GEOTECHNICAL RECOMMENDATIONS REPORT
SHORELINE EROSION RESTORATION PROJECT
2905 SEA VIEW PARKWAY
ALAMEDA, CALIFORNIA

BSK PROJECT NO.: G00000635

PREPARED FOR:

CITY OF ALAMEDA PUBLIC WORKS DEPARTMENT
950 W. MALL SQUARE, ROOM 110
ALAMEDA, CALIFORNIA, 94501

APRIL 26, 2023

Table of Contents

Figures

FIGURES

399 Lindbergh Avenue
Livermore CA 94551
P 925.315.3151
www.bskassociates.com

Sent via e-mail: thalaby@alamedaca.gov

April 26, 2023 BSK Project No. G00000635

Tawfic N. Halaby, PE
Supervising Civil Engineer
City of Alameda Public Works Department
950 W. Mall Square, Room 110
Alameda, California 94501

SUBJECT: **Geotechnical Recommendations Report**
2905 Sea View Parkway Shoreline Erosion Restoration Project
Alameda, California

Dear Mr. Halaby:

BSK Associates (BSK) is pleased to submit this letter report presenting geotechnical recommendations for the 2905 Sea View Parkway Shoreline Restoration Project in Alameda, California. A Vicinity Map showing the location of the project is presented on Figure 1. This report contains a description of the project, our data review, and presents our geotechnical recommendations for the shoreline erosion restoration. The purpose of this report is to provide geotechnical repair recommendations to restore two localized areas of erosion (Site) occurring north of 2905 Sea View Parkway in Alameda, California. We retained Bellecci & Associates (Bellecci) of Pleasanton, California as our civil engineering subconsultant. Bellecci retained the services of Rincon Consultants (Rincon) of Oakland, California, to manage the San Francisco Bay Area Conservation and Development Commission (BCDC) communication and permitting. Our scope of services, as outlined in our proposal dated July 15, 2022 (BSK Proposal No. GL21-22977), included the following tasks:

- BCDC Permit Application Process,
- Data review,
- Site Visit with Bellecci,
- Preparation of this report
- Geotechnical Review of Plans and Specifications,
- Civil Engineering Services, and
- Construction Observation and Testing

Note that only the data review, site visit with Bellecci, and preparation of this report tasks were completed for this project. The BCDC permit application process and civil engineering services were started but were suspended by the City of Alameda (City) due to project constraints that only became evident during the pre-application process with the permitting agencies. Nevertheless, the City

requested that BSK complete preparation of this report, so it can be used as a reference for future shoreline restoration efforts by the City.

It should be noted that BSK's services specifically excluded a subsurface investigation and the assessment of site environmental characteristics, particularly those involving hazardous substances.

1. SITE AND PROJECT DESCRIPTION

The project consists of evaluating and developing repair recommendations for two localized areas of severe shoreline erosion located along the north shore on Bay Farm Island in Alameda, California. The localized erosional areas are located on the shoreline north of the 2905 Sea View Parkway and 2901 Sea View Parkway properties immediately north of the Bay Trail. The shoreline erosion is starting to encroach on the existing unpaved pedestrian pathway portion of the Bay Trail that is adjacent to the shoreline. The approximate shoreline erosion areas are shown on Figure 2, Restoration Site Plan.

Portions of the north shoreline are protected with rock slope protection (RSP), however at the localized shoreline erosional features, the shoreline is exposed. The City plans to repair and restore the areas of erosion to prevent future encroachment onto the existing unpaved pedestrian pathway.

According to topographic mapping by Bellecci[1], the Site surface elevations range from 4 feet near the flat, intertidal zone to approximately 10 feet near the top of the erosional scarps (NAVD 88). The shoreline erosional features, which both have formed into relatively steep embankments, are approximately 2½ to 3 feet high (measured from base of loose soil to top of embankment crown) and are approximately 40 to 45 feet long at their widest horizontal distance. According to the National Oceanic and Atmospheric Administration (NOAA) tide elevation datum, mean high water tide for the Site is approximately 6 feet (NAVD 88).

If the actual project differs significantly from that described above, we should be contacted to review and/or revise the conclusions and recommendations presented in this report.

2. DATA REVIEW

2.1 Previous Investigation Reports

The following geotechnical investigation reports were used in the preparation of this current letter report:

- *Limited Geotechnical Investigation, Shoreline Park Erosion Restoration Project, Alameda, California,* dated April 15, 2021 by BSK Associates (Project No. G21-045-11L).
- *Geotechnical Evaluation of Erosion at Alameda Shoreline Park, Alameda, California*, dated December 12, 2012 by Treadwell & Rollo (Project No. 750513310).

[1] Topographic Plans entitled, "Cross Sections Exhibit, North Shore Bay Farm Island, City of Alameda, State of California", dated January 2023 by Bellecci & Associates (Job No. 220099).

- *Temporary Erosion Control Measures at South Side San Leandro Channel*, dated December 2012 by City of Alameda (Drawing/Project No. 9359-41).

2.2 Historical Aerial Photographs

A review of historical aerial photographs for the Site area was performed to evaluate the Site's and surrounding area's geomorphic features and evidence of past erosion.

Historical Aerial Documents and Websites Reviewed	
Document or Website	**Year of aerial photo(s)/document reviewed**
Historical Aerials Viewer[2]	1946, 1958, 1968, 1980, 2002, 2009, 2012, 2016
Frame Finder[3]	1939, 1946, 1965, 2000
Aerial Photos/Maps provided by City of Alameda	1910, 1943, 1966, 1977

Based on our review of the above historical aerial photographs and documents, prior to 1920, Bay Farm Island's (formerly known as Harbor Bay Isle) natural shoreline was further inland and appeared to consist mostly of tidal marshland with meandering drainage channels. The only developed portion of Bay Farm Island was limited to a small wedge of land south of present day Mecartney Road. Circa 1966, the area north and west of Mecartney Road was developed to where the present-day Bay Farm Island shoreline exists.

In historical aerial photographs from the early 2000s, it appears the natural, unprotected north shoreline of Bay Farm Island developed localized areas that have eroded. From circa 2000 to present day, the entire length of the north Bay Farm Island shoreline has receded as much as 50 feet inland. The erosional features that are the subject of this project, appear to have developed after 2015 and have progressively receded inland.

3. SITE GEOLOGY

According to the California Geological Survey (CGS, 2003)[4], the Site is mapped as artificial fill over young Bay Mud deposits, which includes man-made deposits of various materials over soft/compressible estuary clays and silts. Artificial fill can be loose to dense depending whether it is engineered or non-engineered and on the age of deposition. The artificial fill at the Site is likely sandy soil dredged from the San Francisco Bay that was used to develop marshlands into land throughout the Bay Area (Nichols and Wright, 1971)[5]. Based on mapping by Nichols and Wright (1971), who mapped historic margins of marshland in the San

[2] https://www.historicaerials.com/viewer
[3] University of California, Santa Barbara Library, Map & Imagery Laboratory, International Topographic Map Indexes, Frame Finder, http://mil.library.ucsb.edu/ap_indexes/FrameFinder/, adopted September 2017.
[4] CGS (2003), Seismic Hazard Zone Report for the San Leandro 7.5-Minute Quadrangle, Alameda County, California, Seismic Hazard Zone Report 078.
[5] Nichols and Wright (1971), Preliminary Map of Historic Margins of Marshland, San Francisco Bay, California, dated 1971, Open-File Report 71-216, scale 1:125:000.

Francisco Bay, the Site is located on the north border of a historic marshland boundary.

4. SITE RECONNAISSANCE AND ANTICIPATED SUBSURFACE CONDITIONS

On September 13, 2022, a geologist and a geotechnical engineer from BSK visited the site accompanied by representatives from the City, Bellecci, and Rincon to observe existing site conditions. Based on our observations during our site visit and our review of nearby project reports, we anticipate the Site to be underlain by a loose to medium dense silty sand fill layer over compressible Bay Mud. Groundwater at the Site is anticipated to be between 1 and 5 feet below the ground surface, depending on tidal elevations.

5. CONCLUSIONS

Based on our data review and site reconnaissance, we conclude that the main cause of localized erosion occurring at the Site is tidal wave action in combination with the lack of shoreline protection during periods of high wave energy such as storm events. Due to the heavy rainstorms during the past 2022-2023 winter, it appears erosion at the Site has worsened in a short time and has fully-encroached the unpaved pedestrian pathway. The two localized shoreline erosional features should be reconstructed seaward to match the adjacent, relatively intact natural shoreline edges and protected against high energy tidal wave action to reduce the potential for further erosion. Due to the overall conditions of the natural northern Bay Farm Island shoreline, consideration should be given to protecting the entire exposed length of the shoreline (i.e., well beyond the two embankment erosion features discussed herein) to reduce future erosion in the future along the entire shoreline. However, as previously stated, the focus of the recommendations presented in this report is just the restoration of the two shoreline erosional features shown on Figure 2.

6. RECOMMENDATIONS

Based on our findings and discussions with the City, Bellecci, Rincon, and several regulatory agencies who have permitting oversight for the Site, we evaluated several restoration options. Below we discuss the three main restoration options we evaluated:

1. Restoration Option 1 – Gray/Green Revetment with a 3H:1V slope: Removal of sloughed/caved soil debris and organic matter at the base of the embankments, reconstructing the shoreline to match the existing shoreline edges by backfilling and replacing with sandy fill, reclaiming existing rock slope protection (RSP) scattered along shoreline in this area, placing reclaimed and new RSP with a 3H:1V (horizontal to vertical) slope gradient, adding native plantings above of the slope, and adding reef balls[6] at the toe of the restoration below the mean high water (MHW) line to help attenuate wave energy and provide marine habitat;

[6] Reef balls are artificial reef modules which mimic the structure and function of a natural reef. They are typically made of concrete with special additives to obtain a pH that is similar to that of sea water. They are hollow and their surfaces are full of perforations.

2. Restoration Option 2 – Gray/Green Revetment with a 2H:1V slope: Same as Option 1 but the RSP has a 2H:1V slope gradient; and
3. Restoration Option 3 – Gray/Green Revetment with a 1.5H:1V slope: Same as Option 1 but the RSP has a 1.5H:1V slope gradient and the sandy fill includes geogrid reinforcement.

Although Option 1 would provide a more stable slope gradient and appear esthetically more natural, it would result in a higher construction cost and more fill placed below the MHW line. During our pre-application meeting with the City, Rincon, Bellecci, the BCDC, and several other regulatory agencies having permitting jurisdiction over the Site, the most favorable restoration option was Option 3 due to minimal fill being placed below the MHW and in the San Francisco Bay. It also results in a more compact configuration that is much less exposed to wave action from multiple directions than the other two options, particularly Option 1. **Therefore, we recommend that Option 3 be chosen for this project.**

Conceptual site plans and cross sections for restoration Option 3 are presented on Figures 3 and 4. Construction considerations and pertinent details for restoration Option 3 are described below.

7.1 Restoration Option 3 – Gray/Green Revetment with a 1.5H:1V Slope

As shown on Figure 4, this option includes removal of the sloughed/caved soil debris and organic matter at the base of the embankment followed by backfill with sandy fill material to be consistent with the existing surrounding sandy fill soil (see fill requirements in the "Site Preparation and Grading" section below). Due to the 1.5H:1V fill and RSP slope gradient recommended for the restoration at the Site, we recommend Mirafi® BXG120 biaxial geogrid or equivalent be used to reinforce the fill slope for the repair. The first layer of geogrid should be located 1-foot above the base of the existing Bay Mud layer. Subsequent layers of geogrid should be spaced at a maximum of 1-foot vertical intervals. The geogrid should extend horizontally from the face of the slope to the back of the back cut (back of the repair) and be overlapped a minimum of 2 feet at the seams. This recommended geogrid layout and configuration is only preliminary and will need to be finalized during construction based on actual field conditions.

At the top of newly restored slope crest, a biodegradable woven coir erosion control blanket meeting the requirements of Section 21-2.02O(4), Type B of the 2018 Caltrans Standard specifications, such as North American Green BioNet® 125 (C125BN) or equivalent, should be placed and staked immediately behind the crest of the RFP for erosion control protection. Native vegetation should be planted in cut slits of the woven coir erosion control blanket and should match or be similar to the existing vegetation along the shoreline unless otherwise recommended by a qualified bioengineering or landscape professional. The woven coir erosion control blanket should extend from the edge of the existing unpaved pedestrian pathway to the crest of the RSP slope. The woven coir erosion control blanket should be overlapped a minimum of 1 foot at the seams and fixed to the surface of the slope using wooden stakes or staples per the manufacturer's requirements.

The backfill in the upper 1-foot behind the crest of the RSP slope should consist of fertilized topsoil and be planted between the months of October and March (i.e., the typical rainy season in the San Francisco Bay Area) to facilitate plant growth. The City should consult with a qualified bioengineering or landscape

professional, so that vegetation suitable for a marine environment and proper topsoil are selected and guidance can be provided to the City on any required periodic maintenance.

Once the embankment erosion features have been backfilled, covered with biodegradable woven coir erosion control blanket, staked/stapled, and native vegetation planted, we recommend that RSP be installed as part of the outer surface of the fill slope to provide long-term protection against future surface erosion. We recommend reclaiming the existing scattered RSP shown on Figure 3 and using it as part of the RSP material for the shoreline restoration. We do not expect the quantity of scattered RSP to be sufficient for the two restoration areas, so additional RSP material will need to be imported to the Site. The RSP layer should be a minimum of 1-foot thick. Due to the presence of the soft/compressible Bay Mud layer immediately below the embankment erosion feature, the keyway at the toe of the repair should be limited to a depth of 1 foot as shown on Figure 4.

The imported RSP material should consist of Class II rock gradation per Section 72-2.02B of the 2018 Caltrans Standard Specifications. The RSP should be manually placed using Method A per Section 72-2.03B of the 2018 Caltrans Standard Specifications. The RSP layer should be underlain by Class 10 RSP fabric meeting the requirements of Section 96-1.02I of the 2018 Caltrans Standard Specifications, such as Mirafi® 1100NC or equivalent overlapped at minimum of 1 foot at the seams. The RSP fabric should be overlapped a minimum of 2 feet upslope of the toe of the repair as shown on Figure 4.

7.2 Site Preparation and Grading

Our general site preparation and grading recommendations are as follows:

1. The areas to be graded should initially be cleared of debris, significant surface vegetation, and obstructions. Stripped surface organics should be stockpiled and may be reused for the topsoil of the slope or disposed off-site.
2. From a geotechnical standpoint only, the on-site sandy soils only are generally suitable for re-use as general engineered fill provided they are free of debris, vegetation, and other deleterious matter and properly processed so that particle sizes are not greater than 3 inches in largest dimension. At least 90 percent by weight of the fill/backfill materials should be passing the 1-inch sieve. All fill materials should be subject to evaluation and approval by a BSK representative prior to their use.
3. Except for the topsoil in the upper 1-foot behind the crest of the RSP slope and the RSP material, imported fill should be granular in nature, durable, and adhere to the gradation and plasticity criteria presented in the table below (unless otherwise permitted by BSK). The objective is for imported fill to consist of Well Graded Sand with Silt (SW-SM) to allow it to be well compacted during placement. BSK should be provided a sample of the proposed import fill material at least 10 business days prior to importing the material to the Site, so that we can confirm it meets the requirements presented herein.

IMPORT FILL	
Sieve	**Percent Passing by weight**
1”	100
No. 4	90-100
No. 8	80-95
No. 16	50-85
No. 30	25-60
No. 50	15-30
No. 100	10-20
No. 200	5-12
Plasticity Index	8 or less
Liquid Limit	Less than 20%

4. Fill/backfill should be placed in thin lifts up to 8-inch maximum uncompacted thickness, properly moisture conditioned to near optimum moisture content and compacted to at least 90 percent compaction per ASTM D1557. **Due to the presence of soft/compressible young Bay Mud immediately below the embankment erosion feature, no vibration should be applied during compaction of fill/backfill during the repair to avoid destabilizing the Bay Mud.** Ideally, compaction should be performed using a sheepsfoot wheel mounted on a backhoe or excavator.
5. A BSK representative should be present throughout the repair operation on a near full-time basis to confirm that the earthwork and repair recommendations presented in this report are properly followed during construction and to perform compaction testing to assist the contractor in obtaining the required degree of compaction and proper moisture content. Where the moisture content or compaction is outside the range required, additional compactive effort and adjustment of moisture content should be made until the specified compaction and moisture conditioning is achieved.
6. BSK should be notified at least 48 hours prior to any grading and backfill operations. The procedure and methods of grading may then be discussed between the contractor and BSK.

7.3 Excavation and Backfill

We anticipate that excavations can be made with standard earthwork equipment, such as excavators and backhoes. However, due to the geometry and space constraints at the Site, earthwork equipment would likely consist of mini excavators, small compaction equipment, and excavators with long reaches or draglines. The contractor should limit the use of earthwork equipment only to the area immediately upslope of the embankment erosion features. At no time should earthwork equipment be allowed to drive over the Bay Mud layer to avoid destabilizing it.

Construction equipment and soil stockpiles should be set back a minimum horizontal distance of “H” away from the edge of excavations, where “H” is equal to the depth of the excavation. This setback distance also applies to shored excavations unless the shoring design takes into account any surcharge loads associated with the construction equipment and stockpiles.

Free groundwater is anticipated to be at depth of approximately 1 to 5 feet BGS at the Site, depending on the tide elevation, so conventional sump pumps used in typical trenching and excavation projects should be available during construction when groundwater is encountered, and/or if substantial runoff water accumulates within the excavations as a result of wet weather conditions. The contractor should anticipate the need for removing groundwater or seepage water from excavations and should include such costs in their bid.

Appropriate provisions should be made to prevent surface water from ponding adjacent to the top of excavations and flowing over the sides of the excavations, otherwise the excavation side walls and/or slopes could be compromised. Backfill for excavations should be compacted as noted previously.

8. ADDITIONAL SERVICES AND LIMITATIONS

8.1 Plan Review (if any) and Construction Observation

In the event the City prepares any plans/figures or specifications beyond what is presented in the report, BSK should be provided an opportunity to review this information before it goes out to bid. BSK should also be retained by the City to perform field observation and compaction testing during construction. The anticipated tests, observations, and consultation by BSK during construction should include, but are not limited to:

- Review of contractor submittals and requests for information (RFIs);
- Observation of site clearing and stripping of vegetation;
- Observation of subgrade preparation prior to backfill;
- Observation and compaction testing of backfill;
- Observation of placement of geogrid in backfill;
- Observation of placement of woven coir erosion control blanket, and
- Observation of placement of RSP and RSP fabric.

8.2 Limitations

The findings, conclusions, and recommendations contained in this report are based on our field observations and review of previous investigations, and the communication we had with the City, Bellecci, Rincon, and the regulatory agencies during the pre-application process. It is possible that soil and subsurface conditions could vary from those assumed in this report. If soil conditions are encountered during construction that differ from those described herein, we should be notified immediately in order that a review may be made and any supplemental recommendations provided. If the scope of the proposed construction changes from that described in this report, our recommendations should also be reviewed. **It should also be noted that the repair recommendations provided herein should only be performed once proper permitting is obtained by the City from the regulatory agencies that have permitting oversight for the Site.**

We prepared this report in substantial accordance with the generally accepted geotechnical engineering practice as it exists in the Site area at the time of our study. No warranty, either express or implied, is made. The recommendations provided in this report are based on the assumption that an adequate program of tests and observations will be conducted by BSK during the construction phase in order to evaluate compliance with our recommendations.

This report may be used only by the Client and only for the purposes stated within a reasonable time from its issuance, but in no event later than six months to one (1) year from the date of the report, or if conditions at the Site have changed. If this report is used beyond this period, BSK should be contacted to evaluate whether site conditions have changed since the report was issued.

Also, land or facility use, on and off-site conditions, regulations, or other factors may change over time, and additional work may be required with the passage of time. Based on the intended use of the report, BSK may recommend that additional work be performed and that an updated report be issued.

The scope of services for this report did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous substances in the soil, surface water, or groundwater at this Site.

BSK conducted site reconnaissance and provided recommendations for this project. We understand that BSK will be given an opportunity to perform a formal geotechnical review of the final project plans and specifications (if any). In the event BSK is not retained to review the final project plans and specifications to evaluate if our recommendations have been properly interpreted, we will assume no responsibility for misinterpretation of our recommendations. We also understand that BSK will be given an opportunity to observe and test the earthwork and repair operations during construction. The purpose of these services would be to provide BSK the opportunity to observe the actual soil conditions encountered during construction, evaluate the applicability of the recommendations presented in this report to the soil conditions encountered, and recommend appropriate changes in design or construction procedures if conditions differ from those described herein.

9. CLOSURE

BSK appreciates the opportunity to provide our services to you and trust this report meets your needs at this time. If you have any questions concerning the information presented, please contact us at 925-315-3151.

Respectfully submitted,
BSK Associates

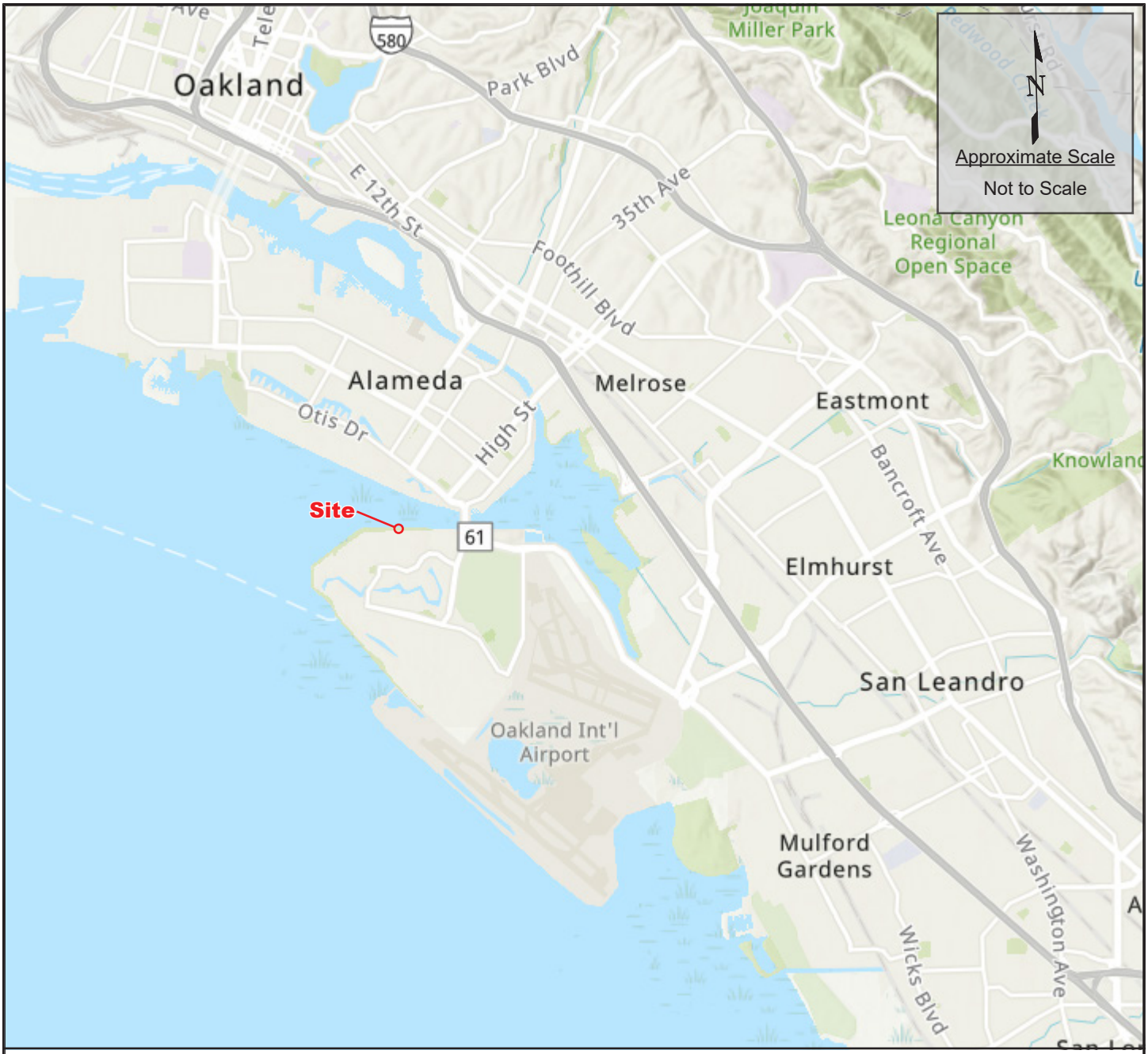
Michael J. Romero, PG #9869
Project Geologist

PROFESSIONAL GEOLOGIST
MICHAEL J. ROMERO
No. 9869
STATE OF CALIFORNIA

Cristiano Melo, PE, GE #2756
Livermore Branch Manager

REGISTERED PROFESSIONAL ENGINEER
CRISTIANO B.C. DEMELO
No. 2756
Exp. 09/30/24
GEOTECHNICAL
STATE OF CALIFORNIA

FIGURES



References: 1. Esri, NASA, NGA, USGS | California State Parks, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/ NASA, USGS, Bureau of Land Management, EPA, NPS, USDA

Note: Locations are approximate

BSK ASSOCIATES

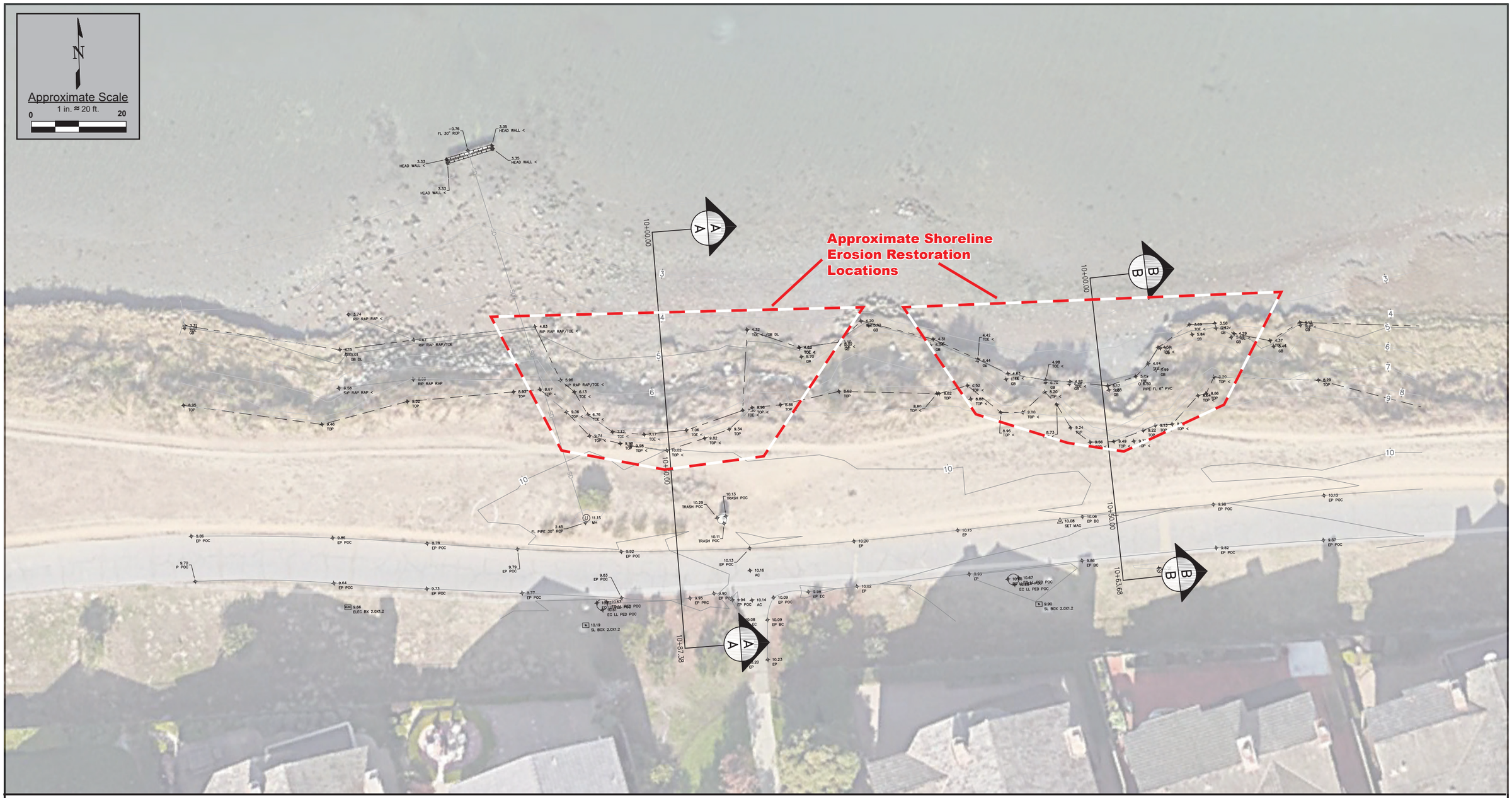
PROJECT NO. G00000635	
DRAWN: 4/10/23	
DRAWN BY: M. Romero	
CHECKED BY: C. Melo	
FILE NAME: VicMap.indd	

VICINITY MAP

Geotechnical Recommendations Letter
Shoreline Erosion Restoration Project
2905 Sea View Parkway
Alameda, California

FIGURE

1



References: 1. http://earth.google.com, Image from August, 2020
2. Topographic Plans entitled, "Cross Sections Exhibit, North Shore Bay Farm Island, City of Alameda, State of California, dated January 2023 by Bellecci & Associates (Job No. 220099).

Notes: 1. Locations are approximate.

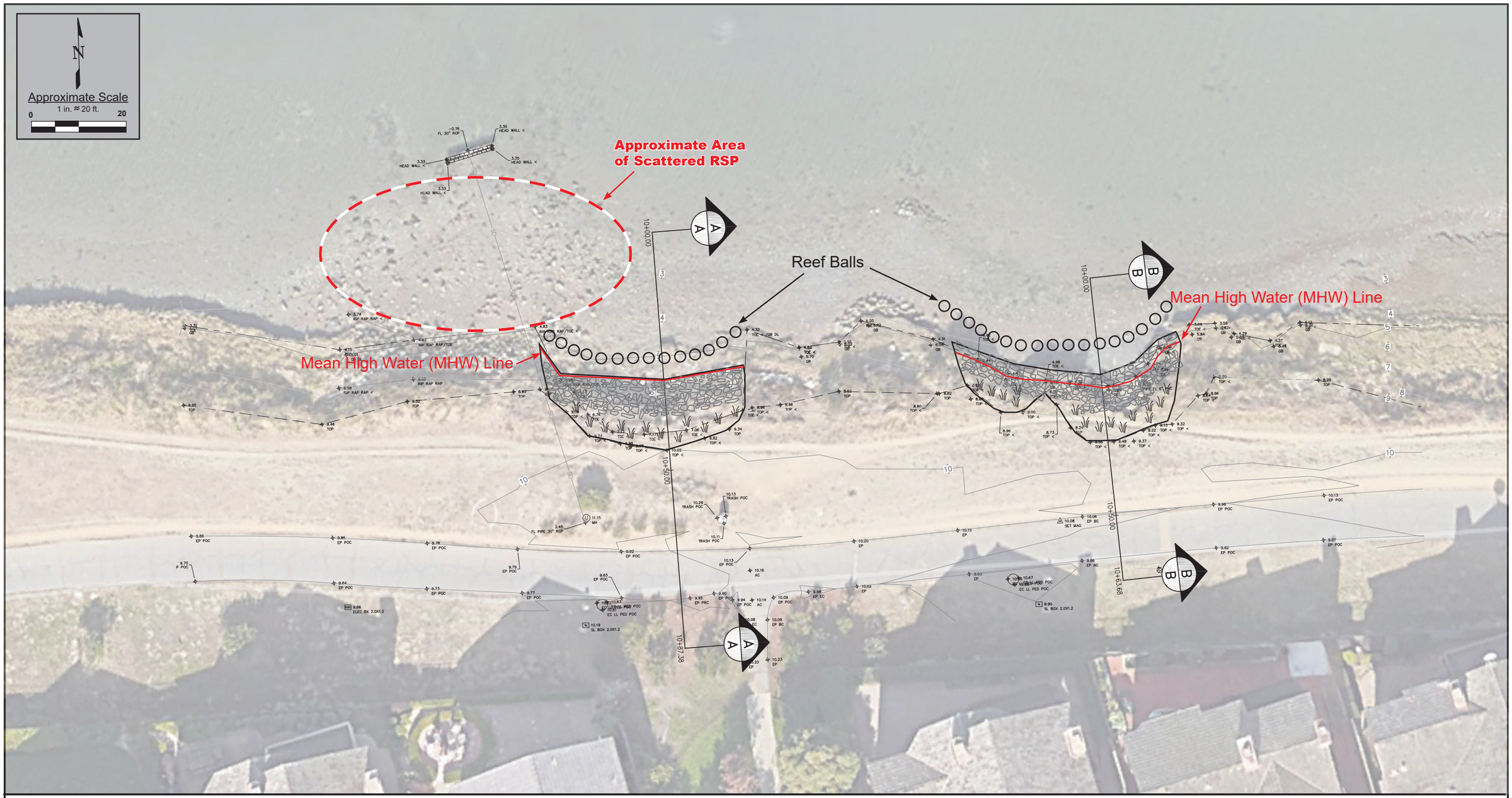
BSK ASSOCIATES®

PROJECT NO. G00000635
DRAWN: 4/10/23
DRAWN BY: M. Romero
CHECKED BY: C. Melo
FILE NAME: SitePlan.indd

RESTORATION SITE PLAN

Geotechnical Recommendations Letter
Shoreline Erosion Restoration Project
2905 Sea View Parkway
Alameda, California

FIGURE
2



References: 1. http://earth.google.com, Image from August, 2020
2. Topographic Plans entitled, "Cross Sections Exhibit, North Shore Bay Farm Island, City of Alameda, State of California, dated January 2023

Notes: 1. Locations are approximate
2. Not for construction.

BSK ASSOCIATES®

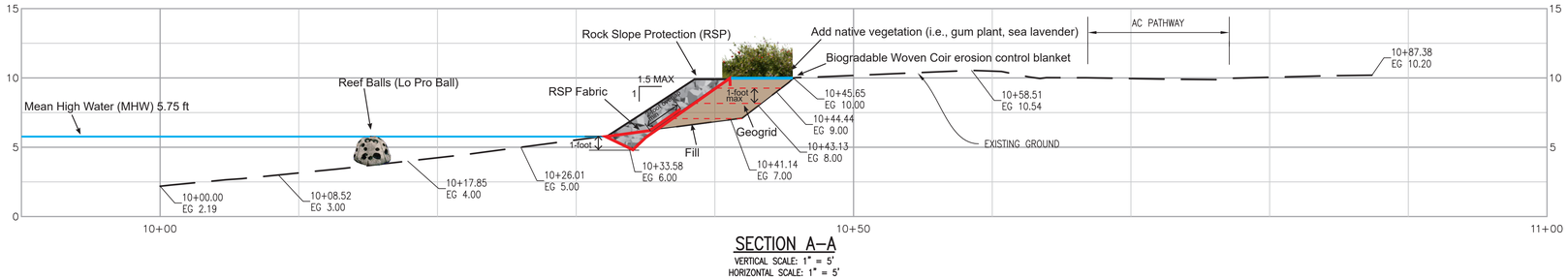
PROJECT NO. G00000635
DRAWN: 4/10/23
DRAWN BY: M. Romero
CHECKED BY: C. Melo
FILE NAME: SitePlan.indd

CONCEPTUAL RESTORATION SITE PLAN (1.5H:1V SLOPE GRADIENT)

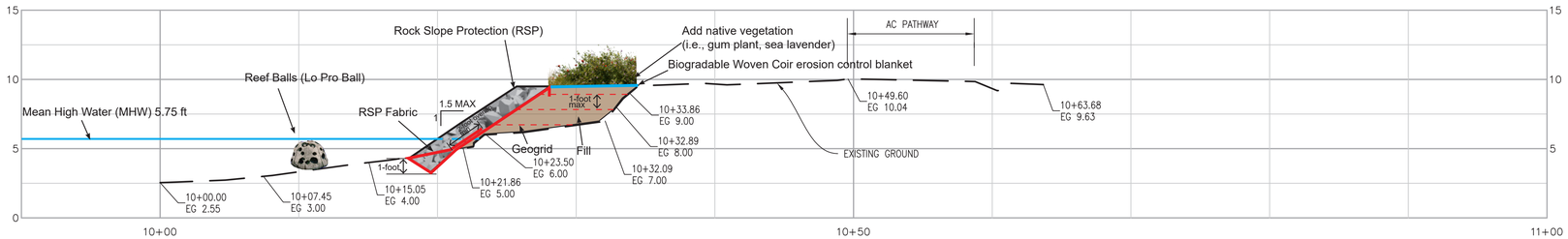
**Geotechnical Recommendations Letter
Shoreline Erosion Restoration Project
2905 Sea View Parkway
Alameda, California**

FIGURE
3

1.5H:1V Conceptual Restoration



SECTION A–A
VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 5'



SECTION B–B
VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 5'

Notes:

1. Existing subgrade should be cleared of debris, organic matter, and other deleterious matter prior to backfilling.
2. The sandy fill should be compacted to a minimum 90 percent relative compaction at near optimum moisture content (based on ASTM D1557) with exception of the upper 1 foot that will be used as landscaping and may be compacted to a minimum of 85 percent compaction. Do not apply vibration during compaction.
3. The geogrid should consist of Mirafi BXG120 or equivalent and should overlap a minimum 2 feet at the seams.
4. The upper 1 foot of backfill behind the crest of the RSP slope should consist of topsoil for landscaping and should be fertilized and cultivated per landscaping professional recommendations.
5. Biogradable woven coir erosion control blanket should be overlapped a minimum 1 foot at the seams and fixed to the surface of the slope with stakes or staples per the manufacturers requirements.
6. RSP material should consist of Class II rock gradation per Section 72-2.02B of the 2018 Caltrans Standard Specifications. It should be manually placed using Method A per Section 72-2.03B of the 2018 Caltrans Standard Specifications. The RSP material scattered along the intertidal zone(see Figure 3) may also be used.
7. RSP fabric should consist of Class 10 RSP fabric meeting the requirements of Section 96-1.02I of the Caltrans Standard Specifications, such as Mirafi® 1100NC or equivalent overlapped a minimum of 1 foot at the seams.
8. A 1-foot deep keyway should be excavated at the toe of the repair to allow the RSP fabric to be overlapped a minimum of 2 feet upslope of the toe of the repair.

Reference:

1. Topographic Plans entitled, "Cross Sections Exhibit, North Shore Bay Farm Island, City of Alameda, State of California, dated January 2023 by Bellecci & Associates (Job No. 220099).

BSK ASSOCIATES®

PROJECT NO.: G00000635	**CONCEPTUAL RESTORATION CROSS SECTIONS A-A' & B-B' (1.5H:1V SLOPE GRADIENT)**
DRAWN: 4/10/2023	
DRAWN BY: M. Romero	
CHECKED BY: C. Melo	Geotechnical Recommendations Letter Shoreline Erosion Restoration Project 2905 Sea View Parkway Alameda, California
FILE NAME: 11x17 Site Plan and X-Section.indd	

FIGURE
4