGMENT) "B" 43+50 TO "B" 48+50
C9	13	SEGMENT A (SOUTH SEGMENT) "B" 48+50 TO "B" 53+50
C10	14	SEGMENT A (SOUTH SEGMENT) "B" 53+50 TO "B" 58+50
C11	15	SEGMENT B (NORTH SEGMENT) "B" 58+50 TO "B" 63+50
C12	16	SEGMENT B (NORTH SEGMENT) "B" 63+50 TO "B" 68+50
C13	17	SEGMENT B (NORTH SEGMENT) "B" 68+50 TO "B" 73+50
C14	18	SEGMENT B (NORTH SEGMENT) "B" 73+50 TO "B" 78+50
C15	19	SEGMENT B (NORTH SEGMENT) "B" 78+50 TO "B" 83+50
C16	20	SEGMENT B (NORTH SEGMENT) "B" 83+50 TO "B" 88+50
C17	21	SEGMENT B (NORTH SEGMENT) "B" 88+50 TO "B" 93+50
C18	22	SEGMENT B (NORTH SEGMENT) "B" 93+50 TO "B" 98+50
C19	23	SEGMENT B (NORTH SEGMENT) "B" 98+50 TO "B" 103+50
C20	24	SEGMENT B (NORTH SEGMENT) "B" 103+50 TO "B" 108+50
C21	25	SEGMENT B (NORTH SEGMENT) "B" 108+50 TO "B" 113+50
C22	26	SEGMENT B (NORTH SEGMENT) "B" 113+50 TO "B" 118+50
C23	27	SEGMENT B (NORTH SEGMENT) "B" 118+50 TO "B" 123+50
C24	28	SEGMENT B (NORTH SEGMENT) "B" 123+50 TO "B" 128+50
C25	29	SEGMENT B (NORTH SEGMENT) "B" 128+50 TO "B" 133+50
C26	30	SEGMENT B (NORTH SEGMENT) "B" 133+50 TO "B" 138+50

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SAN FRANCISCO BAY TRAIL AT POINT MOLATE

OWNER

East Bay Regional Park District

EAST BAY REGIONAL PARK DISTRICT
2950 PERALTA OAKS CT,
OAKLAND, CA 94605

NO.	DATE	DESCRIPTION

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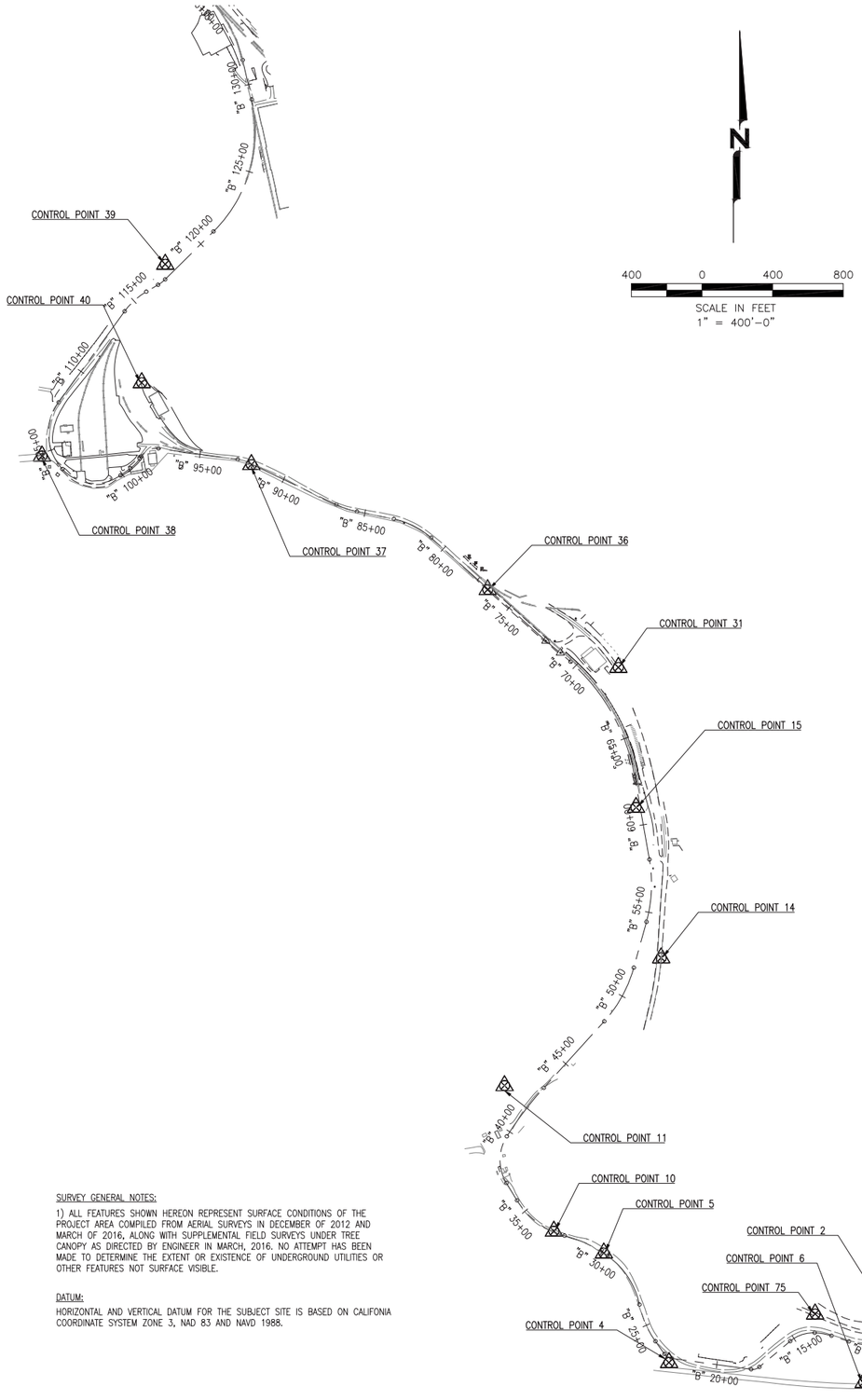
DATE: 07/01/2016

SHEET TITLE

KEY MAP

DRAWING G3

SHEET 3 OF 41



SURVEY GENERAL NOTES:

1) ALL FEATURES SHOWN HEREON REPRESENT SURFACE CONDITIONS OF THE PROJECT AREA COMPILED FROM AERIAL SURVEYS IN DECEMBER OF 2012 AND MARCH OF 2016, ALONG WITH SUPPLEMENTAL FIELD SURVEYS UNDER TREE CANOPY AS DIRECTED BY ENGINEER IN MARCH, 2016. NO ATTEMPT HAS BEEN MADE TO DETERMINE THE EXTENT OR EXISTENCE OF UNDERGROUND UTILITIES OR OTHER FEATURES NOT SURFACE VISIBLE.

DATUM:

HORIZONTAL AND VERTICAL DATUM FOR THE SUBJECT SITE IS BASED ON CALIFONIA COORDINATE SYSTEM ZONE 3, NAD 83 AND NAVD 1988.

SURVEY CONTROL

CONTROL POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
2	2167974.84	6012290.13	47.20	FIXED MAG & WASHER
4	2167796.03	6010982.92	18.46	FIXED REBAR & CAP
5	2168416.08	6010613.58	18.81	FIXED MAG & WASHER
6	2167683.04	6012085.55	19.19	FIXED 60D NAIL & WASHER
10	2168539.71	6010330.60	17.51	FIXED MAG & WASHER
11	2169364.18	6010051.09	10.66	FIXED REBAR & CAP
14	2170087.96	6010938.36	60.22	FIXED MAG & WASHER
15	2170939.65	6010795.92	17.89	FIXED REBAR & CAP
31	2171732.70	6010695.82	22.02	FIXED MAG & WASHER
36	2172172.82	6009955.46	21.27	FIXED MAG & WASHER
37	2172880.97	6008616.54	21.19	FIXED MAG & WASHER
38	2172929.89	6007430.55	16.76	FIXED MAG & WASHER
39	2174015.81	6008128.95	10.38	FIXED REBAR & CAP
40	2173345.02	6007995.72	21.34	FIXED REBAR & CAP
75	2168071.04	6011810.72	46.08	BRASS DISC IN WELL (OLD 35)

HORIZONTAL ALIGNMENT – SF BAY TRAIL

PI STATION	NORTHING	EASTING	Δ OR BEARING	DISTANCE	RADIUS
9+50.00	2167872.72	6012219.75	N 64° 21' 29" W	50.00	
10+00.00	2167894.36	6012174.68	Δ LT 31° 03' 51"		60.00
10+32.53	2167900.00	6012143.04	Δ RT 23° 23' 08"		350.00
11+75.38	2167915.49	6012002.03	N 72° 02' 12" W	103.73	
12+79.11	2167947.48	6011903.36	Δ LT 15° 54' 12"		350.00
13+76.26	2167964.32	6011808.00	Δ LT 41° 58' 38"		205.00
15+26.45	2167916.68	6011669.08	S 50° 04' 57" W	227.50	
17+53.95	2167770.70	6011494.60	Δ RT 47° 46' 44"		60.00
18+03.98	2167757.28	6011447.89	N 82° 08' 19" W	454.27	
22+58.26	2167819.41	6010997.88	Δ RT 46° 36' 30"		60.00
23+07.07	2167843.98	6010957.26	N 35° 31' 49" W	88.27	
23+95.34	2167915.82	6010905.97	Δ RT 23° 51' 56"		550.00
26+24.43	2168124.24	6010814.92	Δ LT 42° 52' 28"		450.00
29+61.17	2168399.79	6010635.28	Δ LT 20° 42' 45"		750.00
32+32.29	2168514.19	6010391.10	Δ RT 43° 46' 10"		450.00
35+76.05	2168714.36	6010121.90	N 31° 28' 56" W	114.96	
36+91.02	2168812.40	6010061.86	Δ RT 63° 51' 15"		250.00
39+69.63	2169076.81	6010063.91	Δ RT 09° 53' 35"		2000.00
43+14.97	2169351.11	6010273.01	N 42° 15' 54" E	509.34	
48+24.30	2169728.04	6010615.57	Δ LT 26° 46' 40"		750.00
51+74.82	2170032.19	6010783.30	N 15° 29' 13" E	268.90	
54+43.72	2170291.32	6010855.10	Δ LT 25° 32' 47"		800.00
58+00.42	2170644.68	6010871.85	N 10° 03' 34" W	477.83	
62+78.24	2171115.16	6010788.39	Δ LT 38° 27' 35"		1130.00
70+36.75	2171764.35	6010424.24	N 48° 31' 09" W	76.44	
71+13.19	2171814.98	6010366.97	N 50° 14' 55" W	107.01	
72+20.20	2171883.41	6010284.70	N 48° 05' 10" W	873.14	
80+93.34	2172466.68	6009634.96	Δ LT 30° 28' 56"		450.00
83+32.75	2172572.88	6009423.54	N 78° 34' 06" W	213.60	
85+46.34	2172615.22	6009214.18	Δ RT 14° 05' 60"		500.00
86+69.39	2172654.12	6009097.78	N 64° 28' 06" W	553.79	
92+23.17	2172892.81	6008598.07	Δ LT 17° 42' 09"		200.00
92+84.97	2172910.48	6008539.11	N 82° 10' 16" W	453.69	
97+38.66	2172972.28	6008089.65	Δ LT 64° 59' 19"		100.00
98+52.08	2172927.44	6007992.01	S 32° 50' 25" W	15.65	
98+67.73	2172914.29	6007983.52	Δ RT 21° 55' 30"		200.00
99+44.26	2172859.39	6007930.87	S 54° 45' 55" W	68.46	
100+12.72	2172819.90	6007874.95	Δ RT 82° 50' 15"		250.00
103+74.17	2172855.53	6007546.10	Δ RT 78° 21' 51"		300.00
107+84.49	2173234.00	6007524.84	N 35° 58' 02" E	636.58	
114+21.06	2173749.22	6007898.71	Δ RT 23° 49' 54"		400.00
115+87.44	2173860.00	6008021.24	N 59° 47' 55" E	77.18	
116+64.62	2173898.82	6008087.94	Δ LT 14° 31' 21"		200.00
117+15.31	2173929.57	6008128.07	N 45° 16' 34" E	385.45	
121+00.76	2174200.81	6008401.94	Δ LT 58° 14' 58"		800.00
129+14.07	2174948.81	6008618.56	N 12° 58' 24" W	229.07	
131+43.14	2175172.03	6008567.14	Δ LT 24° 17' 24"		800.00

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FRANK G. HAAD
No. C 64725
EXP. 06/30/17
CIVIL
STATE OF CALIFORNIA

SAN FRANCISCO
BAY TRAIL
AT
POINT MOLATE

OWNER

East Bay Regional Park District

EAST BAY REGIONAL
PARK DISTRICT
2950 PERALTA OAKS CT,
OAKLAND, CA 94605

NO.	DATE	DESCRIPTION

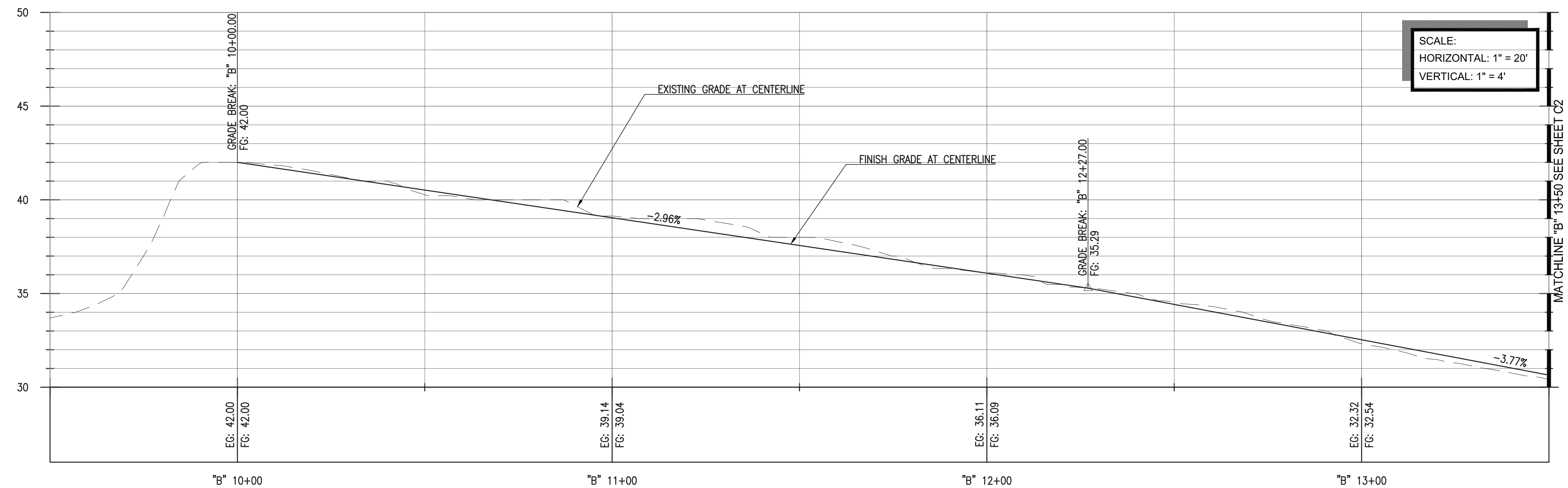
PROJECT NO: 567.04.55
DESIGNED BY: J.B.
DRAWN BY: A.P., K.H., M.G.
CHECKED BY: FGH DATE: 06/23/2016
DATE: 07/01/2016

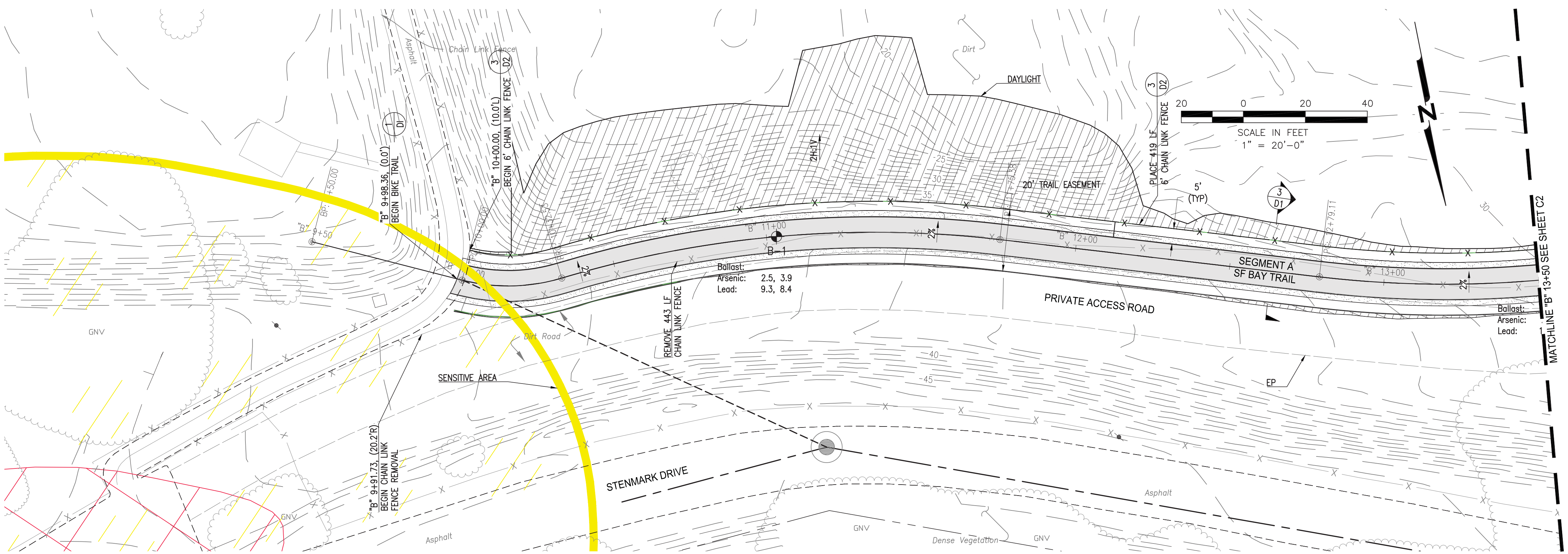
SHEET TITLE

HORIZONTAL AND
SURVEY CONTROL

DRAWING
G4

SHEET 4 OF 41





FENCING NOTE:
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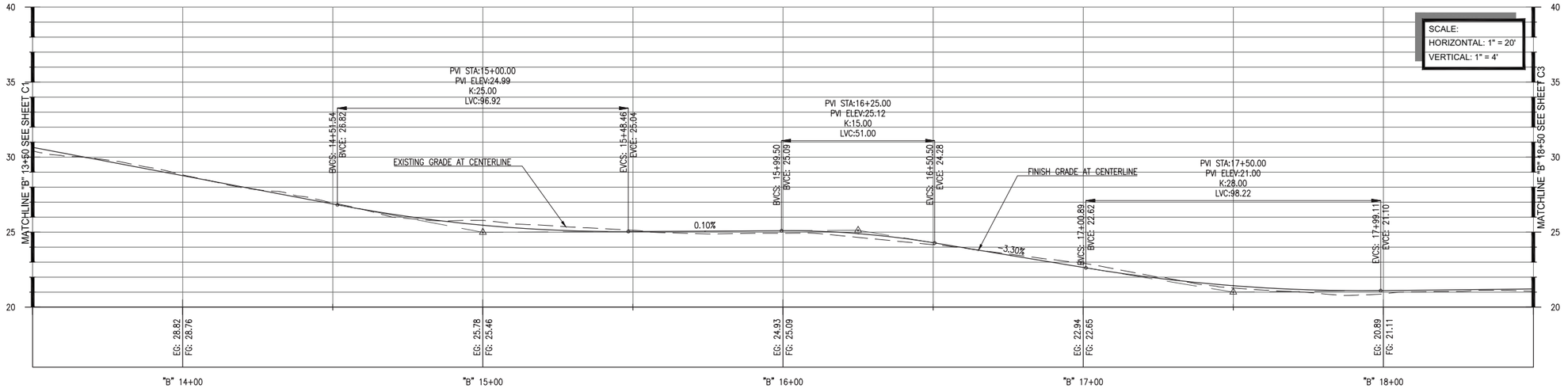
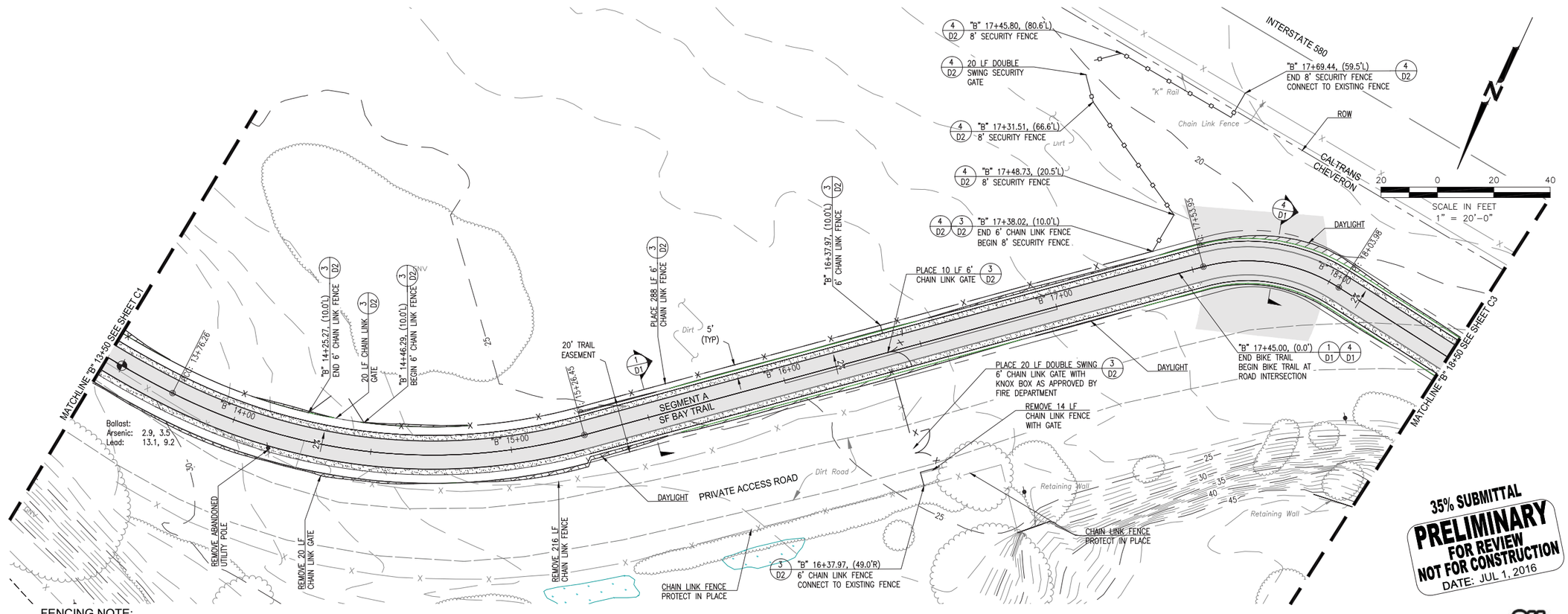
SHEET TITLE
IMPROVEMENT PLAN
"B" 10+00 TO "B" 13+50

DRAWING
C1





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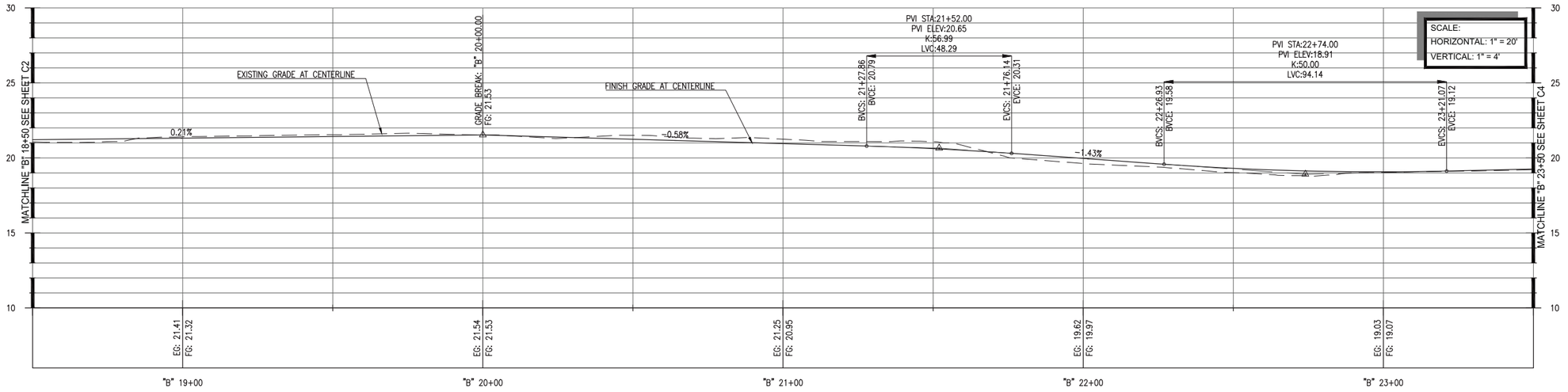
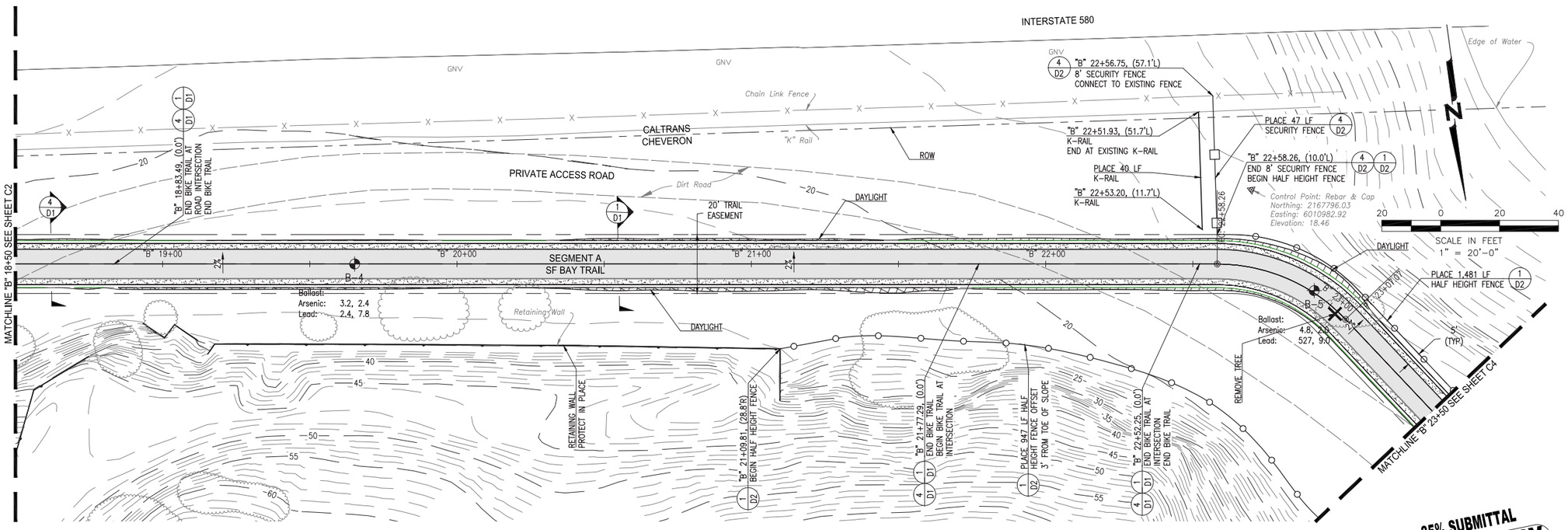
SHEET TITLE

IMPROVEMENT PLAN
"B" 13+50 TO "B" 18+50

DRAWING
C2

SHEET 6 OF 41





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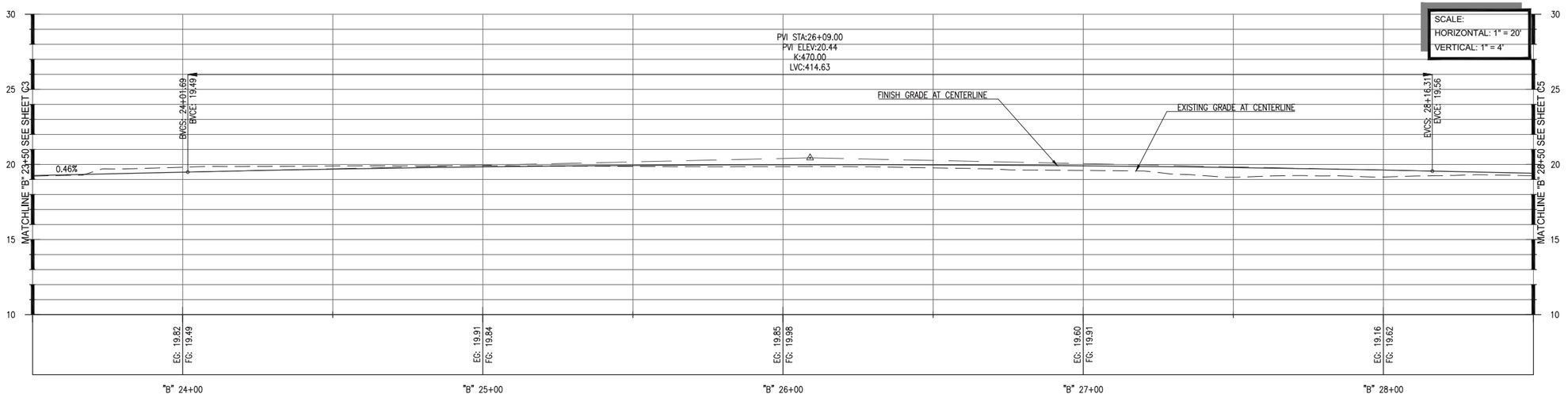
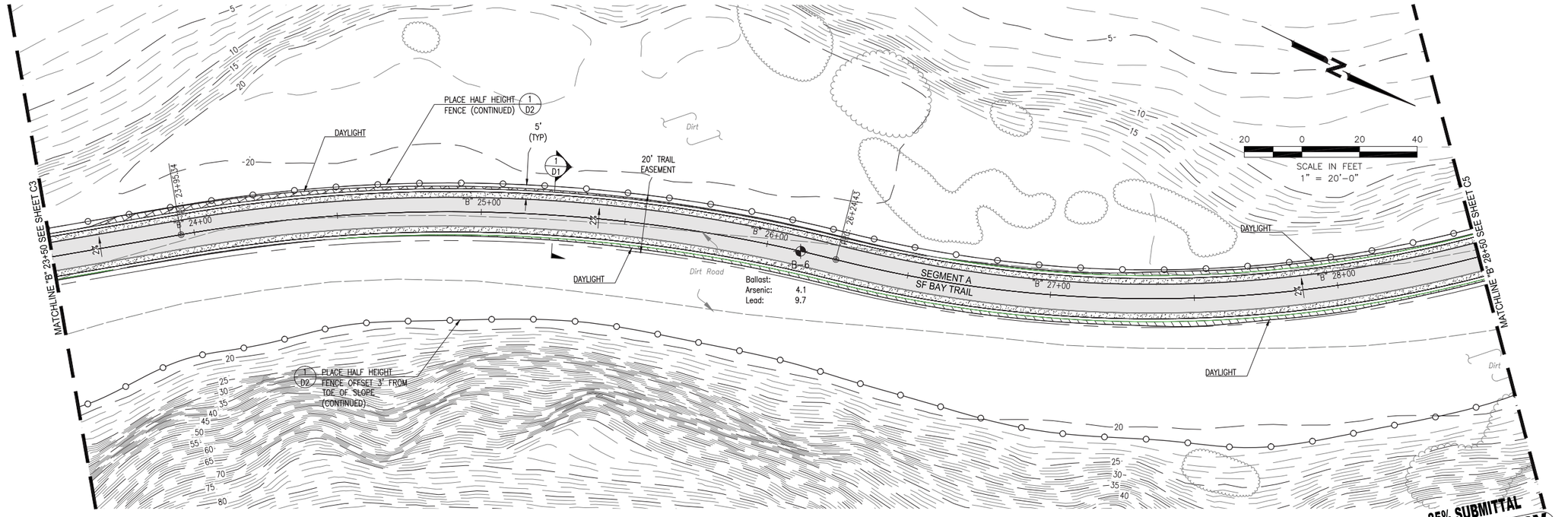
SHEET TITLE

IMPROVEMENT PLAN
"B" 18+50 TO "B" 23+50

DRAWING
C3

SHEET 7 OF 41





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FOR REVIEW
NOT FOR CONSTRUCTION
DATE: JUL 1, 2016

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REGISTERED PROFESSIONAL ENGINEER
FRANK G. HAUDINGER
No. C 64725
EXP. 06/30/17
CIVIL
STATE OF CALIFORNIA

SAN FRANCISCO
BAY TRAIL
AT
POINT MOLATE

OWNER

East Bay Regional Park District

EAST BAY REGIONAL
PARK DISTRICT
2950 PERALTA OAKS CT,
OAKLAND, CA 94605

NO.	DATE	DESCRIPTION

PROJECT NO:	567.04.55
DESIGNED BY:	J.B.
DRAWN BY:	A.P., K.H., M.G.
CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

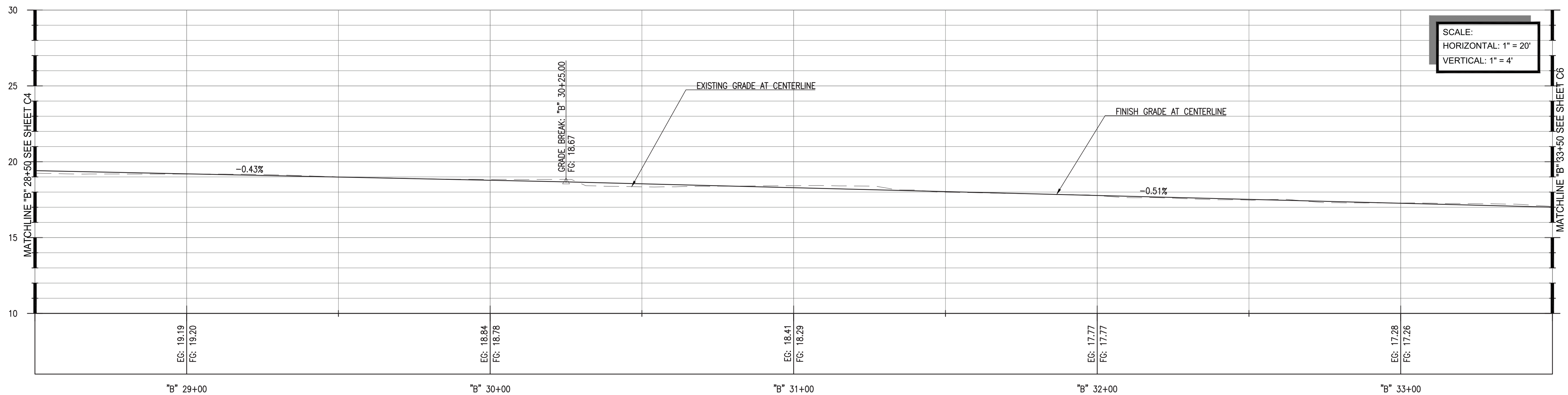
SHEET TITLE

IMPROVEMENT PLAN
"B" 23+50 TO "B" 28+50

DRAWING
C4

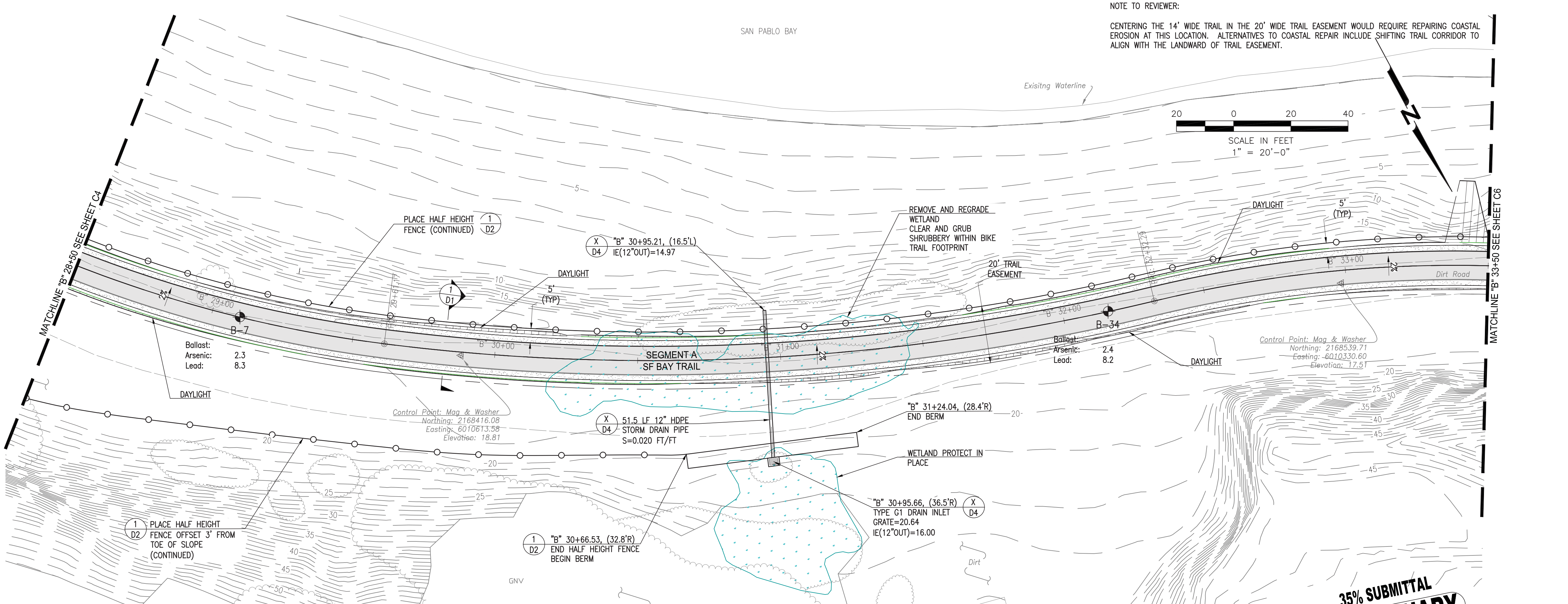
SHEET 8 OF 41

File: P:\active projects\east bay regional park dist - 0567\567.04.55 - bay trail segment a & b\CAD\Sheets\C1-C4 Segment A.dwg | Layout: C4 | Printed Jul 07, 2016 @ 3:16pm | © b.20.0a (LMS Tech)



NOTE TO REVIEWER:

CENTERING THE 14' WIDE TRAIL IN THE 20' WIDE TRAIL EASEMENT WOULD REQUIRE REPAIRING COASTAL EROSION AT THIS LOCATION. ALTERNATIVES TO COASTAL REPAIR INCLUDE SHIFTING TRAIL CORRIDOR TO ALIGN WITH THE LANDWARD OF TRAIL EASEMENT.



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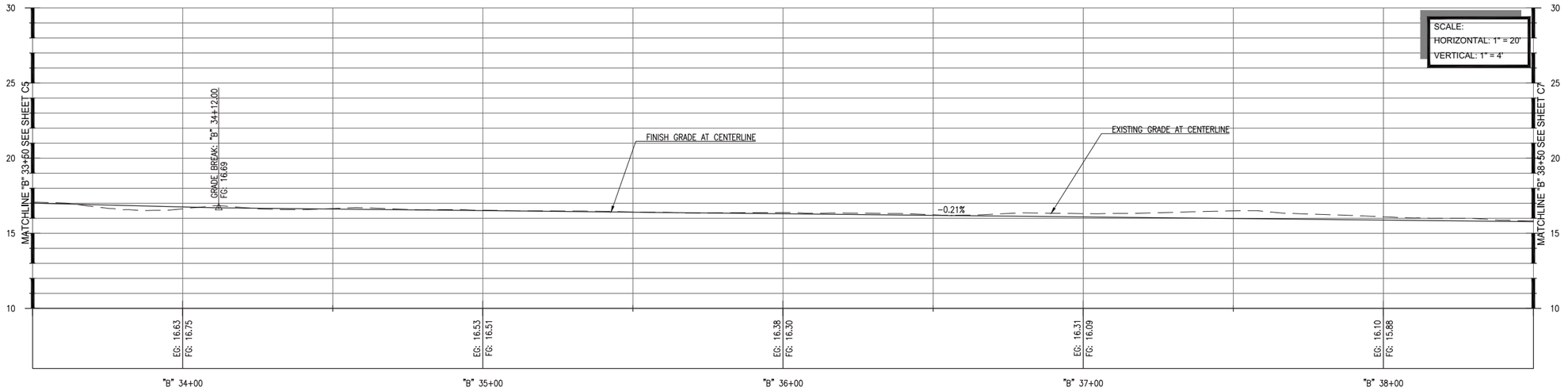
CHECKED BY: FGH DATE: 06/23/2016
DATE: 07/01/2016

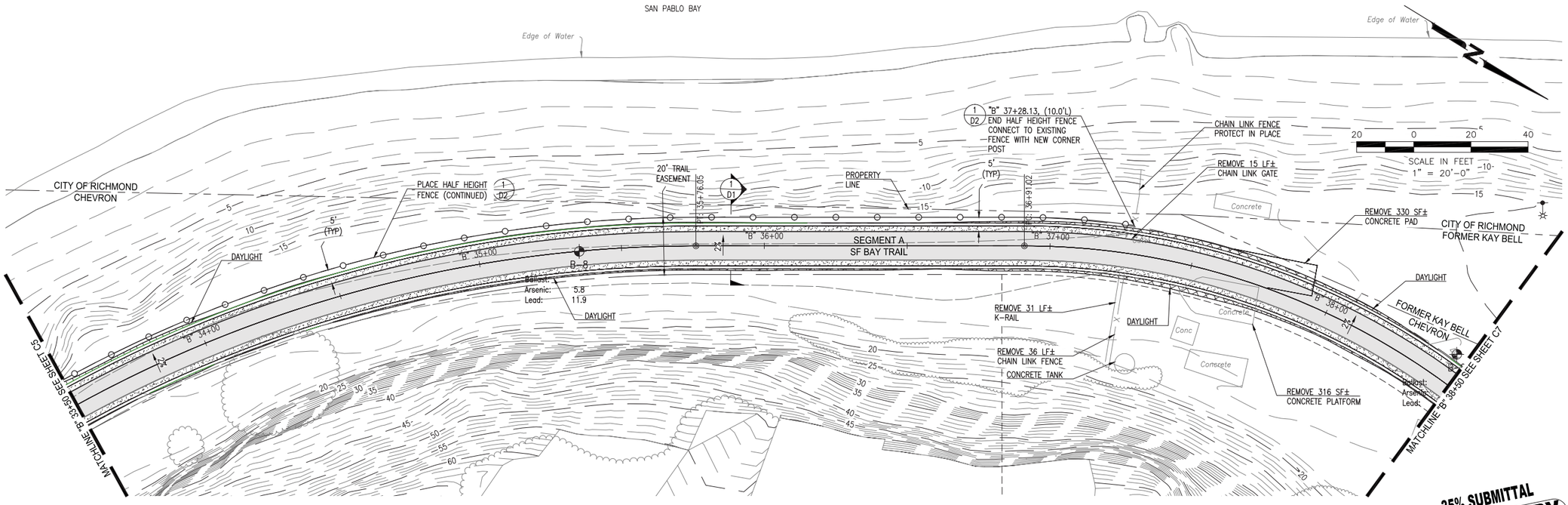
SHEET TITLE

IMPROVEMENT PLAN
"B" 28+50 TO "B" 33+50

DRAWING
C5

SHEET 9 OF 41





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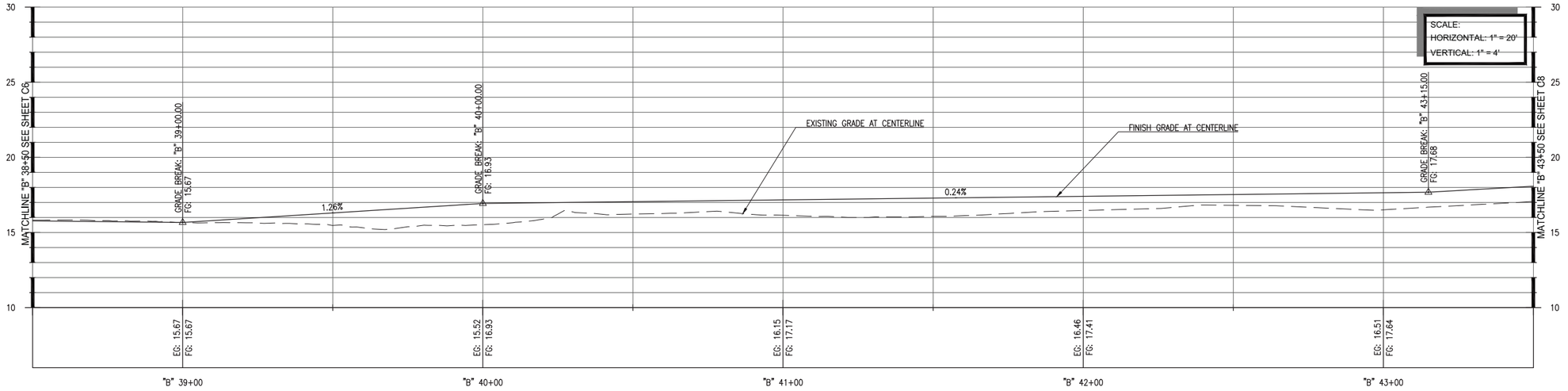
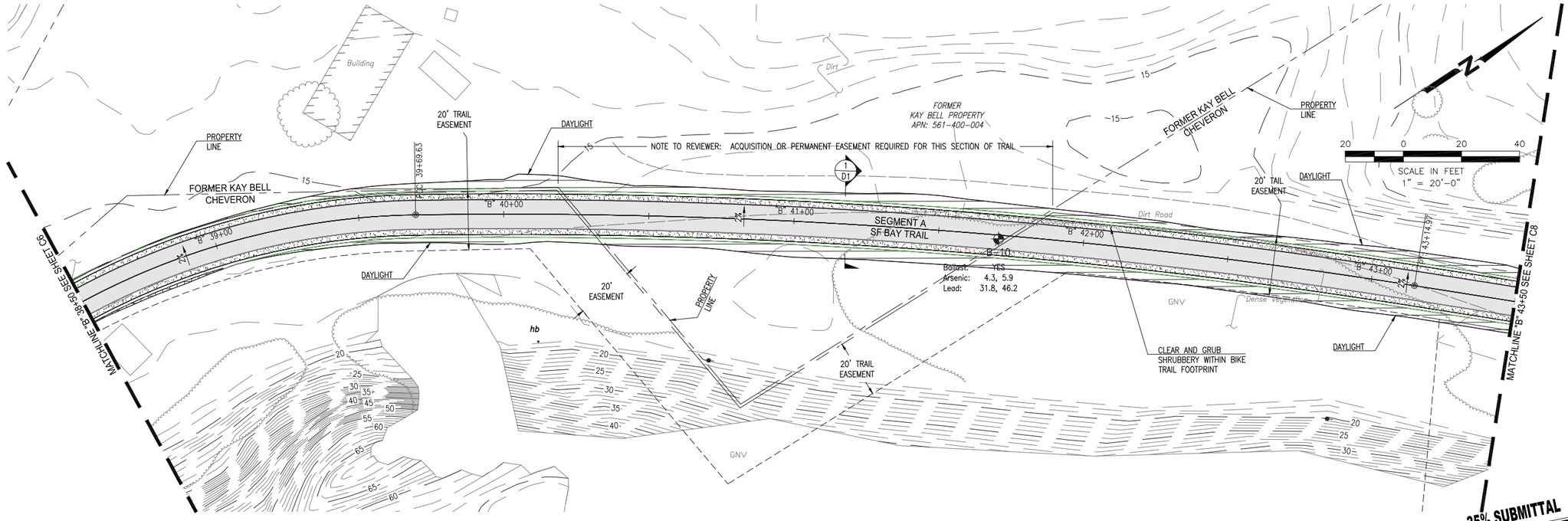
DRAWN BY:	A.P., K.H., M.G.
CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

SHEET TITLE
IMPROVEMENT PLAN
"B" 33+50 TO "B" 38+50

DRAWING
C6

SHEET 10 OF 41





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OWNER

East Bay Regional Park District

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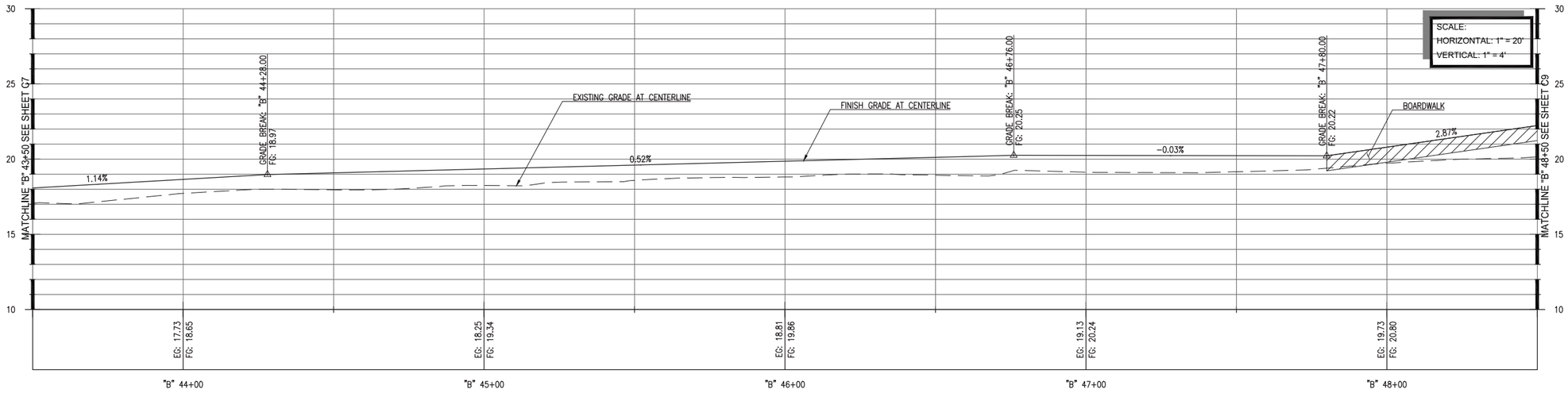
DRAWN BY: A.P., K.H., M.G.
CHECKED BY: FGH DATE: 06/23/2016
DATE: 07/01/2016

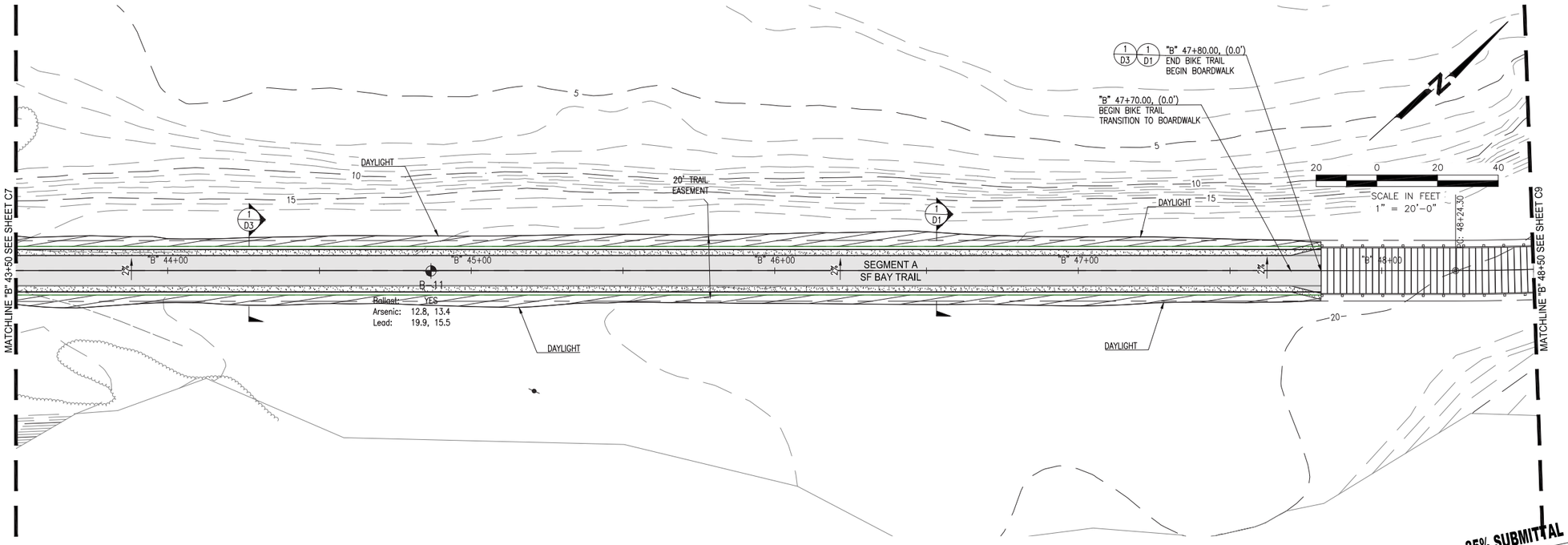
SHEET TITLE

IMPROVEMENT PLAN
"B" 38+50 TO "B" 43+50

DRAWING C7

SHEET 11 OF 41





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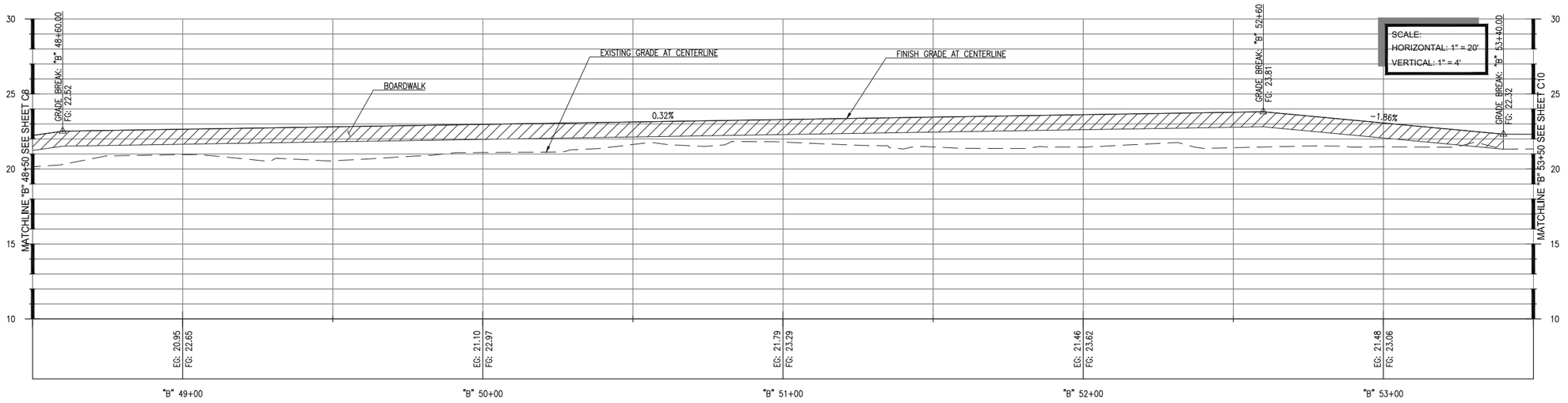
CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

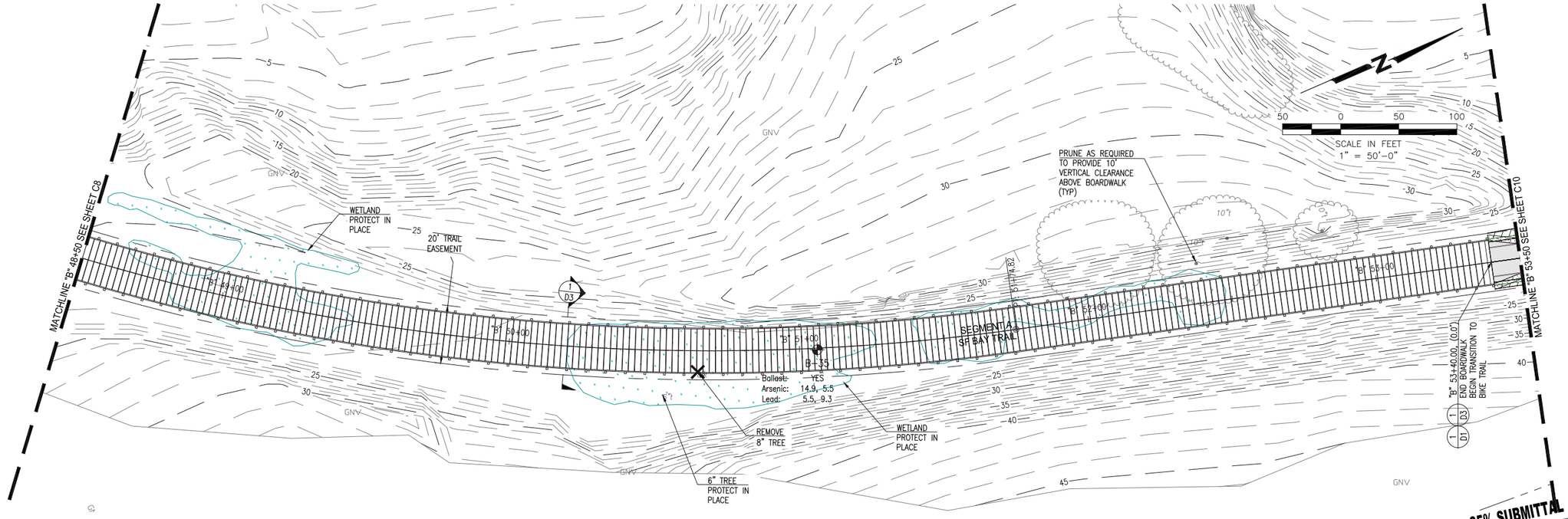
SHEET TITLE

IMPROVEMENT PLAN
"B" 43+50 TO "B" 48+50

DRAWING
C8

SHEET 12 OF 41





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CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

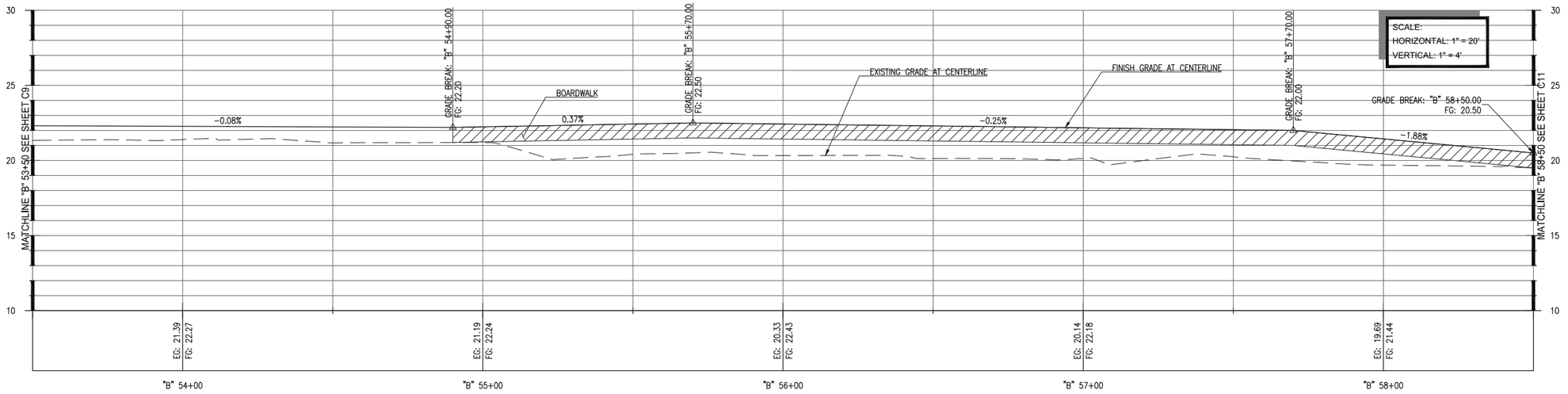
SHEET TITLE

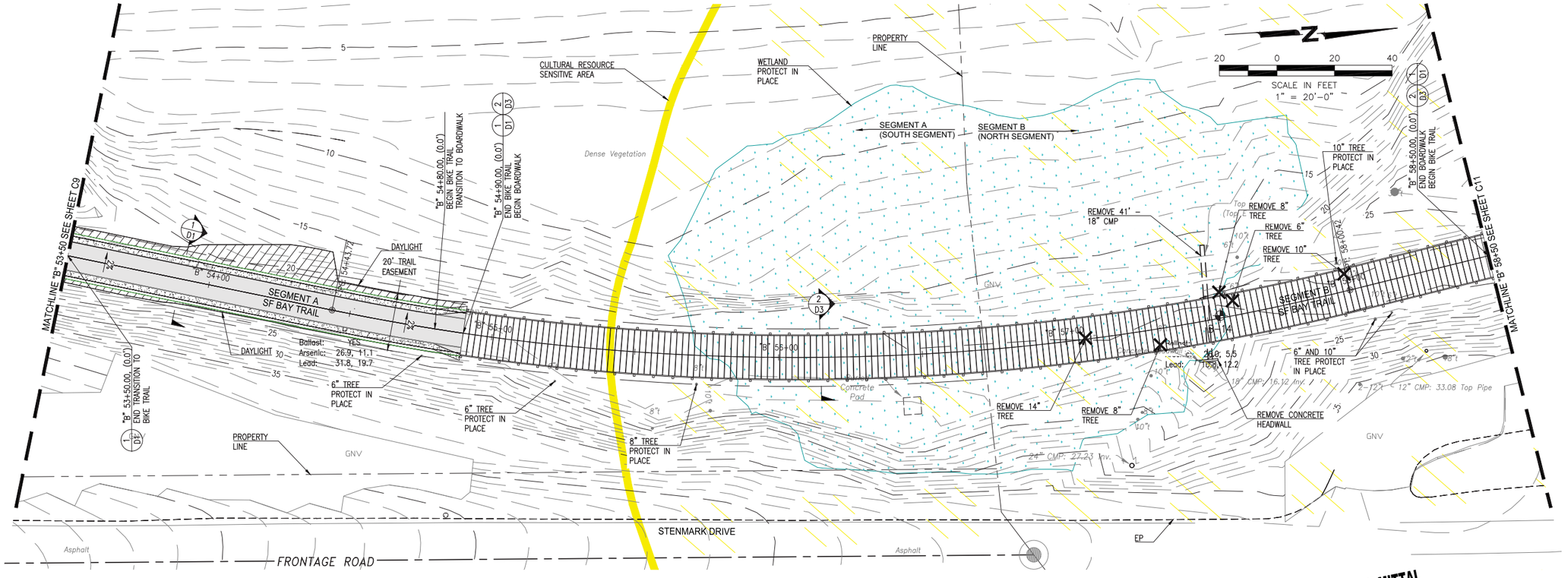
IMPROVEMENT PLAN
"B" 48+50 TO "B" 53+50

DRAWING
C9

SHEET 13 OF 41

File: P:\active projects\east bay regional park dist - 567\TM\567.04.55 - bay trail segment a & b\CAD\Sheets\C9-C10 Sement A.dwg | Layout: C9 | Printed Jul 07, 2016 @ 3:21pm | ID:b.20.0s (LMS Tech)





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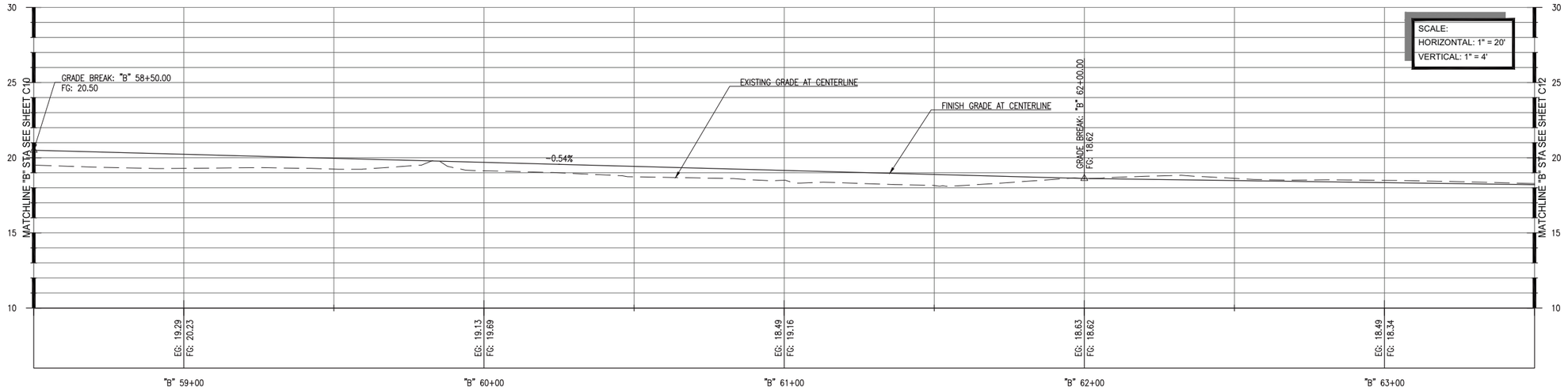
DRAWN BY:	A.P., K.H., M.C.
CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

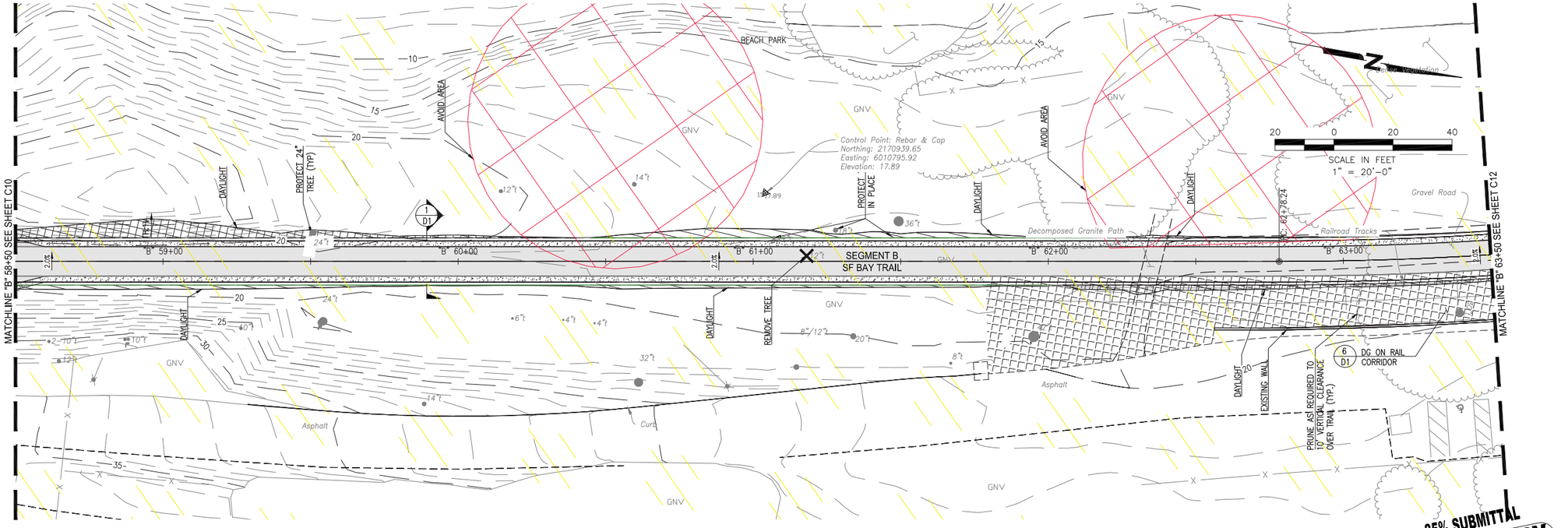
SHEET TITLE

IMPROVEMENT PLAN
"B" 53+50 TO "B" 58+50

DRAWING
C10

SHEET 14 OF 41





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OWNER

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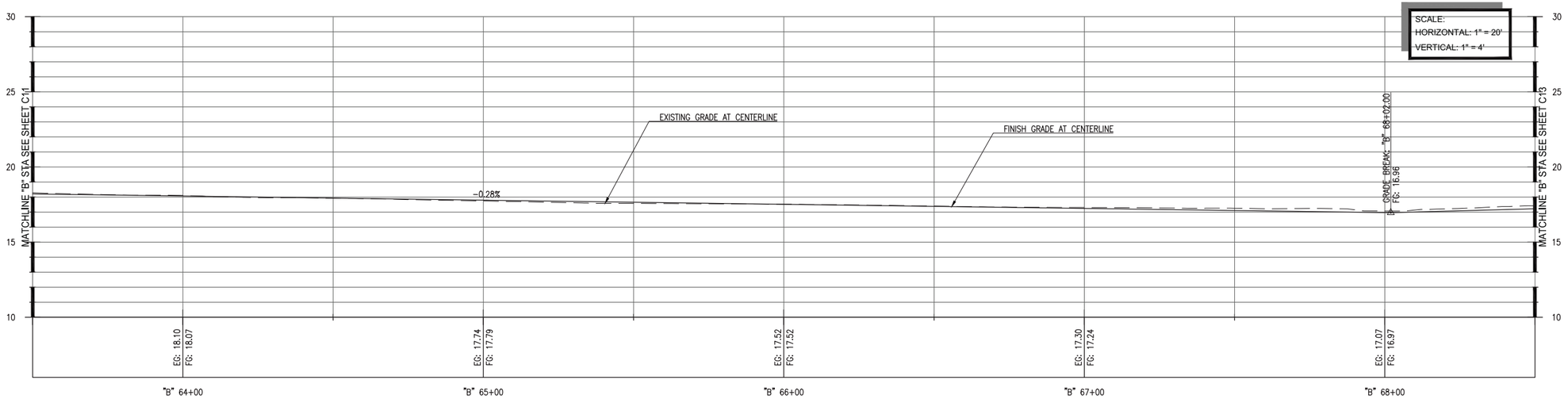
DRAWN BY:	A.P., K.H., M.G.
CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

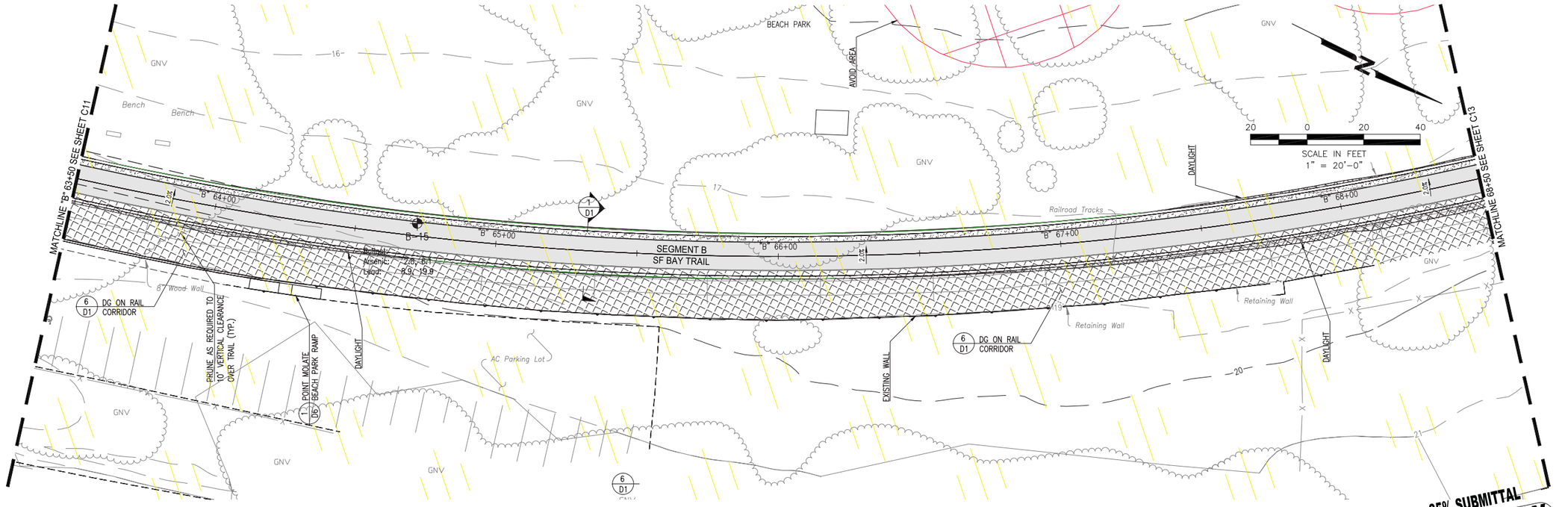
SHEET TITLE

IMPROVEMENT PLAN
"B" 58+50 TO "B" 63+50

DRAWING
C11

SHEET 15 OF 41





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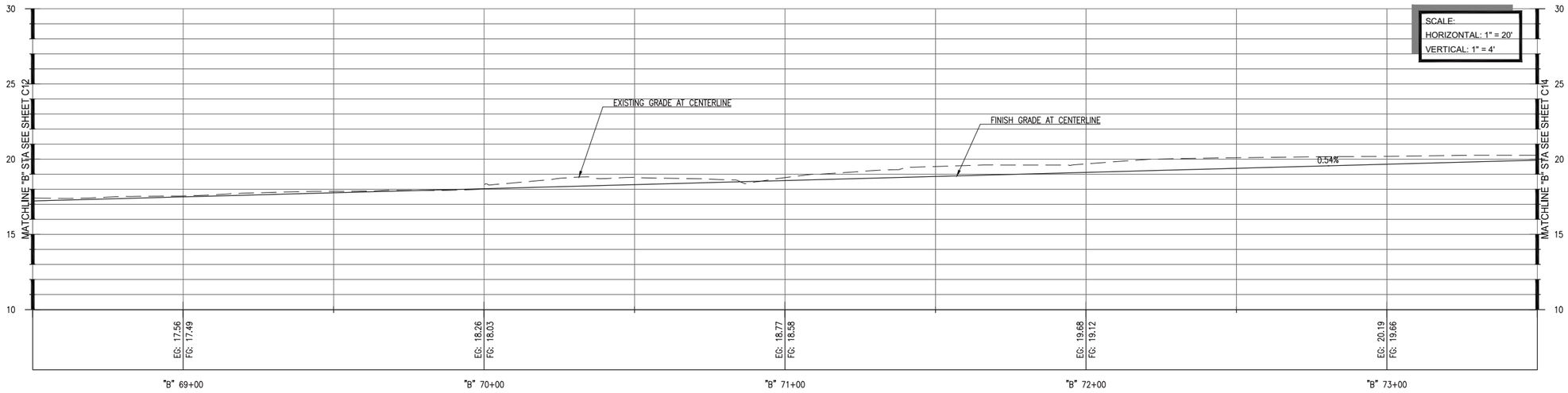
DATE:	07/01/2016

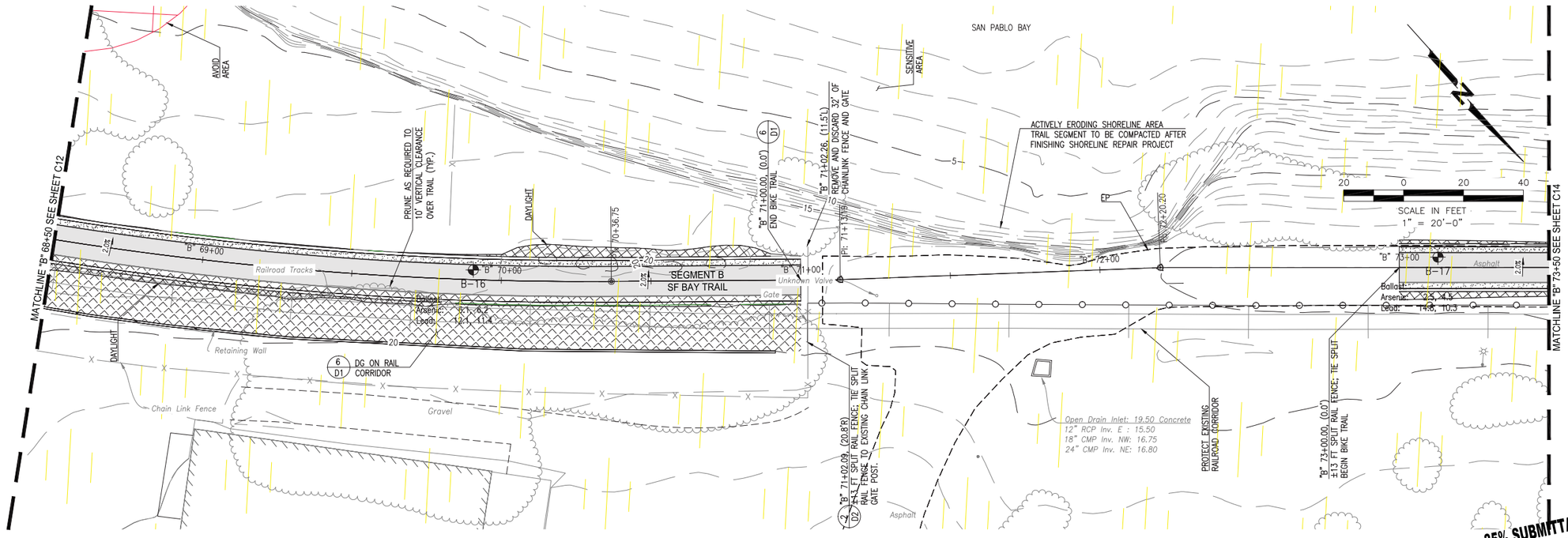
SHEET TITLE

IMPROVEMENT PLAN
"B" 63+50 TO "B" 68+50

DRAWING
C12

SHEET 16 OF 41





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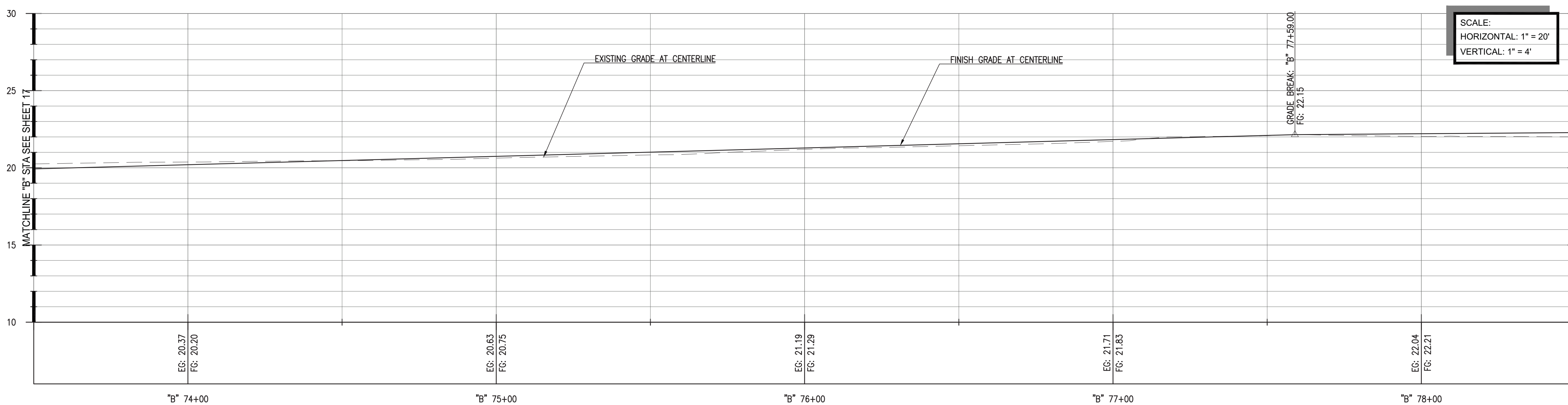
DRAWN BY:	A.P., K.H., M.G.
CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

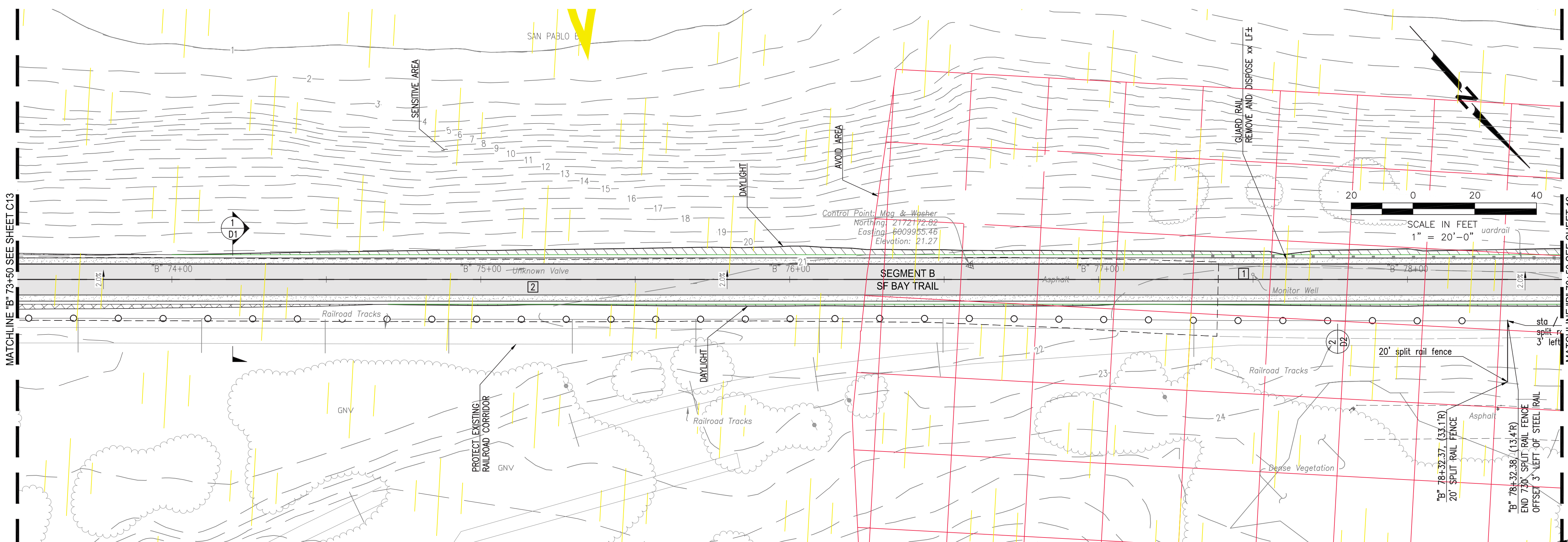
SHEET TITLE

IMPROVEMENT PLAN
"B" 68+50 TO "B" 73+50

DRAWING
C13

SHEET 17 OF 41





KEYNOTES:

1. MONUMENT WELL; PROTECT IN PLACE. ADJUST BOX AND COVER.
2. UNKNOWN VALVE; PROTECT IN PLACE. ADJUST BOX AND COVER.

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CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

SHEET TITLE

IMPROVEMENT PLAN
"B" 73+50 TO "B" 78+50

DRAWING
C14

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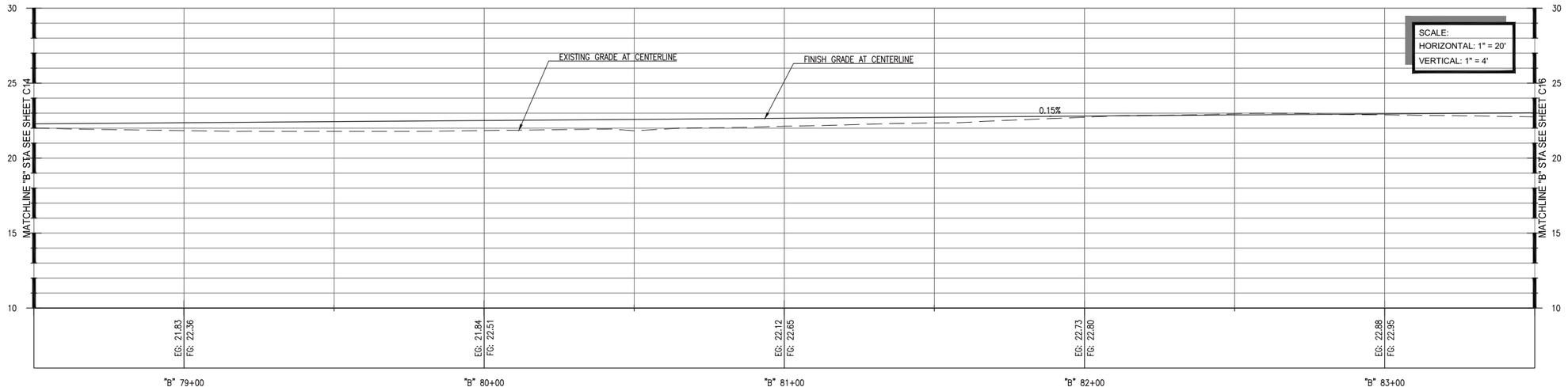

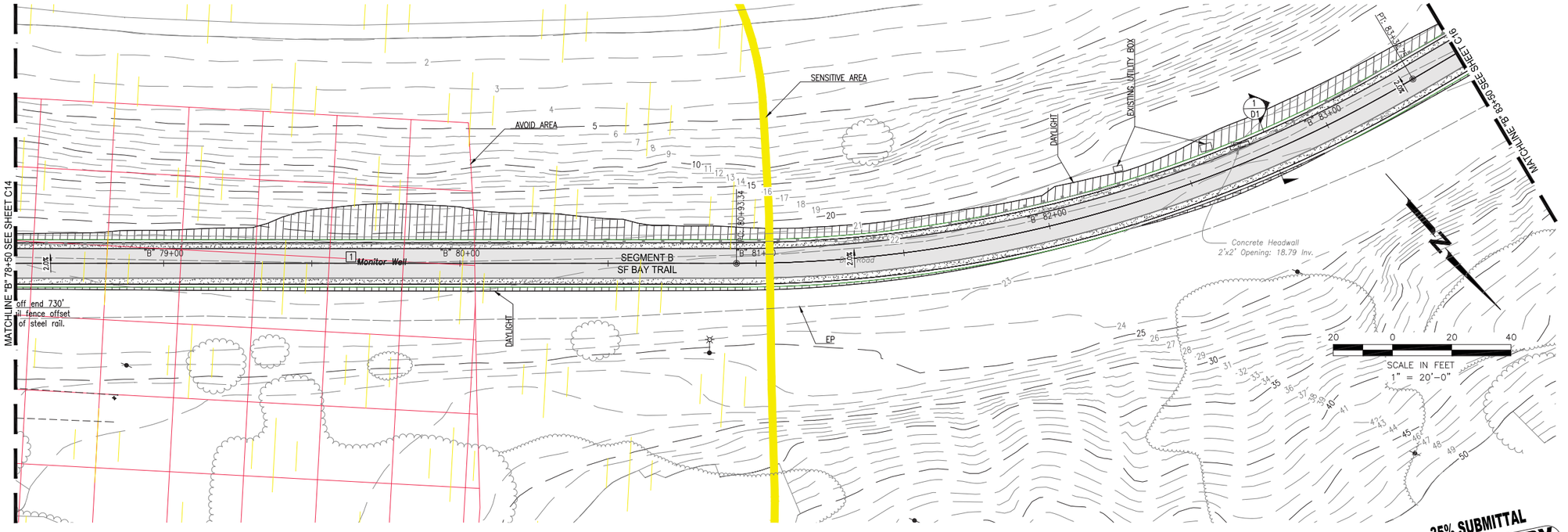

KEYNOTES:

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2 UNKNOWN VALVE; PROTECT IN PLACE. ADJUST BOX AND COVER.

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CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

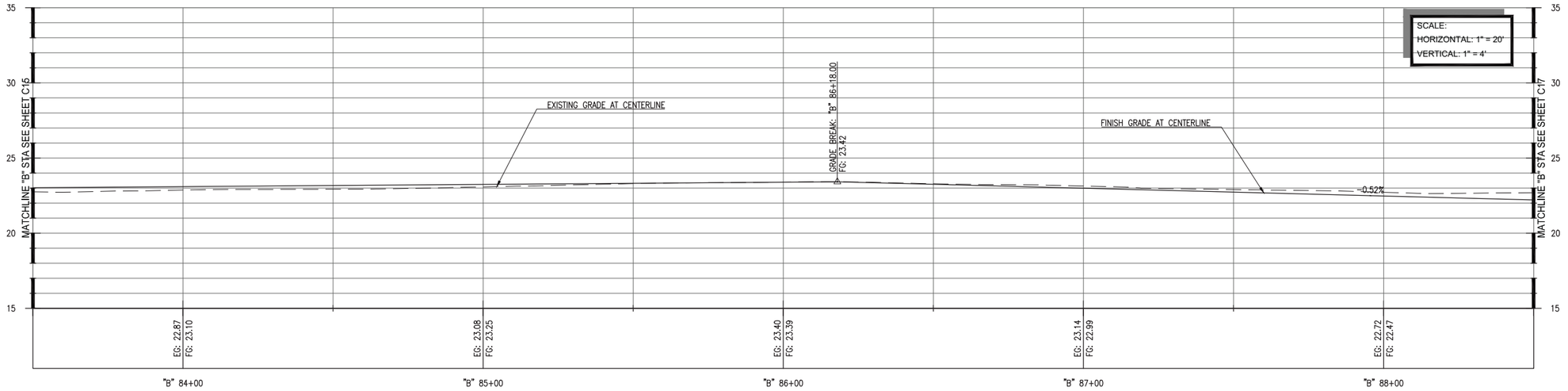
SHEET TITLE

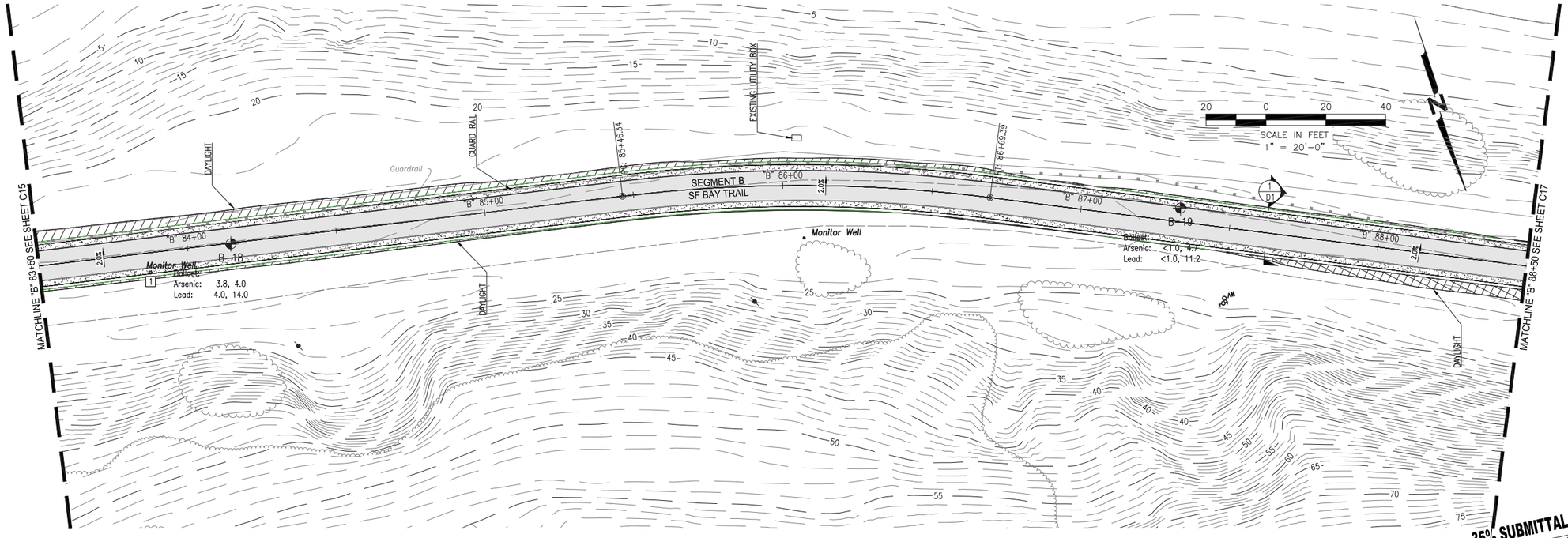
IMPROVEMENT PLAN
"B" 78+50 TO "B" 83+50

DRAWING
C15

SHEET 19 OF 41

File: P:\active projects\east bay regional park dist - cd67\567.04.55 - bay trail segment a & b\CAD\Sheets\C15-C18 Segment B.dwg | Layout: C15 | Printed Jul 07, 2016 @ 3:26pm | ID.b.20.0a (LMS Tech)





KEYNOTES:

[1] MONUMENT WELL; PROTECT IN PLACE. ADJUST BOX AND COVER.
[2] UNKNOWN VALVE; PROTECT IN PLACE. ADJUST BOX AND COVER.

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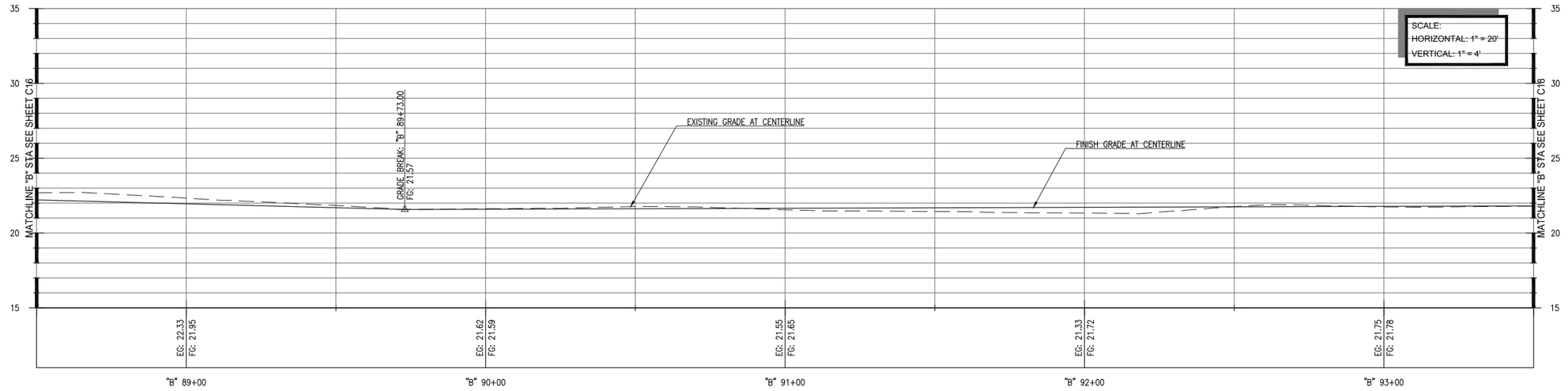
CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

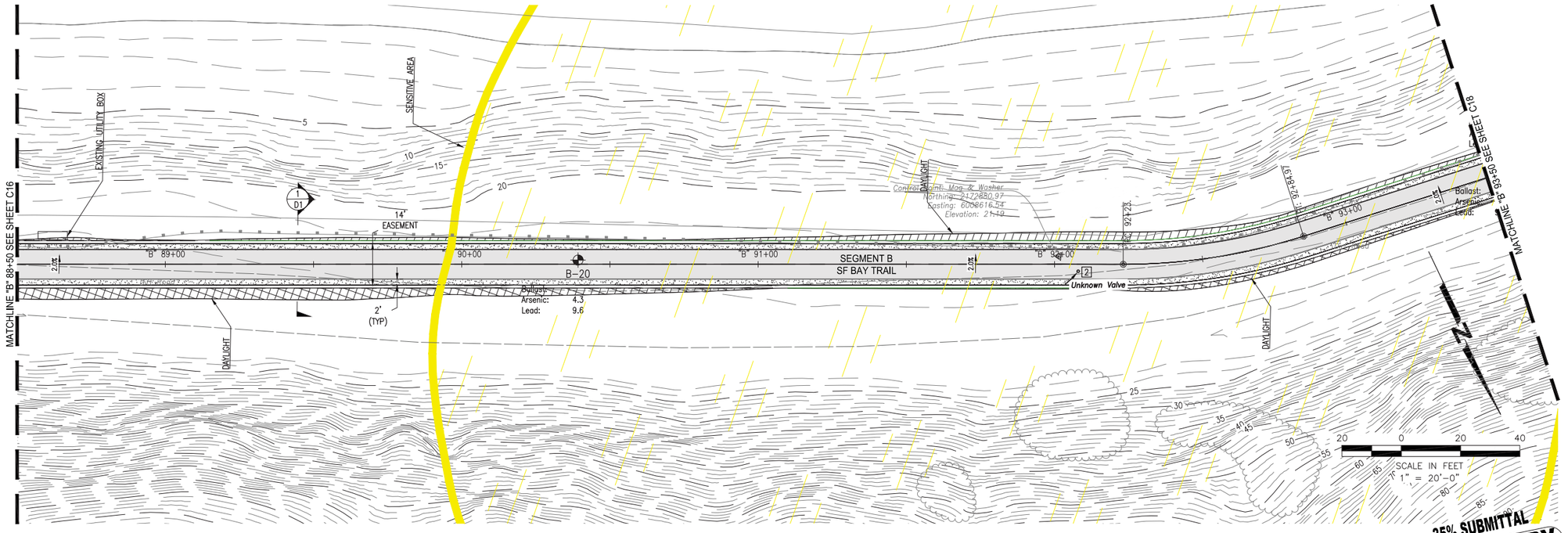
SHEET TITLE

IMPROVEMENT PLAN
"B" 83+50 TO "B" 88+50

DRAWING
C16

SHEET 20 OF 41





KEYNOTES:

[1] MONUMENT WELL; PROTECT IN PLACE. ADJUST BOX AND COVER.
[2] UNKNOWN VALVE; PROTECT IN PLACE. ADJUST BOX AND COVER.

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No. C 64725
EXP. 06/30/17
CIVIL
STATE OF CALIFORNIA

SAN FRANCISCO
BAY TRAIL
AT
POINT MOLATE

OWNER

East Bay Regional Park District

EAST BAY REGIONAL
PARK DISTRICT
2950 PERALTA OAKS CT,
OAKLAND, CA 94605

NO.	DATE	DESCRIPTION

PROJECT NO:	567.04.55
DESIGNED BY:	J.B.
DRAWN BY:	A.P., K.H., M.C.
CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

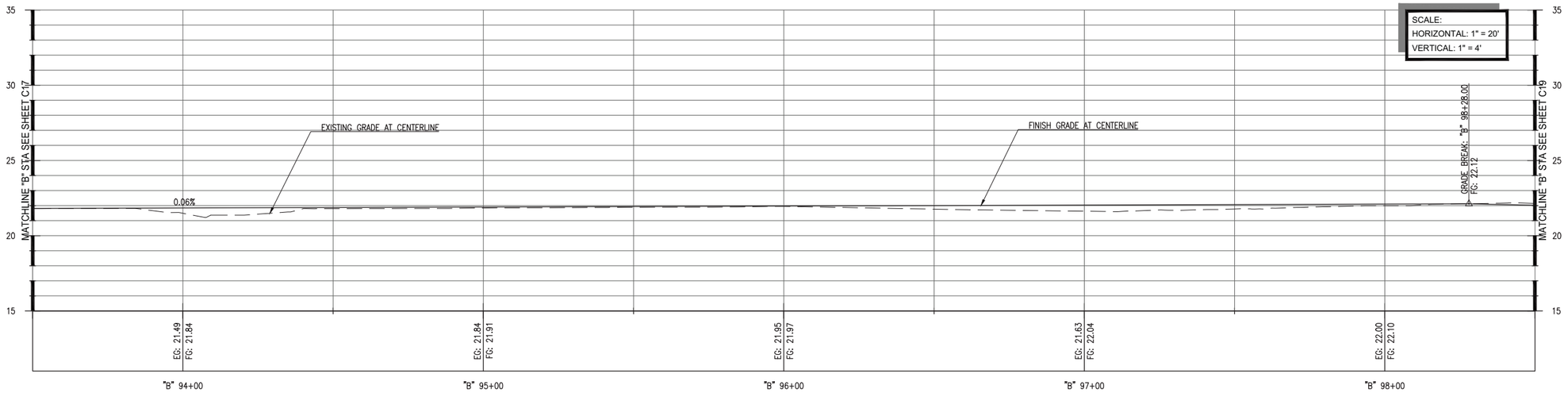
SHEET TITLE

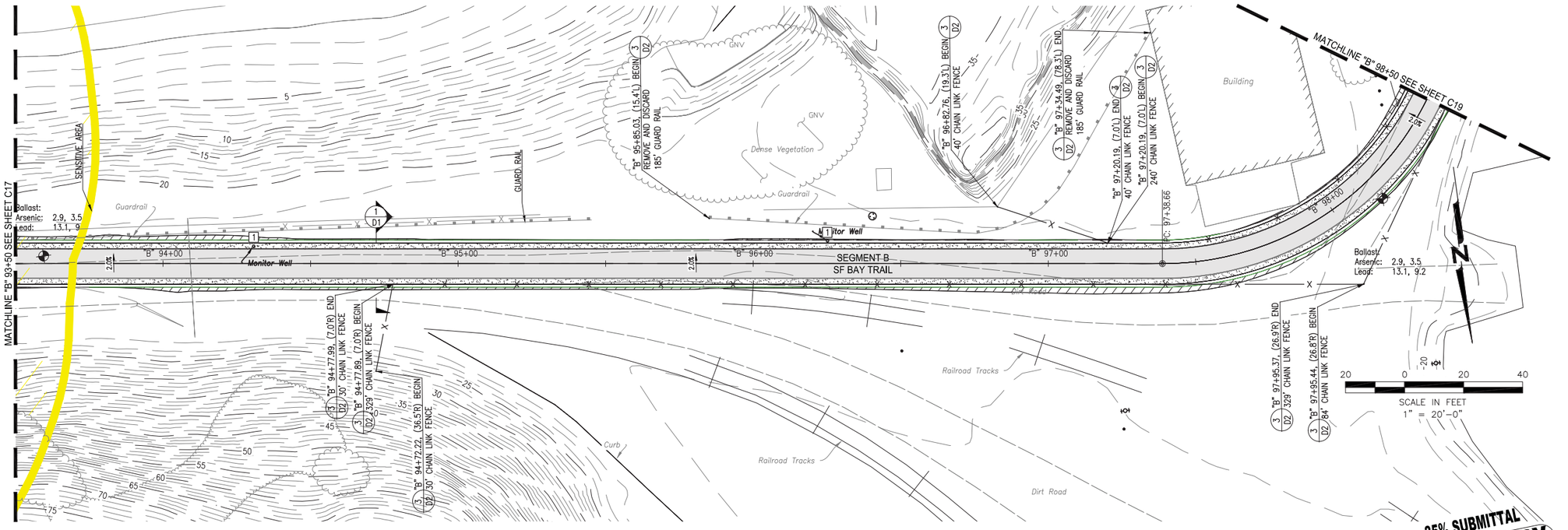
IMPROVEMENT PLAN
"B" 88+50 TO "B" 93+50

DRAWING
C17

SHEET 21 OF 41

File: P:\active projects\east bay regional park dist - 0567\567.04.55 - bay trail segment a & b\CAD\Sheets\C15-C18 Segment B.dwg | Layout: C17 | Printed Jul 07, 2016 @ 3:16pm | ID,AP-20,0s (LMS Tech)





KEYNOTES:

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2950 PERALTA OAKS CT,
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DESIGNED BY:	J.B.
DRAWN BY:	A.P., K.H., M.G.
CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

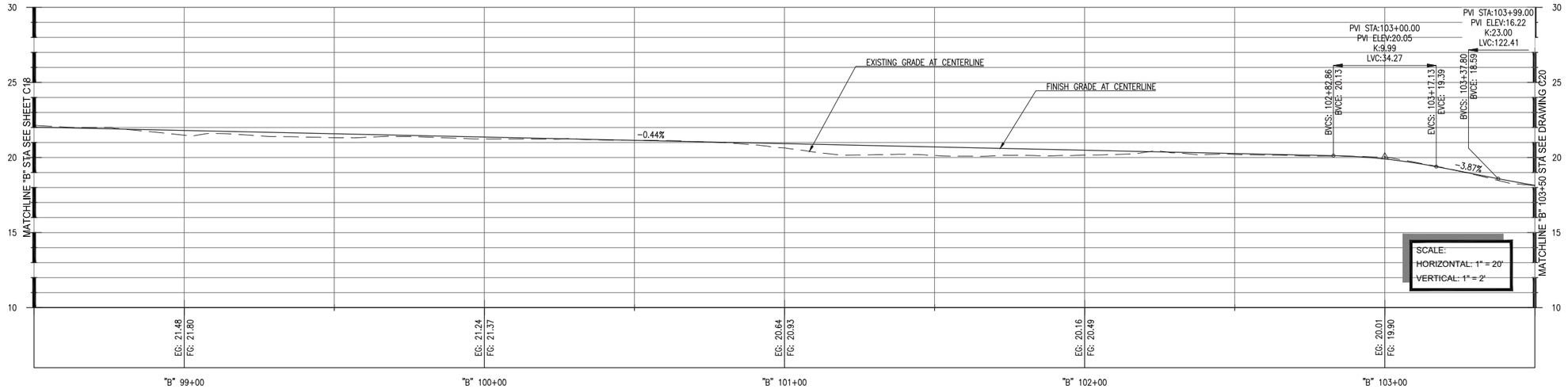
SHEET TITLE

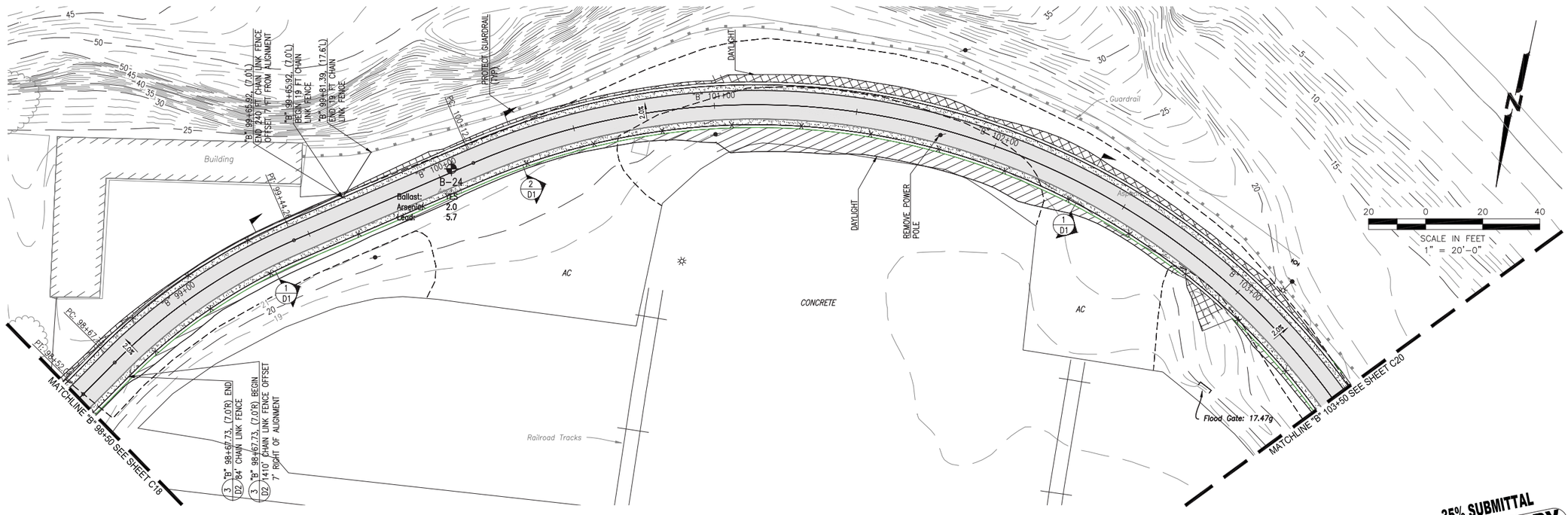
SEGMENT B
(NORTH SEGMENT)
"B" 93+50 TO "B" 98+50

DRAWING
C18

SHEET 22 OF 41

File: P:\active projects\east bay regional park dist - 0567\567.04.55 - bay trail segment a & b\CAD\Sheets\C15-C18 Segment B.dwg | Layout: C18 | Printed Jul 07, 2016 @ 3:17pm | ID.AP.20.0a (LMS Tech)





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OAKLAND, CA 94605

NO.	DATE	DESCRIPTION

PROJECT NO: 567.04.55
DESIGNED BY: J.B.
DRAWN BY: A.P., K.H., M.G.
CHECKED BY: FGH DATE: 06/23/2016
DATE: 07/01/2016

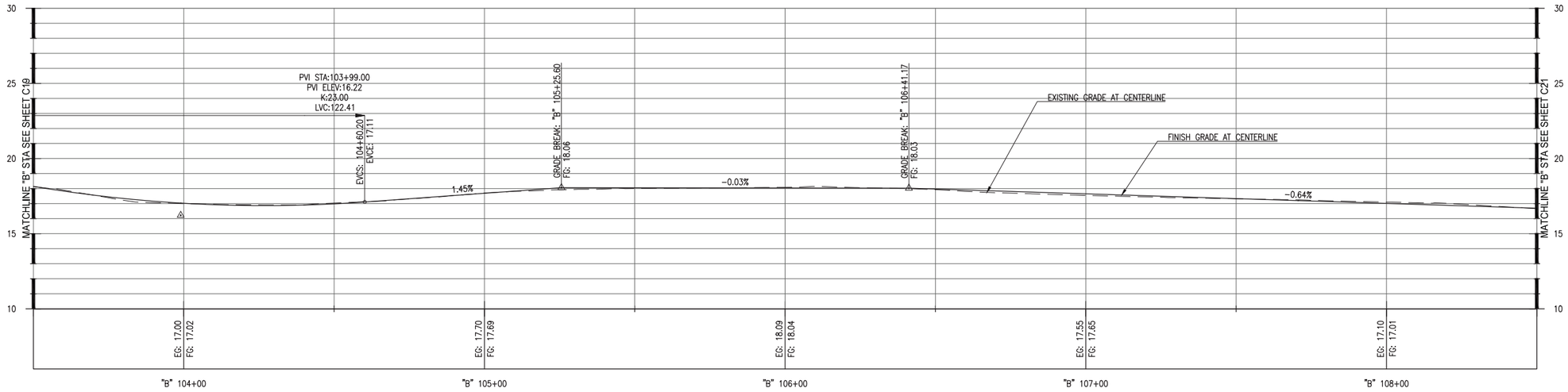
SHEET TITLE

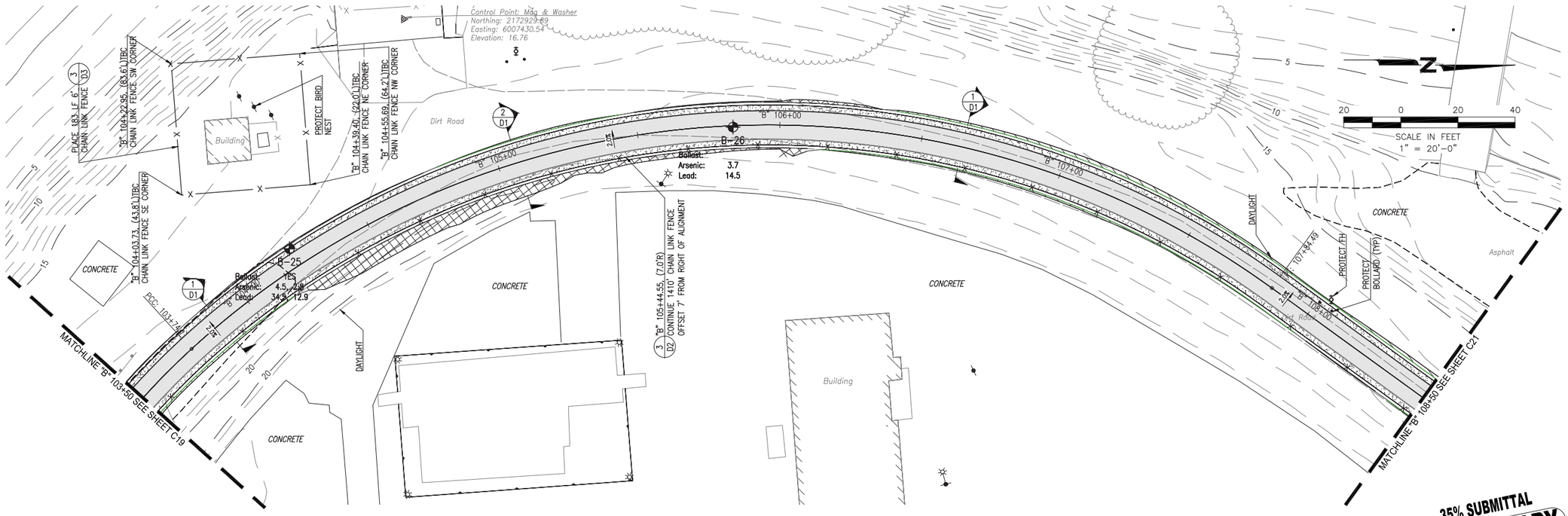
IMPROVEMENT PLAN
"B" 98+50 TO "B" 103+50

DRAWING
C19

SHEET 23 OF 41

File: P:\active projects\east bay regional park dist - ca567\567.04.55 - bay trail segment a & b\CAD\Sheets\C19-C22 Segment B.dwg | Layout: C19 | Printed Jul 07, 2016 @ 3:18pm | ID:AP-20.0a (LMS Tech)





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OWNER

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OAKLAND, CA 94605

NO.	DATE	DESCRIPTION

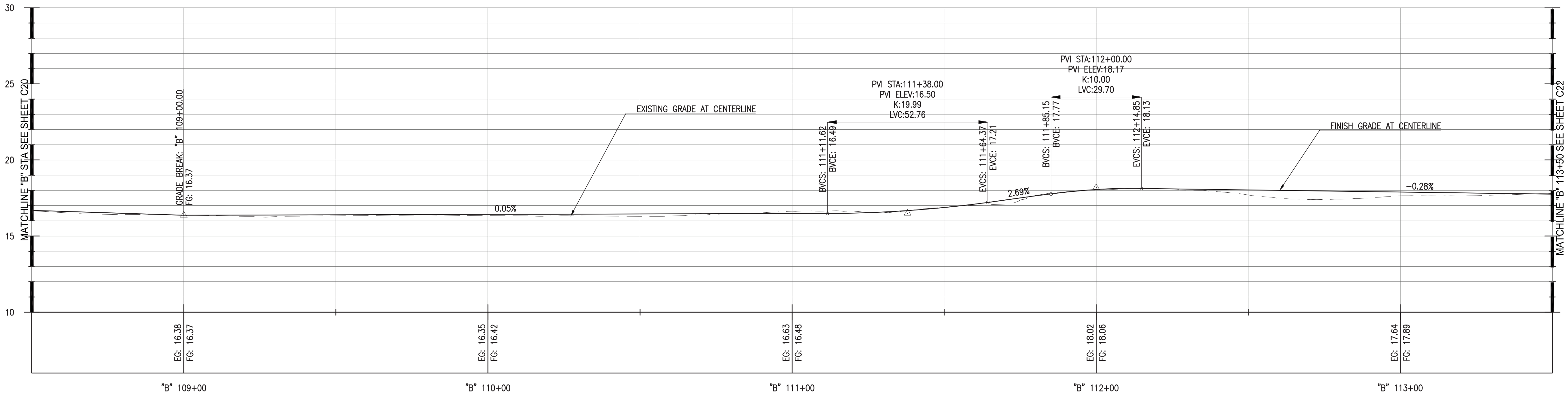
PROJECT NO:	567.04.55
DESIGNED BY:	J.B.
DRAWN BY:	A.P., K.H., M.G.
CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

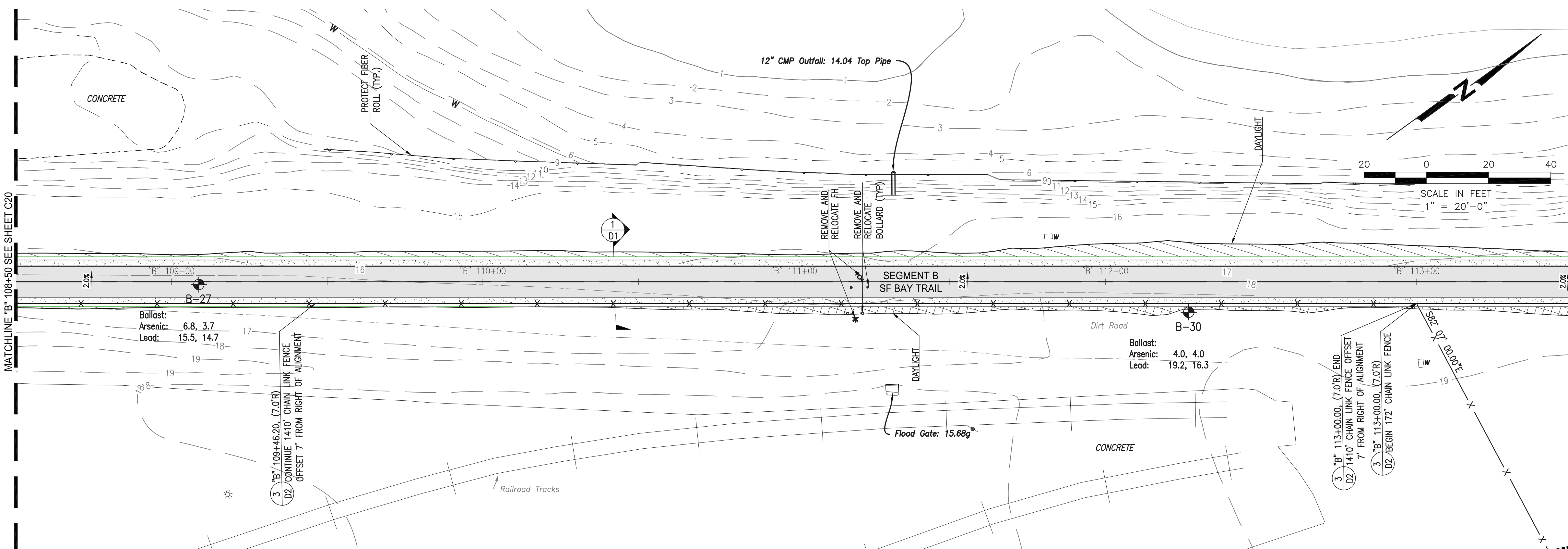
SHEET TITLE

IMPROVEMENT PLAN
"B" 103+50 TO "B" 108+50

DRAWING
C20

SHEET 24 OF 41





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OAKLAND, CA 94605

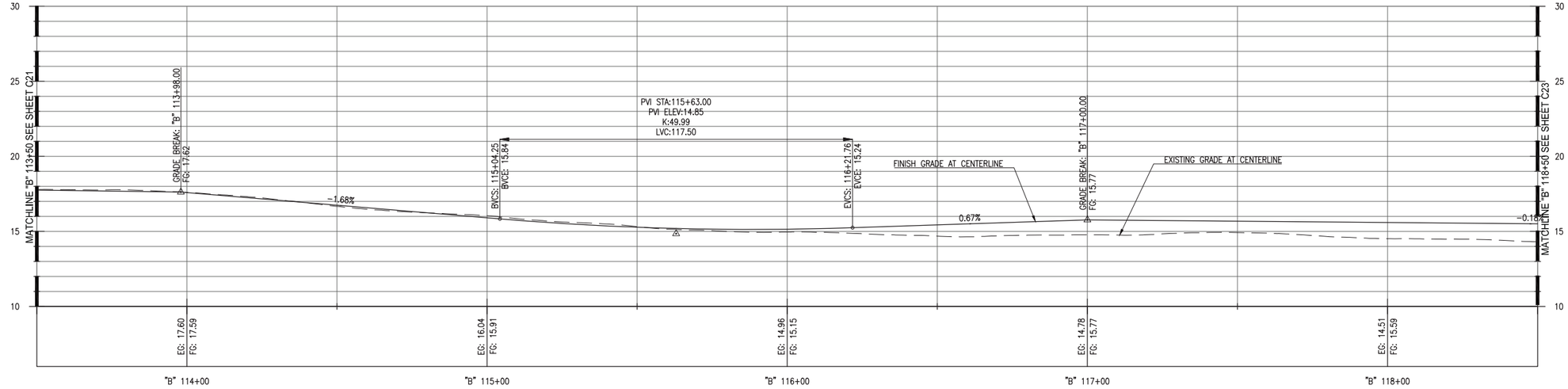
NO.	DATE	DESCRIPTION

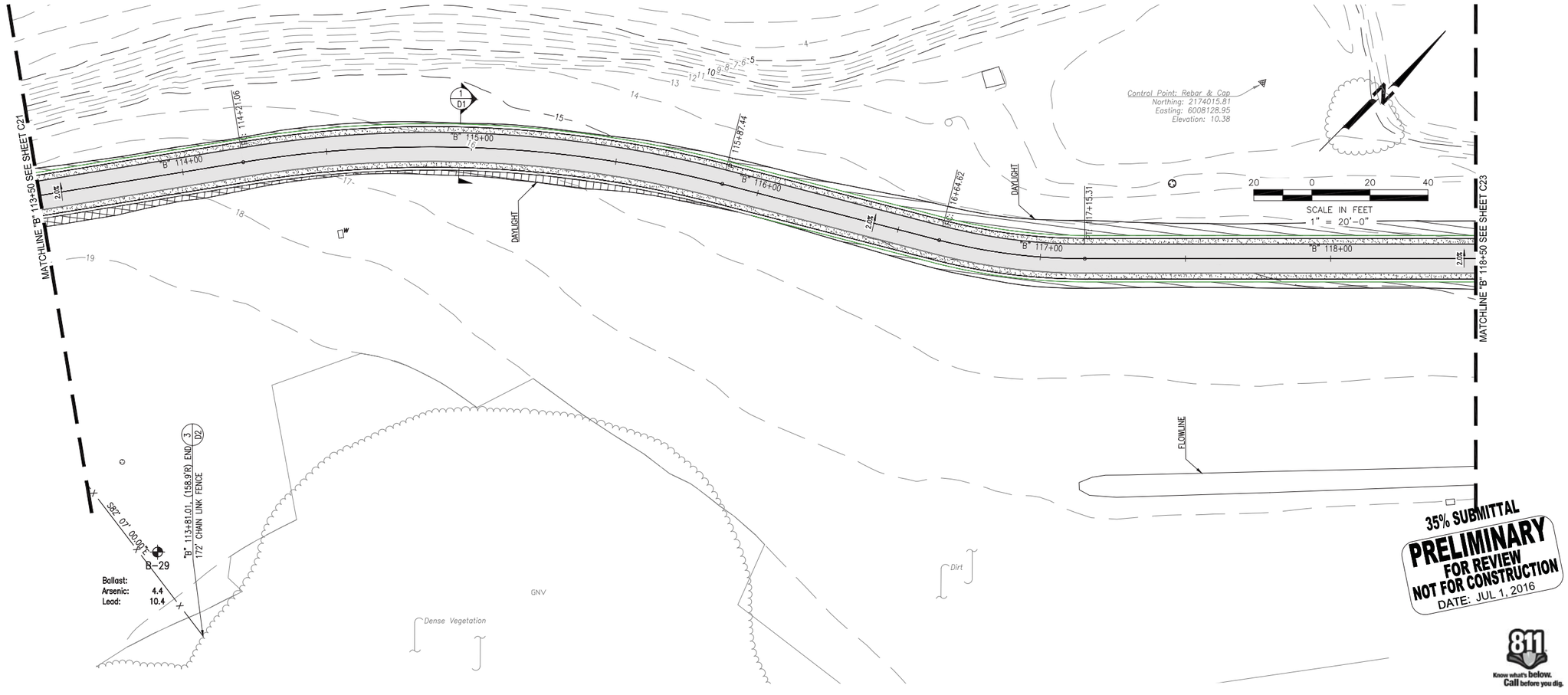
PROJECT NO: 567.04.55
DESIGNED BY: J.B.
DRAWN BY: A.P., K.H., M.G.
CHECKED BY: FGH DATE: 06/23/2016
DATE: 07/01/2016

SHEET TITLE

IMPROVEMENT PLAN "B" 108+50 TO "B" 113+50

DRAWING C21





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DRAWN BY:	A.P., K.H., M.G.
CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

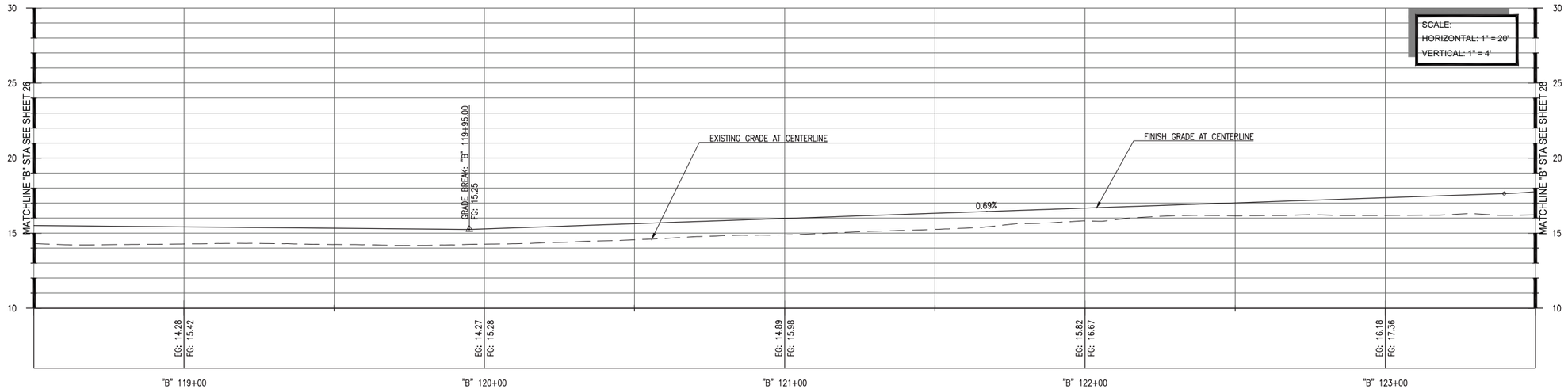
SHEET TITLE

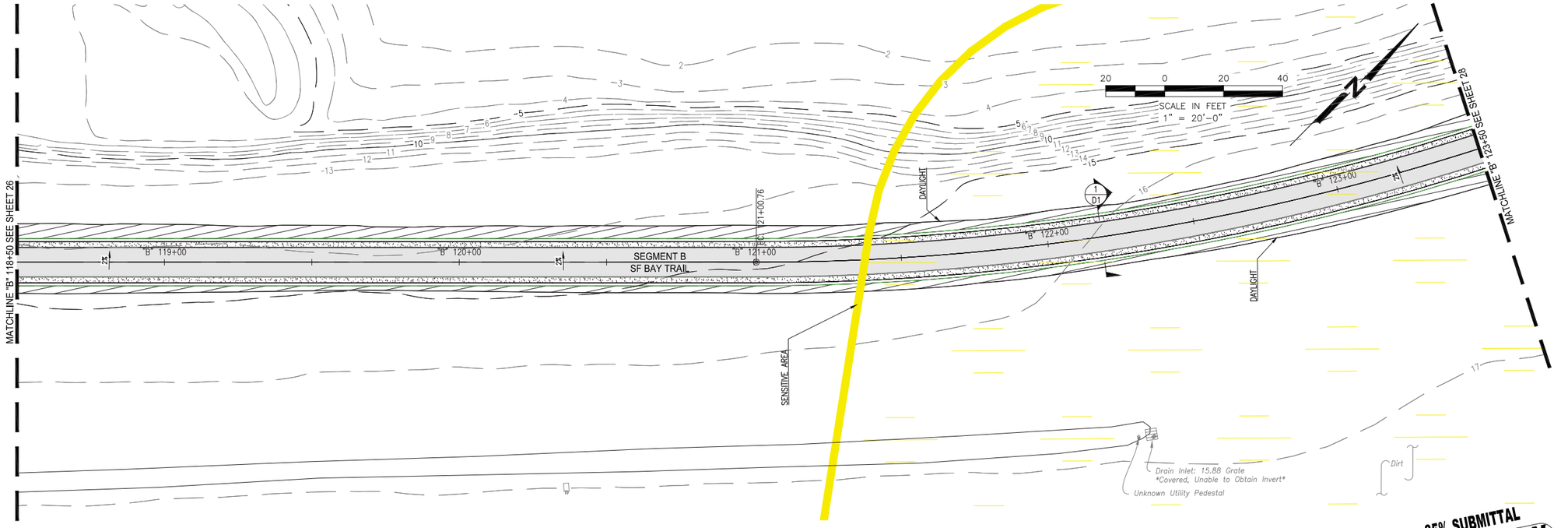
IMPROVEMENT PLAN
"B" 113+50 TO "B"
118+50

DRAWING
C22

SHEET 26 OF 41

File: P:\active projects\east bay regional park dist - c567\567.04.55 - bay trail segment a & b\CAD\Sheets\C19-C22 Segment B.dwg | Layout: C22 | Printed Jul 07, 2016 @ 3:19pm | D.AP.20.0a (LMS Tech)





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CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

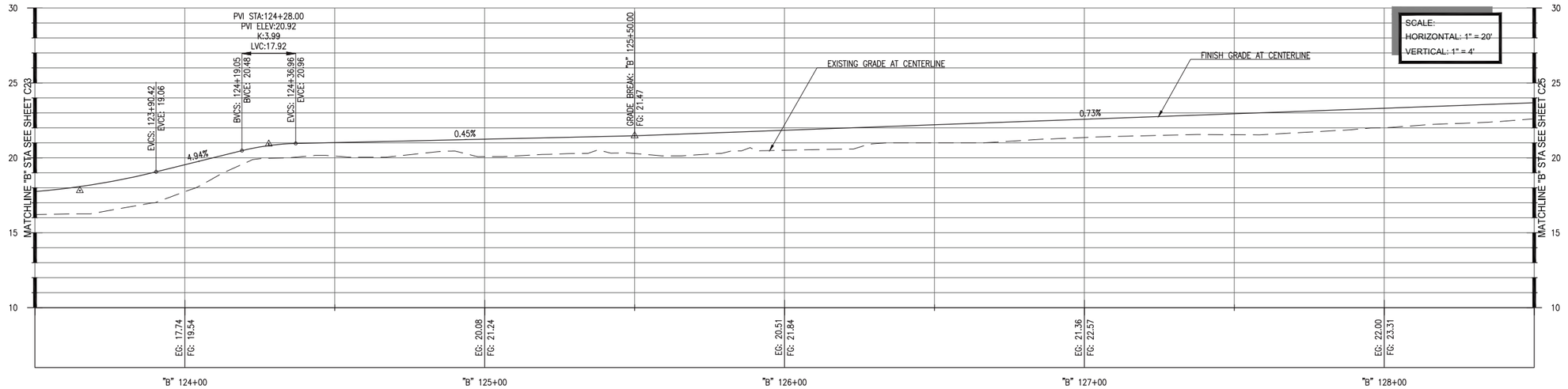
SHEET TITLE

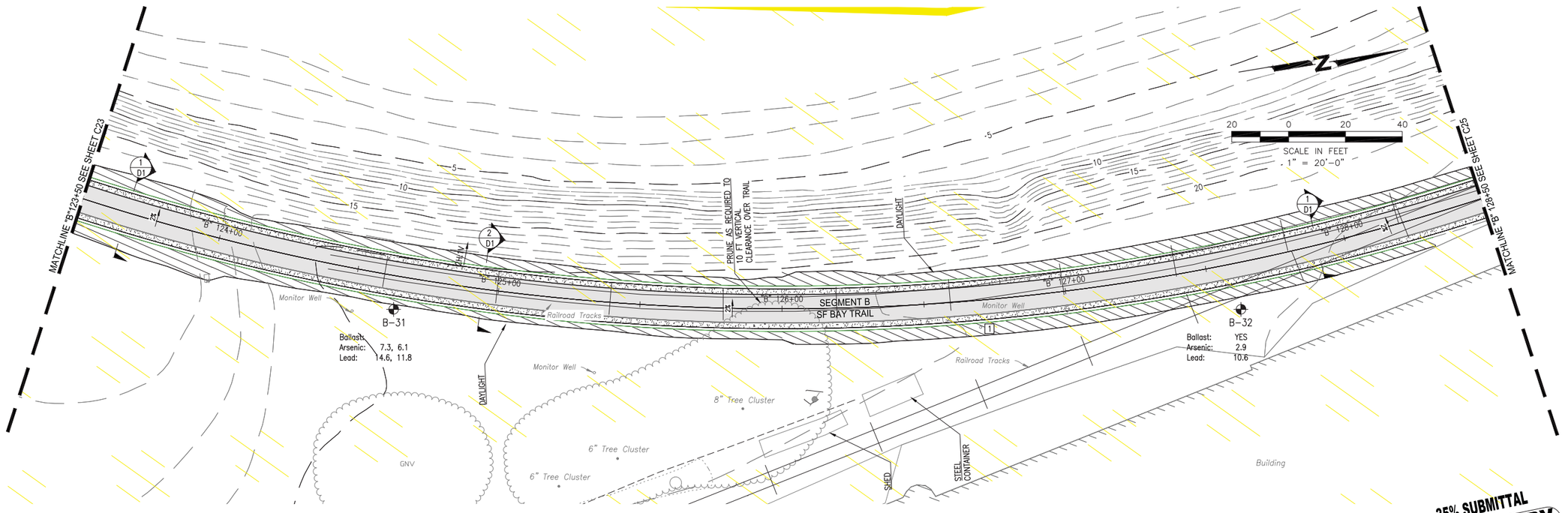
IMPROVEMENT PLAN
"B" 118+50 TO "B"
123+50

DRAWING
C23

SHEET 27 OF 41

File: P:\active projects\east bay regional park dist - 567\T\567.04.55 - bay trail segment a & b\CAD\Sheets\C23-C26 Segment B.dwg | Layout: C23 | Printed Jul 07, 2016 @ 3:20pm | (D.AP.20.0a (LMS Tech)





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OAKLAND, CA 94605

NO.	DATE	DESCRIPTION

PROJECT NO:	567.04.55
DESIGNED BY:	J.B.
DRAWN BY:	A.P., K.H., M.G.
CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

SHEET TITLE

IMPROVEMENT PLAN
"B" 123+50 TO "B"
128+50

DRAWING
C24

SHEET 28 OF 41

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2950 PERALTA OAKS CT,
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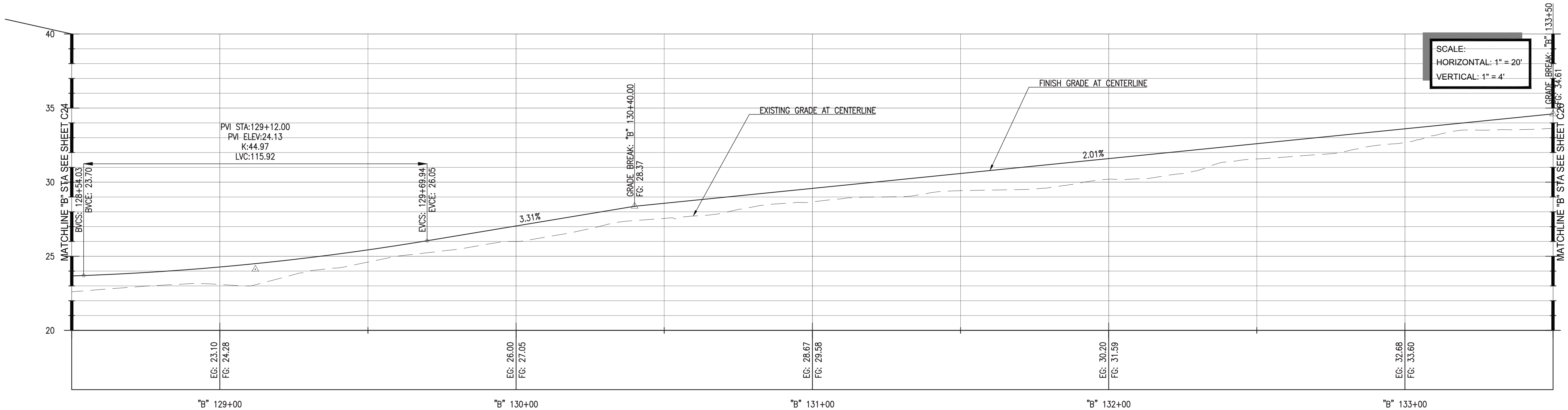

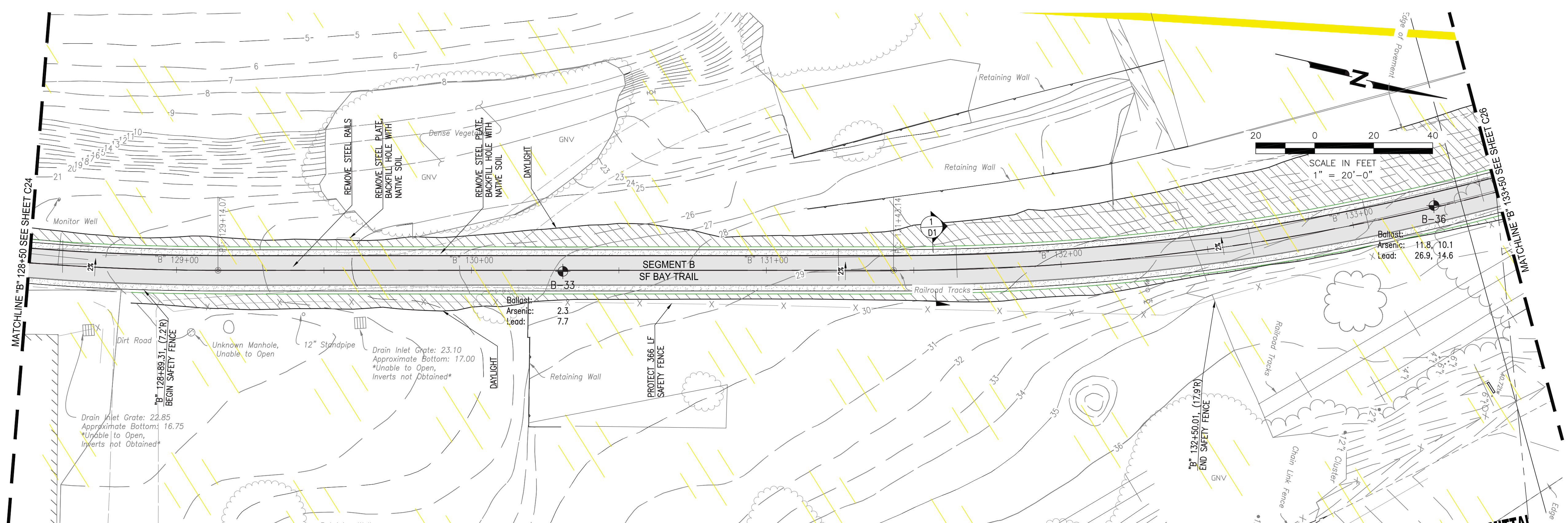

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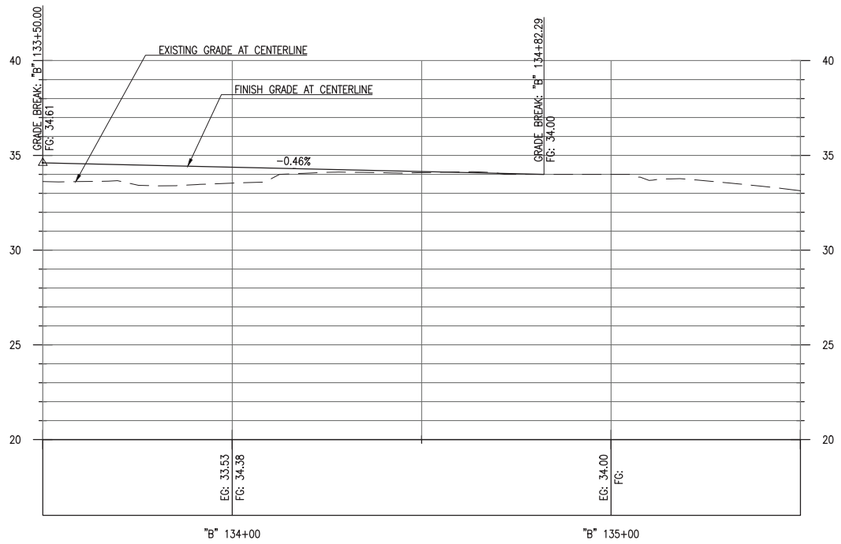
CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

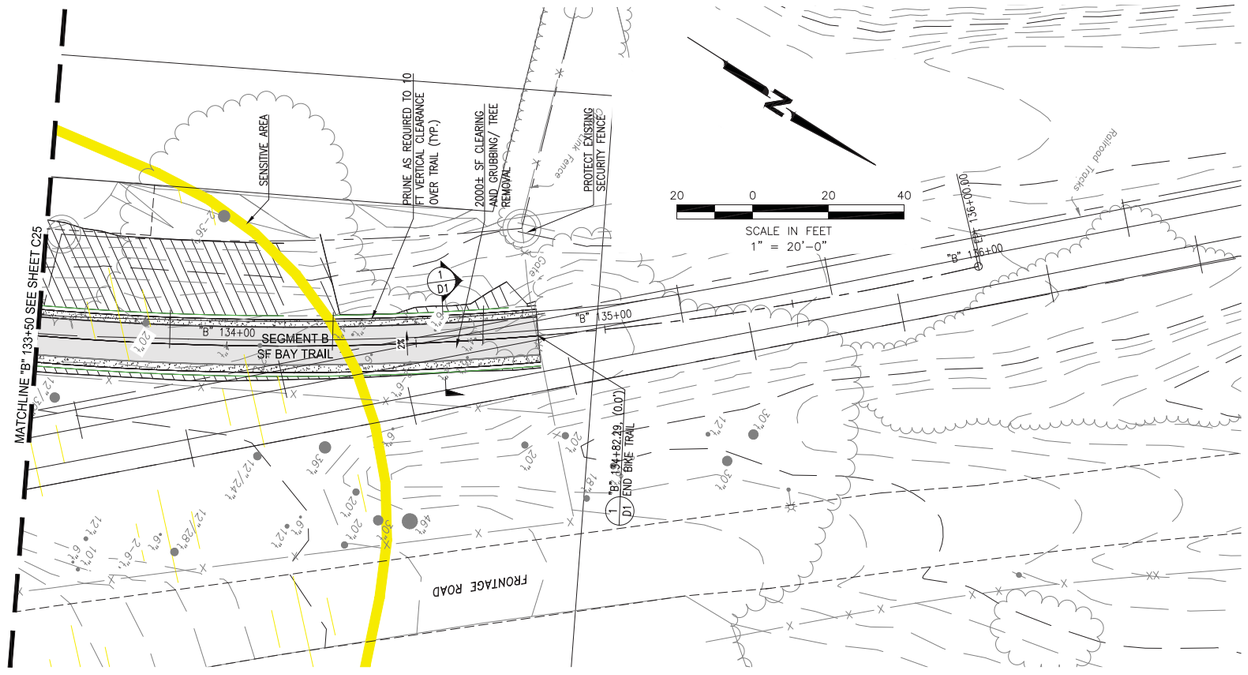
SHEET TITLE

IMPROVEMENT PLAN
"B" 128+50 TO "B"
133+50

DRAWING
C25

SHEET 29 OF 41





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DRAWN BY:	A.P., K.H., M.G.
CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

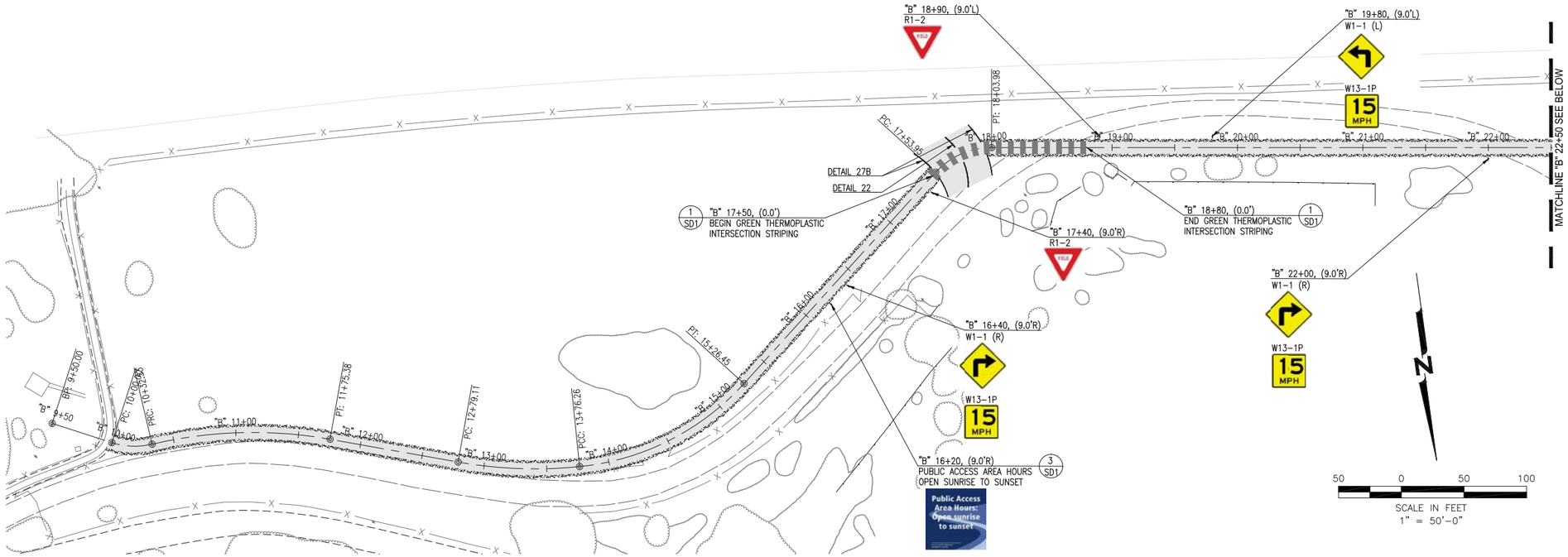
SHEET TITLE

IMPROVEMENT PLAN
"B" 133+50 TO "B"
136+00

DRAWING
C26

SHEET 30 OF 41

File: P:\active projects\east bay regional park dist - ca567\567.04.55 - bay trail segment a & b\CAD\Sheets\C23-C28 Segment B.dwg | Layout: C26 | Printed Jul 07, 2016 @ 3:21pm | ID.AP-20.0a (UAS Tech)



NOTES:
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OWNER

East Bay Regional Park District

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DRAWN BY:	A.P., K.H., M.C.
CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

SHEET TITLE

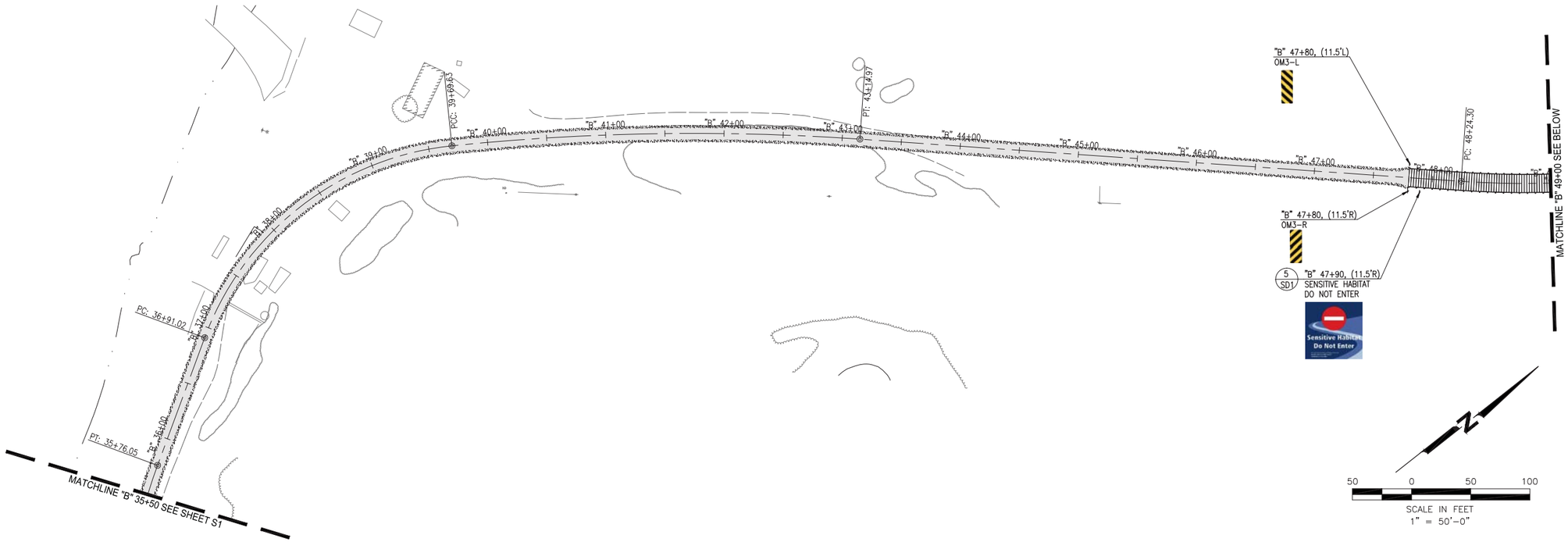
STRIPING AND SIGNAGE PLAN "B" 9+50 TO "B" 35+50

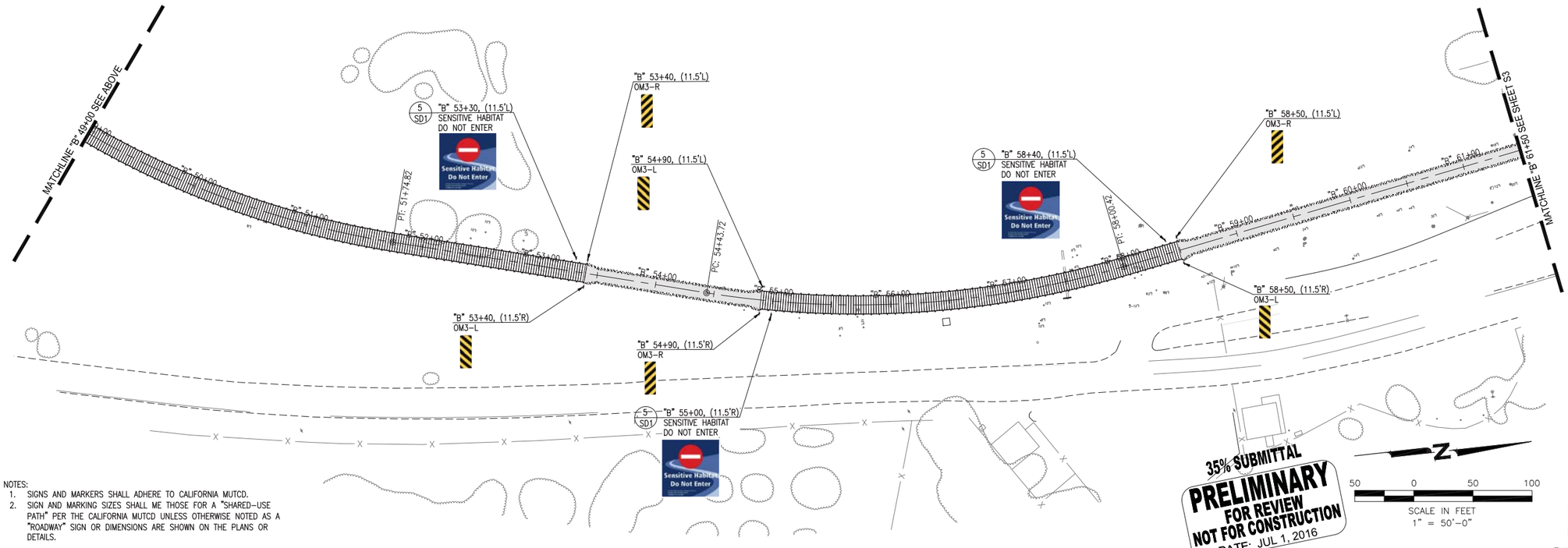
DRAWING

S1

SHEET 31 OF 41

File: P:\active projects\east bay regional park dist - 567\567.04.55 - bay trail segment a & b\CAD\Sheets\S1-S5 Striping and Signage Plans.dwg | Layout: S1 | Printed Jul 07, 2016 @ 3:29pm | ID.AP-20.0a (LMS Tech)





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DRAWN BY:	A.P., K.H., M.G.
CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

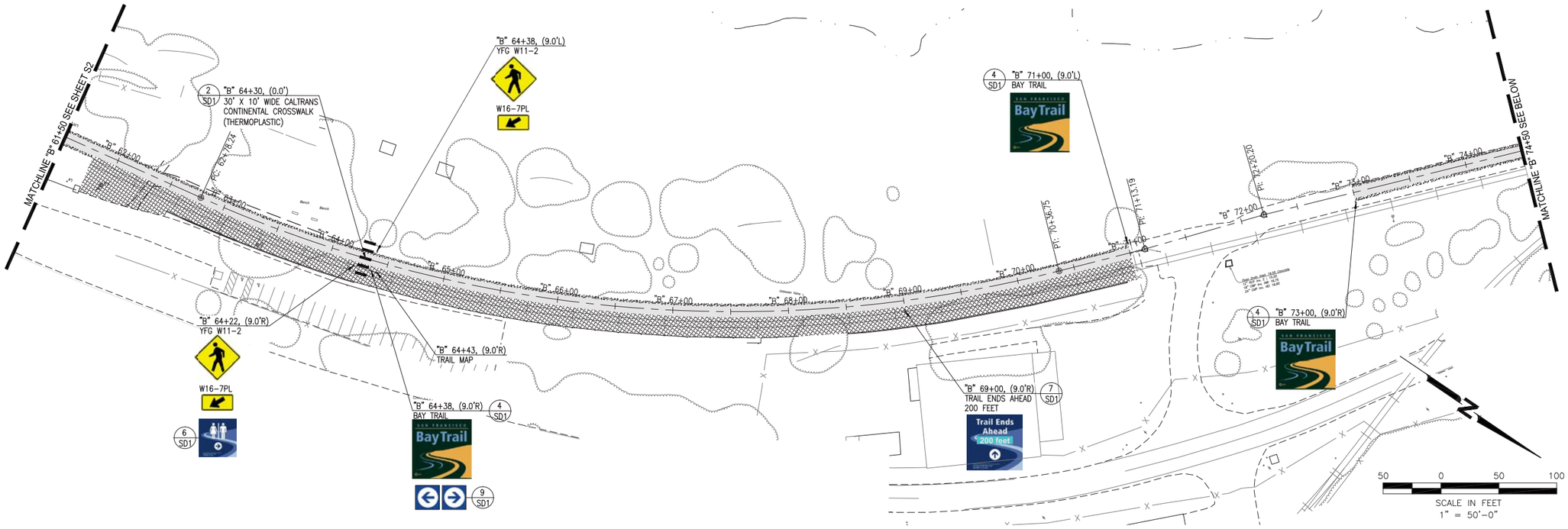
SHEET TITLE

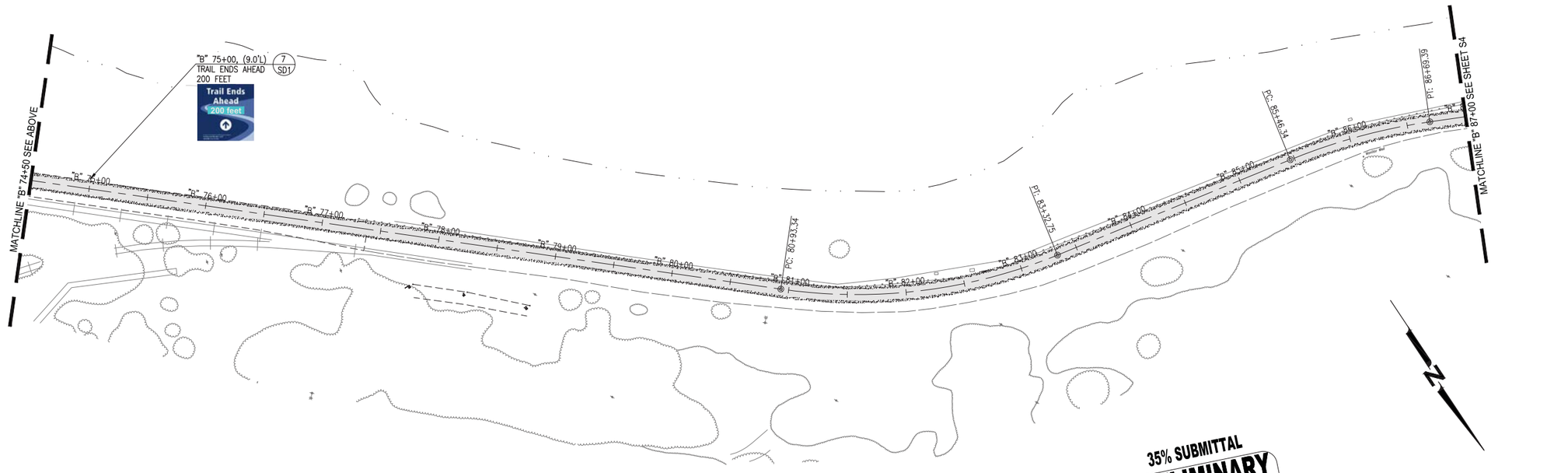
STRIPING AND SIGNAGE PLAN "B" 35+50 TO "B" 61+50

DRAWING

S2

SHEET 32 OF 41





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STATE OF CALIFORNIA

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2950 PERALTA OAKS CT,
OAKLAND, CA 94605

NO.	DATE	DESCRIPTION

PROJECT NO:	567.04.55
DESIGNED BY:	J.B.
DRAWN BY:	A.P., K.H., M.G.
CHECKED BY: FGH	DATE: 06/23/2016
DATE:	07/01/2016

SHEET TITLE

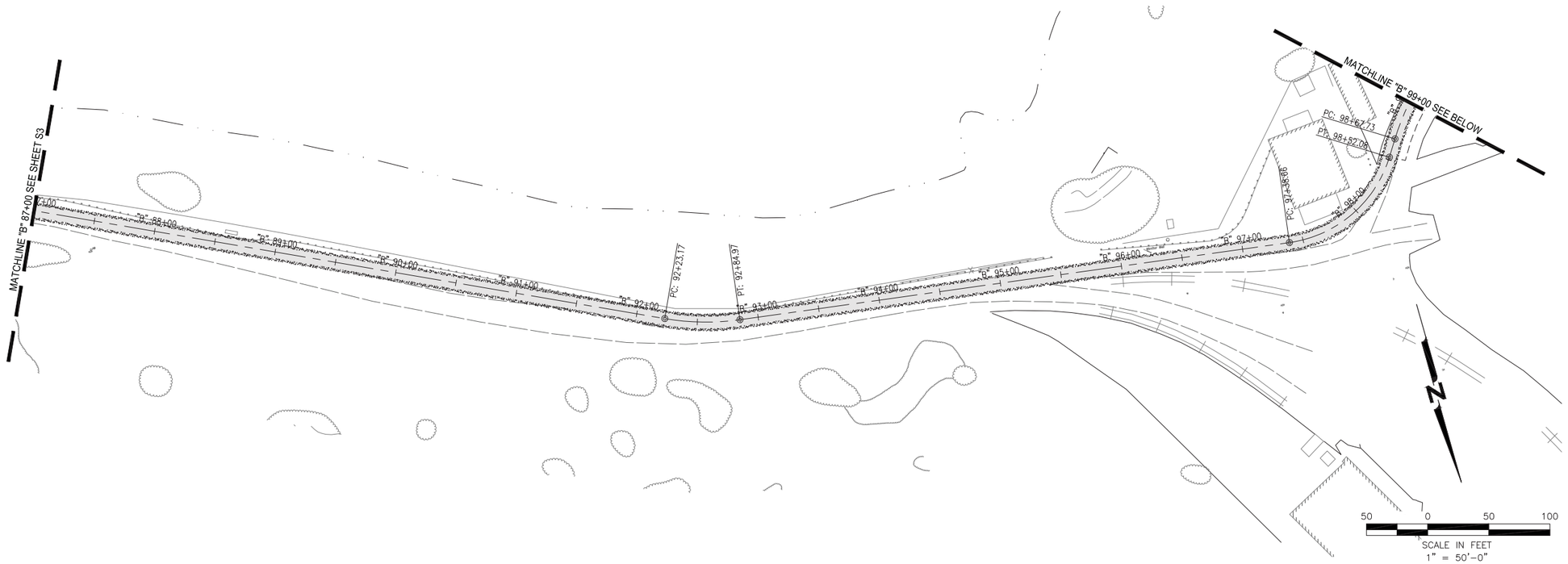
STRIPING AND SIGNAGE PLAN "B" 61+50 TO "B" 87+00

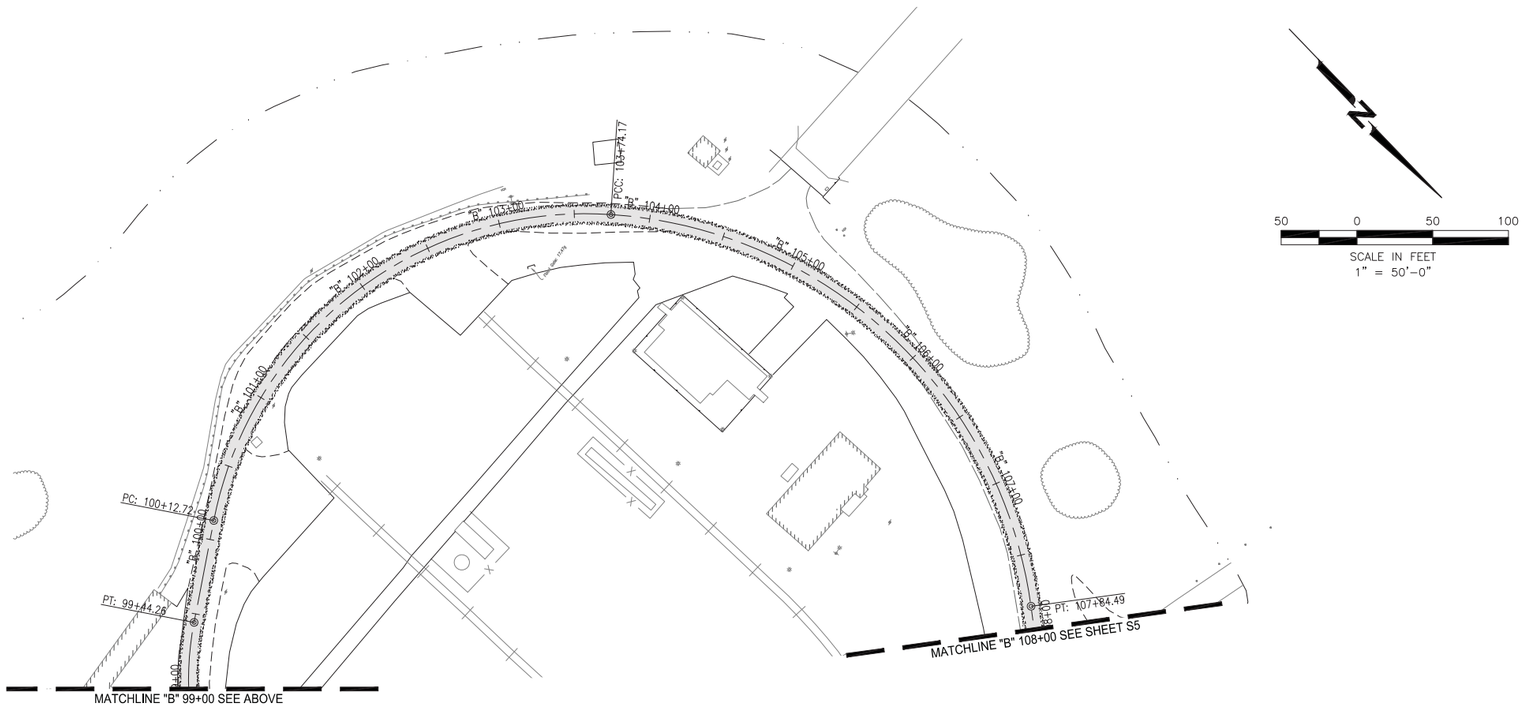
DRAWING

S3

SHEET 33 OF 41

File: P:\active projects\east bay regional park dist - 567\567.04.55 - bay trail segment a & a\CAD\Sheets\S1-S5 Striping and Signage Plans.dwg | Layout: S3 | Printed Jul 07, 2016 @ 3:29pm | ID:AP-20.0s (LMS Tech)





NOTES:
1. SIGNS AND MARKERS SHALL ADHERE TO CALIFORNIA MUTCD.
2. SIGN AND MARKING SIZES SHALL ME THOSE FOR A "SHARED-USE PATH" PER THE CALIFORNIA MUTCD UNLESS OTHERWISE NOTED AS A "ROADWAY" SIGN OR DIMENSIONS ARE SHOWN ON THE PLANS OR DETAILS.

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NOT FOR CONSTRUCTION
DATE: JUL 1, 2016

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REGISTERED PROFESSIONAL ENGINEER
FRANK G. HAUDINGER
No. C 64725
EXP. 06/30/17
CIVIL
STATE OF CALIFORNIA

SAN FRANCISCO BAY TRAIL AT POINT MOLATE

OWNER

East Bay Regional Park District

EAST BAY REGIONAL PARK DISTRICT
2950 PERALTA OAKS CT,
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DATE:	07/01/2016

SHEET TITLE

STRIPING AND SIGNAGE PLAN "B" 87+00 TO "B" 108+00

DRAWING

S4

SHEET 34 OF 41

File: P:\active projects\east bay regional park dist - 567\567.04.55 - bay trail segment a & a\CAD\Sheets\S1-S5 Striping and Signage Plans.dwg | Layout: S4 | Printed Jul 07, 2016 @ 3:29pm | ID:AP-20.0s (LMS Tech)

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DATE:	07/01/2016

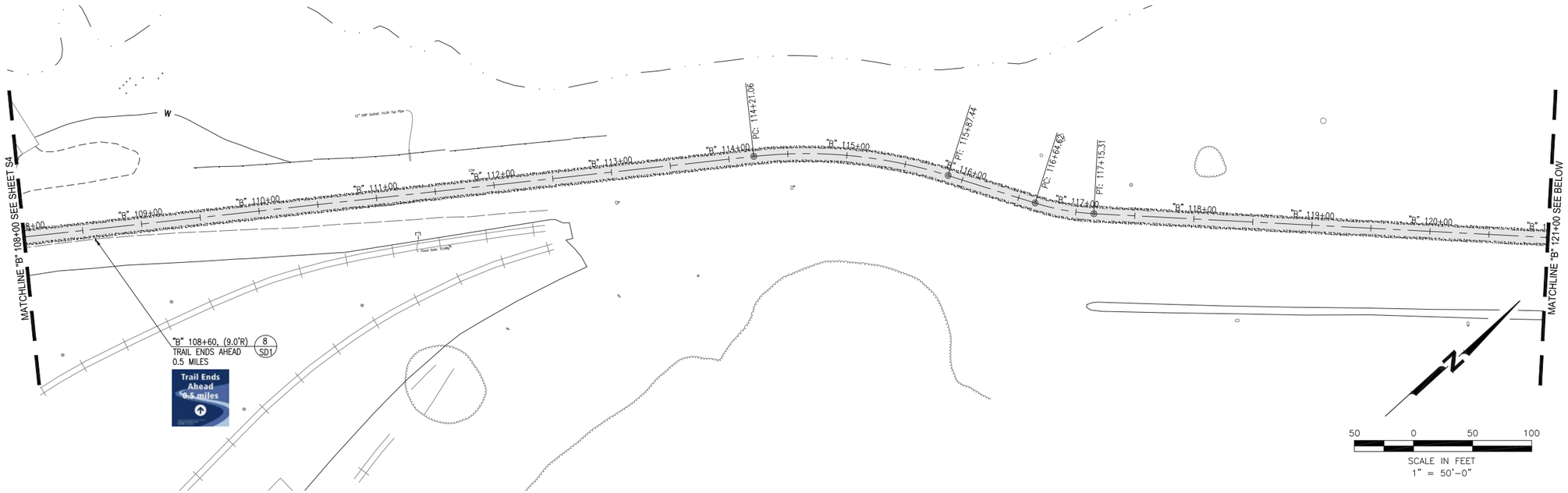
SHEET TITLE

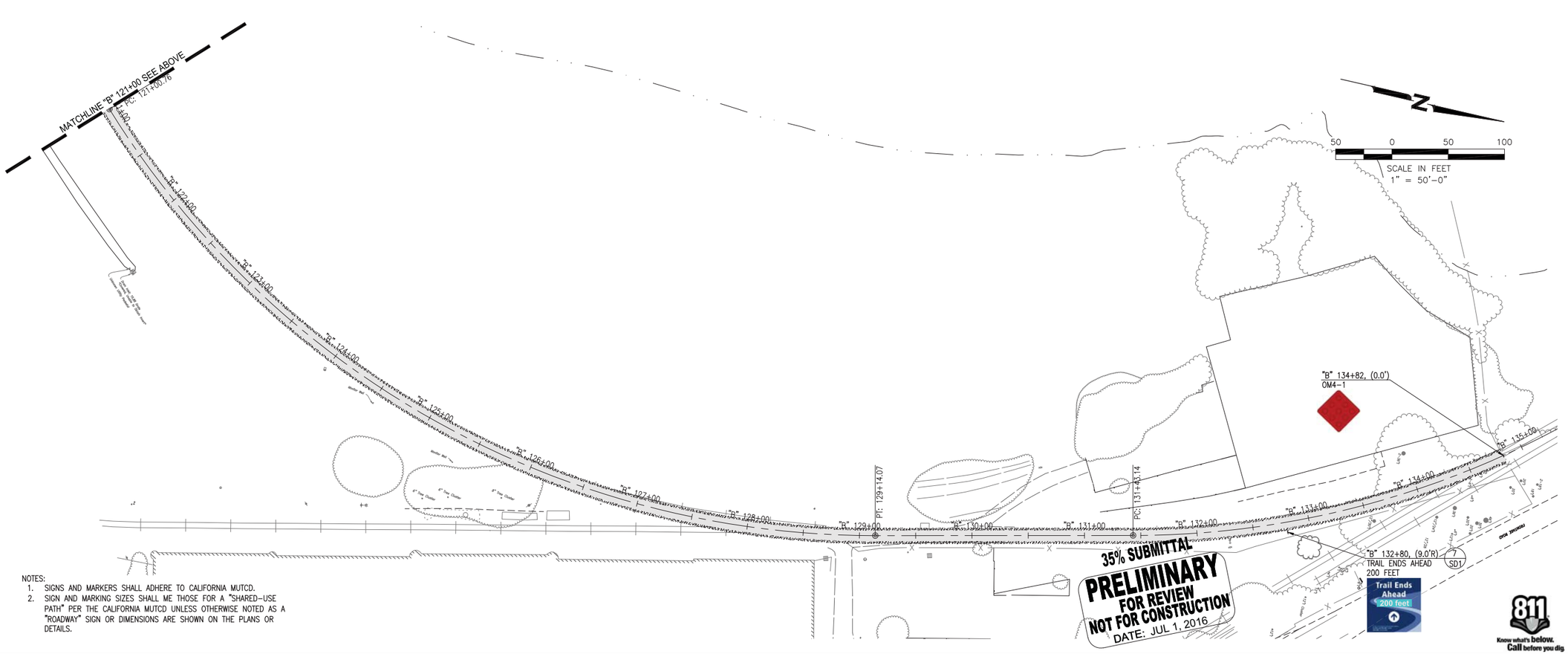
STRIPING AND SIGNAGE PLAN "B" 108+00 TO "B" 135+00

DRAWING

S5

SHEET 35 OF 41





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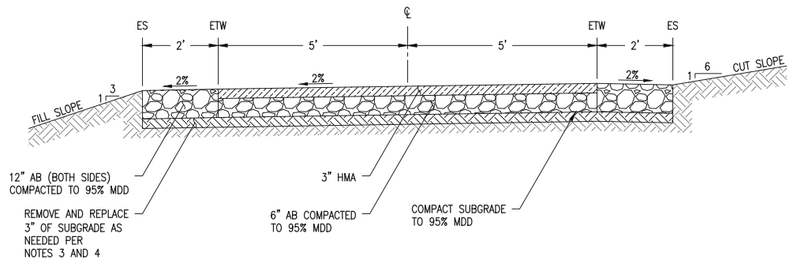
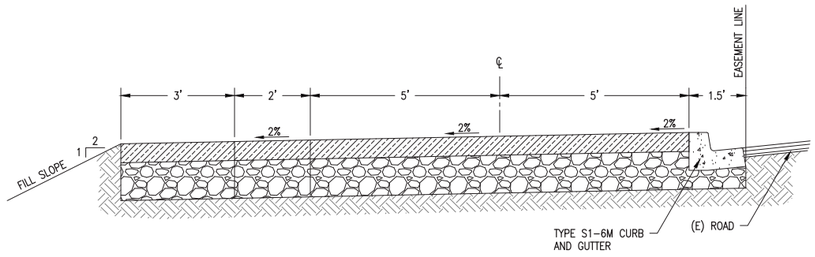


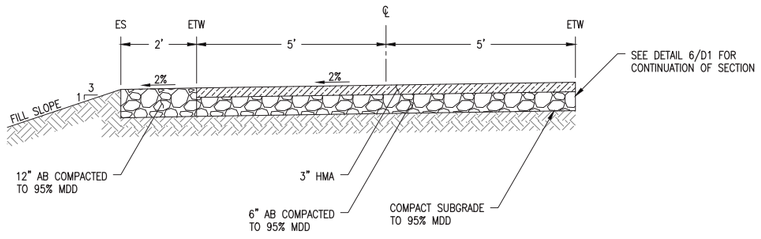
1 D1 TYPICAL TRAIL SECTION
NTS

NOTES:

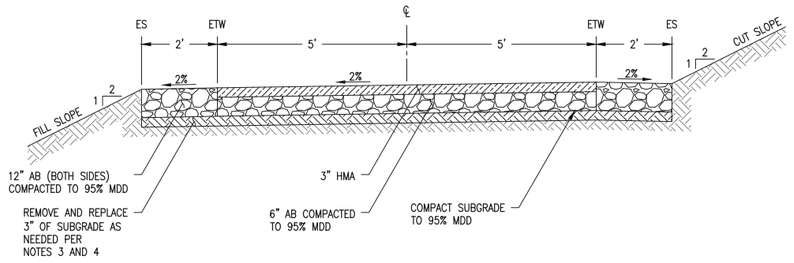
1. TYPICAL FILL SLOPES SHALL BE 3H:1V OR FLATTER.
2. TYPICAL CUT SLOPES SHALL BE 6H:1V PREFERRED AND 4H:1V MAXIMUM.
3. WHERE PROPOSED 14' WIDE TRAIL (ES TO ES) OVERLAPS WITH EXISTING RAILROAD CORRIDOR, 3" OF SUBGRADE SHALL BE REMOVED AND REPLACED WITH CLEAN FILL, OR NATIVE SOIL WHICH DID NOT ORIGINATE FROM A RAILROAD CORRIDOR AND THEN COMPACTED TO 95% MDD PRIOR TO PLACEMENT OF AB.
4. SUBGRADE MATERIAL REMOVED PER NOTE 3 MAY BE USED AS FILL MATERIAL OUTSIDE OF THE 14' WIDE TRAIL (ES TO ES) OR AS FILL MATERIAL BENEATH THE TRAIL CORRIDOR IT IS AT LEAST 12" BELOW FINISHED GRADE.



3 D1 TYPICAL TRAIL SECTION
(CHEVRON WETLANDS)
NTS



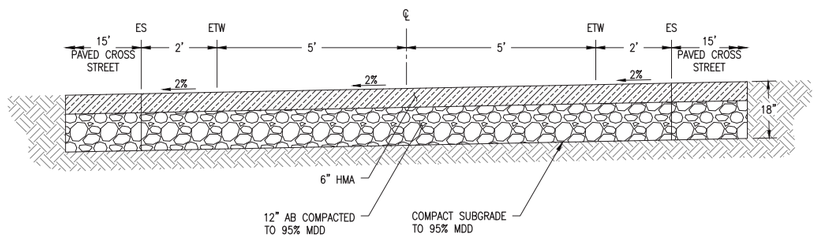
5 D1 TYPICAL TRAIL SECTION
(POINT MOLATE BEACH PARK)
NTS



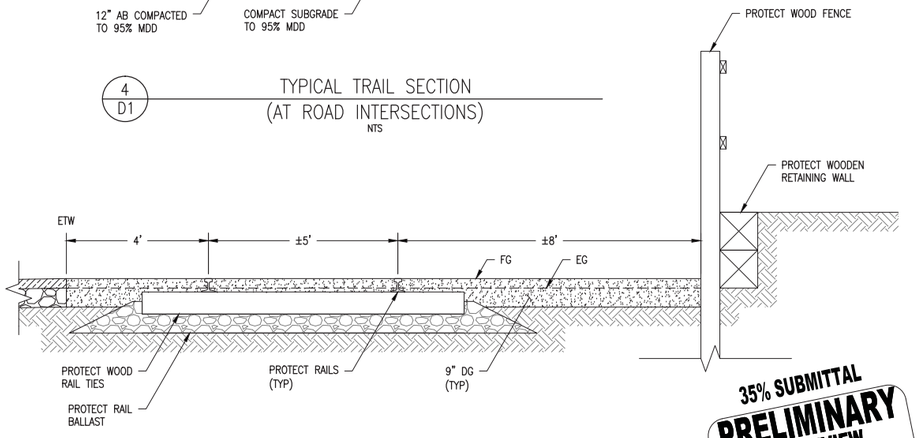
2 D1 TYPICAL NARROW TRAIL SECTION
NTS

NOTES:

1. TYPICAL FILL SLOPES SHALL BE 3H:1V OR FLATTER.
2. TYPICAL CUT SLOPES SHALL BE 6H:1V PREFERRED AND 4H:1V MAXIMUM.
3. WHERE PROPOSED 14' WIDE TRAIL (ES TO ES) OVERLAPS WITH EXISTING RAILROAD CORRIDOR, 3" OF SUBGRADE SHALL BE REMOVED AND REPLACED WITH CLEAN FILL, OR NATIVE SOIL WHICH DID NOT ORIGINATE FROM A RAILROAD CORRIDOR AND THEN COMPACTED TO 95% MDD PRIOR TO PLACEMENT OF AB.
4. SUBGRADE MATERIAL REMOVED PER NOTE 3 MAY BE USED AS FILL MATERIAL OUTSIDE OF THE 14' WIDE TRAIL (ES TO ES) OR AS FILL MATERIAL BENEATH THE TRAIL CORRIDOR IT IS AT LEAST 12" BELOW FINISHED GRADE.



4 D1 TYPICAL TRAIL SECTION
(AT ROAD INTERSECTIONS)
NTS



6 D1 RAILWAY BURIAL SECTION
WITH DECOMPOSED GRANITE
NTS

NOTES:

1. TOP OF DG FG TO BE SLOPED 2% NOMINAL OR 5% MAX.
2. EXCAVATE BETWEEN TIES OVER LENGTH OF TIE TO ALLOW FOR PLACEMENT OF 1' OF CLEAN SOIL INCLUDING 4" DG.

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SAN FRANCISCO
BAY TRAIL
AT
POINT MOLATE

OWNER

East Bay Regional Park District

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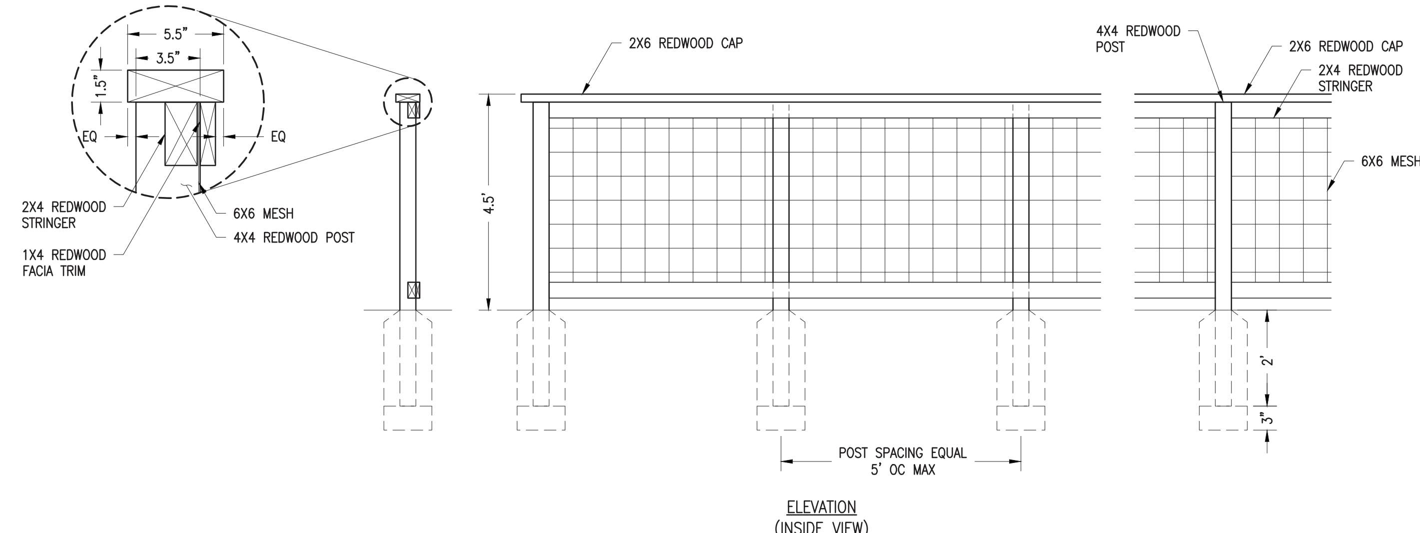
SHEET TITLE

PAVEMENT DETAILS

DRAWING D1

SHEET 36 OF 41

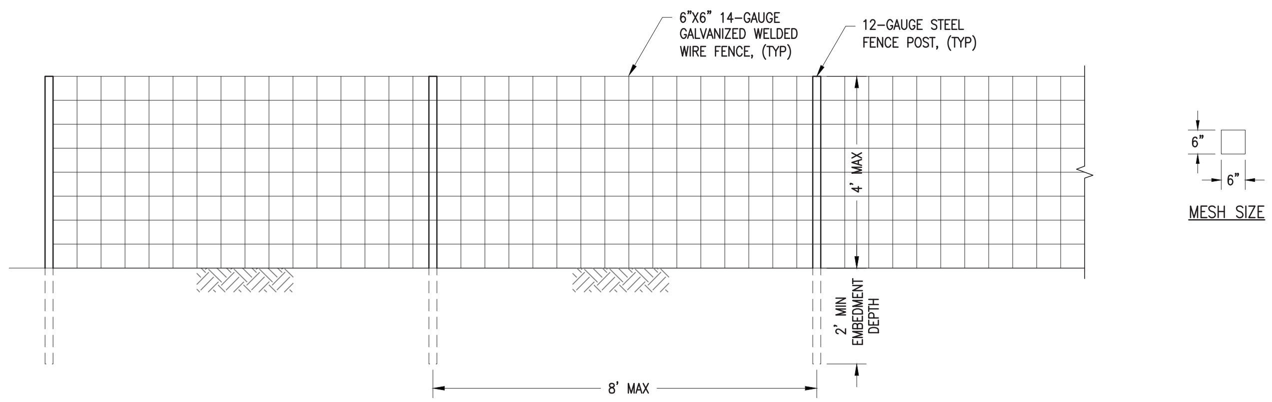


SECTION

ELEVATION (INSIDE VIEW)

ALTERNATE 1

ELEVATION (OUTSIDE VIEW)



MESH SIZE

ELEVATION

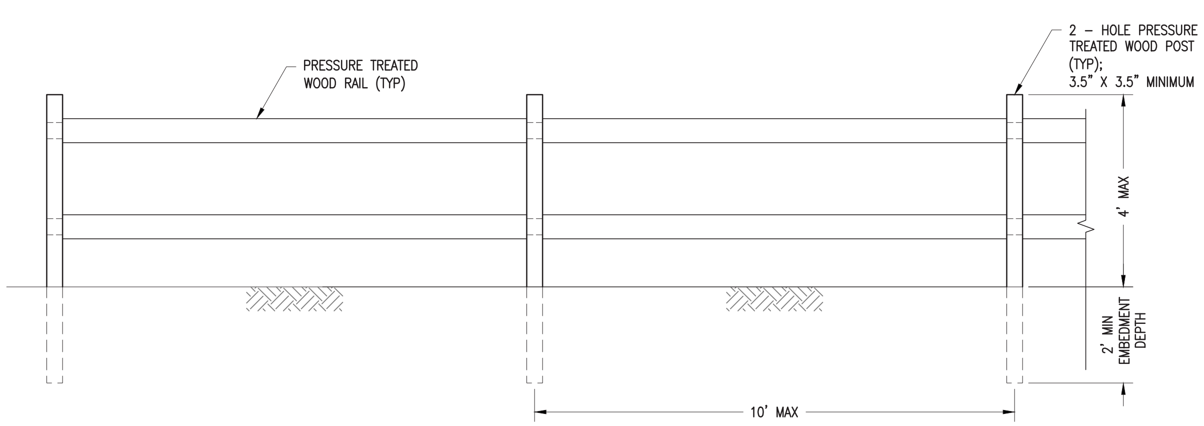
ALTERNATE 2

1 / D2 HALF HEIGHT FENCE

NTS

NOTE:

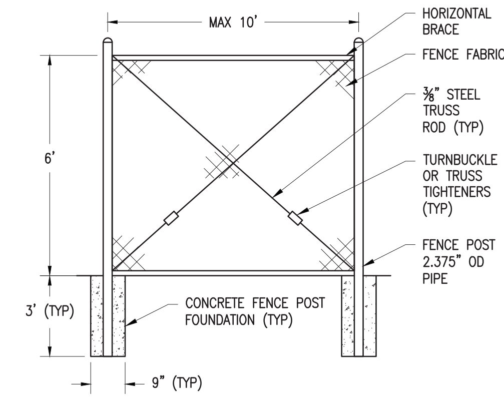
1. WELDED WIRE FENCE TO BE FIRMLY FASTENED TO POSTS WITH GALVANIZED FENCE CLIPS.



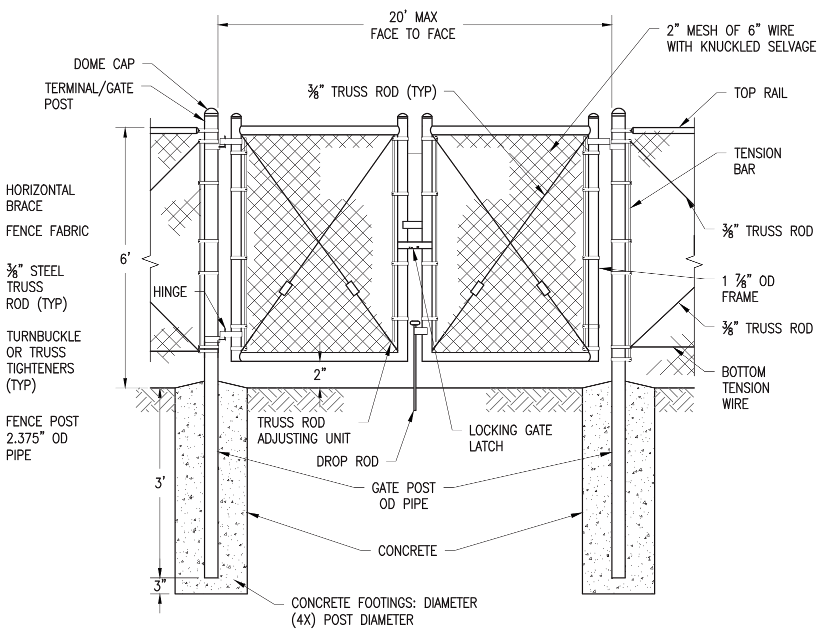
2 / D2 WOODEN SPLIT RAIL FENCE (ELEVATION)

NTS

GATE POST		
FENCE HEIGHT	GATE WIDTHS	ROUND OD PIPE
6'-0" AND LESS	UP THRU 6'-0"	2.875"
	OVER 6'-0" THRU 12'-0"	4.500"
	OVER 12'-0" THRU 18'-0"	5.563"
	OVER 18'-0" TO 24'-0" MAX	6.625"



FENCING



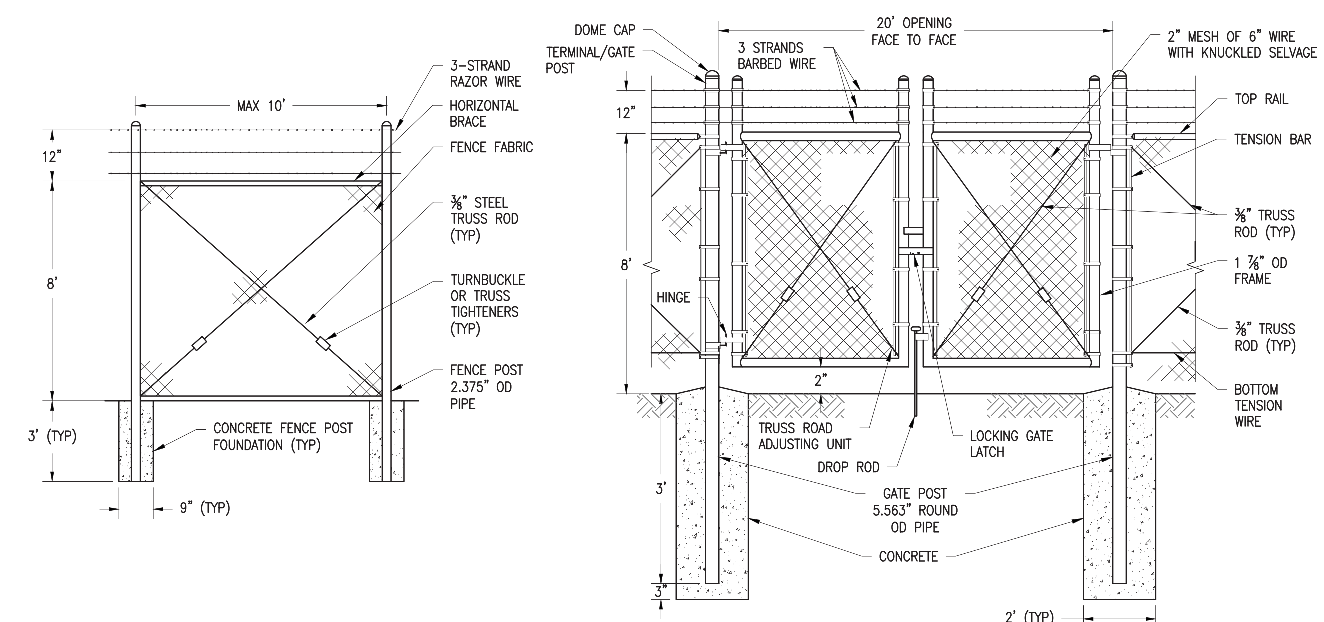
GATE

3 / D2 CHAIN LINK FENCE AND GATE

NTS

NOTES:

1. CHAIN LINK FABRIC SHALL BE ZINC COATED STEEL MANUFACTURED IN COMPLIANCE WITH ASTM STANDARD A 392 WITH A 2 INCH MESH OF 6 GAUGE WIRE WITH KNUCKLED SELVAGE.
2. TENSION WIRE SHALL BE 6 GAUGE.



FENCING

GATE

4 / D2 SECURITY FENCE AND GATE

NTS

NOTES:

1. CHAIN LINK FABRIC SHALL BE ZINC COATED STEEL MANUFACTURED IN COMPLIANCE WITH ASTM STANDARD A 392 WITH A 2 INCH MESH OF 6 GAUGE WIRE WITH KNUCKLED SELVAGE.
2. TENSION WIRE SHALL BE 6 GAUGE.

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SAN FRANCISCO BAY TRAIL AT POINT MOLATE

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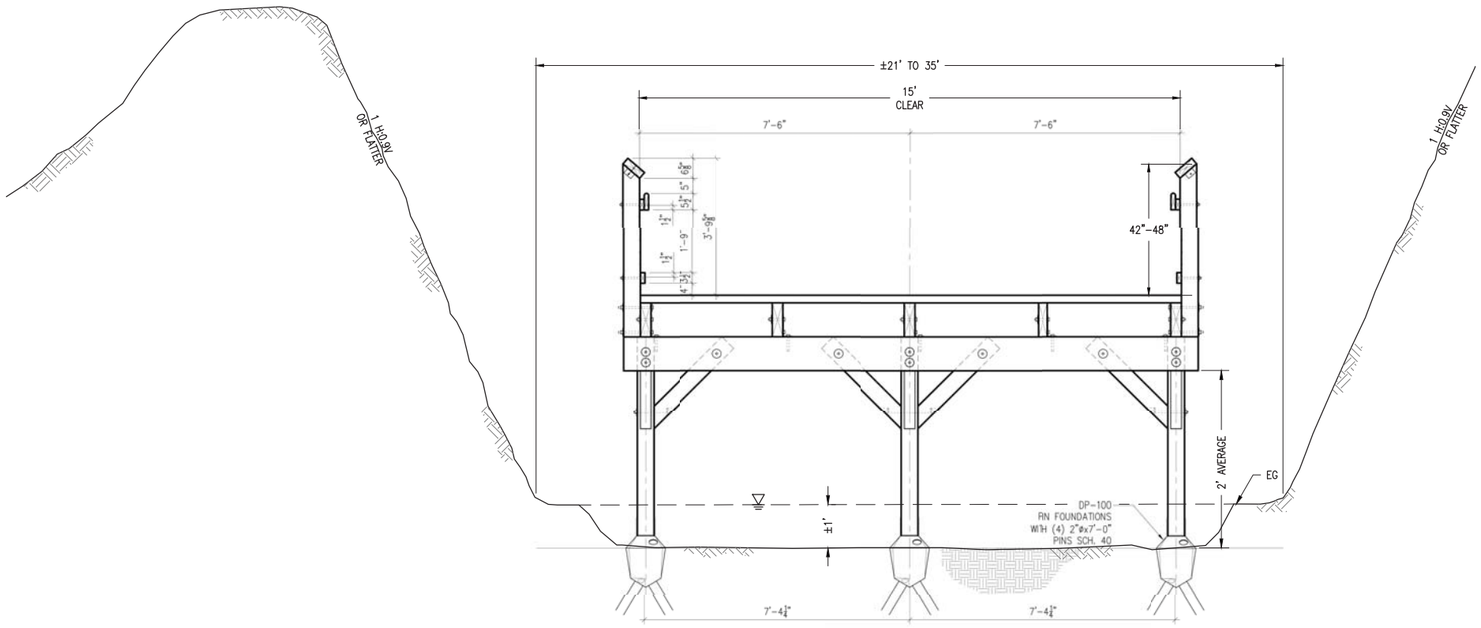
SHEET TITLE

FENCING DETAILS

DRAWING D2

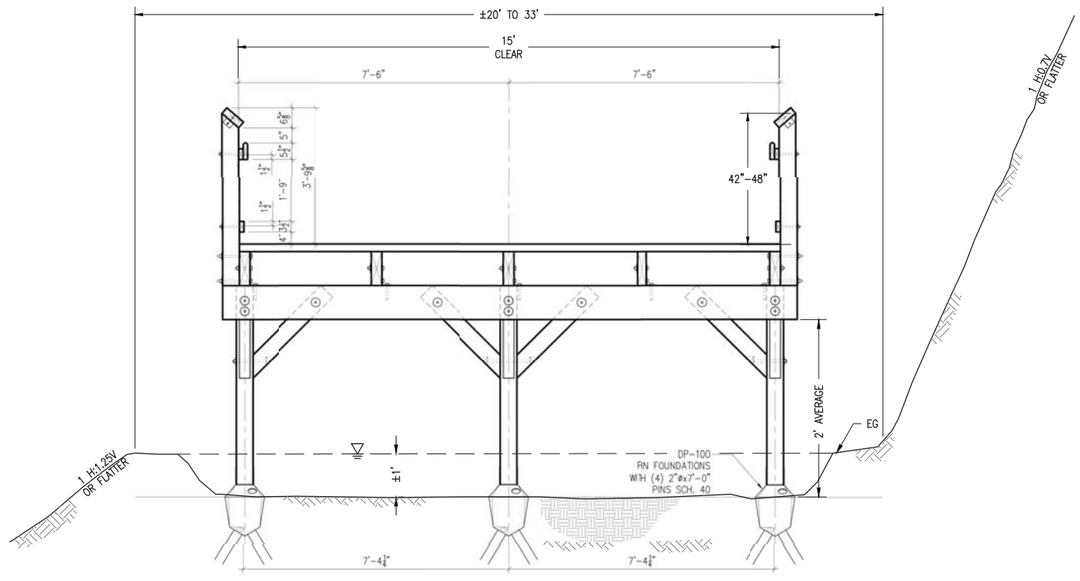


BOARDWALK SECTION

1 / D3 BOARDWALK 1 SECTION TYPICAL SECTION

NTS

SOURCE: DRAWING COURTESY OF WESTERN WOOD STRUCTURES, INC.
DATE: 06/07/2016



BOARDWALK SECTION

2 / D3 BOARDWALK 2 SECTION TYPICAL SECTION

NTS

SOURCE: DRAWING COURTESY OF WESTERN WOOD STRUCTURES, INC.
DATE: 06/07/2016

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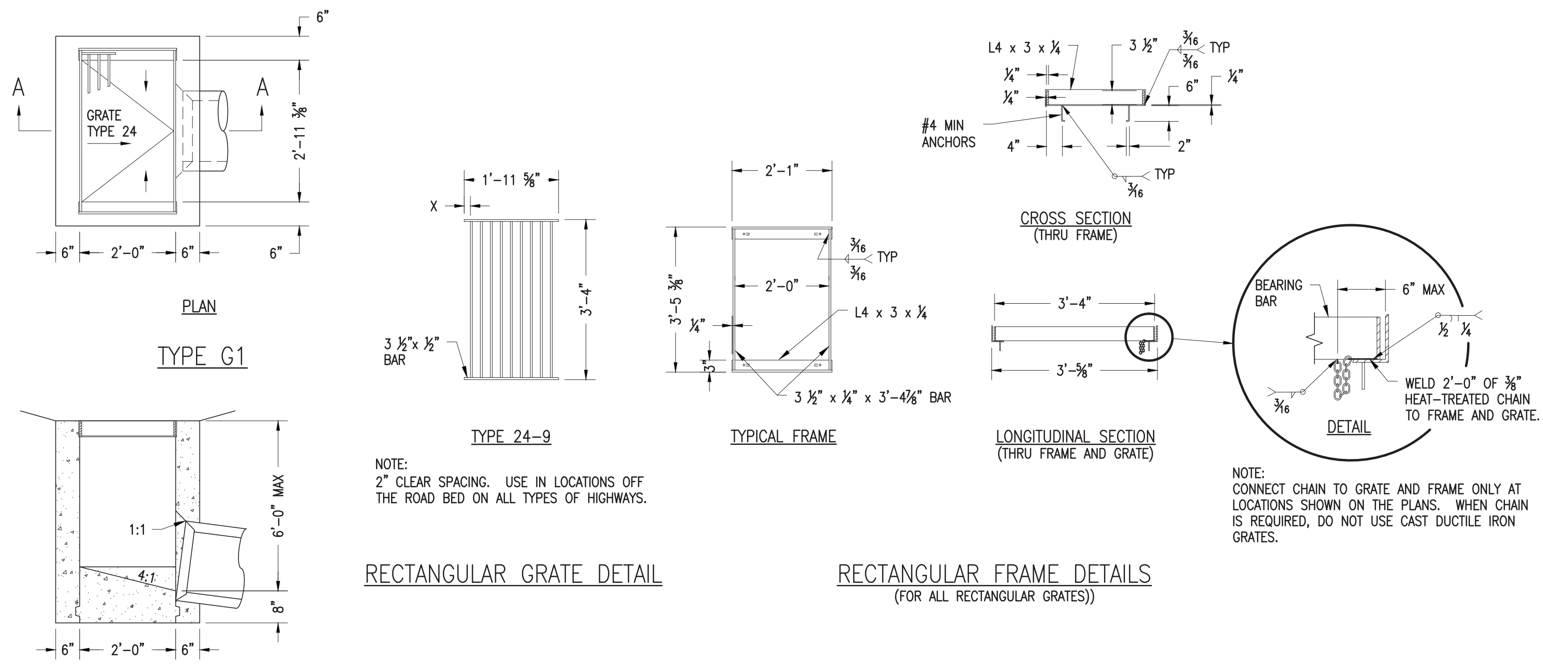
SHEET TITLE

BOARDWALK DETAILS

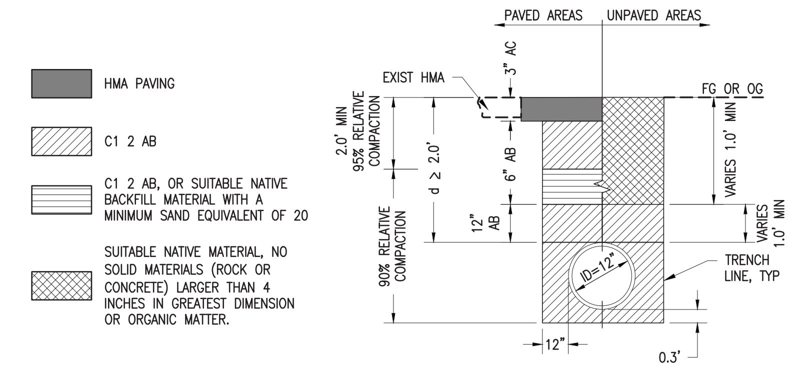
DRAWING D3

SHEET 38 OF 41



1 / D4 CALTRANS TYPE G1 DRAINAGE INLET

NTS



2 / D4 STORM DRAIN TRENCH DETAIL

NTS

NOTES:
1. UNSUITABLE NATIVE MATERIAL SHALL BE EXCAVATED BELOW THE LIMIT OF EXCAVATION AND REPLACED WITH SUITABLE BACKFILL MATERIAL WHEN DIRECTED BY THE ENGINEER.

3 / D4 CIRCULAR UTILITY BOX ADJUSTMENT DETAIL

NTS

4 / D4 RECTANGULAR UTILITY BOX REPLACEMENT DETAIL

NTS

5 / D4 MONITORING WELL BOX ADJUSTMENT DETAIL

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SHEET TITLE

UTILITY DETAILS

DRAWING
D4

1
D5

POINT MOLATE BEACH PARK RAMP

NTS

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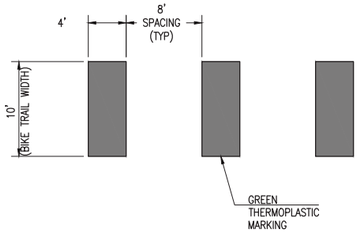
SHEET TITLE

CURB RAMP DETAILS

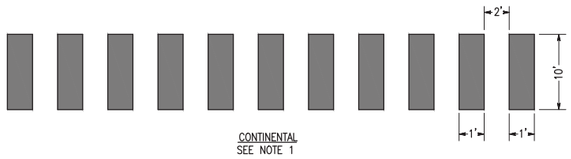
DRAWING
D5

SHEET 40 OF 41

File: P:\active projects\east bay regional park dist - cc567\567.04.55 - bay trail segment a & b\CAD\Sheets\D1-D6 DETAILS.dwg | Layout: D5 | Printed Jul 07, 2016 @ 3:05pm | ID:AP.20.0a (LMS Tech)



1 SD1 INTERSECTION STRIPING
NTS

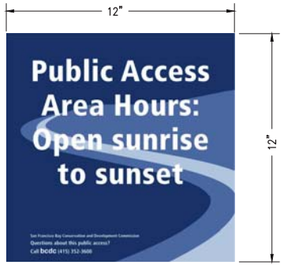


CONTINENTAL
SEE NOTE 1

NOTES:

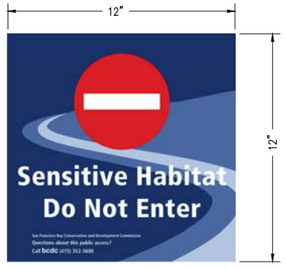
1. SPACES BETWEEN MARKINGS SHOULD BE PLACED IN WHEEL TRACKS OF EACH LANE.
2. SPACINGS NOT TO EXCEED 2.5 TIMES WIDTH OF LONGITUDINAL LINE.
3. ALL CROSSWALK MARKINGS MUST BE WHITE EXCEPT FOR THOSE NEAR SCHOOLS MUST BE YELLOW.

2 SD1 CALTRANS CONTINENTAL CROSSWALK
NTS

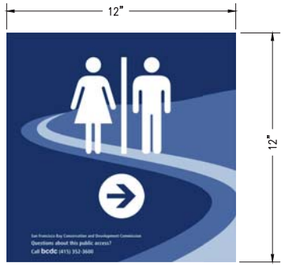


3 SD1 PUBLIC ACCESS HOURS SIGN
NTS

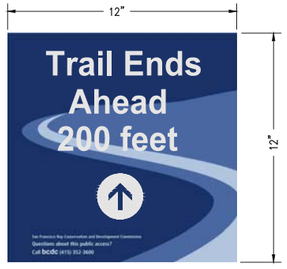
4 SD1 BAY TRAIL SIGN
NTS



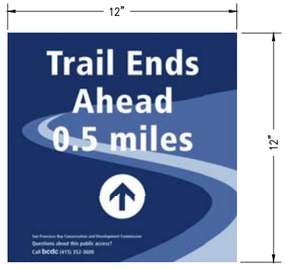
5 SD1 SENSITIVE HABITAT SIGN
NTS



6 SD1 RESTROOM SIGN
NTS



7 SD1 TRAIL ENDS 200 FT. SIGN
NTS



8 SD1 TRAIL ENDS 0.5 MILES SIGN
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9 SD1 5" ARROW SIGN
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SHEET TITLE

SIGNAGE AND STRIPING DETAILS

DRAWING SD1

SHEET 41 OF 41

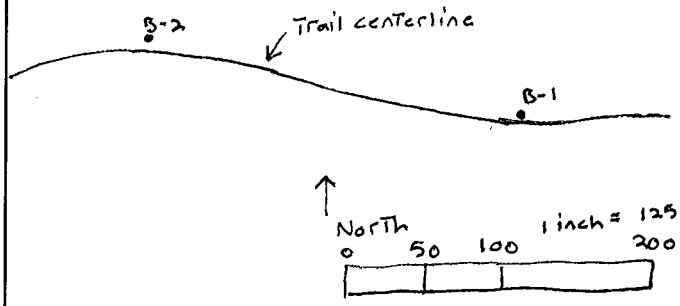
APPENDIX B. BORING LOGS

NCE 8795 Folsom Blvd, Ste 250 Sacramento, CA 95826
P: 916.388.5655 F: 916.388.5676

FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING: Segment A



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-1
	TOTAL DEPTH: 2-Feet
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: California GeoTech Services, LLC	
DRILL RIG TYPE: Solid Flight auger	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: Cal Mod. / SPT	
HAMMER WT.: 140 lbs	DROP:
STARTED, TIME: 0931 hours	DATE: 3/8/16
COMPLETED, TIME: 1005 hours	DATE: 3/8/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		15 17	18"	15"						1			
		17 7	18"	15"						2			
		5 4								3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Asphalt (2.5-inches)

Silty sand (SM) - dark grayish brown (10YR 4/2); 60% Fine to medium sand; 25% non-plastic Fines; 5% Fine rounded gravel; dense to loose; moist.

B-1-0.5 was collected at 0956 hours.

B-1-1.5 was collected at 1000 hours.

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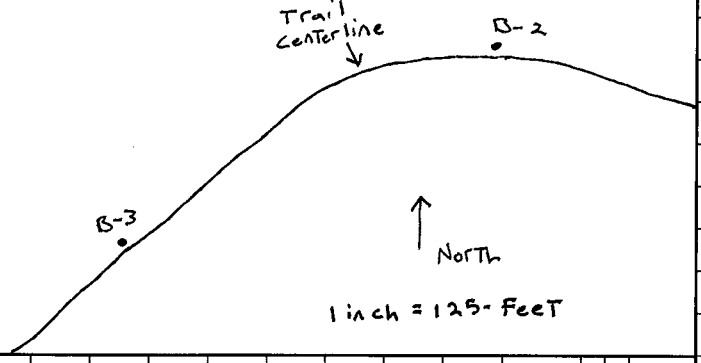
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING: Segment A



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-2
JOB NO.: 567.04.55	TOTAL DEPTH: 2-Feet (24-inches)
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: California GeoTech Services, LLC	EDITED BY:
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified, SPT	
HAMMER WT.: 140 lbs	DROP:
STARTED, TIME: 1012 hours	DATE: 3/8/16
COMPLETED, TIME: 1041 hours	DATE: 3/8/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		42 23	19"	12"						1			
		12 14	18	12"						2			
		8 8								3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Asphalt - 2-inches Thick

Silty Sand (SM) - brown (7.5YR4/2); 70% Fine to medium sand; 25% non-plastic fines; 5% Fine rounded gravel; moist.

B-2-0.5 was collected at 1036 hours.

B-2-1.5 was collected at 1041 hours.

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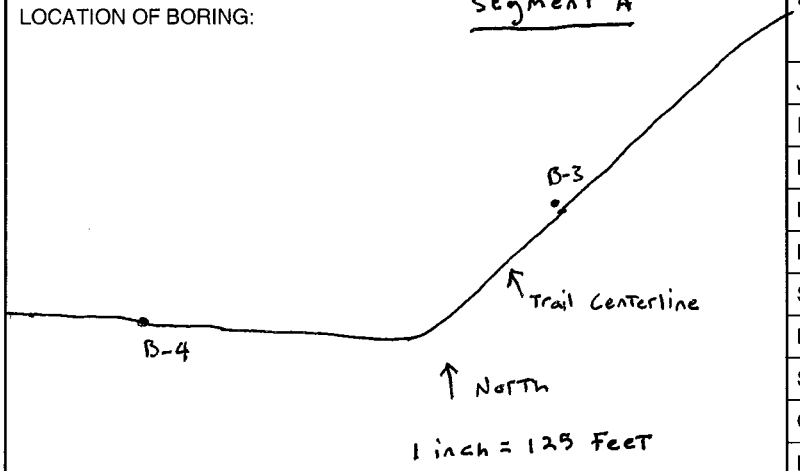
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING: Segment A



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-3
JOB NO.: 567.04.55	TOTAL DEPTH: 24-inches
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: California GeoTech Services, LLC	EDITED BY:
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris, Veni	
SAMPLING METHODS: Cal Modified	
HAMMER WT.: 140 lbs	DROP:
STARTED, TIME: 1100 hours	DATE: 3/8/16
COMPLETED, TIME: 1115 hours	DATE: 3/8/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		29	18"	16"						1			
		35											
		35								2			
		50 For 6"		5"									
		6"								3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Silty Sand with Gravel (SM) - brown (7.5YR4/2); 60% Fine Sand; 20% non-plastic fines; 20% Fine rounded gravel;

B-3-0.5 was collected at 1104 hours.

B-3-1.5 was collected at 1112 hours

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BORING NUMBER B-04

CLIENT Subconsultant to NCE for EBRPD
PROJECT NAME SF Bay Trail at Point Molate
PROJECT NUMBER 151190
PROJECT LOCATION Richmond, CA
DATE STARTED 3/8/2016 **COMPLETED** 3/8/2016
GROUND ELEVATION 22 ft **DATUM** NAVD88 **HOLE SIZE** 4 in.
DRILLING CONTRACTOR California Geotech
COORDINATES: **LATITUDE** 37.932945 **LONGITUDE** -122.408486
DRILLING RIG/METHOD Moble B-24/4-in. Solid Flight Auger
GROUNDWATER AT TIME OF DRILLING --- not encountered
LOGGED BY R. Briseno **CHECKED BY** D. Burger
GROUNDWATER AT END OF DRILLING --- N/A
HAMMER TYPE 140 lb hammer with 30 in. cathead
GROUNDWATER AFTER DRILLING --- N/A

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (FIELD VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTIC LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	FINES CONTENT (%)
0											
1		SILTY SAND (SM) to SILTY SAND with GRAVEL (SM), brown, moist, medium dense, some well graded gravel up to 1 in. (ARTIFICIAL FILL)	CM	15-11-9		107	4				
2		R-value = 72									
3		Grades to loose	SPT	5-3-4							
4											

Bottom of borehole at 4.0 ft. Borehole backfilled with grout.

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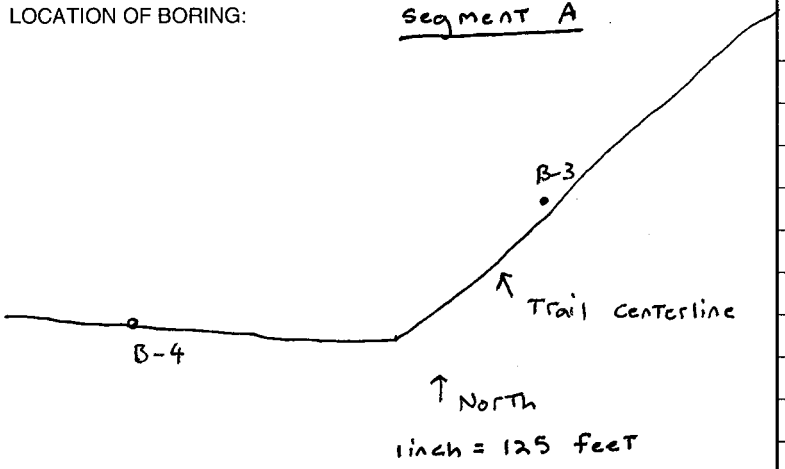
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING: Segment A



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-4
	TOTAL DEPTH: 24-inches
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: California GeoTech Services, LLC	
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: Cal. Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1130 hours	DATE: 3/8/16
COMPLETED, TIME: 1200 hours	DATE: 3/8/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		15 24	18"	16"						1			
		19 8	18"	16"						2			
		7 6								3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

silty sand with gravel (sm) - brown (7.5YR4/2); 60% fine sand; 20% non-plastic fines; 20% fine rounded gravel; dense; moist.

B-4-0.5 was collected at 1133 hours.

B-4-1.5 was collected at 1138 hours.

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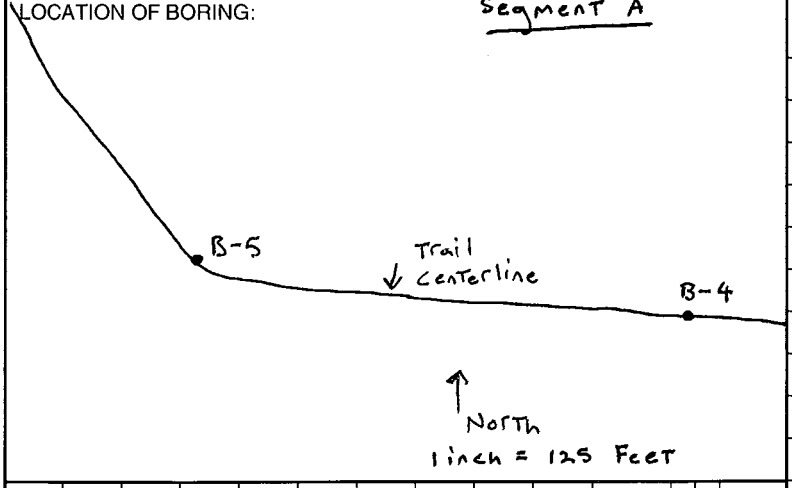
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING: Segment A



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-5
	TOTAL DEPTH: 24-inches
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: California GeoTech Services, LLC	
DRILL RIG TYPE: Truck mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: Cal Modified (0.5) and drill cuttings (1.5')	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1200 hours	DATE: 3/8/16
COMPLETED, TIME: 1240 hours	DATE: 3/8/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		4 6	18"	18"						1			
		10 25	18"	12"						2			sand-stone
		13 15								3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

SILT (ML) - dark brown (7.5YR 3/2); 90%. non-plastic to low plastic fines; 10%. fine sand; trace fine rounded gravel; ~~stiff~~; ~~wet~~. Roots observed throughout. ~~Bedrock~~ was encountered at about one foot bgs ~~(Poorly Graded Sand (SP))~~ - very pale brown (10YR 7/3); predominantly fine grained sand; strongly cemented; dry.

B-5-0.5 was collected at 1220 hours.

B-5-1.5 was collected at 1230 hours.

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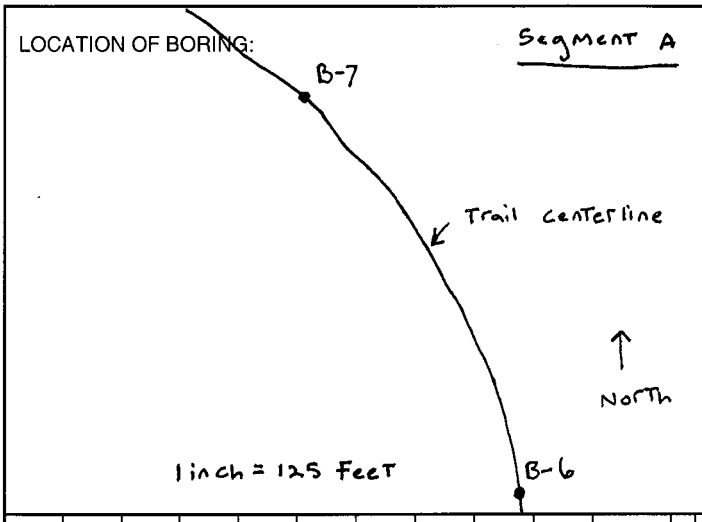
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-6
JOB NO.: 567.04.55	TOTAL DEPTH: ~~10~~ 10-inches
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: California GeoTech Services, LLC	EDITED BY:
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: Sample was collected from drill cuttings	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1240 hours	DATE: 3/8/16
COMPLETED, TIME: 1300 hours	DATE: 3/8/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG	
		50 for 2"	2"	2"						1				Asphalt - 2 inches Bed-rock Poorly Graded Sand (SP) - very pale brown (10YR7/3), predominantly fine sand; very dense; dry. Bedrock (chert) was encountered at about 4-inches below the ground surface. B-6-0.4 was collected at 1254 hours.

2 3 4 5 6 7 8 9 10

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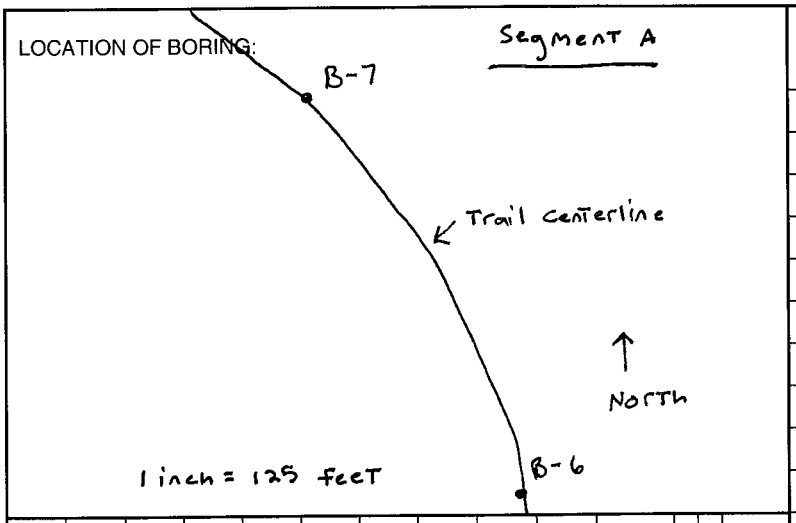
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-7
	TOTAL DEPTH: 12-inches
JOB NO.: 567.04,55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: California GeoTech Services, LLC	
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: Sample was collected from drill cuttings.	
HAMMER WT.:	DROP:
STARTED, TIME: 1300 hours	DATE: 3/8/16
COMPLETED, TIME: 1320 hours	DATE: 3/8/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
										1			Sand-stone
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Asphalt = 3 inches

Poorly Graded Sand (SP) - very pale brown (10YR7/3); predominantly fine sand; very dense; dry.

Bedrock (sandstone) was encountered at a depth of 4-inches below the ground surface.

B-7-0.4 was collected at 1311 hours.

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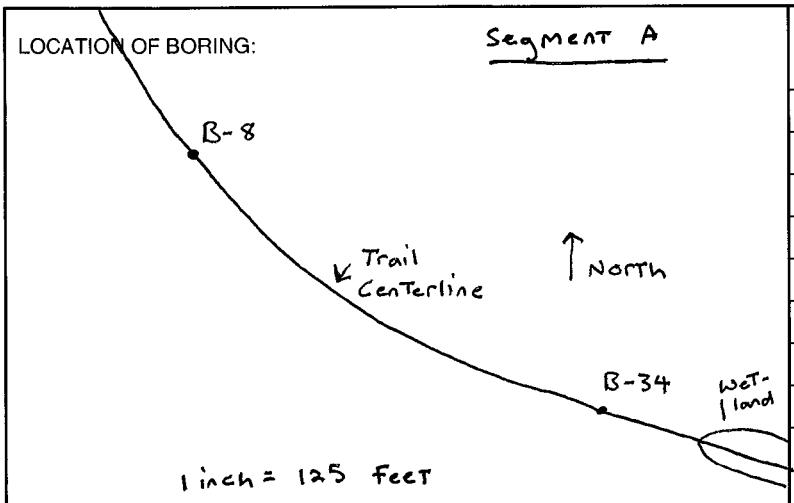
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-8
	TOTAL DEPTH: 24-inches
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: California FeoTech Services, LLC	
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: Sample was collected from drill cuttings.	
HAMMER WT.:	DROP:
STARTED, TIME: 1355 hours	DATE: 3/8/16
COMPLETED, TIME: 1430 hours	DATE: 3/8/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME: DATE: BY:	
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
										1			Bedrock
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Asphalt = 2.5"

Bedrock was encountered directly below the asphalt. The bedrock is composed of silty sand (SM) - brown (7.5YR4/2); 70% fine sand; 30% non-plastic fines; moist.

B-8-0.2 was collected at 1404 hours.

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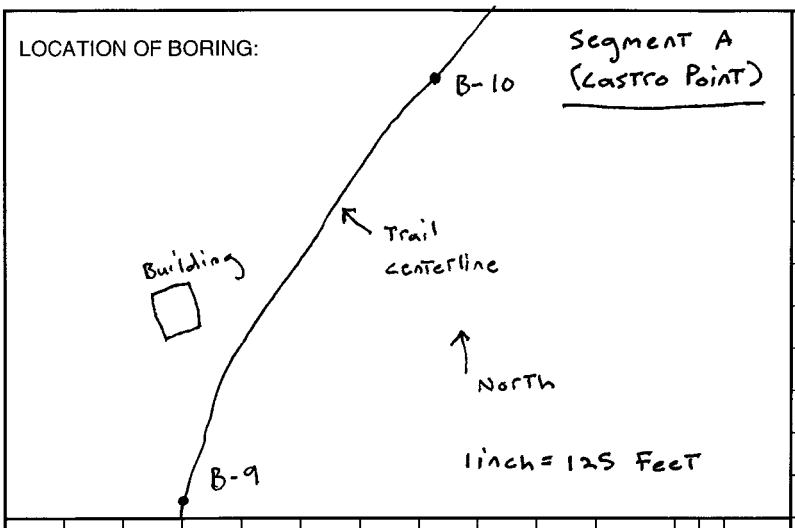
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-9
JOB NO.: 567.04.55	TOTAL DEPTH: 24-inches
PROJ. MGR.: B. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: California GeoTech Services, LLC	EDITED BY:
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 0829 Hours	DATE: 3/10/16
COMPLETED, TIME: 0907 Hours	DATE: 3/10/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE	DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		15	18"	12"			1			Sand-stone
		16								
		12					2			
							3			
							4			
							5			
							6			
							7			
							8			
							9			
							10			

Asphalt - 2"

3" Poorly Graded Sand (SP) - very dark gray (10YR3/1), predominantly medium sand, trace amounts of coarse sand, medium dense, moist.

Sandstone was encountered at approximately five inches bgs.

B-9-0.2 was collected at 0903 hours.

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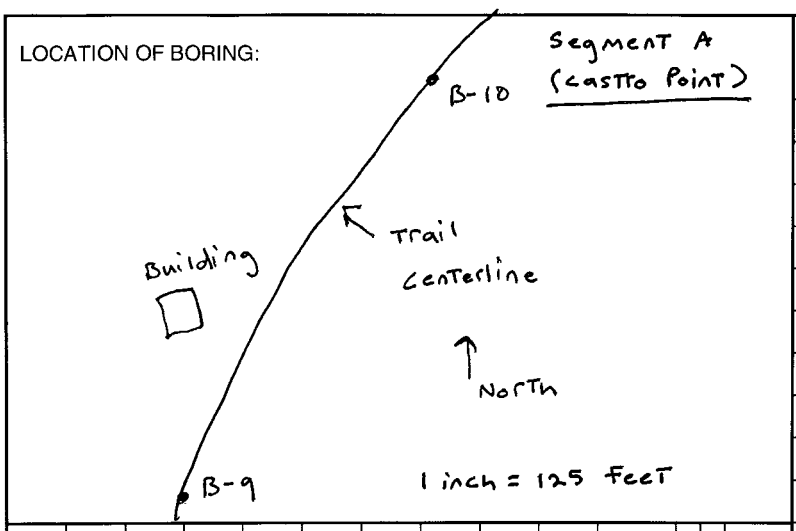
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-10
	TOTAL DEPTH: 24-inches
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: California GeoTech Services, LLC	
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 0907 hours	DATE: 3/10/16
COMPLETED, TIME: 0930 hours	DATE: 3/10/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER SAMPLE RECOVERY	GRAPHIC LOG
		6	18"	9"						1		
		6										
		12								2		
										3		
										4		
										5		
										6		
										7		
										8		
										9		
										10		

3" Poorly Graded Gravel (GM) - very dark gray (10YR3/1); predominantly fine rounded gravel; trace amounts of non-plastic fines.

Lean clay with sand (CL) - brown (7.5YR3); 85% low plastic fines; 15% fine sand; very stiff; moist.

B-10-0.5 was collected at 0922 hours.

B-10-1.5 was collected at 0927 hours.

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CAL ENGINEERING & GEOLOGY

BORING NUMBER B-11

CLIENT Subconsultant to NCE for EBRPD
PROJECT NAME SF Bay Trail at Point Molate
PROJECT NUMBER 151190
PROJECT LOCATION Richmond, CA
DATE STARTED 3/10/2016 **COMPLETED** 3/10/2016
GROUND ELEVATION 18 ft **DATUM** NAVD88 **HOLE SIZE** 4 in.
DRILLING CONTRACTOR California Geotech
COORDINATES: **LATITUDE** 37.937559 **LONGITUDE** -122.411725
DRILLING RIG/METHOD Moble B-24/4-in. Solid Flight Auger
GROUNDWATER AT TIME OF DRILLING --- not encountered
LOGGED BY R. Briseno **CHECKED BY** D. Burger
GROUNDWATER AT END OF DRILLING --- N/A
HAMMER TYPE 140 lb hammer with 30 in. cathead
GROUNDWATER AFTER DRILLING --- N/A

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (FIELD VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTIC LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	FINES CONTENT (%)
0		POORLY GRADED GRAVEL (GP) (AGGREGATE BASE)									
1											
2		LEAN CLAY (CL) with GRAVEL, brown with light brown mottling, moist, hard, some light brown silt, iron stained, trace chert and sandstone rock fragments (ARTIFICIAL FILL)	CM	8-10-13		115	14				
3		SILTY SAND with GRAVEL (SM), brown and light brown, dense, friable, gravel up to 1.5 in., fine to medium sand, sandstone rock fragments, decrease gravel with depth	SPT	13-27-14							
4											

Bottom of borehole at 4.0 ft. Borehole backfilled with grout.

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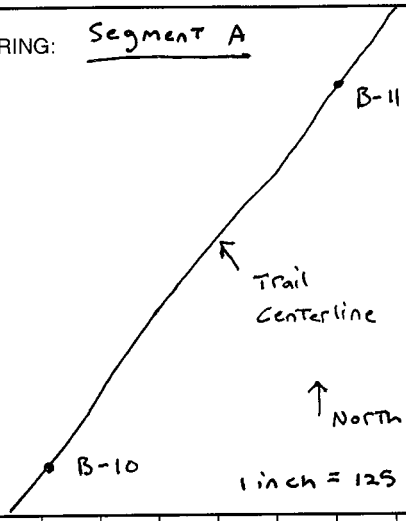
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING: Segment A



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-11
JOB NO.: 567.04.55	TOTAL DEPTH: 24-inches
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: California GeoTech Services, LLC	EDITED BY:
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 0930 hours	DATE: 3/10/16
COMPLETED, TIME: 1000 hours	DATE: 3/10/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		9	18"	9"						1			
		16											
		11								2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

18" Poorly Graded Gravel (GP) - very dark gray (10YR3/1); predominantly fine rounded gravel up to two inches in length; trace amounts of non-plastic fines and fine sand; medium dense; wet.

6" Lean clay with sand (CL) - brown (7.5YR3); 85%, low plastic fines; 15% Fine sand; very stiff; moist.

B-11-0.5 was collected at 0949 hours.

B-11-1.5 was collected at 0949 hours.

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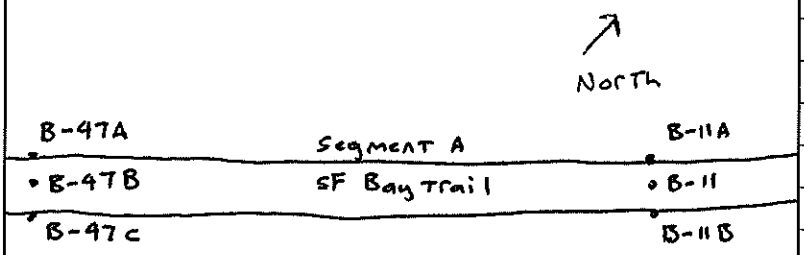
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 43+50 to "B" 48+50
Drawing C8

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-11A
	TOTAL DEPTH: 2- Feet
JOB NO.: 567.04, 55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous core	
HAMMER WT.:	DROP:
STARTED, TIME: 1415 hours	DATE: 5/31/16
COMPLETED, TIME: 1420 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER SAMPLE RECOVERY	GRAPHIC LOG
			24	24						0		
										1		
										2		
										3		
										4		
										5		
										6		
										7		
										8		
										9		
										10		

(2-inches) Poorly Graded Gravel (GM) - very dark gray (10YR3/1); predominantly fine rounded gravel; trace amounts of non-plastic fines; dry,

Lean clay with sand (CL) - brown (7.5YR3); 85% low plastic fines; 15% fine sand; very stiff; moist

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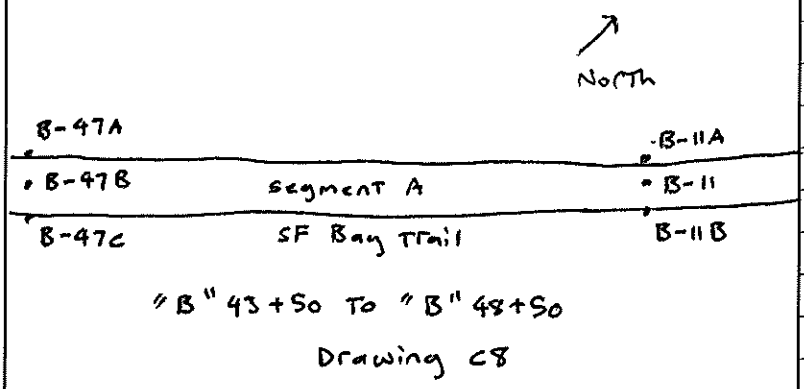
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 43+50 To "B" 48+50

Drawing C8

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-11B
	TOTAL DEPTH: 2 - Feet
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous core	
HAMMER WT.:	DROP:
STARTED, TIME: 1420 hours	DATE: 5/31/16
COMPLETED, TIME: 1424 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	19						1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

(3-inches) Poorly Graded Gravel (GM) - very dark gray (10YR3/1); predominantly fine rounded gravel; trace amounts of non-plastic fines; dry.

Lean clay with Sand (CL) - brown (7.5YR5/3); 85% low plastic fines; 15% fine sand; very stiff; moist.

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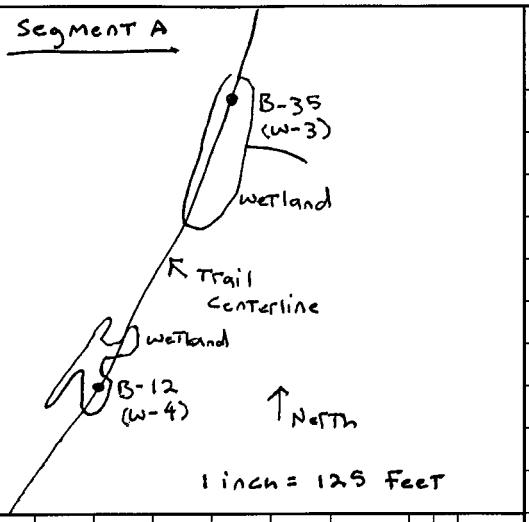
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING: Segment A



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-12
	TOTAL DEPTH: 24-inches
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: California GeoTech Services, LLC	
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1020 hours	DATE: 3/10/16
COMPLETED, TIME: 1100 hours	DATE: 3/10/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME: DATE: BY:	
SURFACE ELEV.:	DATUM:

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		10	18"	0						1			No Recovery
		18											
		14								2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

CONDITIONS: Two holes were ~~drilled~~ advanced to 24-inches bgs. No recovery. Gravel extends from ground surface to at least ~~one foot~~ bgs. The gravel ranges from fine to coarse (up to 3-inches) in length.

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BORING NUMBER B-13

CLIENT Subconsultant to NCE for EBRPD
PROJECT NAME SF Bay Trail at Point Molate
PROJECT NUMBER 151190
PROJECT LOCATION Richmond, CA
DATE STARTED 3/10/2016 **COMPLETED** 3/10/2016
GROUND ELEVATION 21 ft **DATUM** NAVD88 **HOLE SIZE** 4 in.
DRILLING CONTRACTOR California Geotech
COORDINATES: **LATITUDE** 37.939839 **LONGITUDE** -122.410159
DRILLING RIG/METHOD Superman, indoor outdoor access
GROUNDWATER AT TIME OF DRILLING --- not encountered
LOGGED BY R. Briseno **CHECKED BY** D. Burger
GROUNDWATER AT END OF DRILLING --- N/A
HAMMER TYPE 140 lb hammer with 30 in. cathead
GROUNDWATER AFTER DRILLING --- N/A

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (FIELD VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTIC LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	FINES CONTENT (%)
0		POORLY GRADED GRAVEL (GP) (AGGREGATE BASE)									
1		SILTSTONE, yellowish brown, moist, weakly cemented, very severely weathered, iron stained, thinly bedded, grades to sandstone (BEDROCK)	CM	13-17		118	13				
2											
3		SILTY SANDSTONE with gray clay interbeds, moderately fractured, tight	SPT	24-27							
4											

Bottom of borehole at 4.0 ft. Borehole backfilled with grout.

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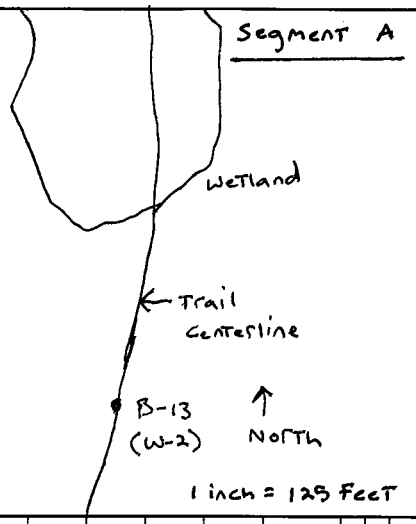
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-13
JOB NO.: 561.04.55	TOTAL DEPTH: 24-inches
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: California GeoTech services, LLC	EDITED BY:
DRILL RIG TYPE: Superman	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1300 hours	DATE: 3/10/16
COMPLETED, TIME: 1410 hours	DATE: 3/10/16

BORING DEPTH (ft.)	Two		
CASING DEPTH (ft.)			
WATER DEPTH (ft.)			
TIME:			
DATE:			

BACKFILLED, TIME: DATE: BY:

SURFACE ELEV.: DATUM:

CONDITIONS:

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		9	18"	14"						1			
		12											
		20								2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

8" Poorly Graded Gravel - very dark gray (10YR 3/1); predominantly fine rounded gravel; trace amounts of non-plastic fines and fine sand; medium dense; wet.

Silty Sand (SM) - brownish yellow (10YR 5/6); 50% fine sand; 30% non-plastic fines; medium dense; moist.

Sandstone - 2-Feet

B-13-0.5 was collected at 1356 hours.

B-13-1.5 was collected at 1400 hours

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BORING NUMBER B-14

CLIENT Subconsultant to NCE for EBRPD
PROJECT NAME SF Bay Trail at Point Molate
PROJECT NUMBER 151190
PROJECT LOCATION Richmond, CA
DATE STARTED 3/8/2016 **COMPLETED** 3/8/2016
GROUND ELEVATION 20 ft **DATUM** NAVD88 **HOLE SIZE** 4 in.
DRILLING CONTRACTOR California Geotech
COORDINATES: **LATITUDE** 37.940664 **LONGITUDE** -122.410108
DRILLING RIG/METHOD Moble B-24/4-in. Solid Flight Auger
GROUNDWATER AT TIME OF DRILLING --- not encountered
LOGGED BY R. Briseno **CHECKED BY** D. Burger
GROUNDWATER AT END OF DRILLING --- N/A
HAMMER TYPE 140 lb hammer with 30 in. cathead
GROUNDWATER AFTER DRILLING --- N/A

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (FIELD VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTIC LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	FINES CONTENT (%)
0											
1		LEAN CLAY (CL), brown, moist, firm, gravel up to 1 in., sparse silt (ARTIFICIAL FILL)	CM	11-11-8		108	5				
2											
3		LEAN CLAY (CL) with SILT (ML) and GRAVEL (CL), brown with dark brown inclusions, moist, soft, iron stained, crushed siltstone and graywacke rock fragments	SPT	5-5-6				28	18	10	
4											

Bottom of borehole at 4.0 ft. Borehole backfilled with grout.

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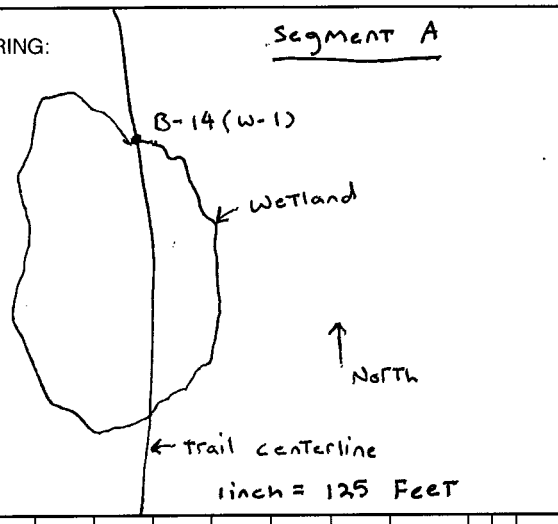
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-14
JOB NO.: 567.04.55	TOTAL DEPTH: 24-inches
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: California GeoTech Services, LLC	EDITED BY:
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: Cal mod., SPT	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1500 hours	DATE: 3/8/16
COMPLETED, TIME: 1530 hours	DATE: 3/8/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		6 4	18"	18"						1			
		7 3	18"	18"						2			
		5 6								3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Fill

Silty sand with Gravel (SM) - brown (10YR 5/3), 50% Fine sand; 30% non-plastic fines; 20% Fine rounded gravel; medium dense; wet.

Lean clay (CL) - brown (10YR 5/3); predominantly low plasticity fines; stiff; wet. To medium

organic material such as roots were found throughout the sample intervals.

B-14-0.5 was collected at 1510 hours.

B-14-1.5 was collected at 1515 hours.

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BORING NUMBER B-15

CLIENT Subconsultant to NCE for EBRPD
PROJECT NAME SF Bay Trail at Point Molate
PROJECT NUMBER 151190
PROJECT LOCATION Richmond, CA
DATE STARTED 3/8/2016 **COMPLETED** 3/8/2016
GROUND ELEVATION 18 ft **DATUM** NAVD88 **HOLE SIZE** 4 in.
DRILLING CONTRACTOR California Geotech
COORDINATES: **LATITUDE** 37.942582 **LONGITUDE** -122.410655
DRILLING RIG/METHOD Moble B-24/4-in. Solid Flight Auger
▽ **GROUNDWATER AT TIME OF DRILLING** 2.0 ft / Elev 16.0 ft
LOGGED BY R. Briseno **CHECKED BY** D. Burger
GROUNDWATER AT END OF DRILLING --- N/A
HAMMER TYPE 140 lb hammer with 30 in. cathead
GROUNDWATER AFTER DRILLING --- N/A

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (FIELD VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTIC LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	FINES CONTENT (%)
0		Crushed rock (RAILROAD BALAST)									
1		FAT CLAY (CH), mottled black with gray and brown, dry, hard, sandstone and chert rock fragments, iron staining (ARTIFICIAL FILL) R-value = 22	CM	12-12-9							
2		▽ LEAN CLAY (CH), black, moist to wet, soft, odorous, some iron staining, isolated organic stringers, isolated sandstone rock fragments (NATIVE SOIL)									
			SPT	12-12-11		112	16	48	26	22	
3											

Bottom of borehole at 3.5 ft. Borehole backfilled with grout.

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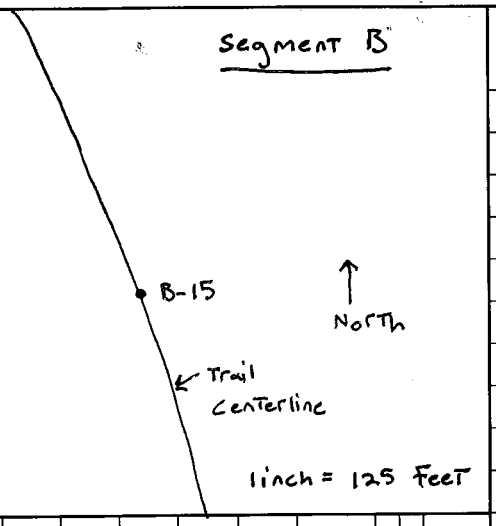
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-15
JOB NO.: 567.04.55	TOTAL DEPTH: 24-inches
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: California Geotech Services, LLC	EDITED BY:
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: Cal Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1330 1530 hours	DATE: 3/8/16
COMPLETED, TIME: 1615 hours	DATE: 3/8/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME: DATE: BY:	
SURFACE ELEV.: DATUM:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		22	18"	18"						1			
		12 11								2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

CONDITIONS:

Silty Gravel with Sand (GM) - very dark grayish brown (10YR 3/2) 50% fine rounded gravel; 30% non-plastic fines; 20% fine sand; moist.

Fat clay (CH) - very dark brown (10YR 2/2); predominantly high plastic fines; very stiff; moist.

B-15-0.5 was collected at 1547 hours.

B-15-1.5 was collected at 1552 hours.

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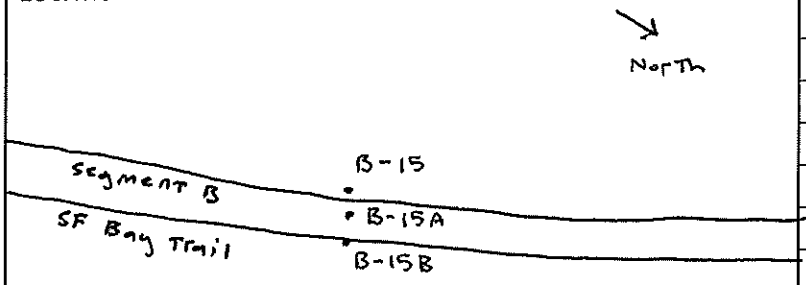
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 63+50 to "B" 68+50

Drawing c12

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-15A
JOB NO.: 567.04.55	TOTAL DEPTH: 2-Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1239 hours	DATE: 5/31/16
COMPLETED, TIME: 1245 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	16						0			100%
										1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

silty Gravel with Sand (GM) - very dark grayish brown (10YR3/2); 30% non-plastic fines; 20% fine sand; 50% fine rounded gravel; loose; dry.

Fat Clay (CH) - very dark brown (10YR2/2); predominantly high plastic fines; very stiff; moist.

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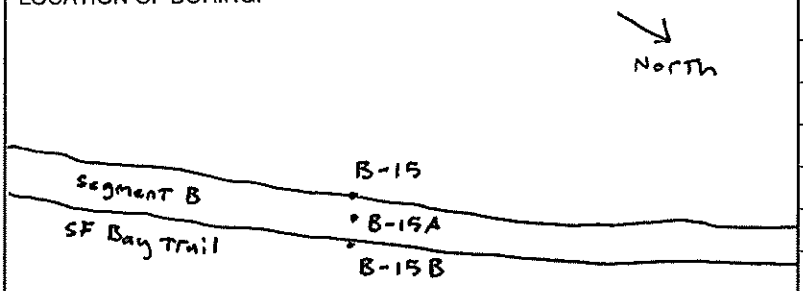
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 63+50 To "B" 68+50

Drawing C12

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-15B
	TOTAL DEPTH: 2-Feet
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1230 hours	DATE: 5/31/16
COMPLETED, TIME: 1239 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	18						0			
										1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Silty Gravel with sand (GM) - very dark grayish brown (10YR 3/2); 30% non-plastic fines; 20% fine sand; 50% fine rounded gravel; loose; dry.

Fat clay (CH) - very dark brown (10YR 2/2); predominantly high plastic fines; very stiff; moist.

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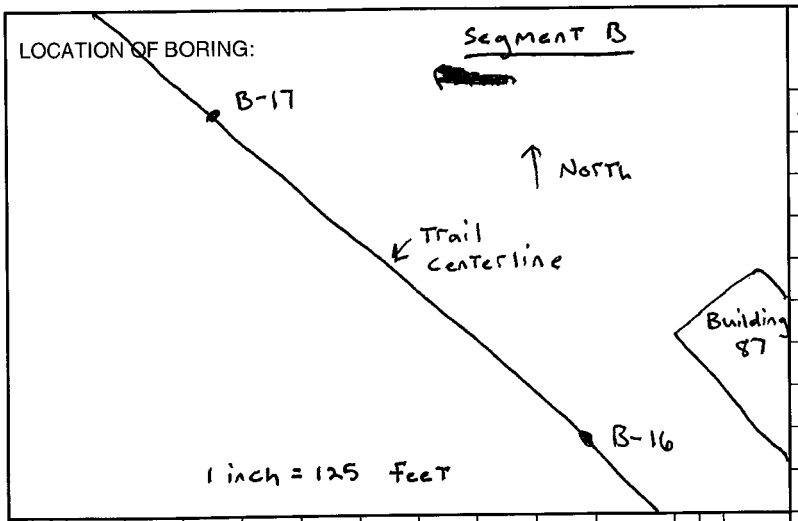
FIELD LOG OF BORING

Sheet 1 of 1



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-16
	TOTAL DEPTH: 24-inches
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: California FeoTech Services, LLC	
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1630 hours	DATE: 3/8/16
COMPLETED, TIME: 1700 hours	DATE: 3/8/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		4 9 9	18"	18"						1			
		9 7								2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Silty Gravel with Sand (GM) - very dark grayish brown (10YR 3/2); 30% non-plastic fines; 20% fine sand; 50% fine rounded gravel; wet.

Fat clay (CH) - very dark brown (10YR 2/2); predominantly high plastic fines; very stiff; moist.

B-16-03 was collected at 1636 hours.

D-16-1.5 was collected at 1640 hours.

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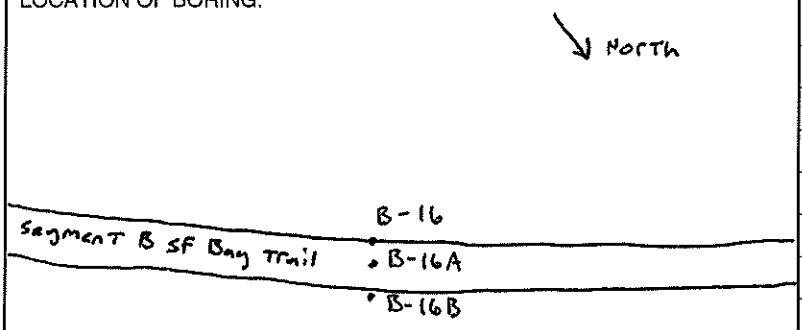
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 69+50 To "B" 73+50

Drawing C13

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-16A
JOB NO.: 567.04.55	TOTAL DEPTH: 2-Feet
PROJ. MGR.: R, Shaffer	LOGGED BY: B. Bardsley
	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1213 hours	DATE: 5/31/16
COMPLETED, TIME: 1216 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER SAMPLE RECOVERY	GRAPHIC LOG	
			24	15						0			Silty Gravel with sand (GM) - very dark grayish brown (10YR3/2); 30% non-plastic fines; 20% fine sand; 50% fine rounded gravel; loose dry.
										1			Fat clay (CH) - very dark brown (10YR2/2); predominantly high plastic fines; very stiff; moist.
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

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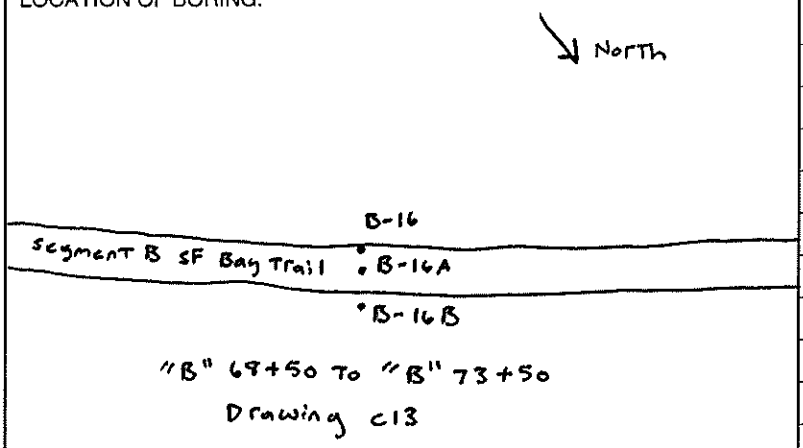
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-16B
JOB NO.: 567.04.55	TOTAL DEPTH: 2-Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1209 hours	DATE: 5/31/16
COMPLETED, TIME: 1211 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG	
			24	19						0				Silty Gravel with Sand (GM) - very dark grayish brown (10YR 3/2), 30% non-plastic fines, 20% fine sand, 50% fine rounded gravel, loose, dry.
										1				Fat Clay (CH) - very dark brown (10YR 2/2), predominantly high plastic fines, very stiff, moist.
										2				
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										10				

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BORING NUMBER B-17

CLIENT Subconsultant to NCE for EBRPD
PROJECT NAME SF Bay Trail at Point Molate
PROJECT NUMBER 151190
PROJECT LOCATION Richmond, CA
DATE STARTED 3/9/2016 **COMPLETED** 3/9/2016
GROUND ELEVATION 20 ft **DATUM** NAVD88 **HOLE SIZE** 4 in.
DRILLING CONTRACTOR California Geotech
COORDINATES: **LATITUDE** 37.944316 **LONGITUDE** -122.412507
DRILLING RIG/METHOD Moble B-24/4-in. Solid Flight Auger
GROUNDWATER AT TIME OF DRILLING --- not encountered
LOGGED BY R. Briseno **CHECKED BY** D. Burger
GROUNDWATER AT END OF DRILLING --- N/A
HAMMER TYPE 140 lb hammer with 30 in. cathead
GROUNDWATER AFTER DRILLING --- N/A

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (FIELD VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTIC LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	FINES CONTENT (%)
0		ASPHALT									
		3 in. POORLY GRADED GRAVEL (GP) (AGGREGATE BASE)									
		LEAN to FAT CLAY with SILT and GRAVEL (CL-CH), mottled black with brown, moist, hard, angular gravel up to 1 in., siltstone rock fragments, iron stained (ARTIFICIAL FILL)									
1			CM	40-26-22		118	10				
2		Increased very fine to fine sand, caliche stringers at 2.5 ft.									
3			SPT	11-22-20							

Bottom of borehole at 3.5 ft. Borehole backfilled with grout.

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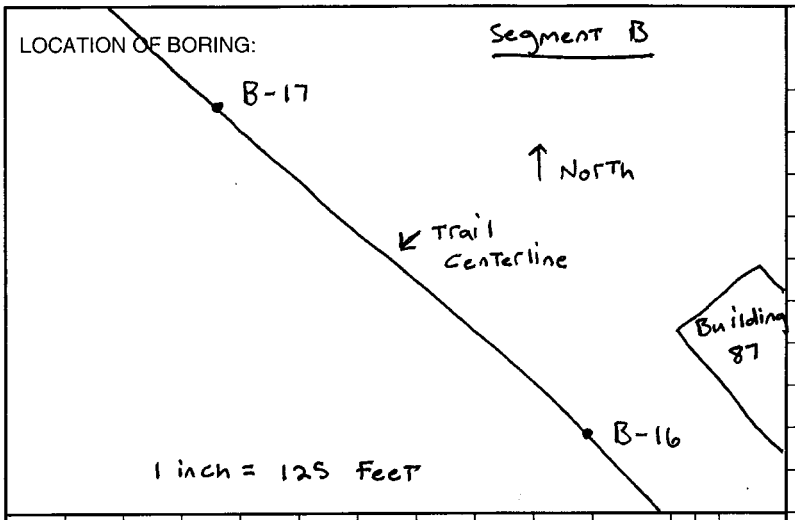
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-17
JOB NO.: 567.04.55	TOTAL DEPTH: 24-inches
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: California GeoTech Services, LLC	EDITED BY:
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: Cal. Modified	
HAMMER WT.: 140 lbs	DROP:
STARTED, TIME: 0830 hours	DATE: 3/9/16
COMPLETED, TIME: 0859 hours	DATE: 3/9/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		11	18"	14"						1			
		22 20								2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Asphalt - 3"

Baserock - 2" (Silty Gravel (GM) - very dark grayish brown (10YR3/2); fine rounded gravel; trace non-plastic fines and fine sand; moist.

Silty Clay with Gravel (CL-ML) - brown (7.5YR 5/3); 50% low plastic fines; 30% non-plastic fines; 20% fine rounded gravel; hard; moist.

B-17-0.5 was collected at 0843 hours.

B-17-1.5 was collected at 0846 hours.

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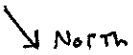
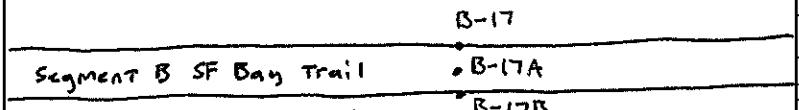
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:





PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-17A
JOB NO.: 567.04.55	TOTAL DEPTH: 2- Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1200 hours	DATE: 5/31/16
COMPLETED, TIME: 1205 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG	
			24	16						0				Asphalt (3-inches) Baserock (2-inches)
										1				Silty clay with Gravel (CL-ML) - brown (7.5YR5/3); 90% non-plastic to low plastic Fines; 20% Fine rounded gravel; hard; moist.
										2				
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										10				

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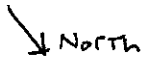
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



B-17

Segment B SF Bay Trail • B-17A

• B-17B

"B" 68+50 To "B" 73+50

Drawing C13

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-17B
JOB NO.: 567.04.55	TOTAL DEPTH: 2-Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1156 hours	DATE: 5/31/16
COMPLETED, TIME: 1200 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	16						0			

0.25 Asphalt (3-inches)
Baserock (2-inches)

Silty clay with Gravel (CL-ML) - brown (7.5YR 5/3), 80% non-plastic to low plastic fines; 20% fine rounded gravel; hard; moist.

1
2
3
4
5
6
7
8
9
10

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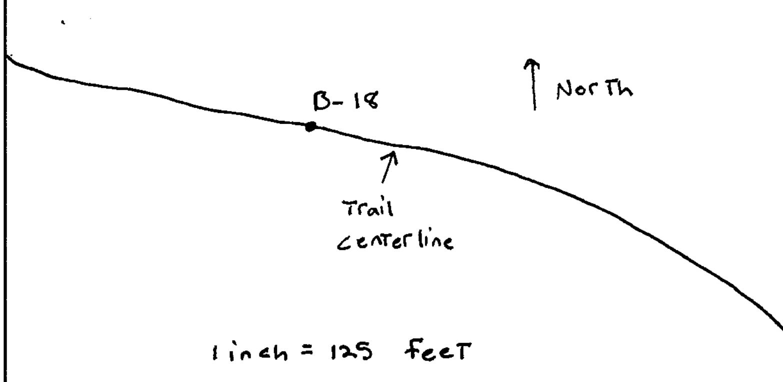
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING: Segment B



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-18
	TOTAL DEPTH: 24-inches
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: California GeoTech Services, LLC	
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 0910 hours	DATE: 3/9/16
COMPLETED, TIME: 0930 hours	DATE: 3/9/16

BORING DEPTH (ft.)			
CASING DEPTH (ft.)			
WATER DEPTH (ft.)			
TIME:			
DATE:			

BACKFILLED, TIME: DATE: BY:

SURFACE ELEV.: DATUM:

CONDITIONS:

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG	DESCRIPTION
		18	18"	17"									//////	Silty clay with Gravel (CL-ML) - brown (7.5YR5/3); 40% low plastic fines; 30% non-plastic fines; 30% fine rounded gravel; hard; wet.
		19								1			//////	
		42											//////	
										2				
										3				
										4				
										5				B-18-0.5 was collected at 0924 hours. B-18-1.5 was collected at 0929 hours.
										6				
										7				
										8				
										9				
										10				

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BORING NUMBER B-19

CLIENT Subconsultant to NCE for EBRPD
PROJECT NAME SF Bay Trail at Point Molate
PROJECT NUMBER 151190
PROJECT LOCATION Richmond, CA
DATE STARTED 3/9/2016 **COMPLETED** 3/9/2016
GROUND ELEVATION 23 ft **DATUM** NAVD88 **HOLE SIZE** 4 in.
DRILLING CONTRACTOR California Geotech
COORDINATES: **LATITUDE** 37.946267 **LONGITUDE** -122.416632
DRILLING RIG/METHOD Moble B-24/4-in. Solid Flight Auger
GROUNDWATER AT TIME OF DRILLING --- not encountered
LOGGED BY R. Briseno **CHECKED BY** D. Burger
GROUNDWATER AT END OF DRILLING --- N/A
HAMMER TYPE 140 lb hammer with 30 in. cathead
GROUNDWATER AFTER DRILLING --- N/A

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (FIELD VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTIC LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	FINES CONTENT (%)
0		POORLY GRADED GRAVEL (GP) (AGGREGATE BASE)									
1		GRAVELLY LEAN CLAY with SAND (CL) and SILTY GRAVEL with SAND (GM), mottled brown with gray, dry to moist, hard and dense, sandstone rock fragments, very fine sand, gravel up to 1/2 in. (ARTIFICIAL FILL)	CM	24-25-24		123	10				
2											
3		Increase size of gravel and percentage of sandstone rock fragments	SPT	9-8-5							

Bottom of borehole at 3.5 ft. Borehole backfilled with grout.

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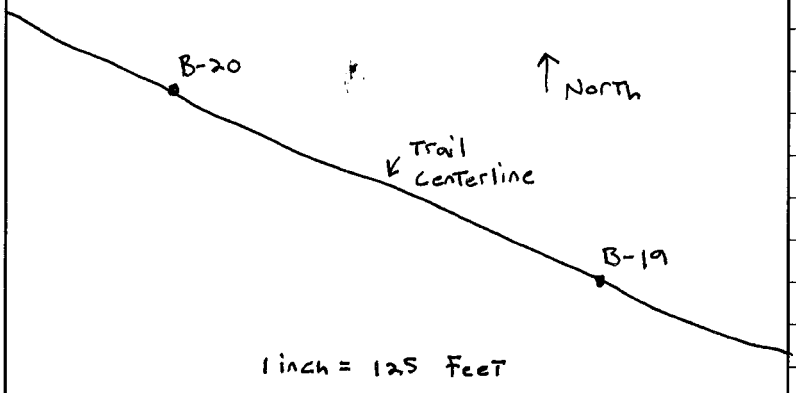
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING: Segment B



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-19
JOB NO.: 567.04.55	TOTAL DEPTH: 24-inches
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: California GeoTech Services, LLC	EDITED BY:
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: Cal. Mod.	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 0934 hours	DATE: 3/9/16
COMPLETED, TIME: 1000 hours	DATE: 3/9/16

BORING DEPTH (ft.)			
CASING DEPTH (ft.)			
WATER DEPTH (ft.)			
TIME:			
DATE:			

BACKFILLED, TIME: DATE: BY:

SURFACE ELEV.: DATUM:

CONDITIONS:

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		[redacted]	[redacted]	[redacted]									
		10	18"	15"						1			
		11											
		30								2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Silty Gravel (GM) - very dark grayish brown (10YR 3/2); 80% Fine rounded gravel; 20% non-plastic to low plastic fines; hard; wet. 5"

Silty clay with Gravel (CL-ML) - brown (7.5YR 5/3); 50% low plastic fines; 30% non-plastic fines; 20% Fine rounded gravel; hard; moist.

B-19-0.5 was collected at 0956 hours.

B-19-1.5 was collected at 0959 hours.

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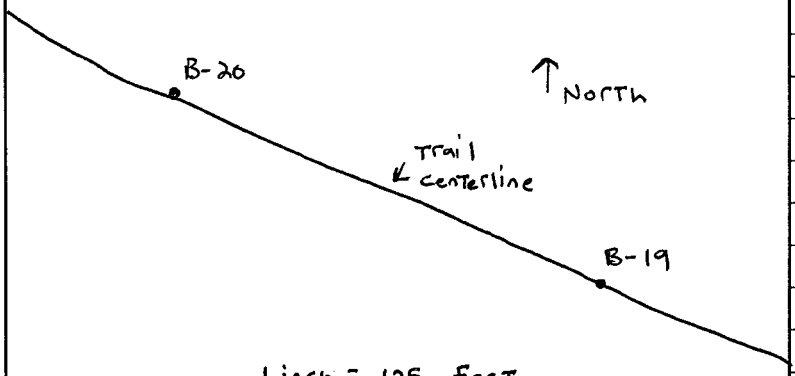
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING: Segment B



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-20
	TOTAL DEPTH: 24- inches
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: California GeoTech Services, LLC	
DRILL RIG TYPE: Truck mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1000 hours	DATE: 3/9/16
COMPLETED, TIME: 1030 hours	DATE: 3/9/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		[illegible] [illegible] 16								1			Asphalt-3" Base[illegible] Silty clay with Gravel (CL/ML) - brown (7.5YR3/3), 50%, low plastic fines, 30% non-plastic fines, 20% fine rounded gravel, hard, moist.
		36 [illegible] 20								2			Sandstone
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Sandstone was encountered at one foot bgs.

B-20-0.3 was collected at 1026 hours.

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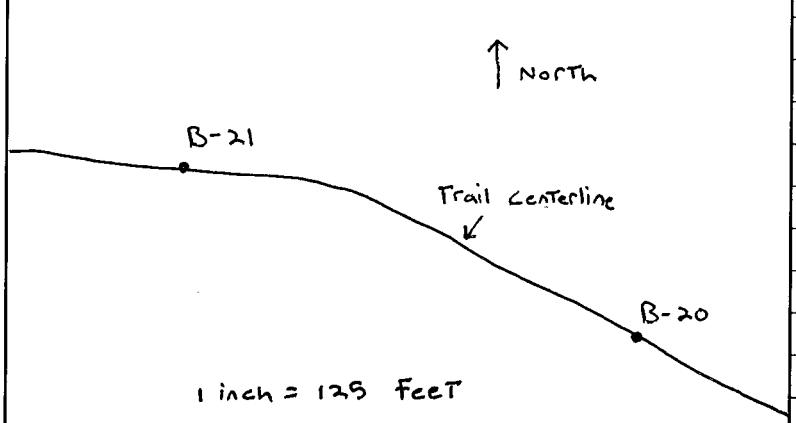
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING: Segment B



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-21
	TOTAL DEPTH: 24-inches
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: B. Shafer	EDITED BY:
DRILLING CONTRACTOR: California Geotech Services, LLC	
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1036 hours	DATE: 3/9/16
COMPLETED, TIME: 1100 hours	DATE: 3/9/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		11	18"	16"						1			
		18											
		26								2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Silty Gravel (GM) – very dark grayish brown (10YR3/2); 80%. fine rounded gravel; 20%. non-plastic Fines; hard; wet. Plant roots observed from ground surface to about six inches bgs.

B-21-0.5 was collected at 1045 hours.

B-21-1.5 was collected at 1048 hours.

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BORING NUMBER B-22

CLIENT Subconsultant to NCE for EBRPD
PROJECT NAME SF Bay Trail at Point Molate
PROJECT NUMBER 151190
PROJECT LOCATION Richmond, CA
DATE STARTED 3/9/2016 **COMPLETED** 3/9/2016
GROUND ELEVATION 21 ft **DATUM** NAVD88 **HOLE SIZE** 4 in.
DRILLING CONTRACTOR California Geotech
COORDINATES: **LATITUDE** 37.947179 **LONGITUDE** -122.419665
DRILLING RIG/METHOD Moble B-24/4-in. Solid Flight Auger
GROUNDWATER AT TIME OF DRILLING --- not encountered
LOGGED BY R. Briseno **CHECKED BY** D. Burger
GROUNDWATER AT END OF DRILLING --- N/A
HAMMER TYPE 140 lb hammer with 30 in. cathead
GROUNDWATER AFTER DRILLING --- N/A

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (FIELD VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTIC LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	FINES CONTENT (%)
0		Crushed rock (RAILROAD BALAST)									
		SANDSTONE, brown, dry to moist, hard rock, very severely weathered, fine sand, micaceous (BEDROCK)									
1			CM	38-50/2"							
2			SPT	9-6-6							
3											

Bottom of borehole at 3.2 ft. Borehole backfilled with grout.

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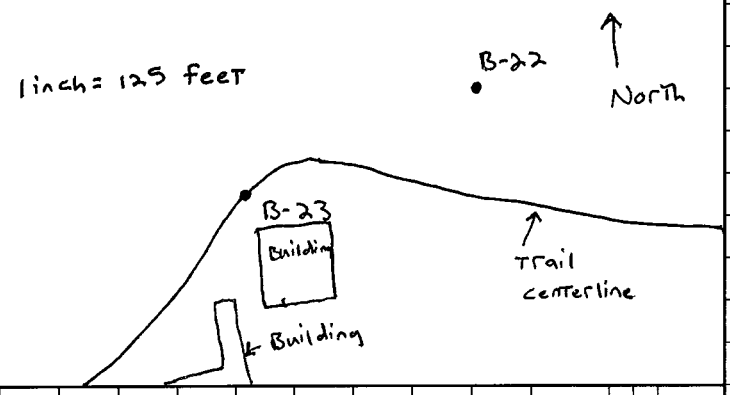
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING: Segment B (Drum lot #1)



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-22
	TOTAL DEPTH: 24-inches
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: California GeoTech Services, LLC	
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1101 hours	DATE: 3/9/16
COMPLETED, TIME: 1120 hours	DATE: 3/9/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		34	18"	15"						0			
		31											
		37								1			sand-stone
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Silty Gravel (GM) - very dark grayish brown (10YR 3/2); 80% fine rounded gravel; 20% non-plastic fines; hard; wet.

Sandstone was encountered at a depth of approximately 10-inches bgs.

B-22-0.4 was collected at 1109 hours.

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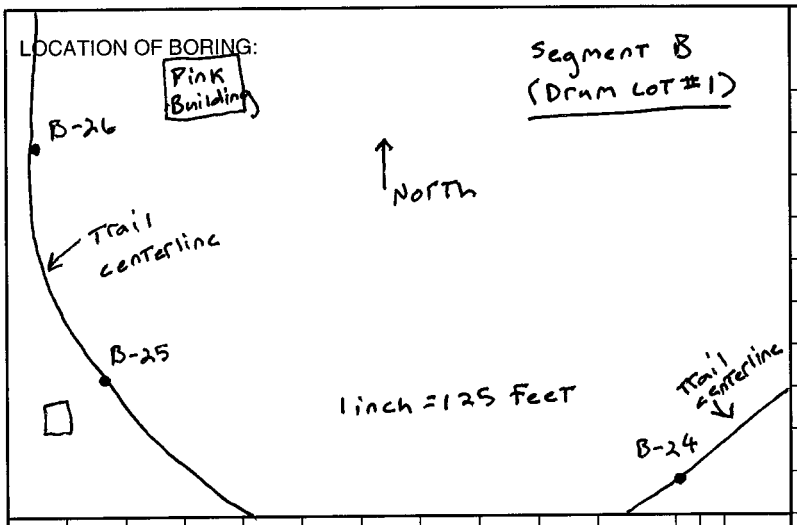
FIELD LOG OF BORING

Sheet 1 of 1



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-24
JOB NO.: 567.04.55	TOTAL DEPTH: 24-inches
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: California GeoTech Services, LLC	EDITED BY:
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1411 hours	DATE: 3/9/16
COMPLETED, TIME: 1440 hours	DATE: 3/9/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE	DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		40								
		~~40~~ 40	18"	14"			1			Sand-stone
		~~50~~ 30								
		32					2			
							3			
							4			
							5			
							6			
							7			
							8			
							9			
							10			

~~Asphalt - 3"~~
~~2" Poorly Graded Sand with Gravel (SP) - very dark gray (10YR3/1); 70% fine sand, 30% fine gravel; very dense, moist.~~

Sandstone was encountered at a depth of approximately 5-inches bgs.

B-24-0.3 was collected at 1429 hours.

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BORING NUMBER B-25

CLIENT Subconsultant to NCE for EBRPD
PROJECT NAME SF Bay Trail at Point Molate
PROJECT NUMBER 151190
PROJECT LOCATION Richmond, CA
DATE STARTED 3/9/2016 **COMPLETED** 3/9/2016
GROUND ELEVATION 17 ft **DATUM** NAVD88 **HOLE SIZE** 4 in.
DRILLING CONTRACTOR California Geotech
COORDINATES: **LATITUDE** 37.946765 **LONGITUDE** -122.421944
DRILLING RIG/METHOD Moble B-24/4-in. Solid Flight Auger
GROUNDWATER AT TIME OF DRILLING --- not encountered
LOGGED BY R. Briseno **CHECKED BY** D. Burger
GROUNDWATER AT END OF DRILLING --- N/A
HAMMER TYPE 140 lb hammer with 30 in. cathead
GROUNDWATER AFTER DRILLING --- N/A

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (FIELD VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTIC LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	FINES CONTENT (%)
0											
1		R-value = 25									
			CM	15-19-18		117	7				
2		WELL GRADED GRAVEL with SAND and SILT (GW-SM), brown, moist, medium dense, very fine sand, sandstone rock fragments, angular gravel up to 3/4 in., iron stained (ARTIFICIAL FILL)									
3		WELL GRADED SAND with SILT and GRAVEL (SW-SM), medium dense	SPT	5-7-8							
4											

Bottom of borehole at 4.0 ft. Borehole backfilled with grout.

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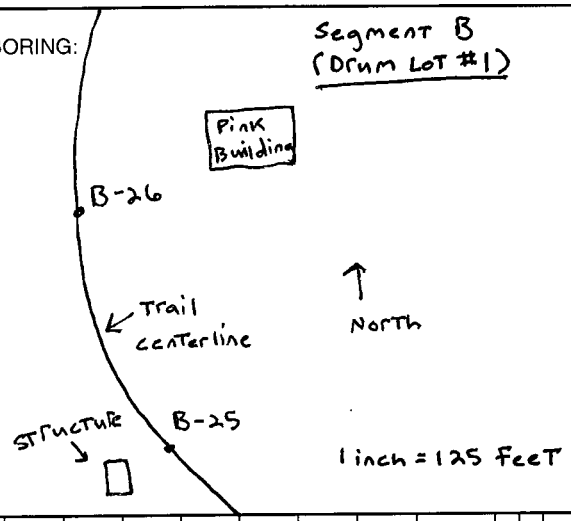
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-25
JOB NO.: 567.04.55	TOTAL DEPTH: 24-inches
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: California Geotech Services, LLC	EDITED BY:
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1335 hours	DATE: 3/9/16
COMPLETED, TIME: 1400 hours	DATE: 3/9/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME: DATE: BY:	
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE	DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		4 12 25	15"	12"			1			
		25 19					2			
							3			
							4			
							5			
							6			
							7			
							8			
							9			
							10			

Poorly Graded Gravel with Sand (GP) - very dark gray (10YR3/1); 55% fine rounded gravel; 45% fine to medium sand.

Silty Gravel with Sand (GM) - brown (7.5YR5/3); 50% fine rounded gravel; 30% non-plastic fines; 20% fine sand; dense; wet.

B-25-0.5 was collected at 1354 hours.

B-25-1.5 was collected at 1358 hours.

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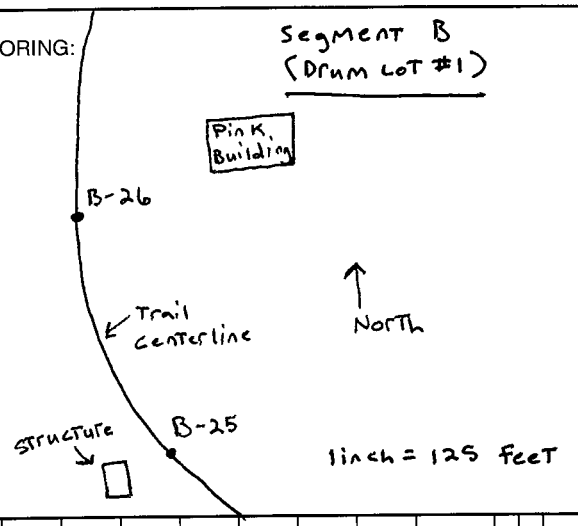
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-26
	TOTAL DEPTH: 24-inches
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: California GeoTech Services, LLC	
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1313 hours	DATE: 3/9/16
COMPLETED, TIME: 1340 hours	DATE: 3/9/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME: DATE: BY:	
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE	DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		30 50 for 6"	12"	7"			1			Sand-stone

Silty Gravel (Fm) - ~~brown~~ brown (7.5YR5/3); 70% Fine rounded gravel; 20% non-plastic Fines; 10% fine sand; very dense; wet.

Sandstone was encountered at a depth of approximately 12-inches bgs.

B-26-0.5 was collected at 1329 hours.

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BORING NUMBER B-27

CLIENT Subconsultant to NCE for EBRPD
PROJECT NAME SF Bay Trail at Point Molate
PROJECT NUMBER 151190
PROJECT LOCATION Richmond, CA
DATE STARTED 3/9/2016 **COMPLETED** 3/9/2016
GROUND ELEVATION 16 ft **DATUM** NAVD88 **HOLE SIZE** 4 in.
DRILLING CONTRACTOR California Geotech
COORDINATES: **LATITUDE** 37.947989 **LONGITUDE** -122.421672
DRILLING RIG/METHOD Moble B-24/4-in. Solid Flight Auger
GROUNDWATER AT TIME OF DRILLING --- not encountered
LOGGED BY R. Briseno **CHECKED BY** D. Burger
GROUNDWATER AT END OF DRILLING --- N/A
HAMMER TYPE 140 lb hammer with 30 in. cathead
GROUNDWATER AFTER DRILLING --- N/A

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (FIELD VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTIC LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	FINES CONTENT (%)
0											
1		WELL GRADED GRAVEL with SAND and SILT (GW-GM), brown, moist, medium dense, very fine sand, sandstone and siltsone rock fragments, rounded gravel, iron stained (ARTIFICIAL FILL)	CM	10-18-17		115	8				
2		R-value = 77									
3		CLAYEY GRAVEL with SAND (GC)	SPT	9-8-8							
4											

Bottom of borehole at 4.0 ft. Borehole backfilled with grout.

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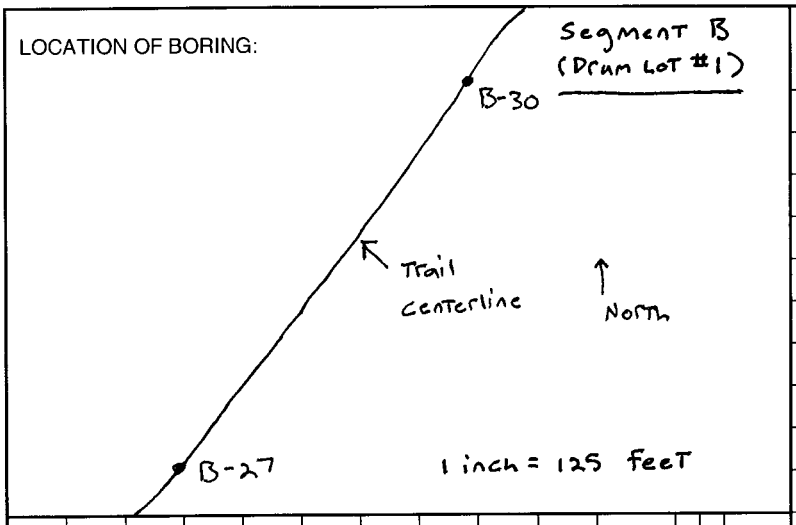
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-27
JOB NO.: 567.04.55	TOTAL DEPTH: 24 - inches
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: California GeoTech Services, LLC	EDITED BY:
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1242 hours	DATE: 3/9/16
COMPLETED, TIME: 1310 hours	DATE: 3/9/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		15											
	16	18	18"	18"						1			
	18	14								2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Silty Gravel with Sand (GM) - brown (7.5YR5/3); 50% Fine rounded gravel; 30% non-plastic fines; 20% Fine sand; dense; wet.

B-27-0.5 was collected at 1255 hours.

B-27-1.5 was collected at 1258 hours.

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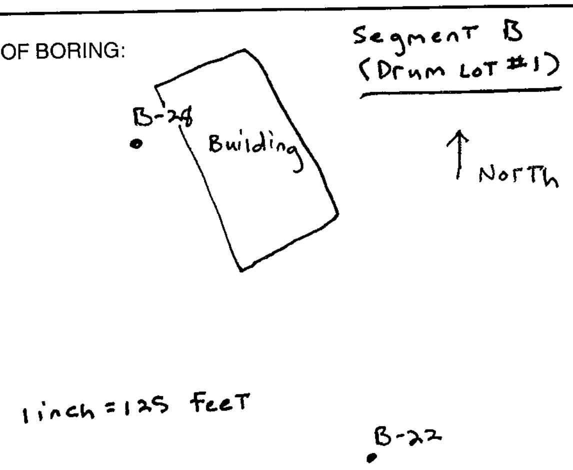
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-28
	TOTAL DEPTH: 24-inches
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: California GeoTech Services, LLC	
DRILL RIG TYPE: Truck mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1130 hours	DATE: 3/9/16
COMPLETED, TIME: 1150 hours	DATE: 3/9/16

BORING DEPTH (ft.)			
CASING DEPTH (ft.)			
WATER DEPTH (ft.)			
TIME:			
DATE:			

BACKFILLED, TIME: DATE: BY:

SURFACE ELEV.: DATUM:

CONDITIONS:

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG	
		20 23 50 for 5"	17.5	10"									Sand-stone	Silty Gravel (GM) - very dark grayish brown (10YR 3/2); 80% fine rounded gravel; 20% non-plastic fines; hard; wet. Sandstone was encountered at a depth of approximately six inches bgs.
										1				
										2				
										3				B-28-0.3 was collected at 1144 hours.
										4				
										5				
										6				
										7				
										8				
										9				
										10				

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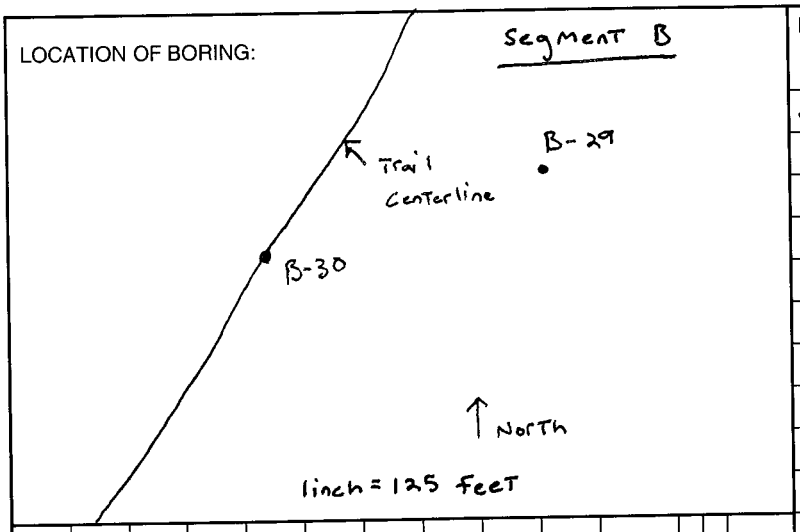
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-29
	TOTAL DEPTH: 24-inches
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: California GeoTech Services, LLC	
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: chris veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1150 hours	DATE: 3/9/16
COMPLETED, TIME: 1215 hours	DATE: 3/9/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		31	18"	14"									
		30								1			sand-stone
		39											
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Silty Gravel (GM) - very dark grayish brown (10YR3/2); 80% fine rounded gravel; 20% non-plastic to low plastic fines; hard, wet. Sandstone was encountered at a depth of approximately six inches bgs.

B-29-0 was collected at 1212 hours

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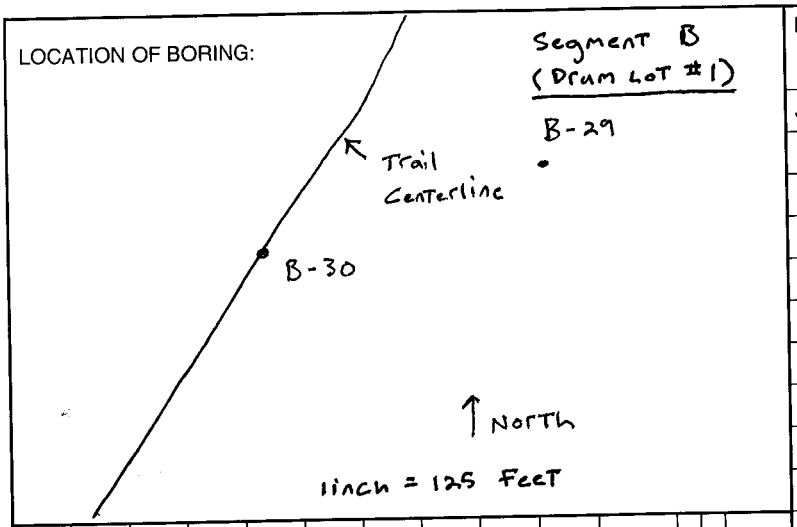
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-30
	TOTAL DEPTH: 24-inches
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: California GeoTech Services, LLC	
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1218 hours	DATE: 3/9/16
COMPLETED, TIME: 1240 hours	DATE: 3/9/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		4 6 7 8	18"	18"						1 2 3 4 5 6 7 8 9 10			

Silty Gravel (FM) - brown (7.5YR5/3); 70% fine rounded gravel; 30% non-plastic to low plastic fines; medium dense; wet.

B-30-0.2 was collected at 1233 hours.

B-30-1.5 was collected at 1237 hours.

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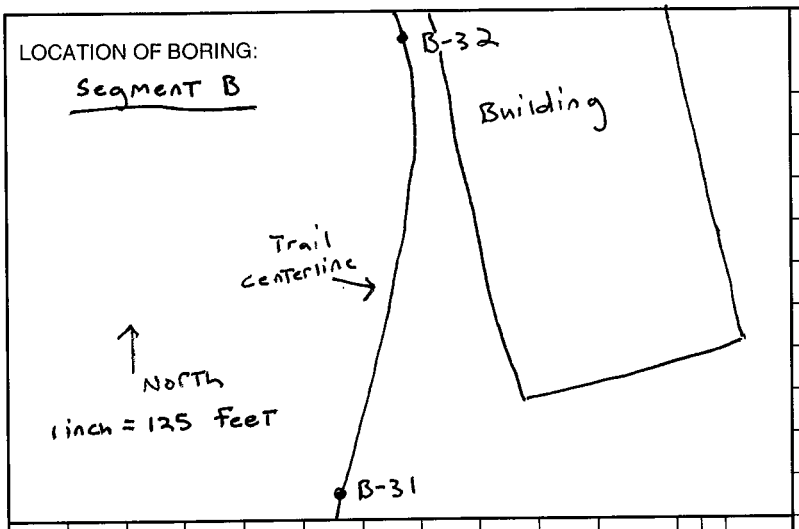
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING: Segment B



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-31
JOB NO.: 567.04.55	TOTAL DEPTH: 24-inches
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: California GeoTech Services, LLC	EDITED BY:
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1510 hours	DATE: 3/9/16
COMPLETED, TIME: 1530 hours	DATE: 3/9/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		16 33 35	18"	14"						1 2 3 4 5 6 7 8 9 10			

3"

Silty sand (SM) - very dark gray (10YR3/1); 30% non-plastic fines and organic matter; 20% fine sand; very dense; wet.

Silty Gravel with sand (GM) - brown (7.5YR5/3); 50% fine rounded gravel; 30% non-plastic fines; 20% fine sand; very dense; wet.

B-31-0.5 was collected at 1515 hours.

B-31-1.5 was collected at 1520 hours.

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BORING NUMBER B-32

CLIENT Subconsultant to NCE for EBRPD
PROJECT NAME SF Bay Trail at Point Molate
PROJECT NUMBER 151190
PROJECT LOCATION Richmond, CA
DATE STARTED 3/9/2016 **COMPLETED** 3/9/2016
GROUND ELEVATION 22 ft **DATUM** NAVD88 **HOLE SIZE** 4 in.
DRILLING CONTRACTOR California Geotech
COORDINATES: **LATITUDE** 37.952063 **LONGITUDE** -122.418113
DRILLING RIG/METHOD Moble B-24/4-in. Solid Flight Auger
GROUNDWATER AT TIME OF DRILLING --- not encountered
LOGGED BY R. Briseno **CHECKED BY** D. Burger
GROUNDWATER AT END OF DRILLING --- N/A
HAMMER TYPE 140 lb hammer with 30 in. cathead
GROUNDWATER AFTER DRILLING --- N/A

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (FIELD VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTIC LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	FINES CONTENT (%)
0		POORLY GRADED GRAVEL (GP) (AGGREGATE BASE)									
1		No recovery of sample between 1 ft. and 2.5 ft., loose	CM	9-6-6							
2											
3		WELL GRADED GRAVEL with SAND (GW), gravel up to 1 in., loose, very fine sand, gravel subangular to angular (ARTIFICIAL FILL)	SPT	3-3-4							
4											

Bottom of borehole at 4.0 ft. Borehole backfilled with grout.

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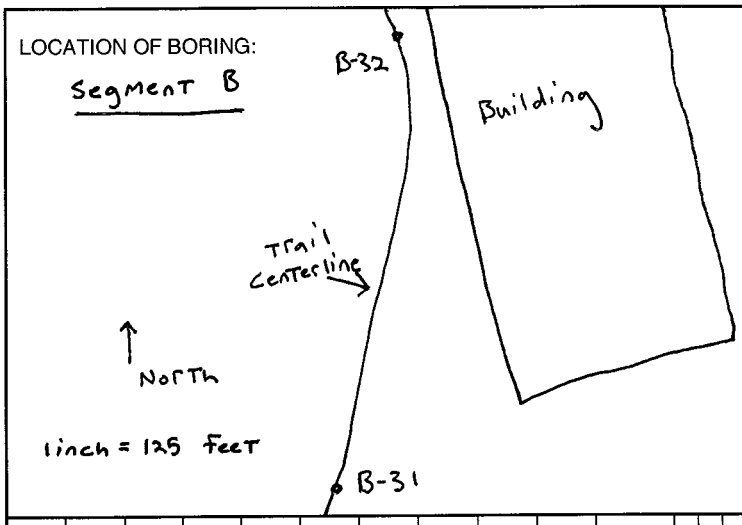
FIELD LOG OF BORING

Sheet 1 of 1



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-32
	TOTAL DEPTH: 24-inches
JOB NO.: 567-04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: California GeoTech Services, LLC	
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1533 hours	DATE: 3/9/16
COMPLETED, TIME: 1550 hours	DATE: 3/9/16

BORING DEPTH (ft.)				
CASING DEPTH (ft.)				
WATER DEPTH (ft.)				
TIME:				
DATE:				

BACKFILLED, TIME: DATE: BY:

SURFACE ELEV.: DATUM:

CONDITIONS:

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		12	18"	5"						1			
		10											
		9								2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

2.5" Asphalt
Poorly Graded Gravel with Sand (GP) - very dark gray (10YR3/1); 80% Fine subrounded gravel; 20% Fine to medium sand; medium dense; moist.

B-32 - 1.5 was collected at 1540 hours.

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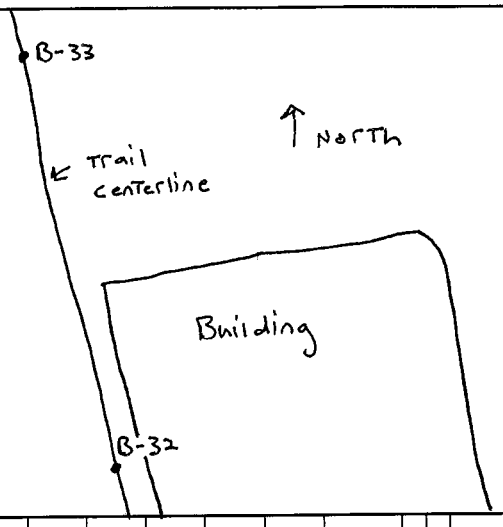
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING: Segment B



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-33
	TOTAL DEPTH: 24-inches
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: California FeoTech Services, LLC	
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: Sample was collected from drill cuttings.	
HAMMER WT.: N/A	DROP:
STARTED, TIME: 1610 hours	DATE: 3/9/16
COMPLETED, TIME: 1630 hours	DATE: 3/9/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
										1			P
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Sandy SILT (ML) - brown (7.5YR5/3); ~80% non-plastic fines; 20% Fine sand; moist. Asphalt layer encountered at approximately one-foot bgs.

B-33-0.2 was collected at 1623 hours.

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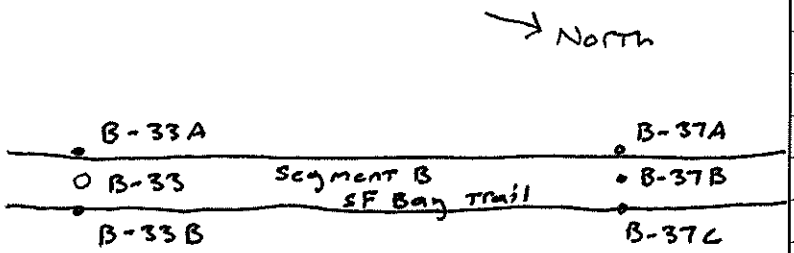
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 128+50 To "B" 133+50
Drawing C25

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-33A
	TOTAL DEPTH: 2-Feet
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1031 hours	DATE: 5/31/16
COMPLETED, TIME: 1040 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	18						0			
										1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Asphalt (one inch)

Silt with sand (ML) - brown (7.5YR5/3); 80% non-plastic fines; 15% fine sand; 5% fine rounded gravel; soft to medium stiff; dry.

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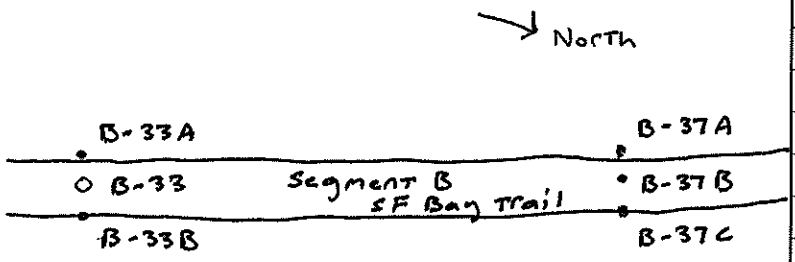
FIELD LOG OF BORING

Sheet _____ of _____

LOCATION OF BORING:



"B" 128+50 to "B" 133+50

Drawing C25

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-33B
	TOTAL DEPTH: 2-Feet
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous core	
HAMMER WT.:	DROP:
STARTED, TIME: 1025 hours	DATE: 5/31/16
COMPLETED, TIME: 1030 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	18						0			
										1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

silt with Sand (ML) - brown (7.5YR 5/3); 85% non-plastic fines; 15% fine Sand; soft to medium stiff; dry.

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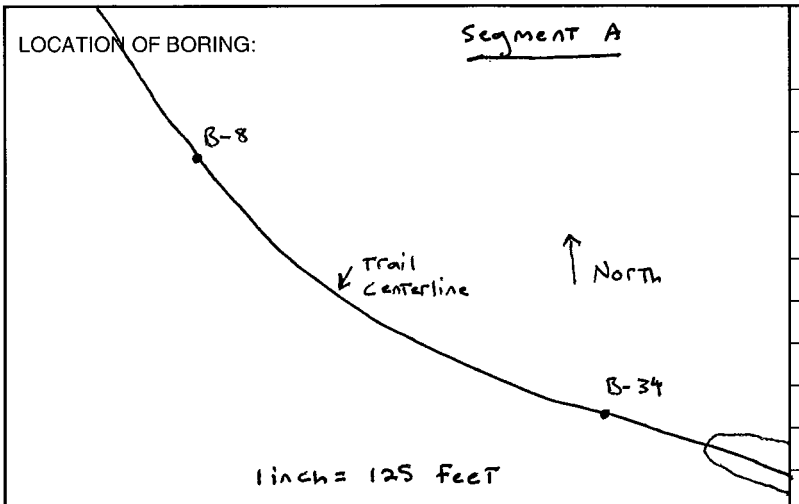
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-34
JOB NO.: 567.04.55	TOTAL DEPTH: 12-inches
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: California GeoTech Services, LLC	EDITED BY:
DRILL RIG TYPE: Truck mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1321 hours	DATE: 3/8/16
COMPLETED, TIME: 1350 hours	DATE: 3/8/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		47 50 for 3"	9"	9"						0 1 2 3 4 5 6 7 8 9 10			

Asphalt = 2.5"

Silty sand (SM) - brown (7.5YR4/2); 70%. Fine sand; 15% non-plastic fines; 5% fine rounded gravel; very dense; moist.

Bedrock was encountered at around 10- to 11-inches below the ground surface.

B-34-0.5 was collected at 1341 hours.

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CAL ENGINEERING & GEOLOGY

BORING NUMBER B-35

CLIENT Subconsultant to NCE for EBRPD
PROJECT NAME SF Bay Trail at Point Molate
PROJECT NUMBER 151190
PROJECT LOCATION Richmond, CA
DATE STARTED 3/10/2016 **COMPLETED** 3/10/2016
GROUND ELEVATION 22 ft **DATUM** NAVD88 **HOLE SIZE** 4 in.
DRILLING CONTRACTOR California Geotech
COORDINATES: **LATITUDE** 37.938922 **LONGITUDE** -122.410463
DRILLING RIG/METHOD Superman, indoor outdoor access
GROUNDWATER AT TIME OF DRILLING --- not encountered
LOGGED BY R. Briseno **CHECKED BY** D. Burger
GROUNDWATER AT END OF DRILLING --- N/A
HAMMER TYPE 140 lb hammer with 30 in. cathead
GROUNDWATER AFTER DRILLING --- N/A

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (FIELD VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTIC LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	FINES CONTENT (%)
0		POORLY GRADED GRAVEL (GP) up to 2 in. (AGGREGATE BASE)									
		SANDY SILT with GRAVEL (ML), olive gray, wet, soft (ARTIFICIAL FILL)									
1			CM	7-14-50/3"							
		SANDSTONE, brown, moist, hard, intensely weathered (BEDROCK)				124	11				

Bottom of borehole at 1.9 ft. Borehole backfilled with grout.

NCE
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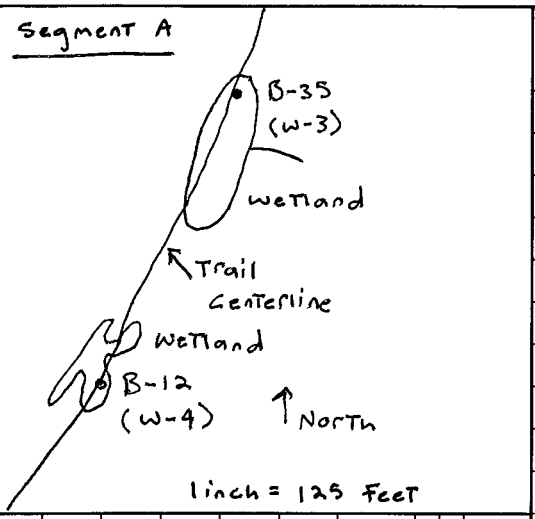
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING: Segment A



PROJECT: # EBRPD SF Bay Trail	BORING NO.: B-35
JOB NO.: 567.04.55	TOTAL DEPTH: 24-inches
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: California GeoTech Services, LLC	EDITED BY:
DRILL RIG TYPE: Superman	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1200 hours	DATE: 3/10/16
COMPLETED, TIME: 1254 hours	DATE: 3/10/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE	DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		18	18"	14"			1			
		14								
		36					2			Sand-stone
							3			
							4			
							5			
							6			
							7			
							8			
							9			
							10			

10" Poorly Graded Gravel (GM) - very dark gray (10YR3/1); predominantly fine rounded gravel up to two inches in length; Trace amounts of non-plastic fines and fine sand; medium dense, wet.

Clayey Silt with Sand (ML-CL) - grayish brown (10YR5/2); 45% non-plastic fines; 40% low plastic fines; hard; wet.

Sandstone was encountered at approximately 16-inches bgs.

B-35-0.8 was collected at 1244 hours.

B-35-1.5 was collected at 1249 hours.

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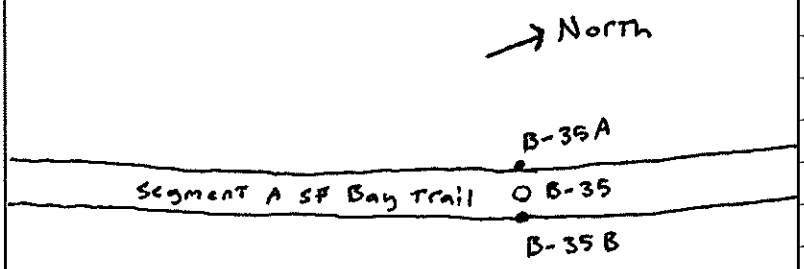
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 48+50 To "B" 53+50
Drawing C9

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-35A
JOB NO.: 567.04.55	TOTAL DEPTH: 15-inches
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE:	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Hand Auger	
HAMMER WT.:	DROP:
STARTED, TIME: 0952 hours	DATE: 6/1/16
COMPLETED, TIME: 1000 hours	DATE: 6/1/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER SAMPLE RECOVERY	GRAPHIC LOG
										1		
										2		
										3		
										4		
										5		
										6		
										7		
										8		
										9		
										10		

Poorly Graded Gravel (GP) - very dark gray (10YR3/1); predominantly fine rounded gravel; Trace amounts of non-plastic fines; dry.

Lean clay (CL) - grayish brown (10YR5/2); predominantly low plastic fines; stiff; moist.

Bedrock was encountered at approximately 15-inches bgs.

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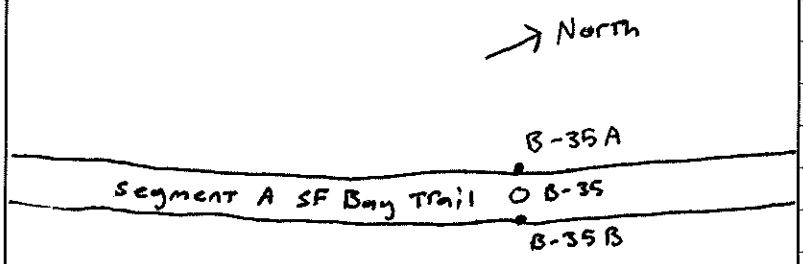
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 48+50 To "B" 53+50
Drawing C9

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-35B
	TOTAL DEPTH: 15-inches
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE:	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Hand Auger	
HAMMER WT.:	DROP:
STARTED, TIME: 0944 hours	DATE: 6/1/16
COMPLETED, TIME: 0951 hours	DATE: 6/1/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
										1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

(8-inches) Poorly Graded Gravel (GM) - very dark gray (10YR3/1); predominantly fine rounded gravel; trace amounts of non-plastic fines; dry.

Lean clay (CL) - grayish brown (10YR5/2); predominantly low plastic fines; stiff; moist.

Bedrock was encountered at approximately 15-inches bgs.

CE&G
CAL ENGINEERING & GEOLOGY

BORING NUMBER B-36

CLIENT Subconsultant to NCE for EBRPD
PROJECT NAME SF Bay Trail at Point Molate
PROJECT NUMBER 151190
PROJECT LOCATION Richmond, CA
DATE STARTED 3/9/2016 **COMPLETED** 3/9/2016
GROUND ELEVATION 33 ft **DATUM** NAVD88 **HOLE SIZE** 4 in.
DRILLING CONTRACTOR California Geotech
COORDINATES: **LATITUDE** 37.953564 **LONGITUDE** -122.418673
DRILLING RIG/METHOD Moble B-24/4-in. Solid Flight Auger
GROUNDWATER AT TIME OF DRILLING --- not encountered
LOGGED BY R. Briseno **CHECKED BY** D. Burger
GROUNDWATER AT END OF DRILLING --- N/A
HAMMER TYPE 140 lb hammer with 30 in. cathead
GROUNDWATER AFTER DRILLING --- N/A

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (FIELD VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTIC LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	FINES CONTENT (%)
0		ELASTIC SILT (MH), strong brown, moist, firm, some iron stains (ARTIFICIAL FILL)									
1											
2		SANDY SILT with GRAVEL (ML), strong brown mottled with light brown, inconsistent color, moist, medium dense, iron stained, subangular pieces of chert, crushed sandstone with clay	CM	12-12-12		113	14				
3		SANDSTONE, yellowish brown to tan, dry, friable, very severely weathered, poorly cemented (BEDROCK)	SPT	25-36-50							
4											

Bottom of borehole at 4.0 ft. Borehole backfilled with grout.

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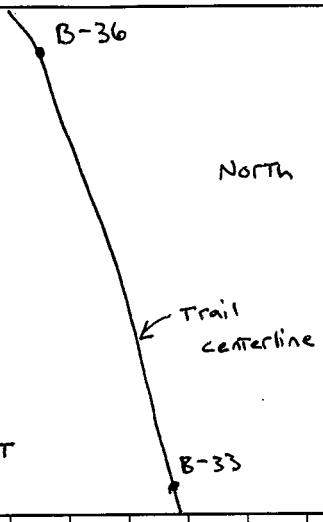
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING: Segment B



PROJECT: EBRPD SF Bay Trail	BORING NO.: B-36
	TOTAL DEPTH: 24-inches
JOB NO.: 567.09.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: California GeoTech Services, LLC	
DRILL RIG TYPE: Truck Mounted B-24	
DRILLER'S NAME: Chris Veni	
SAMPLING METHODS: California Modified	
HAMMER WT.: 140 pounds	DROP:
STARTED, TIME: 1645 hours	DATE: 3/9/16
COMPLETED, TIME: 1700 hours	DATE: 3/9/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
		4											
		4	18"	18"						1			
		6											
		12								2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

3" silty Gravel (GM) - brown (7.5YR5/3); 70% fine rounded gravel; 30% non-plastic fines; wet.

12" clayey Gravel (GC) - same as above except clay instead of silt.

Sandstone

3" silty Gravel (GM) - yellowish brown (10YR 5/6); 40% non-plastic fines; 40% fine rounded gravel; medium dense; moist.

Sandstone was encountered at approximately 18-inches bgs.

B-36-0.5 was collected at 1646 hours.

B-36-1.5 was collected at 1653 hours.

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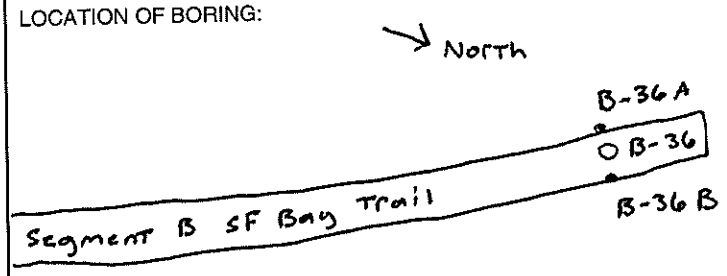
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 128+50 To "B" 133+50

Drawing C25

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-36A
JOB NO.: 567.04.55	TOTAL DEPTH: 2- Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 0959 hours	DATE: 5/31/16
COMPLETED, TIME: 0959 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	24						1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Silty Gravel (GM) - brown (7.5YR5/3); 30% non-plastic fines; 70% fine rounded gravel; medium dense; dry. Bedrock was encountered at approximately 18-inches bgs.

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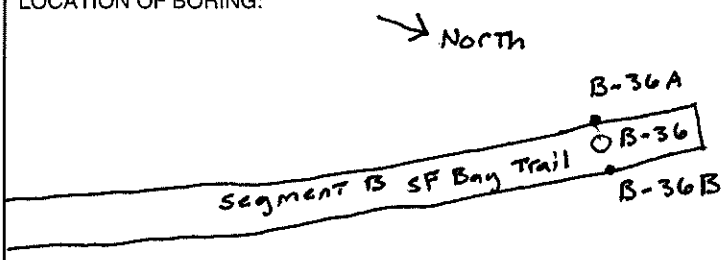
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 128+50 To "B" 133+50
Drawing C25

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-36B
	TOTAL DEPTH: 2-Feet
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 0945 hours	DATE: 5/31/16
COMPLETED, TIME: 0955 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	18" MB						1			SS
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Silty Gravel (GM) - brown (7.5YR 5/3); 70% fine rounded gravel; 30% non-plastic fines; medium dense; dry. Bedrock was encountered at approximately 18-inches bgs.

NCE 8795 Folsom Blvd, Ste 250 Sacramento, CA 95826
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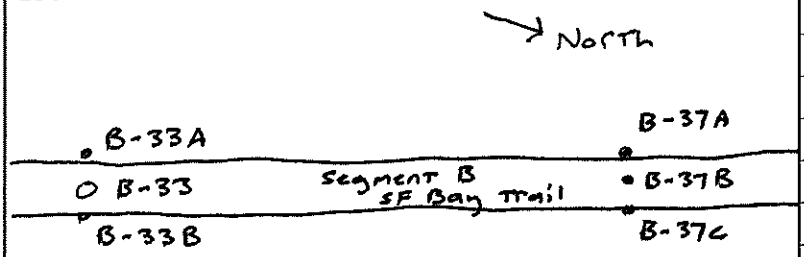
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 128+50 To "B" 133+50
Drawing C25

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-37A
	TOTAL DEPTH: 2-Feet
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous core	
HAMMER WT.:	DROP:
STARTED, TIME: 1018 hours	DATE: 5/31/16
COMPLETED, TIME: 1024 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER SAMPLE RECOVERY	GRAPHIC LOG
										1		
										2		
										3		
										4		
										5		
										6		
										7		
										8		
										9		
										10		

Silty Gravel (GM) - brown (7.5YR5/3); 40% non-plastic Fines; 60% fine rounded gravel; medium dense; dry.

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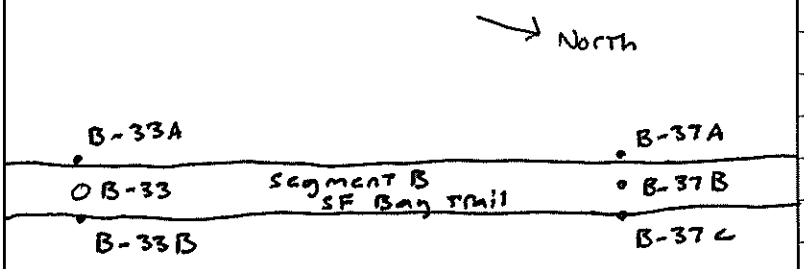
FIELD LOG OF BORING

Sheet _____ of _____

LOCATION OF BORING:



"B" 128+50 to "B" 133+50
Drawing C25

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-37B
	TOTAL DEPTH: 2-Feet
JOB NO.: 567.04, 55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1004 hours	DATE: 5/31/16
COMPLETED, TIME: 1012 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	24						1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Silt with sand (ML) - brown (7.5YR 5/3); ~~[illegible]~~ 90% non-plastic fines; 20% fine sand; medium stiff; dry.

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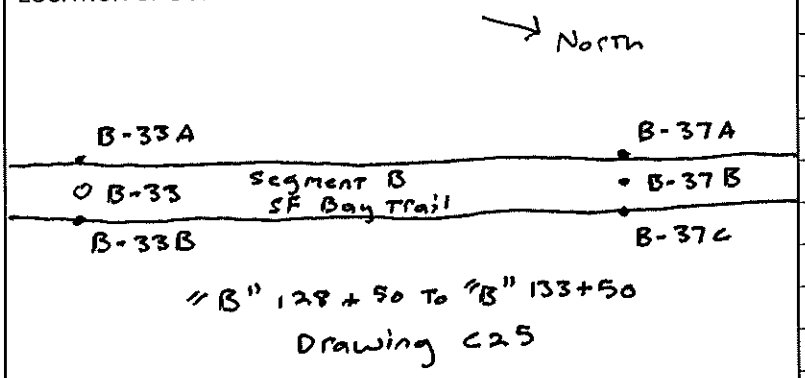
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 128+50 To "B" 133+50

Drawing C25

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-37C
	TOTAL DEPTH: 2 - Feet
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1012 hours	DATE: 5/31/16
COMPLETED, TIME: 1018 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
				24	24					1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Silt with sand (ML) - brown (7.5YR5/3); 85% non-plastic fines; 15% fine sand; medium stiff; dry.

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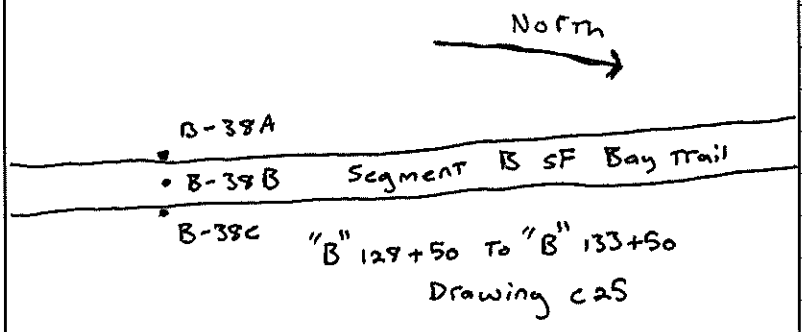
FIELD LOG OF BORING
Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-38A
JOB NO.: 567.04.55	TOTAL DEPTH: 2-Feet
PROJ. MGR.: B. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1100 hours	DATE: 5/31/16
COMPLETED, TIME: 1110 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG	
			24	18						0				Asphalt (3-inches)
										1				Silt with Sand (ML) - brown (7.5YR 5/3); 80%. non-plastic fines; 20% fine sand; medium stiff; dry.
										2				
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										10				

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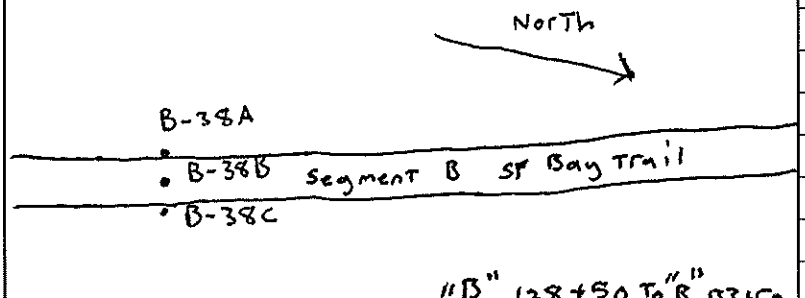
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 128+50 To "B" 133+50
Drawing C25

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-38B
	TOTAL DEPTH: 2-Feet
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1055 hours	DATE: 5/31/16
COMPLETED, TIME: 1100 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER SAMPLE RECOVERY	GRAPHIC LOG
			24	18						1		
										2		
										3		
										4		
										5		
										6		
										7		
										8		
										9		
										10		

Asphalt (one inch)

Silt with sand (ML)- brown (7.5YR5/3); 80%. non-plastic fines; 20% fine sand; medium ~~dense~~ stiff; dry.

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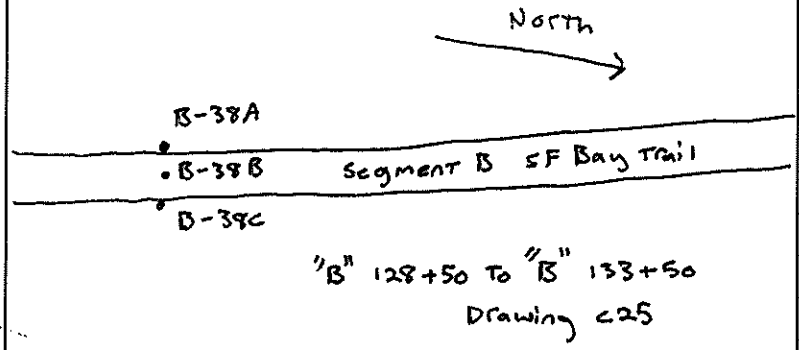
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 128+50 To "B" 133+50
Drawing C25

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-38C
	TOTAL DEPTH: 2-Feet
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.: 1093 hours	DROP: 5/31/16
STARTED, TIME: 1052 hours	DATE: 5/31/16
COMPLETED, TIME:	DATE:

BORING DEPTH (ft.)			
CASING DEPTH (ft.)			
WATER DEPTH (ft.)			
TIME:			
DATE:			

BACKFILLED, TIME: DATE: BY:

SURFACE ELEV.: DATUM:

CONDITIONS:

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	18						0			
										1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Asphalt (4-inches thick)
Wood (one inch)
Silt with Sand (ML) - brown (7.5YR 5/3); 80% non-plastic fines; 20% fine sand; soft to medium stiff; dry.

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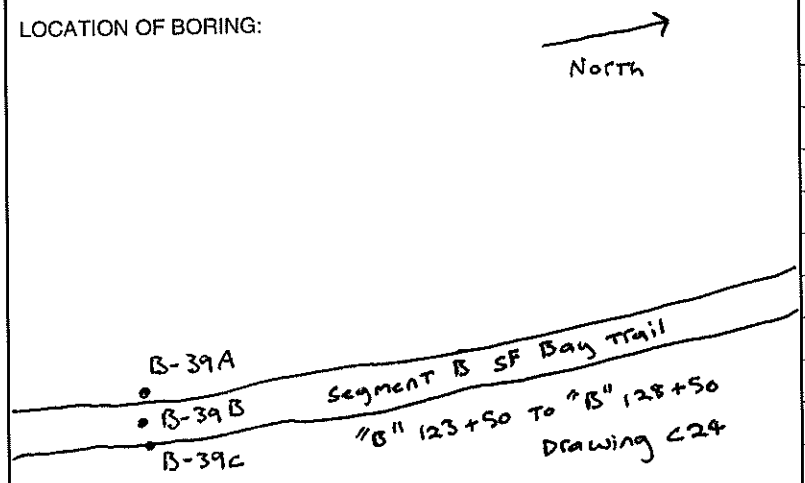
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-39A
JOB NO.: 567.04.55	TOTAL DEPTH: 2 - Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous core	
HAMMER WT.:	DROP:
STARTED, TIME: 1120 hours	DATE: 5/31/16
COMPLETED, TIME: 1125 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER SAMPLE RECOVERY	GRAPHIC LOG
			24	18						0		
										1		
										2		
										3		
										4		
										5		
										6		
										7		
										8		
										9		
										10		

0 - Silty Gravel with sand (GM) - brown (7.5YR5/3); 50% fine rounded gravel; 30% non-plastic fines; 20% fine sand; dense; dry.

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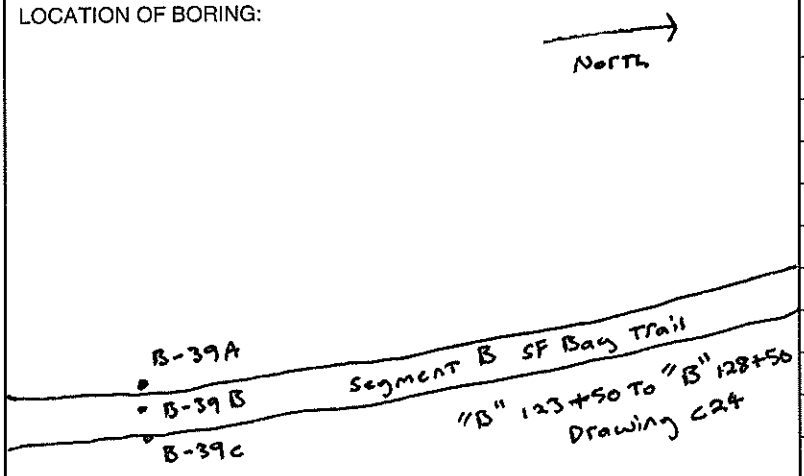
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-39B
JOB NO.: 567.04.55	TOTAL DEPTH: 2 - Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1116 hours	DATE: 5/31/16
COMPLETED, TIME: 1120 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER SAMPLE RECOVERY	GRAPHIC LOG	
			24	18						1			Silty sand (SM) - very dark gray (10YR 3/1); 30% non-plastic fines; 70% fine sand; dense; dry.
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

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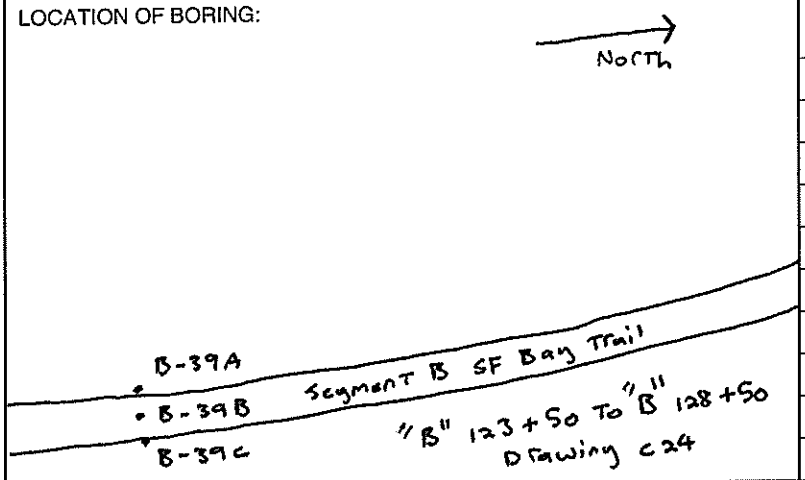
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-39C
	TOTAL DEPTH: 2-Feet
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous core	
HAMMER WT.:	DROP:
STARTED, TIME: 1110 hours	DATE: 5/31/16
COMPLETED, TIME: 1116 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER SAMPLE RECOVERY	GRAPHIC LOG	
			24	20						1			Silty Sand (SM) - very dark gray (10YR 3/1), 30% non-plastic fines; 70% fine sand; very dense; dry.
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

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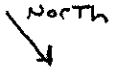
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



B-40A

B-40B Segment B SF Bay Trail

B-40C

"B" 73+50 To "B" 78+50

Drawing C14

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-40C
JOB NO.: 567.04.55	TOTAL DEPTH: 2-Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous core	
HAMMER WT.:	DROP:
STARTED, TIME: 1140 hours	DATE: 5/31/16
COMPLETED, TIME: 1146 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER SAMPLE RECOVERY	GRAPHIC LOG
			24	19"						0		
										1		
										2		
										3		
										4		
										5		
										6		
										7		
										8		
										9		
										10		

Asphalt (2-inches)
Baserock (2-inches)
silty clay with Gravel (CL-ML) - brown (7.5YR5/3); 80%. low to medium plastic fines; 20% fine rounded gravel; ~~dry~~ ~~soft~~ hard; moist.

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FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:

North

B-40A

B-40B Segment B SF Bay Trail

B-40C

"B" 73+50 To "B" 78+50

Drawing C19

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-40A
JOB NO.: 567.04.55	TOTAL DEPTH: 2-Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1150 hours	DATE: 5/31/16
COMPLETED, TIME: 1155 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
										1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Asphalt (2-inches)
Baserock (2-inches)
Silty clay with Gravel (CL-ML) - brown (7.5YR5/3); 80% low to medium plastic Fines; 20% fine rounded gravel; hard; moist.

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FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING: North

B-40A
B-40B Segment 15 SF Bay Trail
B-40C

"B" 73+50 To "B" 79+50

Drawing C14

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-40B
JOB NO.: 567.04.55	TOTAL DEPTH: 2 - Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous core	
HAMMER WT.:	DROP:
STARTED, TIME: 1196 hours	DATE: 5/31/16
COMPLETED, TIME: 1150 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	22						0			
										1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Asphalt (2-inches)
Baserock (2-inches)
Silty clay with Gravel (CL-ML) - brown (7.5YR5/3), 80% low to medium plastic fines, 20% fine rounded gravel; hard; moist.

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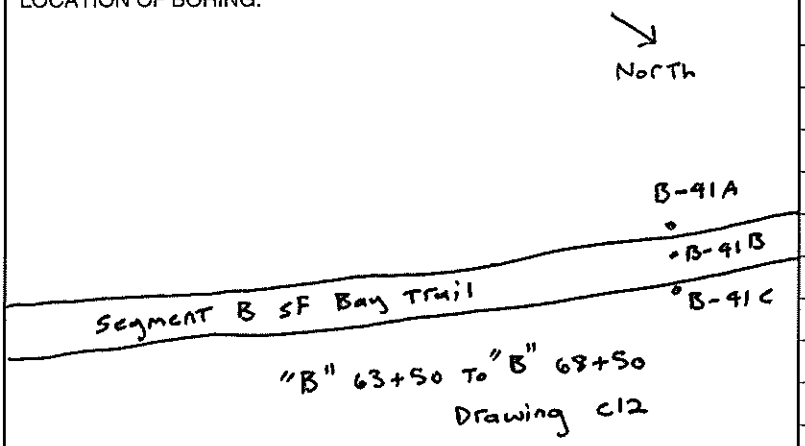
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-41A
JOB NO.: 567.04.55	TOTAL DEPTH: 2-Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1227 hours	DATE: 5/31/16
COMPLETED, TIME: 1230 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER SAMPLE RECOVERY	GRAPHIC LOG	
			24	18						0			Silty Gravel with Sand (GM) - very dark grayish brown (10YR3/2); 30% non-plastic Fines; 20% fine sand; 50% fine rounded gravel; loose; dry.
										1			Fat clay (CH) - very dark brown (10YR 2/2); predominantly high plastic Fines; very stiff; moist.
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

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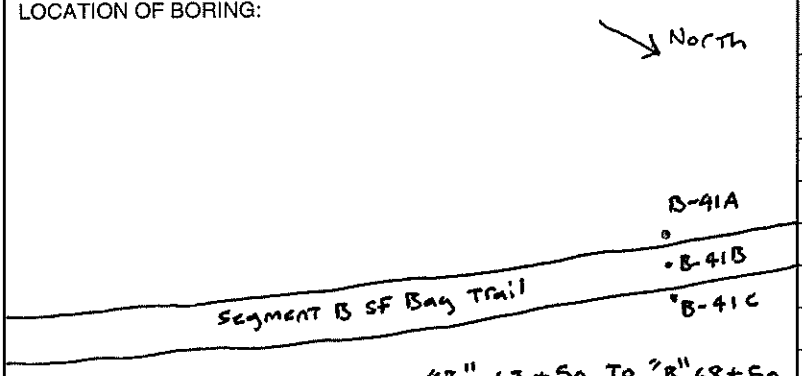
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-41B
	TOTAL DEPTH: 2- Feet
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1222 hours	DATE: 5/31/16
COMPLETED, TIME: 1227 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG	
			24	19						0				Silty Gravel with Sand (GM) - very dark grayish brown (10YR3/2); 30% non-plastic fines; 20% fine sand; 50% fine rounded gravel; loose; dry.
										1				
										2				Fat Clay (CH) - very dark brown (10YR2/2); predominantly high plastic fines; very stiff; moist.
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										10				

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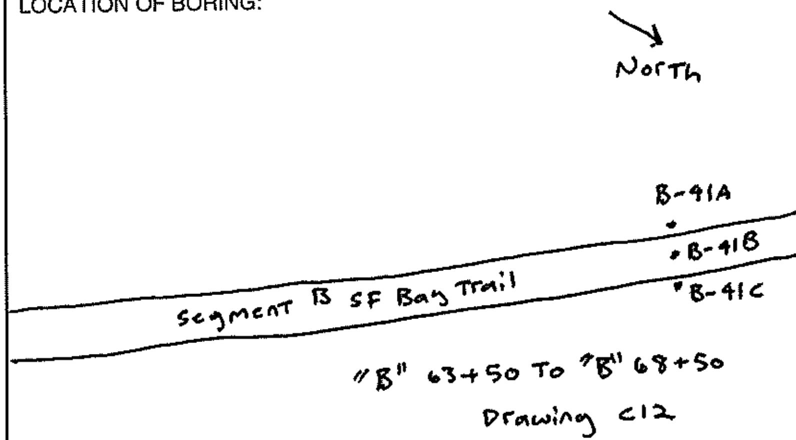
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-41C
	TOTAL DEPTH: 2 - Feet
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1216 hours	DATE: 5/31/16
COMPLETED, TIME: 1222 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG	
			24	18										Silty Gravel with Sand (GM) - very dark grayish brown (10YR 3/2); 30% non-plastic fines; 20% fine sand; 50% fine rounded gravel; loose; dry.
										1				
										2				Fat clay (CH) - very dark brown (10YR 2/2); predominantly high plastic fines; very stiff; moist.
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										10				

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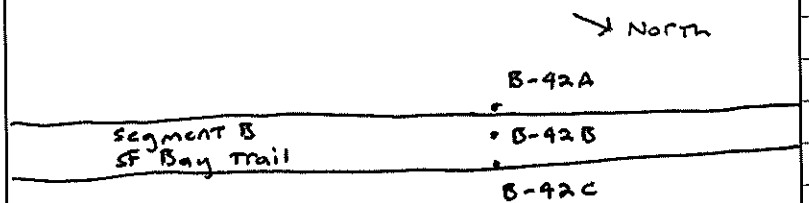
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 59+50 To "B" 63+50

Drawing C11

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-42A
	TOTAL DEPTH: 2-Feet
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1334 hours	DATE: 5/31/16
COMPLETED, TIME: 1337 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	18						0			
										1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Silty Gravel with sand (GM) - very dark grayish brown (10YR3/2); 30% non-plastic fines; 20% fine sand; 50% fine rounded gravel; loose; dry

Fat clay (CH) - very dark brown (10YR2/2); predominantly high plastic fines; very stiff; moist.

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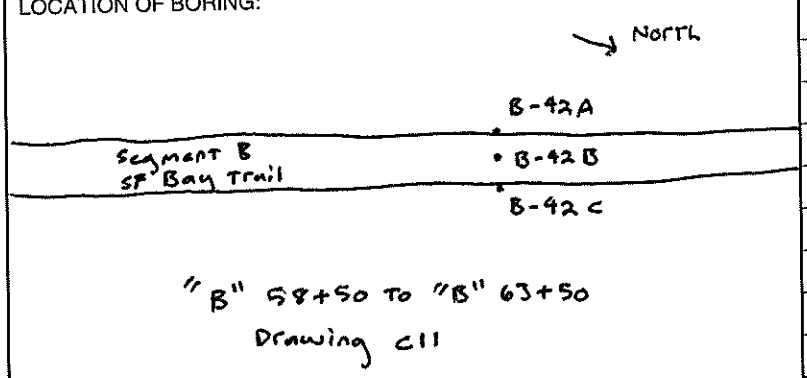
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 58+50 to "B" 63+50
Drawing C11

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-42B
JOB NO.: 567.04.55	TOTAL DEPTH: 2-Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1337 hours	DATE: 5/31/16
COMPLETED, TIME: 1340 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	15						0			

Silty gravel with sand (GM) - very dark grayish brown (10YR 3/2); 30%, non-plastic fines; 20% fine sand; 90% fine rounded gravel; loose; dry

Fat clay (CH) - very dark brown (10YR 2/2); predominantly high plastic fines; very stiff moist,

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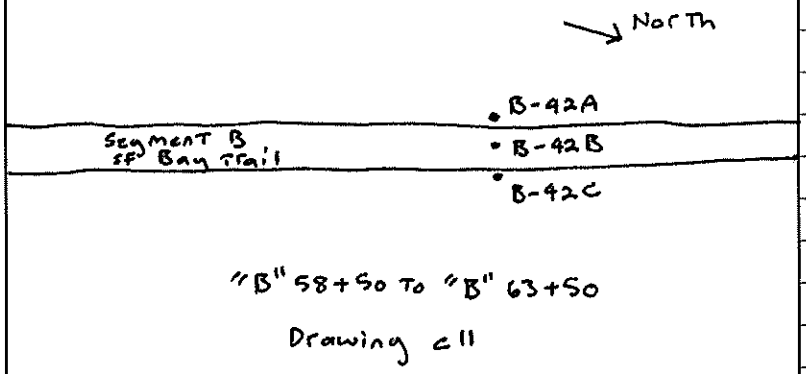
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-42C
JOB NO.: 567.04.55	TOTAL DEPTH: 2-Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous core	
HAMMER WT.:	DROP:
STARTED, TIME: 1340 hours	DATE: 5/31/16
COMPLETED, TIME: 1345 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG	
			24	24						1				Silty Gravel with Sand (GM) - very dark grayish brown (10YR3/2); 30% non-plastic fines; 20% fine sand; 50% fine rounded gravel; loose; dry.
										2				Fat clay (CH) - very dark brown (10YR2/2) predominantly high plastic fines; very stiff; moist.
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										10				

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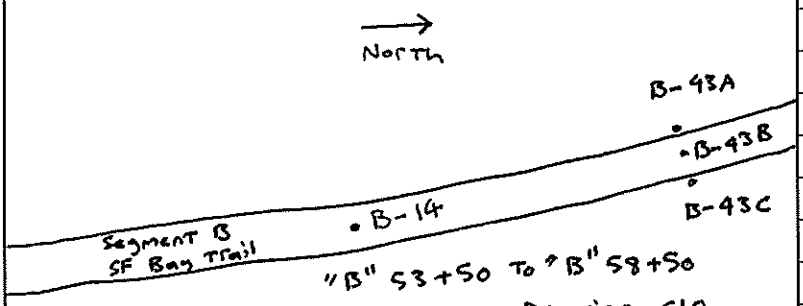
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 53+50 To "B" 58+50

Drawing C10

PROJECT: E.B.R.P.D. SF Bay Trail at Point Molate	BORING NO.: B-43A
	TOTAL DEPTH: 2 - Feet
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1313 hours	DATE: 5/31/16
COMPLETED, TIME: 1318 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	18						0			
										1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Silty Gravel with Sand (GM) - very dark grayish brown (10YR3/2); 30% non-plastic fines; 20% fine sand; 50% fine rounded gravel; loose; dry.

Fat Clay (CH) - very dark brown (10YR2/2); predominantly high plastic fines; very stiff; moist.

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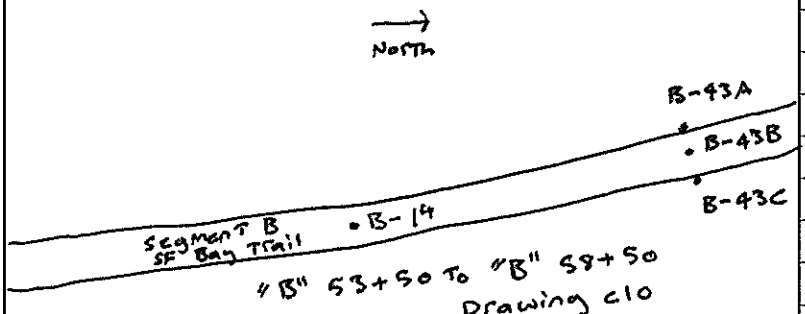
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 53+50 To "B" 58+50
Drawing c10

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-43B
JOB NO.: 567.04.55	TOTAL DEPTH: 2 - Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1318 hours	DATE: 5/31/16
COMPLETED, TIME: 1323 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	19						0			90/10
										1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

City Gravel with sand (GM) - very dark grayish brown (10YR 3/2); 30% non-plastic fines; 20% fine sand; 50% fine rounded gravel; loose; dry.

Fat clay (CH) - very dark brown (10YR 2/2); predominantly high plastic fines; very stiff; moist.

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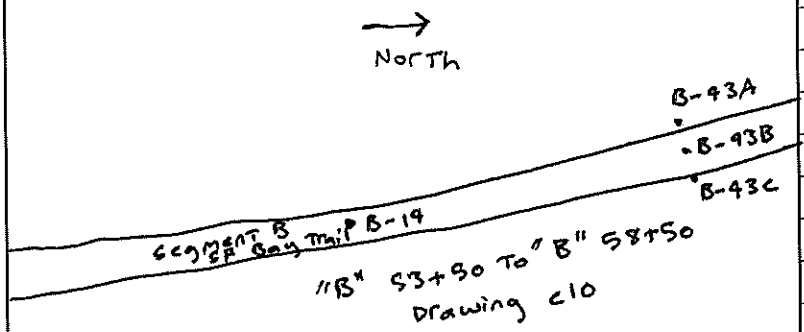
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-43C
JOB NO.: 567.04.55	TOTAL DEPTH: 2-Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1323 hours	DATE: 5/31/16
COMPLETED, TIME: 1328 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	18						0			
										1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Silty Gravel with sand (GM) - very dark grayish brown (10YR 3/2); 30% non-plastic fines; 20% fine sand; 50% fine rounded gravel; loose; dry.

Fat clay (CH) - very dark brown (10YR 2/2), predominantly high plastic fines; very stiff; moist.

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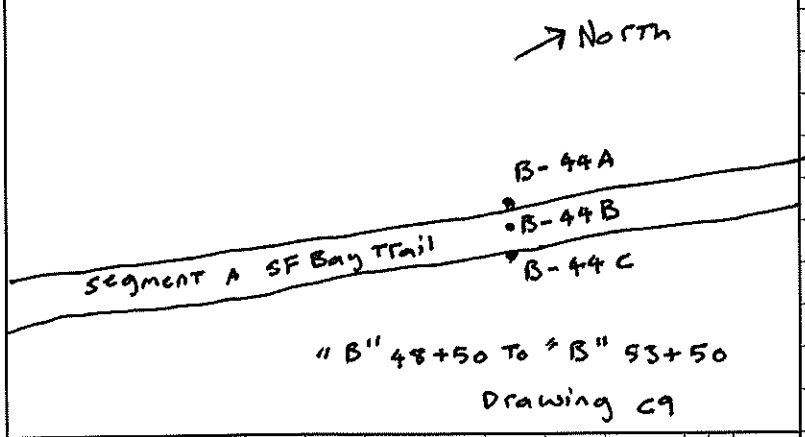
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 48+50 To "B" 93+50

Drawing C9

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-44A
JOB NO.: 567.04.35	TOTAL DEPTH: ~~16~~ 16-inc
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE:	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Hand Auger	
HAMMER WT.:	DROP:
STARTED, TIME: 0911 hours	DATE: 6/1/16
COMPLETED, TIME: 0935 hours	DATE: 6/1/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
										1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

~~Silty~~ Poorly Graded Gravel (GP) - very dark gray (10YR 3/1); predominantly fine rounded gravel; trace amounts of non-plastic fines; dry.

Silty Gravel (GM) - very dark gray (10YR 3/1), 40% non-plastic fines; 60% fine rounded gravel; loose; dry.

Bedrock was encountered at approximate 16-inches bgs.

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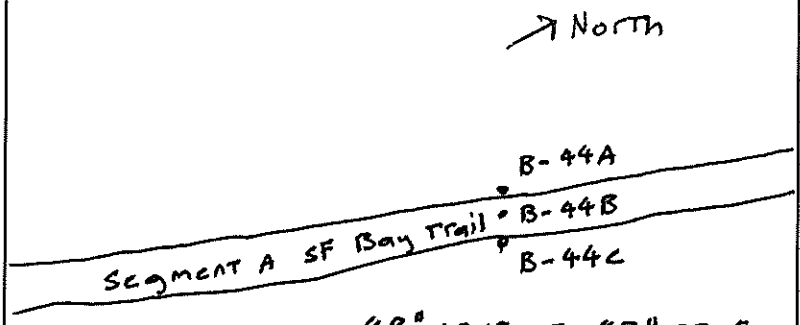
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 48+50 to "B" 53+50

Drawing C9

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-44B
	TOTAL DEPTH: 16+- inches
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Hand Auger	
HAMMER WT.:	DROP:
STARTED, TIME: 0935 hours	DATE: 6/1/16
COMPLETED, TIME: 0990 hours	DATE: 6/1/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER SAMPLE RECOVERY	GRAPHIC LOG
										1		
										2		
										3		
										4		
										5		
										6		
										7		
										8		
										9		
										10		

Poorly Graded Gravel - very dark gray (10YR3/1), predominantly fine rounded gravel; trace amounts of non-plastic fines; dry.

Silty Gravel (GM) - very dark gray (10YR3/1); 40% non-plastic fines; 60% fine rounded gravel; loose; dry.

Bedrock was encountered at approximately 16-inches bgs.

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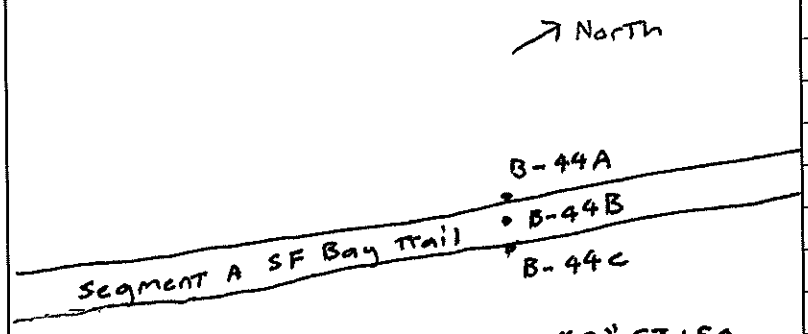
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 48+50 To "B" 53+50
Drawing C9

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-44C
JOB NO.: 567.04.55	TOTAL DEPTH: 19" inches
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE:	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Hand Auger	
HAMMER WT.:	DROP:
STARTED, TIME: 0937 hours	DATE: 6/1/16
COMPLETED, TIME: 0943 hours	DATE: 6/1/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
										1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

Silty Gravel (GM) - very dark gray (10YR3/1); 40% non-plastic fines; 60% Fine rounded gravel; loose; dry.

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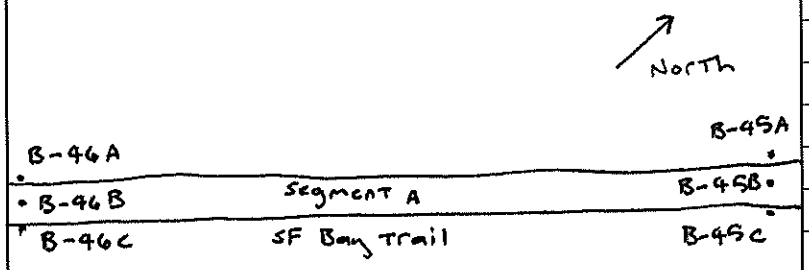
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 43+50 To "B" 48+50

Drawing c8

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-45A
	TOTAL DEPTH: 2 - Feet
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R, Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous core	
HAMMER WT.:	DROP:
STARTED, TIME: 1453 hours	DATE: 5/31/16
COMPLETED, TIME: 1500 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	15						0			

(2-inches) Poorly Graded Gravel (GP) - very dark gray (10YR 3/1); predominantly fine rounded gravel; trace amounts of non-plastic fines; dry.

Lean clay with sand (CL) - brown (7.5YR 3); 85% low plastic fines; 15% fine sand; very stiff; moist.

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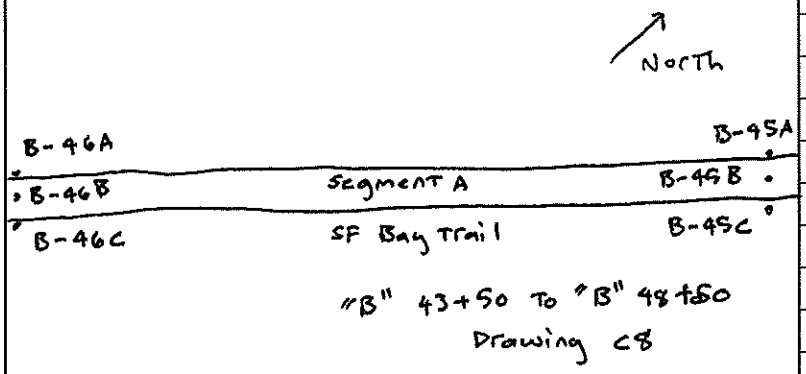
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 43+50 To "B" 48+50
Drawing C8

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-45B
	TOTAL DEPTH: 2 - Feet
JOB NO.: 567.04.55	LOGGED BY:
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous core	
HAMMER WT.:	DROP:
STARTED, TIME: 1448 hours	DATE: 5/31/16
COMPLETED, TIME: 1453 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	15						0			
										1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

(2-inches) Poorly Graded Gravel (GM) - very dark gray (10YR 3/1); predominantly fine rounded gravel; trace amounts of non-plastic fines; dry.

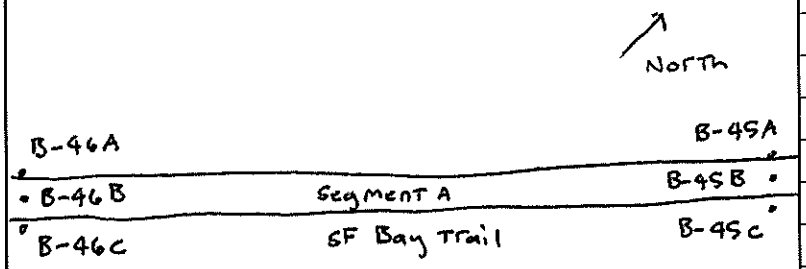
Lean clay with sand (CL) - brown (7.5YR 3); 85% low plastic fines; 15% fine sand; very stiff; moist.

NCE 8795 Folsom Blvd, Ste 250 Sacramento, CA 95826
P: 916.388.5655 F: 916.388.5676

FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 43+50 To "B" 48+50
Drawing C8

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-45C
	TOTAL DEPTH: 2-feet
JOB NO.: 367.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1442 hours	DATE: 5/31/16
COMPLETED, TIME: 1448 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	#6						1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

(2-inches) Poorly Graded Gravel (GM) - very dark gray (10YR3/1); predominantly fine rounded gravel; trace amounts of non-plastic fines; dry.

Lean clay with Sand (CL) - brown (7.5YR3/3); 85% low plastic fines; 15% fine sand; very stiff; moist.

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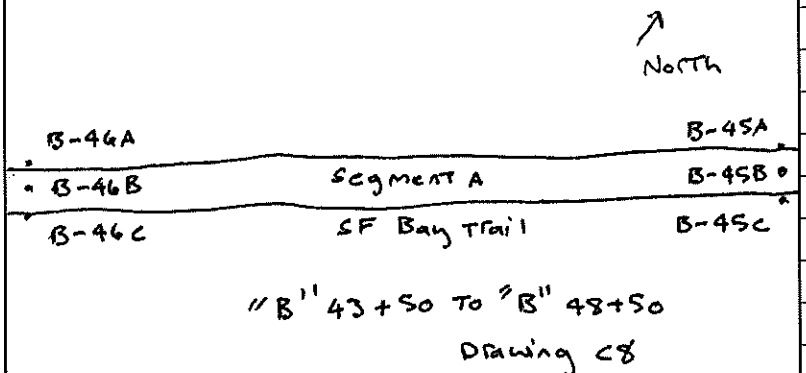
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-46A
JOB NO.: 567.04.55	TOTAL DEPTH: 2-Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1424 hours	DATE: 5/31/16
COMPLETED, TIME: 1429 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
				24	18					0			
										1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

(3inches) Poorly Graded Gravel (GM) - very dark gray (10YR3/1); predominantly fine rounded gravel; trace amounts of non-plastic fines; dry

Lean clay with sand (CL) - brown (7.5YR3); 85%, low plastic fines; 15% fine sand; very stiff; moist.

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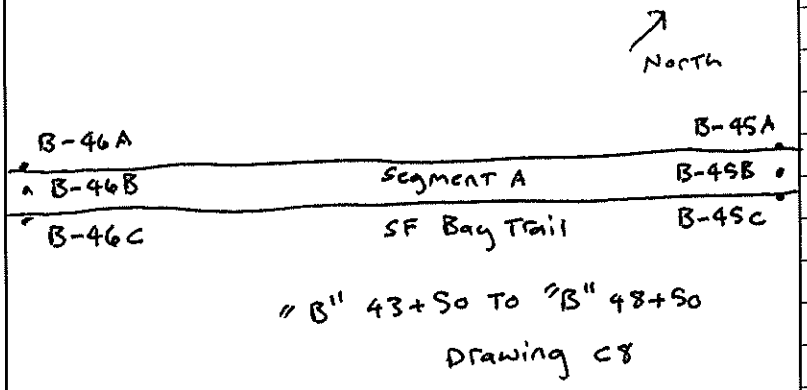
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 43+50 to "B" 48+50

Drawing C8

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-46B
JOB NO.: 567.04.55	TOTAL DEPTH: 2-Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1429 hours	DATE: 5/31/16
COMPLETED, TIME: 1436 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	14						0			

(3-inches) Poorly Graded Gravel (GM) - very dark gray (10YR3/1); predominantly fine rounded gravel; trace amounts of non-plastic fines; dry.

Lean clay with sand (CL) - brown (7.5YR5/3); 85% low plastic fines; 15% fine sand; very stiff; moist.

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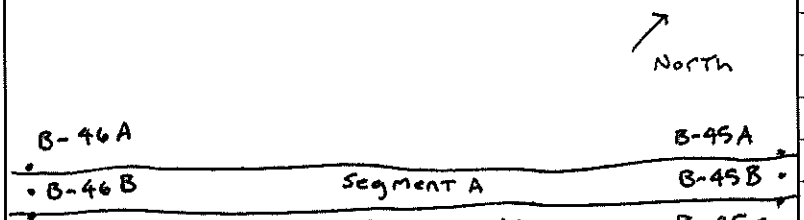
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 43+50 To "B" 48+50

Drawing C8

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-46C
JOB NO.: 567.04.55	TOTAL DEPTH: 2-Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous core	
HAMMER WT.:	DROP:
STARTED, TIME: 1436 hours	DATE: 5/31/16
COMPLETED, TIME: 1442 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	15						0			

(3-inches) Poorly Graded Gravel (GM) - very dark gray (10YR3/1); predominantly fine rounded gravel; trace amounts of non-plastic fines; dry.

Lean clay with sand (CL) - brown (7.5YR3 4/3), low plastic fines; 15% fine sand; very stiff; moist.

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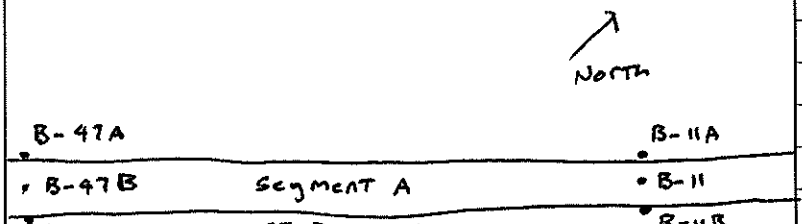
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 43+50 To "B" 48+50

Drawing C8

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-47A
JOB NO.: 567.04.55	TOTAL DEPTH: 2-Feet
PROJ. MGR.: R. Shafer	LOGGED BY: B. Bardsley
DRILLING CONTRACTOR: Confluence Environmental	EDITED BY:
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1408 hours	DATE: 5/31/16
COMPLETED, TIME: 1415 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	24						1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

(3-inches) Poorly Graded Gravel (GM) – very dark gray (10YR 3/1); predominantly fine rounded gravel; Trace amounts of non-plastic fines; d

Lean clay with sand (CL) – brown (7.5YR 3); 85% Low plastic fines; 15% fine sand; very stiff; moist.

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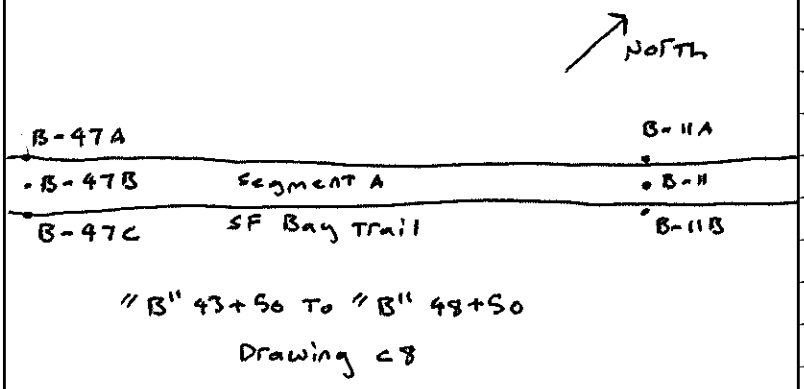
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 43+50 To "B" 48+50

Drawing C8

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-47B
	TOTAL DEPTH: 2-Feet
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Shafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1405 hours	DATE: 5/31/16
COMPLETED, TIME: 1408 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER	SAMPLE RECOVERY	GRAPHIC LOG
			24	18						1			
										2			
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			

(3-inches) Poorly Graded Gravel (GM) - very dark gray (10YR3/1); predominantly fine rounde gravel; trace amounts of non-plastic fines; odor, Lean clay (CL) - brown (7.5YR3); 85% low plastic fines; 15% fine sand; very stiff; moist.

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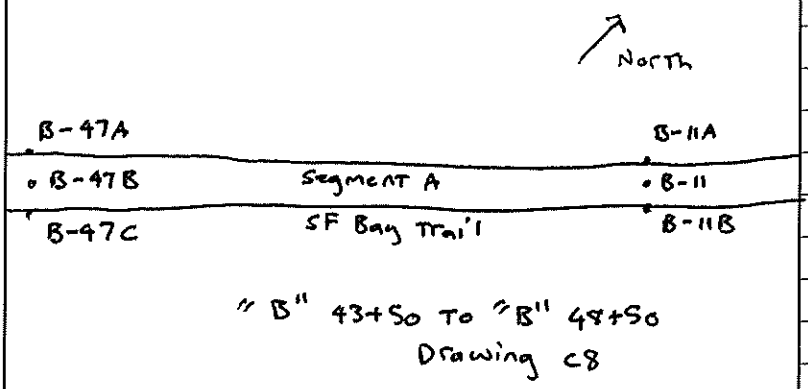
FIELD LOG OF BORING

Sheet 1 of 1

LOCATION OF BORING:



"B" 43+50 to "B" 48+50
Drawing C8

PROJECT: EBRPD SF Bay Trail at Point Molate	BORING NO.: B-47C
	TOTAL DEPTH: 2-Feet
JOB NO.: 567.04.55	LOGGED BY: B. Bardsley
PROJ. MGR.: R. Snafer	EDITED BY:
DRILLING CONTRACTOR: Confluence Environmental	
DRILL RIG TYPE: Direct Push	
DRILLER'S NAME: Jesus Morales	
SAMPLING METHODS: Continuous Core	
HAMMER WT.:	DROP:
STARTED, TIME: 1401 hours	DATE: 5/31/16
COMPLETED, TIME: 1405 hours	DATE: 5/31/16
BORING DEPTH (ft.)	
CASING DEPTH (ft.)	
WATER DEPTH (ft.)	
TIME:	
DATE:	
BACKFILLED, TIME:	DATE: BY:
SURFACE ELEV.:	DATUM:
CONDITIONS:	

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE				DEPTH IN FEET	HYDROPUNCH/OTHER SAMPLE RECOVERY	GRAPHIC LOG
			24	18						0		
										1		
										2		
										3		
										4		
										5		
										6		
										7		
										8		
										9		
										10		

(3-inches) Poorly Graded Gravel (GM) - very dark gray (10YR 3/1), predominantly fine rounded gravel trace amounts of non-plastic fines, dry.

Lean clay with sand (CL) - brown (7.5YR 3), 95% low plastic fines; 15% fine sand, very stiff; moist.

APPENDIX C. LABORATORY DATA

CE&G
CAL ENGINEERING & GEOLOGY

SUMMARY OF LABORATORY RESULTS

CLIENT Subconsultant to NCE for EBRPD **PROJECT NAME** SF Bay Trail at Point Molate

PROJECT NUMBER 151190 **PROJECT LOCATION** Richmond, CA

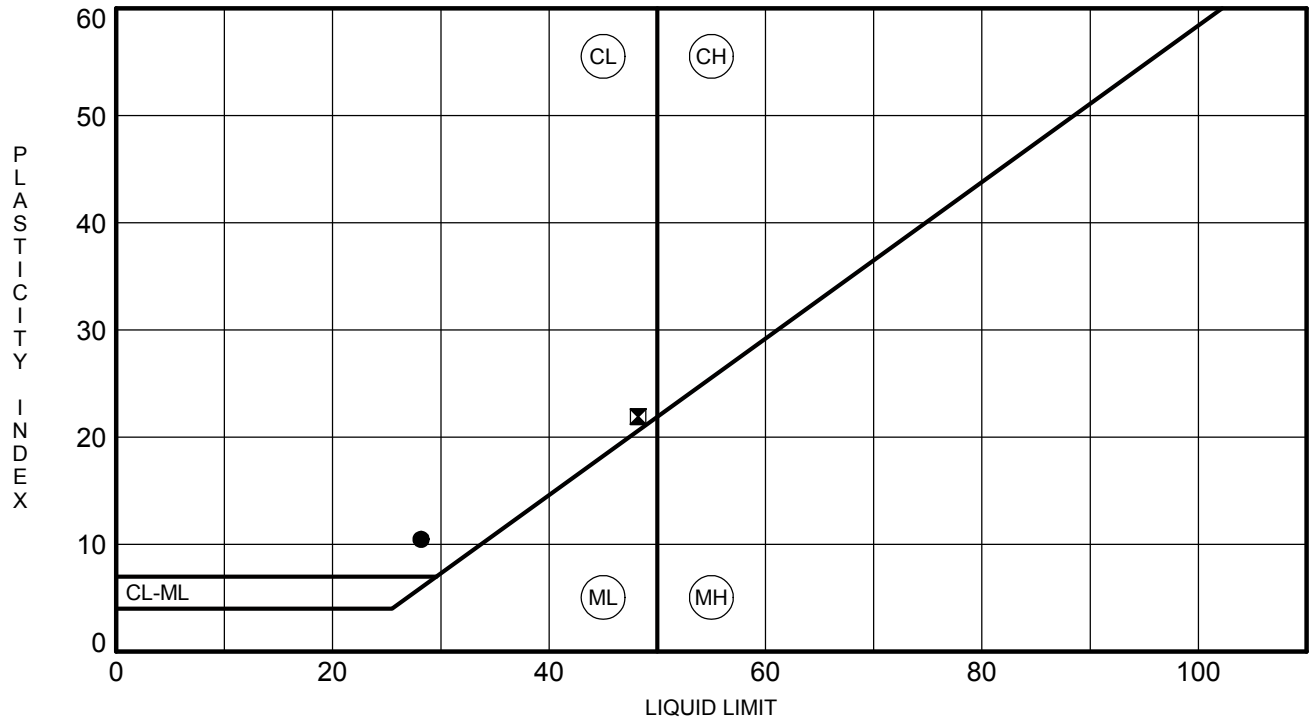
Borehole	Depth	Date Tested	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Screen Size (mm)	%<#200 Sieve	Class-ification	Water Content (%)	Dry Density (pcf)	Satur-ation (%)	Void Ratio
B-04	2.0	3/22/2016							4.4	106.8		
B-11	2.0	3/22/2016							14.3	114.8		
B-13	1.5	3/22/2016							13.0	118.1		
B-14	1.5	3/22/2016							4.6	107.8		
B-14	2.5	3/25/2016	28	18	10							
B-15	2.0	3/22/2016							16.1	112.3		
B-15	2.5	3/25/2016	48	26	22							
B-17	1.5	3/22/2016							10.0	118.0		
B-19	1.5	3/22/2016							10.5	122.8		
B-25	1.5	3/22/2016							7.0	116.9		
B-27	2.0	3/22/2016							7.5	115.2		
B-35	1.6	3/22/2016							10.7	123.9		
B-36	1.5	3/22/2016							14.2	112.6		

CE&G
CAL ENGINEERING & GEOLOGY

ATTERBERG LIMITS RESULTS

CLIENT Subconsultant to NCE for EBRPD **PROJECT NAME** SF Bay Trail at Point Molate

PROJECT NUMBER 151190 **PROJECT LOCATION** Richmond, CA

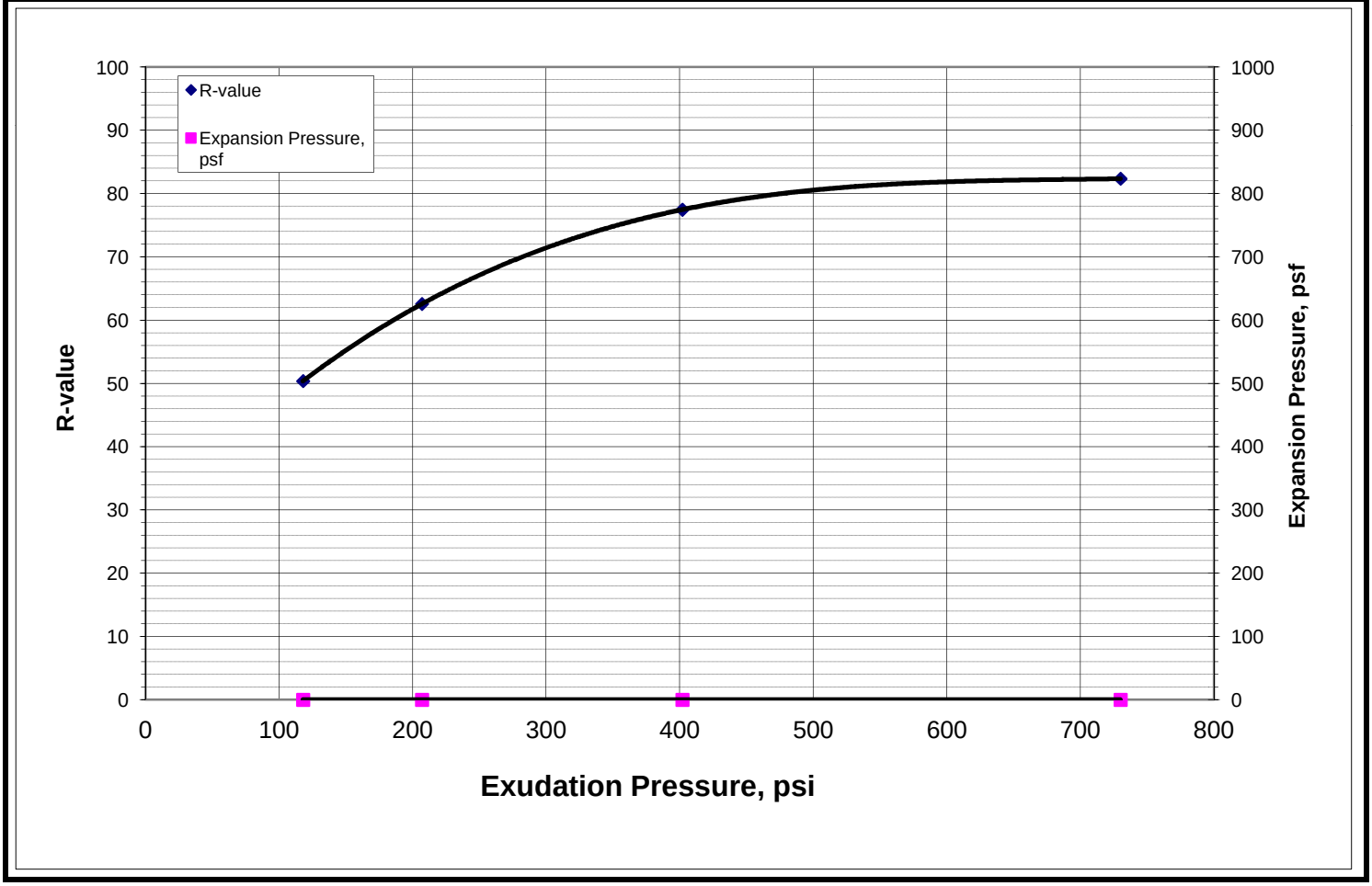


	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification	Date Tested
●	**B-14**	**2.5**	**28**	**18**	**10**		**Brown Lean Clay**	**3/25/2016**
⧓	**B-15**	**2.5**	**48**	**26**	**22**		**Black Lean Clay**	**3/25/2016**

R-value Test Report (Caltrans 301)

Job No.:	471-148	**Date:**	03/29/16	**Initial Moisture,**	2.4%
Client:	Cal Engineering & Geology	**Tested**	MD	**R-value by Stabilometer**	**72**
Project:	151190	**Reduced**	RU		
Sample	R-1 at B4	**Checked**	DC	**Expansion Pressure**	**0** **psf**
Soil Type:	Dark Olive Brown Silty SAND w/ Gravel				

Specimen Number	A	B	C	D	**Remarks:**
Exudation Pressure, psi	207	730	402	118	
Prepared Weight, grams	1300	1300	1300	1300	
Final Water Added, grams/cc	84	75	79	90	
Weight of Soil & Mold, grams	3256	3227	3184	3268	
Weight of Mold, grams	2106	2098	2064	2098	
Height After Compaction, in.	2.49	2.41	2.39	2.51	
Moisture Content, %	9.0	8.3	8.6	9.5	
Dry Density, pcf	128.3	131.0	130.6	128.9	
Expansion Pressure, psf	0.0	0.0	0.0	0.0	
Stabilometer @ 1000					
Stabilometer @ 2000	56	23	28	69	
Turns Displacement	2.78	3	3.15	3.25	
R-value	63	82	77	50	

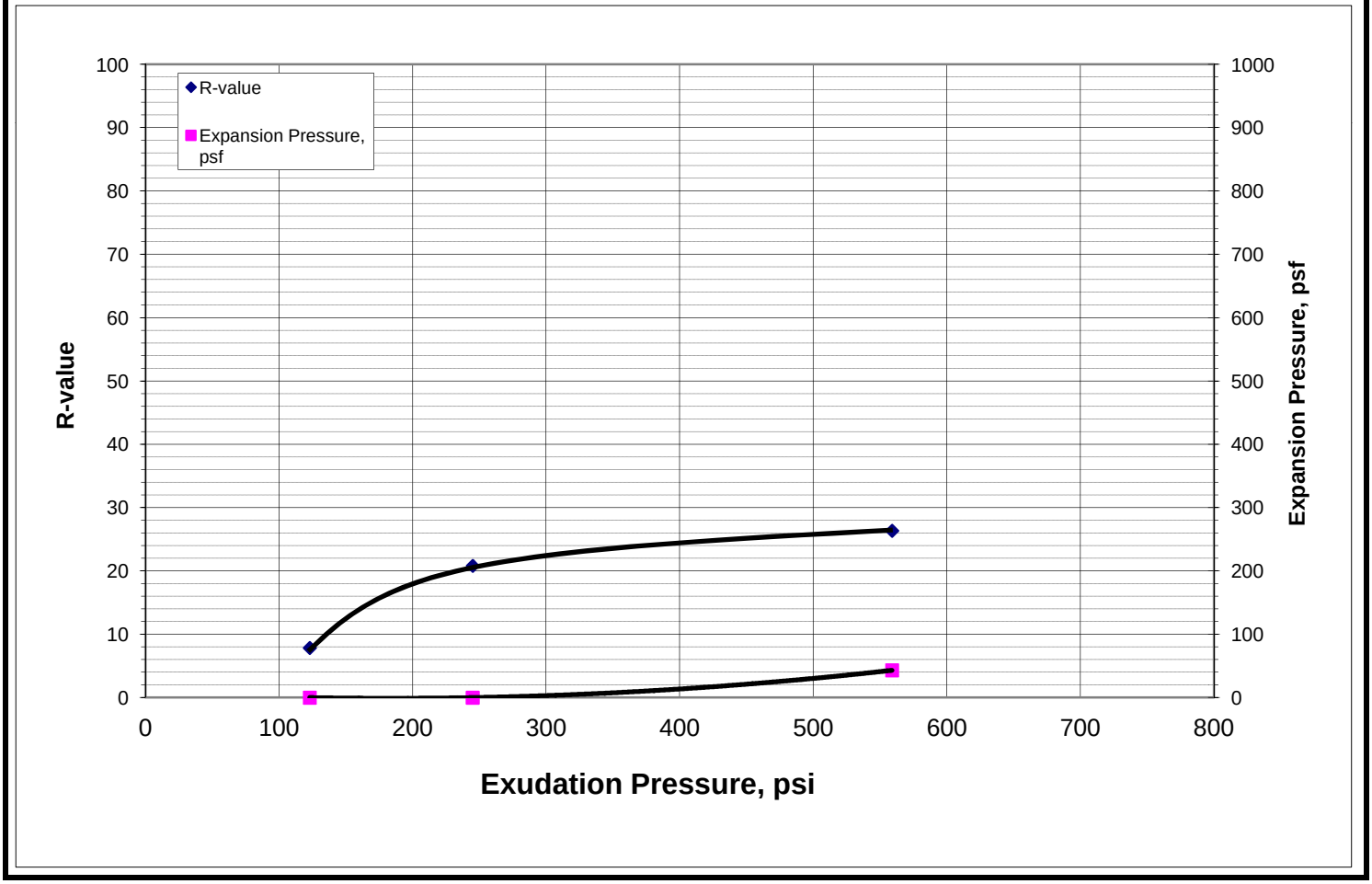


R-value Test Report (Caltrans 301)

Job No.:	471-148	**Date:**	03/30/16	**Initial Moisture,**	5.8%
Client:	Cal Engineering & Geology	**Tested**	MD	**R-value by Stabilometer**	**22**
Project:	151190	**Reduced**	RU		
Sample	R-2 at B15	**Checked**	DC	**Expansion Pressure**	**5** **psf**
Soil Type:	Yellowish Brown Clayey SAND w/ Gravel				

Specimen Number	A	B	C	D
Exudation Pressure, psi	123	559	245	
Prepared Weight, grams	1200	1200	1200	
Final Water Added, grams/cc	82	51	64	
Weight of Soil & Mold, grams	3241	3190	3212	
Weight of Mold, grams	2106	2094	2116	
Height After Compaction, in.	2.56	2.34	2.4	
Moisture Content, %	13.1	10.3	11.5	
Dry Density, pcf	118.8	128.6	124.1	
Expansion Pressure, psf	0.0	43.0	0.0	
Stabilometer @ 1000				
Stabilometer @ 2000	146	108	122	
Turns Displacement	2.89	2.9	2.75	
R-value	8	26	21	

Remarks:

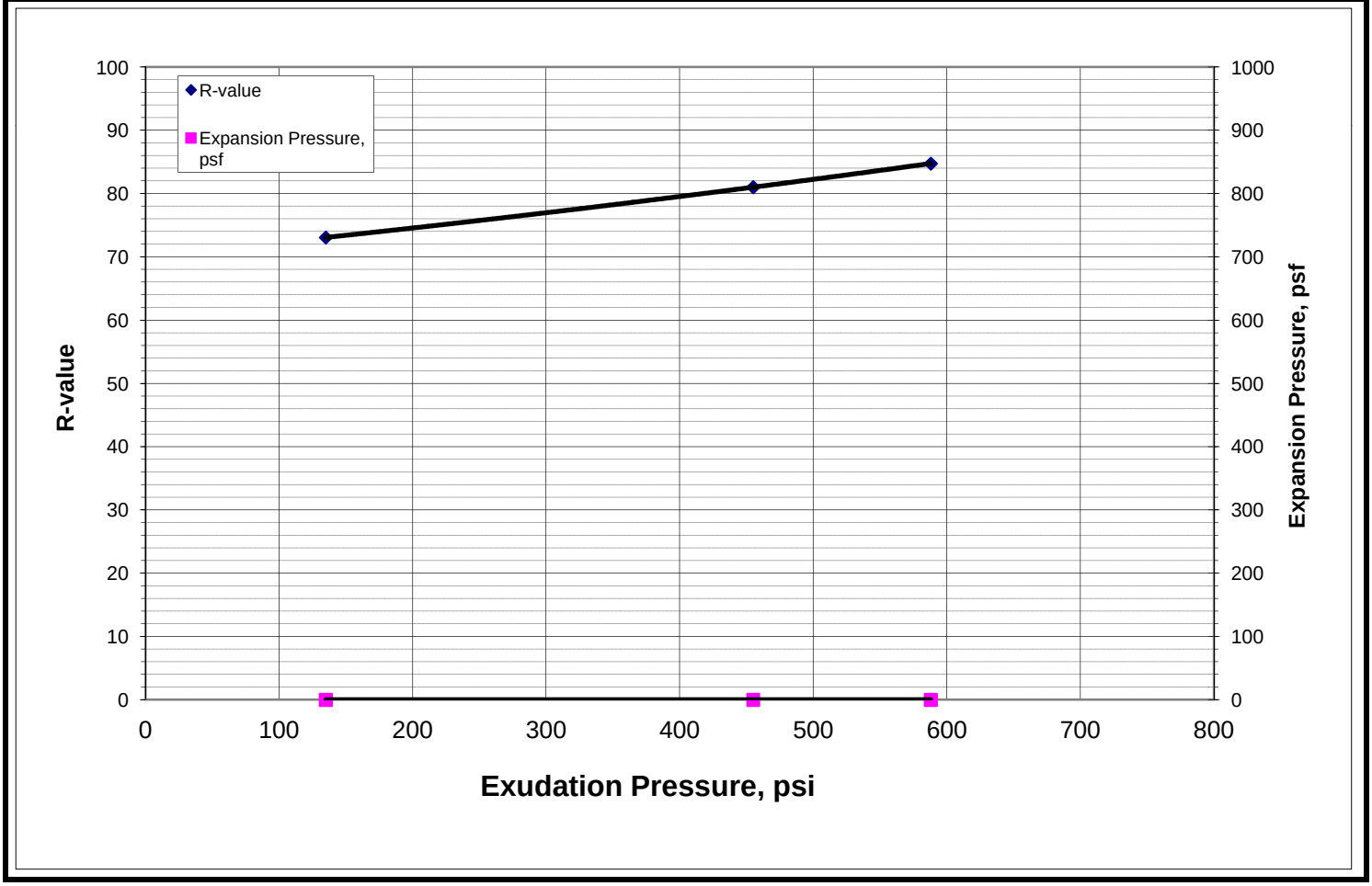


R-value Test Report (Caltrans 301)

Job No.:	471-148	**Date:**	03/29/16	**Initial Moisture,**	3.6%
Client:	Cal Engineering & Geology	**Tested**	MD	**R-value by Stabilometer**	**77**
Project:	151190	**Reduced**	RU		
Sample	R-3 at B27	**Checked**	DC	**Expansion Pressure**	**0** **psf**
Soil Type:	Dark Olive Brown Silty SAND w/ Gravel				

Specimen Number	A	B	C	D
Exudation Pressure, psi	588	135	455	
Prepared Weight, grams	1200	1200	1200	
Final Water Added, grams/cc	77	90	86	
Weight of Soil & Mold, grams	3224	3188	3214	
Weight of Mold, grams	2116	2085	2105	
Height After Compaction, in.	2.48	2.48	2.47	
Moisture Content, %	10.3	11.4	11.0	
Dry Density, pcf	122.7	120.9	122.4	
Expansion Pressure, psf	0.0	0.0	0.0	
Stabilometer @ 1000				
Stabilometer @ 2000	18	36	24	
Turns Displacement	3.55	3.12	3.25	
R-value	85	73	81	

Remarks:



R-value Test Report (Caltrans 301)

Job No.:	471-148	**Date:**	03/25/16	**Initial Moisture,**	5.5%
Client:	Cal Engineering & Geology	**Tested**	MD	**R-value by Stabilometer**	**25**
Project:	151190	**Reduced**	RU		
Sample	R-4 at B25	**Checked**	DC	**Expansion Pressure**	**0** psf
Soil Type:	Yellowish Brown Clayey SAND w/ Gravel				

Specimen Number	A	B	C	D
Exudation Pressure, psi	450	108	215	
Prepared Weight, grams	1200	1200	1200	
Final Water Added, grams/cc	39	71	53	
Weight of Soil & Mold, grams	3214	3250	3242	
Weight of Mold, grams	2077	2098	2102	
Height After Compaction, in.	2.43	2.5	2.47	
Moisture Content, %	8.9	11.7	10.1	
Dry Density, pcf	130.1	124.9	126.9	
Expansion Pressure, psf	0.0	0.0	0.0	
Stabilometer @ 1000				
Stabilometer @ 2000	100	140	128	
Turns Displacement	2.4	3.28	2.8	
R-value	37	10	18	

Remarks: