



DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
450 GOLDEN GATE AVENUE
SAN FRANCISCO, CALIFORNIA 94102

DEC 18 2019

Regulatory Division

SUBJECT: File Number 2015-00391S

Mr. Jeff Moneda
City of Foster City
610 Foster City Boulevard
Foster City, California 94404

Dear Mr. Moneda:

Enclosed are two copies of a Department of the Army (DA) permit to implement the Foster City Levee Improvement Project (CIP 301-657). This project involves raising the elevation of approximately 34,300 linear feet of the Foster City levee system and rehabilitating or improving ancillary structures associated with the levee.

You are advised that the Corps has established an Administrative Appeal Process, as described in our regulations at 33 C.F.R. pt. 331 (65 Fed. Reg. 16486 (March 28, 2000)) and outlined in the enclosed flowchart and Notification of Administrative Appeal Options, Process, and Request for Appeal (NAO-RFA) form. The following two options are available to you in your evaluation of the enclosed permit:

1. You may sign and date both copies of the permit on the line designated for "Permittee." Your signature on the permit indicates that you accept the permit in its entirety and waive all rights to appeal the permit, including its terms and conditions. Both copies of the permit must be returned to this office for final authorization. We will then forward one copy of the fully executed permit for your records, at which time you will be authorized to commence work.
2. You may decline to sign the permit because you object to certain terms and conditions, and you may request that the permit be modified. If you decline the permit, you must return the permit to the District Engineer and may not proceed with your project until notified by the District Engineer. You must outline your objections to the terms and conditions of the permit by completing Section II of the NAO-RFA form. Your objections must be received by the District Engineer within 60 days of the date of this letter, or you will forfeit your right to request changes to the terms and conditions of the permit.

Upon receipt of the completed NAO-RFA form, the District Engineer will evaluate your objections and may: a) modify the permit to address all of your objections, b) modify the permit to address some of your objections, or c) not modify the permit,

having determined that the permit should be issued as previously written. In any of these three cases, the District Engineer will send you a final permit for your reconsideration, as well as a second NAO-RFA form. Should you decline the final proffered permit, you can appeal the declined permit by submitting the completed NAO-RFA form to the Division Engineer. The NAO-RFA form must be received by the Division Engineer within 60 days of the date of the second transmittal letter, or you will forfeit your right to pursue an appeal.

If you fail to sign and return both copies of this permit or fail to request a modification of the permit within 60 days from the date of this letter, your permit application may be withdrawn pursuant to our regulations at 33 C.F.R. § 325.2(d)(5).

You may refer any questions on this matter to Naomi Schowalter of my Regulatory staff by telephone at 415-503-6763 or by e-mail at naomi.a.schowalter@usace.army.mil. All correspondence should be addressed to the Regulatory Division, South Branch, referencing the file number at the head of this letter.

Sincerely,

A handwritten signature in cursive script, appearing to read "Katerina Galacatos".

Katerina Galacatos

South Branch Chief, Regulatory Division

Enclosures

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Jeff Moneda, City of Foster City		File No. 2015-00391S	Date: 12/18/2019
Attached is:			See Section below
✓	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A	
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B	
	PERMIT DENIAL	C	
	APPROVED JURISDICTIONAL DETERMINATION	D	
	PRELIMINARY JURISDICTIONAL DETERMINATION	E	

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://usace.army.mil/inet/functions/cw/cecwo/reg> or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the DISTRICT ENGINEER for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this Notice and return the Notice to the DISTRICT ENGINEER. Your objections must be received by the DISTRICT ENGINEER within 60 days of the date of this Notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your NOTICE, the DISTRICT ENGINEER will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the DISTRICT ENGINEER will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the DISTRICT ENGINEER for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this NOTICE and sending the NOTICE to the DIVISION ENGINEER. This Notice must be received by the DIVISION ENGINEER within 60 days of the date of this Notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this Notice sending the Notice to the DIVISION ENGINEER. This Notice must be received by the DIVISION ENGINEER within 60 days of the date of this Notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this Notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this Notice and sending the Notice to the DIVISION ENGINEER. This Notice must be received by the DIVISION ENGINEER within 60 days of the date of this Notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

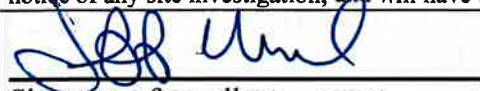
If you have questions regarding this decision and/or the appeal process you may contact:

Katerina Galacatos, Chief, South Branch, Regulatory Division
U.S. Army Corps of Engineers, San Francisco District
1455 Market Street, 16th Floor, Attn: CESPN-R-S
San Francisco, CA 94103-1398
Tel. (415) 503-6778 FAX (415) 503-6690

If you only have questions regarding the appeal process you may also contact:

Thomas J. Cavanaugh, Appeal Review Officer
U.S. Army Corps of Engineers, South Pacific Division
1455 Market Street, 20th Floor, Attn: CESPD-PDS-O
San Francisco, CA 94103-1399
Tel. (415) 503-6574 FAX (415) 503-6646

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.


Signature of appellant or agent.

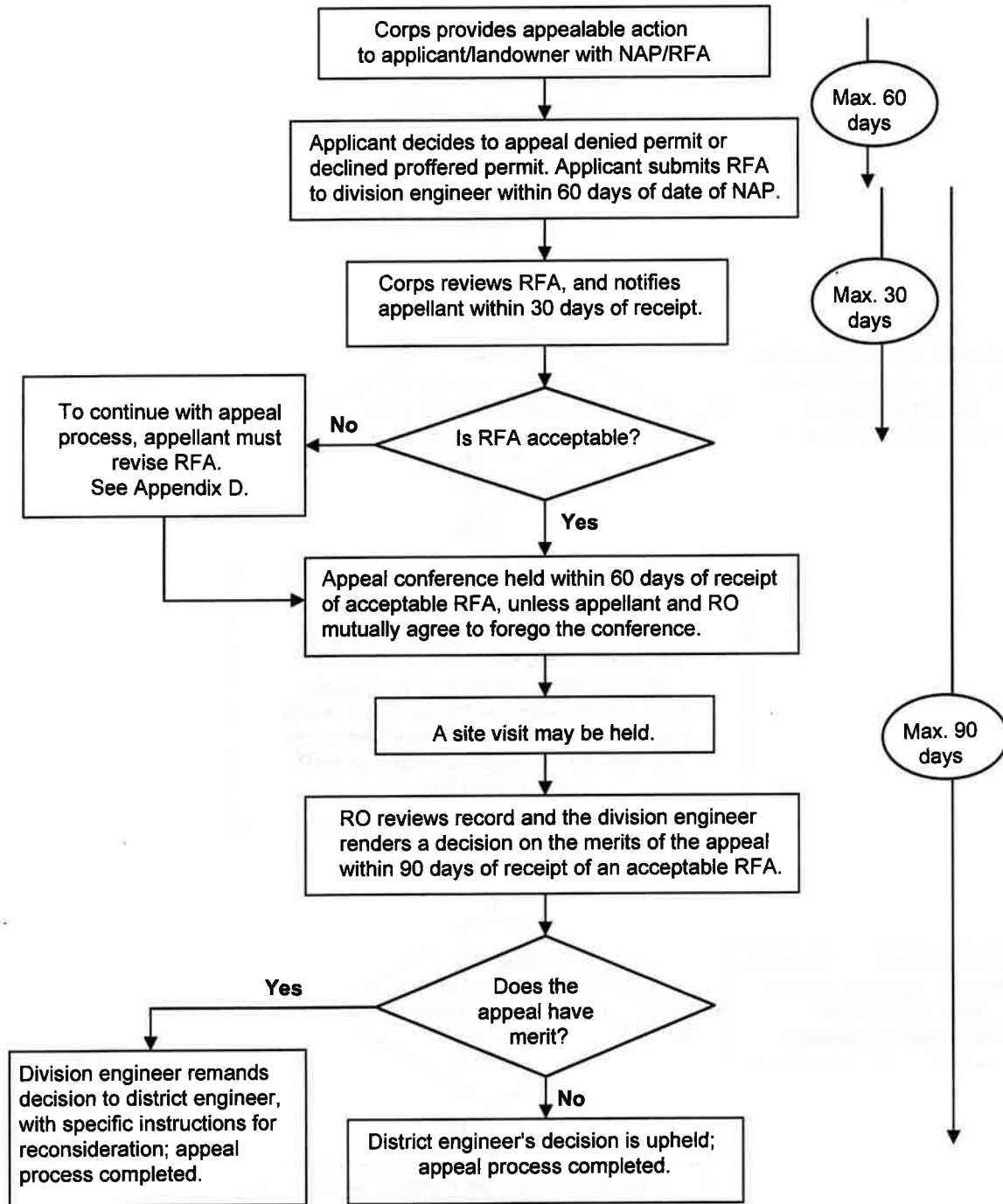
Date:

1/2/20

Telephone number:

650-286-3288

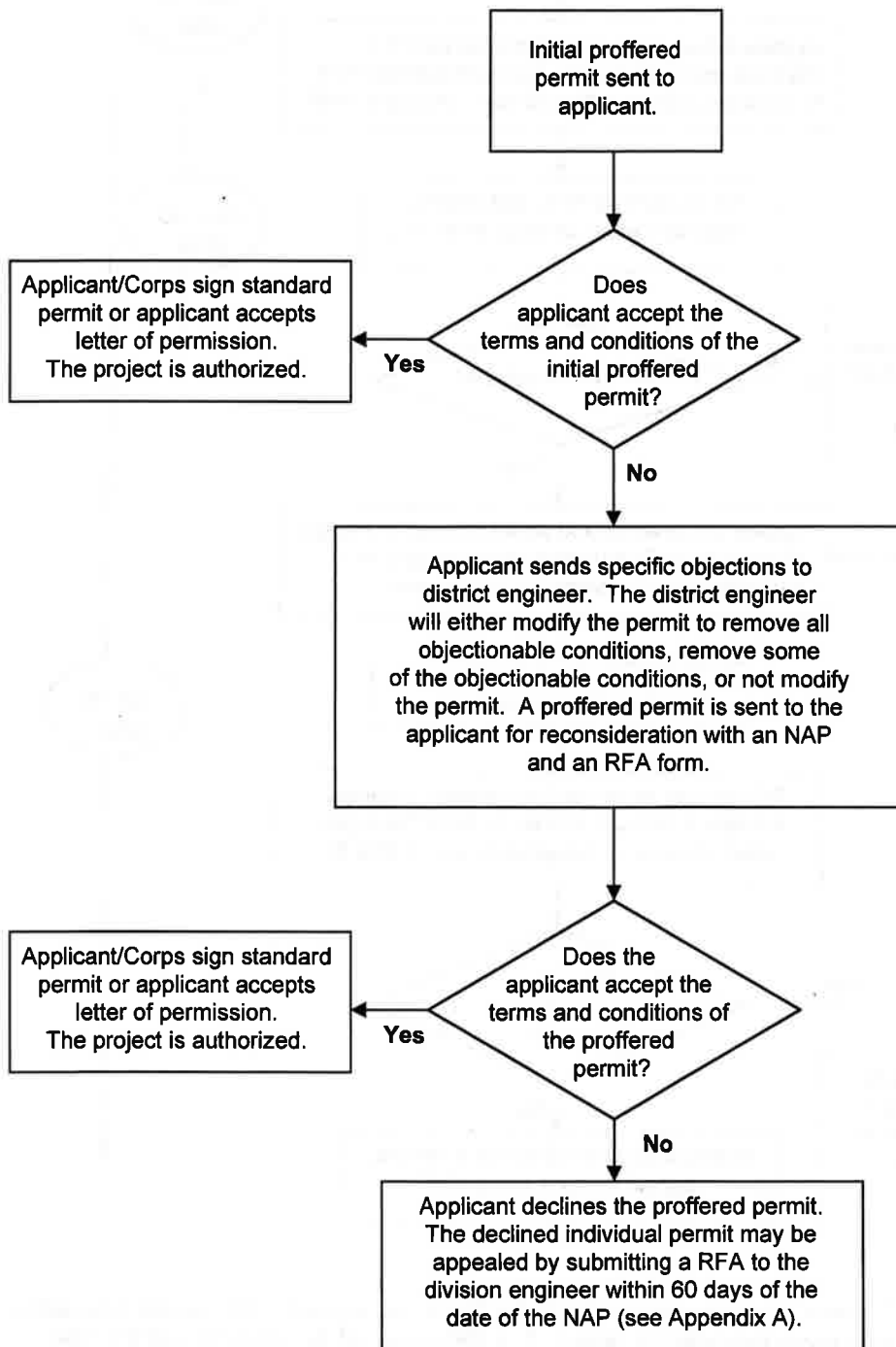
Administrative Appeal Process for Permit Denials and Proffered Permits



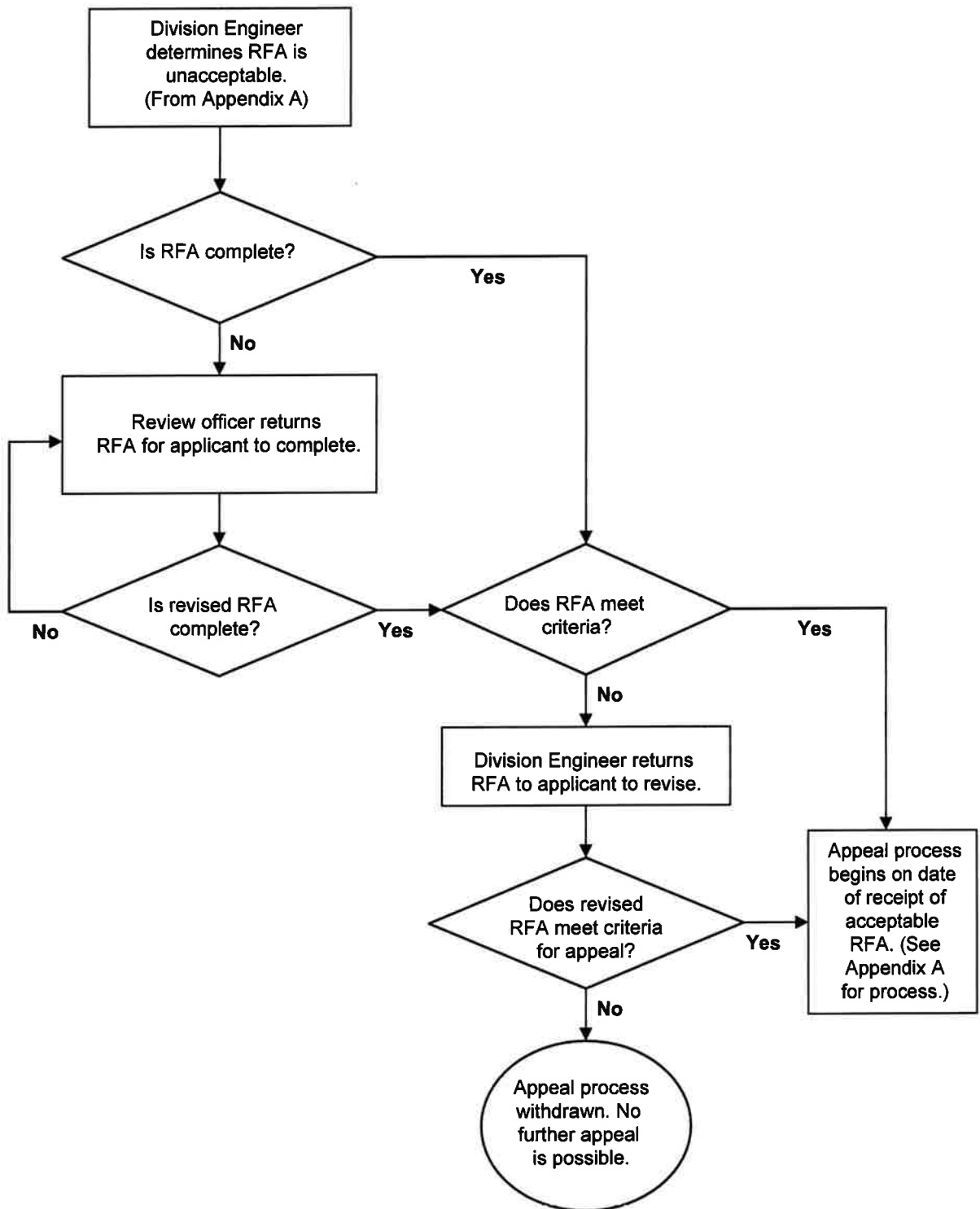
NOTE: If new information is provided to the Corps, the applicant will be asked if the applicant wishes to revise the project or record. If so, the appeal will be withdrawn and the case returned to the District for appropriate action. If not, then the Division Engineer will rule on the merits of the appeal based on the administrative record without consideration of the new information. However, the new information may cause the District Engineer to take action under 33 CFR 325.7, independent of the appeal process.

Appendix A

Applicant Options with Initial Proffered Permit



Process for Unacceptable Request for Appeal





DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
450 GOLDEN GATE AVENUE
SAN FRANCISCO, CALIFORNIA 94102

FOSTER CITY LEVEE IMPROVEMENT PROJECT
DEPARTMENT OF THE ARMY PERMIT

PERMITTEE: Mr. Jeff Moneda, City of Foster City

PERMIT NO.: SPN-2015-00391S

ISSUING OFFICE: San Francisco District

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate District or Division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below:

PROJECT DESCRIPTION: The project involves raising the elevation of approximately 34,300 linear feet of the Foster City levee system. Levee improvements will include a combination of three different construction approaches: sheet pile floodwall, earthen levee, and conventional floodwall. A sheet pile floodwall will be installed along approximately 24,400 linear feet of the levee, an earthen levee along 4,600 feet, and a conventional floodwall along 5,500 feet. The proposed project will raise the elevation of the levee system by 0.5 to 7 feet to meet the 2050 sea level rise prediction.

The project also involves rehabilitating or improving ancillary structures associated with the levee, including the Bay Trail, access ramps, stair structures, intake and outfall structures, and two slough crossings. These modifications and improvements are as follows: nine access ramps or paths will be upgraded or constructed to improve pedestrian access and one access ramp will be upgraded to allow for emergency rescue boats to enter the Bay; eight stair structures will be constructed from the Bay Trail to the Bay; the Foster City Lagoon intake and outfall structures will be modified to accommodate the levee rehabilitation; and two bridges will be constructed to replace the existing earthen pedestrian pathways that separate the O'Neill Slough remnant channel from Belmont Slough. Another pedestrian bridge located at the Bayside Tower complex will be replaced to accommodate levee improvements.

Implementation of the project will permanently impact 0.097 acre and temporarily impact 0.59 acre of potential water of the U.S., including tidal wetlands, tidal other waters, and non-tidal wetlands. In addition, the project would restore full tidal action to O'Neill Slough.

All work shall be completed in accordance with the plans and drawings titled "USACE File #2015-00391S, Foster City Levee Improvement Project, November 27, 2019, Figure 1 to 44," provided as Attachment A.

PROJECT LOCATION: City of Foster City, San Mateo County, California

PERMIT CONDITIONS:

GENERAL CONDITIONS:

1. The time limit for completing the work authorized ends on December 18, 2024. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity,

although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.
5. For your convenience, a copy of the water quality certification or waiver is attached (Attachment B). If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit.
6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.
7. You understand and agree that, if future operations by the United States require the removal, relocation or other alteration of the structure or work authorized herein, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, you will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

SPECIAL CONDITIONS:

1. To remain exempt from the prohibitions of Section 9 of the Endangered Species Act, the non-discretionary Terms and Conditions for incidental take of federally-listed salt marsh harvest mouse (*Reithrodontomys raviventris*) and California clapper rail (*Rallus longirostris obsoletus*) shall be fully implemented as stipulated in the Biological Opinion titled "Formal Consultation on the Foster City Levee Protection Planning and Improvements Project in San Mateo County, California (Corps File No: 2015-00391S)" (page 12), dated October 2, 2019 (Attachment C). Project authorization under this permit is conditional upon compliance with the mandatory terms and conditions associated with incidental take. Failure to comply with the terms and conditions for incidental take, where a take of a federally-listed species occurs, would constitute an unauthorized take and non-compliance with the authorization for your project. The USFWS is, however, the authoritative federal agency for determining compliance with the incidental take statement and for initiating appropriate enforcement actions or penalties under the Endangered Species Act.
2. The NMFS concurred with the determination that the project was not likely to adversely affect Central California Coast (CCC) steelhead (*Oncorhynchus mykiss*), North American green sturgeon (*Acipenser medirostris*), and designated critical habitat for these species. This concurrence was premised, in part, on the conservation measures outlined in Attachment D. These conservation measures are incorporated as special conditions to this authorization for your project to ensure unauthorized incidental take of species and loss of critical habitat does not occur.
3. You shall purchase credits equivalent to at least 0.05 acre of tidal wetlands and 0.05 acre of tidal other waters from the San Francisco Bay Wetland Mitigation Bank. The credits shall be mitigation for permanent impacts to

0.047 acre of tidal and palustrine wetlands and 0.05 acre of tidal other waters of the U.S.

4. The City of Foster City shall implement the Mitigation Monitoring Plan titled "Aquatic Resources Mitigation Plan for the City of Foster City Levee Protection Planning and Improvement Project (CIP 301-657)," dated September 2019 (Attachment E). Mitigation performance criteria shall be adhered to as per the Mitigation Monitoring Plan, and an annual monitoring report shall be submitted to the Corps by January 31 for at least three years following the completion of construction or until success criteria are achieved. This report shall include dated photographs of at least 20 temporary impact sites, including O'Neill Slough. If performance standards are not being met, a brief explanation of the difficulties and potential remedial actions shall be provided.
5. Your responsibility to implement the Mitigation Monitoring Plan as set forth in Special Condition 5 will not be considered fulfilled until you have demonstrated mitigation success and have received written verification from the U.S. Army Corps of Engineers.
6. A post construction report shall be submitted no more than 60 days after the conclusion of construction activities. The report shall compare the completed impacts to waters of the U.S. with the authorized impacts and include before and after photographs of representative temporary and permanent impacts to waters of the U.S.

FURTHER INFORMATION:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:


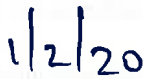
☒ Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. Section 403).
☒ Section 404 of the Clean Water Act (33 U.S.C. Section 1344).
☐ Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. Section 1413).
2. Limits of this authorization:
 - a. This permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.
 - b. This permit does not grant any property rights or exclusive privileges.
 - c. This permit does not authorize any injury to the property or rights of others.
 - d. This permit does not authorize interference with any existing or proposed Federal project.
3. Limits of Federal Liability: In issuing this permit, the Federal Government does not assume any liability for the following:
 - a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
 - b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
 - c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
 - d. Design or construction deficiencies associated with the permitted work.
 - e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. **Reliance on Applicant's Data:** The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.
5. **Reevaluation of Permit Decision:** This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:
 - a. You fail to comply with the terms and conditions of this permit.
 - b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate. (See Item 4 above.)
 - c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 C.F.R. § 325.7 or enforcement procedures such as those contained in 33 C.F.R. §§ 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 C.F.R. § 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. **Extensions:** General Condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

 _____ (PERMITTEE)	 _____ (DATE)
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This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

_____ Katerina Galacatos South Branch Chief Regulatory Division	_____ (DATE)
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When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of

this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFeree)

(DATE)

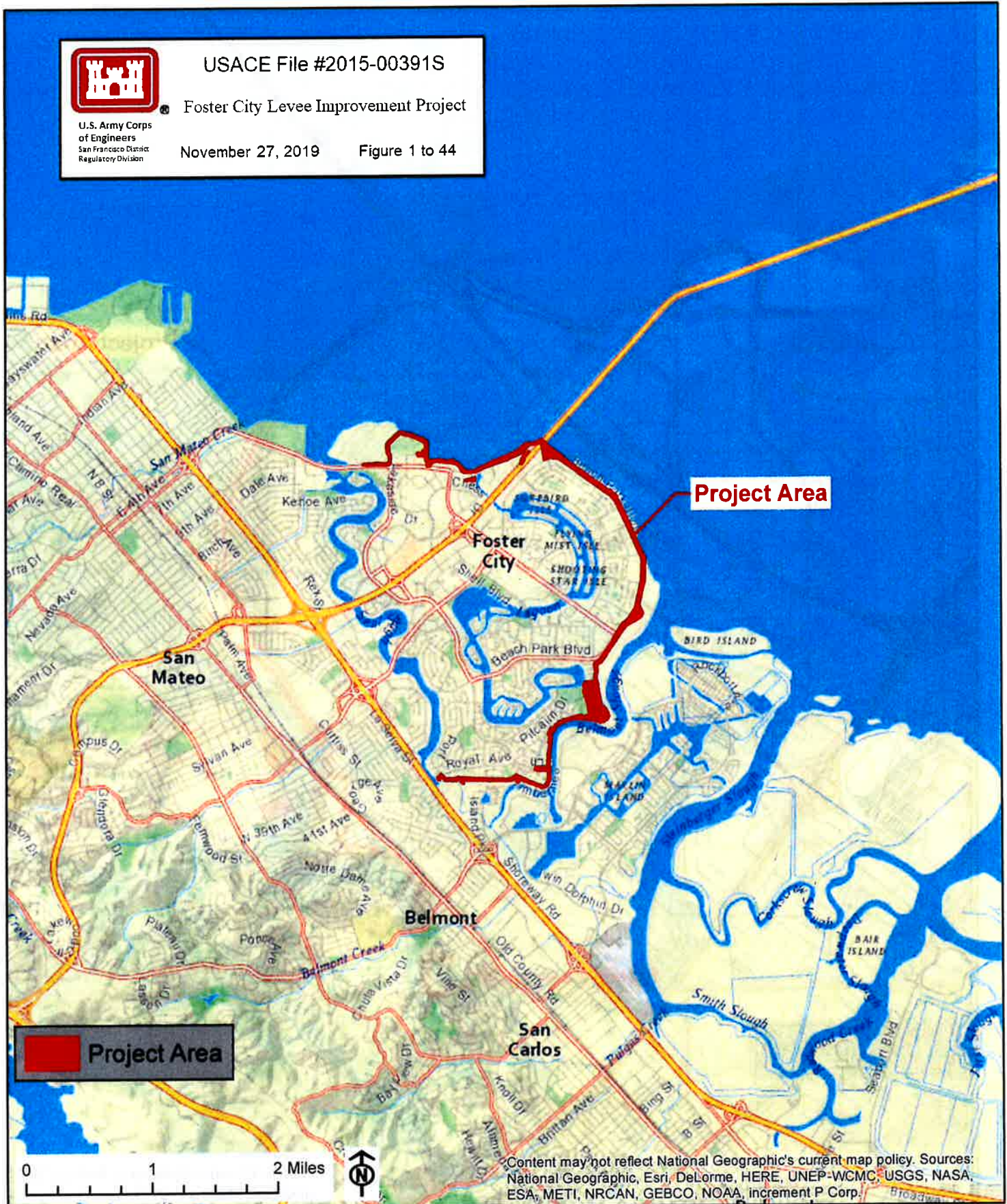


Figure 1. Location Map

Levee Protection Planning and Improvement Project CIP 301-657
City of Foster City, San Mateo County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

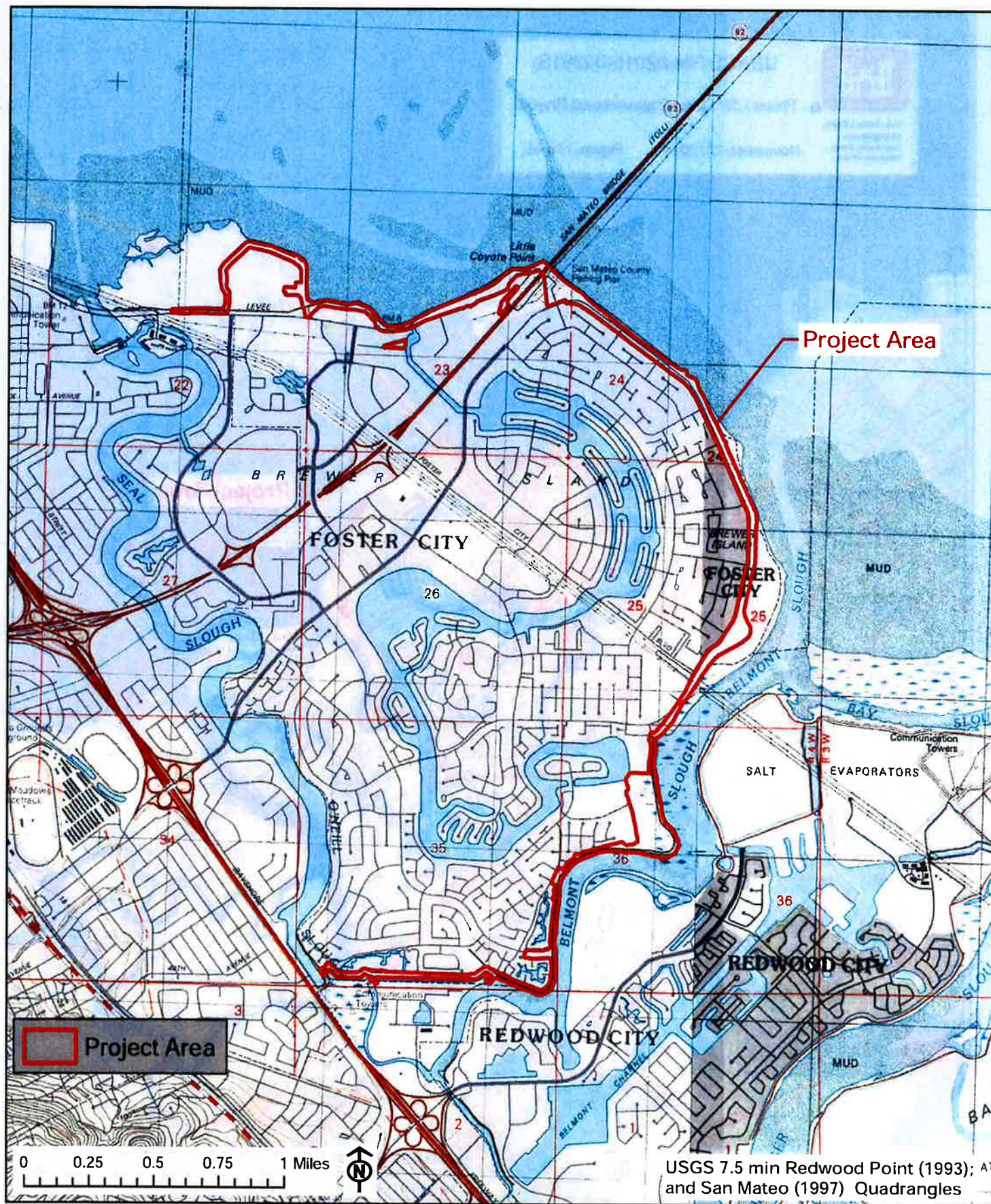


Figure 2. USGS 7.5 Minute Quadrangle Base Map
 Levee Protection Planning and Improvement Project CIP 301-657
 City of Foster City, San Mateo County, California

Huffman-Broadway Group, Inc.
 ENVIRONMENTAL REGULATORY CONSULTANTS



Figure 3. Aerial Imagery

Levee Protection Planning and Improvement Project CIP 301-657
City of Foster City, San Mateo County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

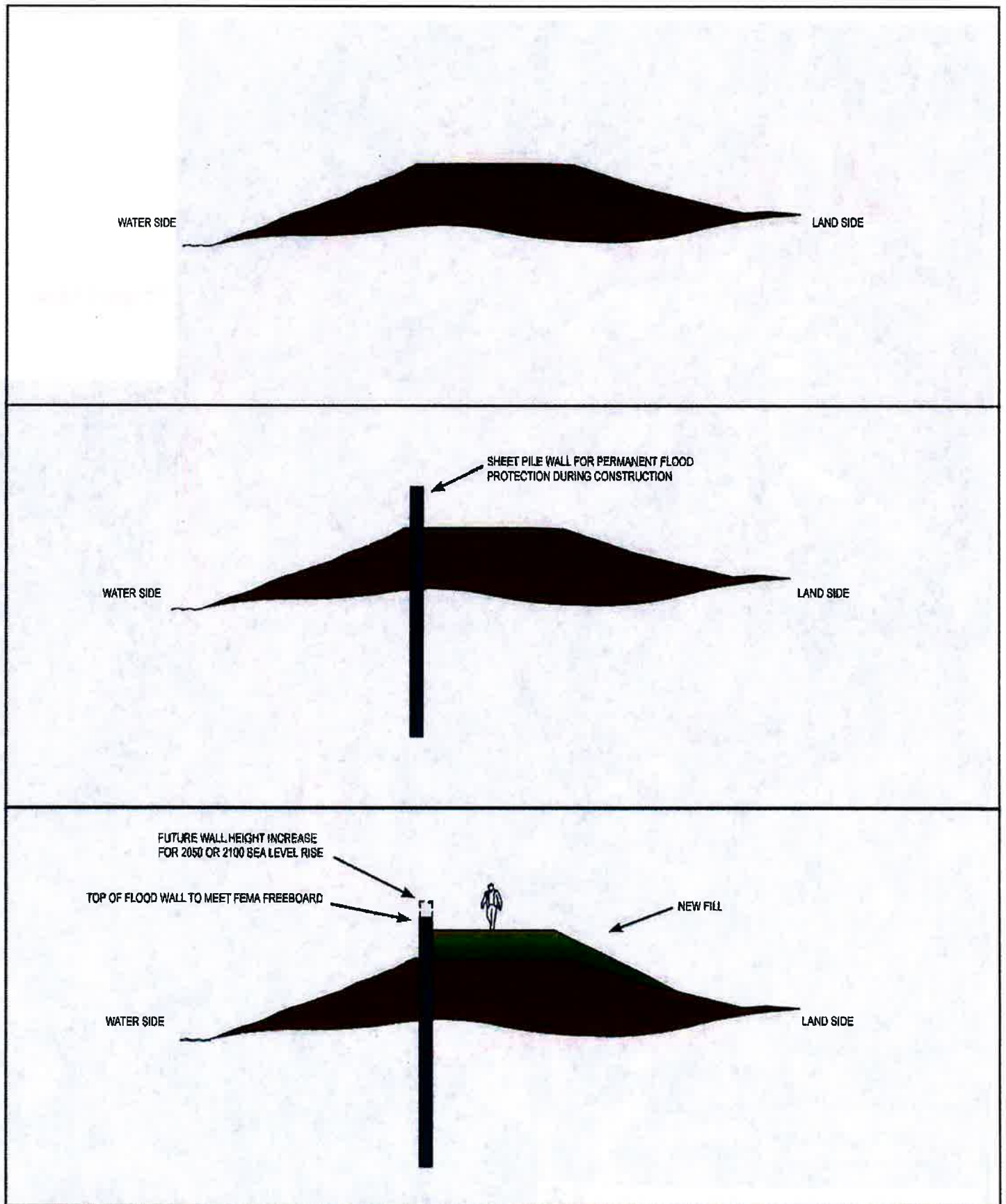


Figure 4. Typical Sheet Pile Flood Wall Cross Section
Levee Protection Planning and Improvement Project CIP 301-657
City of Foster City, San Mateo County, California

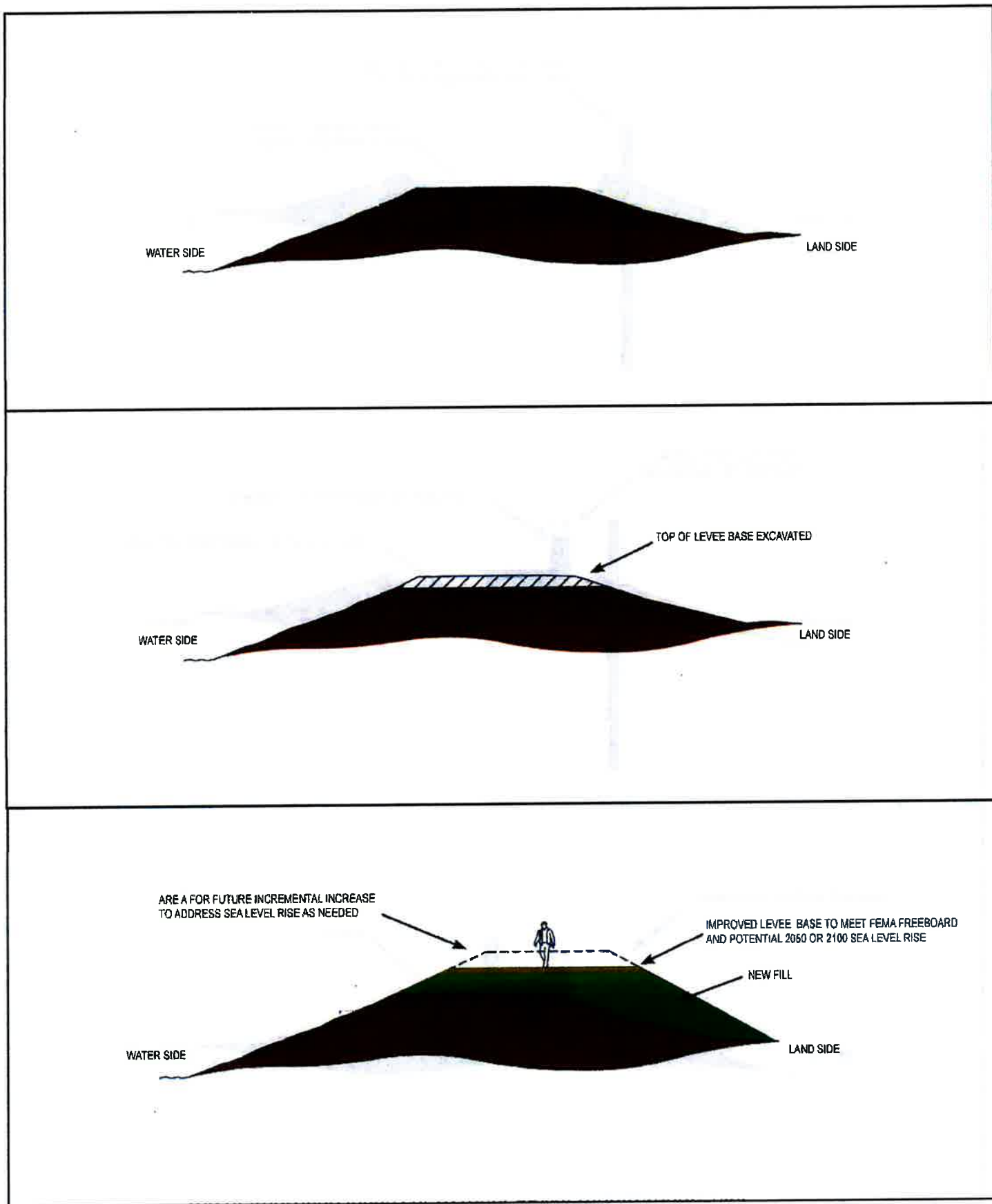


Figure 5. Typical Earthen Levee Cross Section
Levee Protection Planning and Improvement Project CIP 301-657
City of Foster City, San Mateo County, California

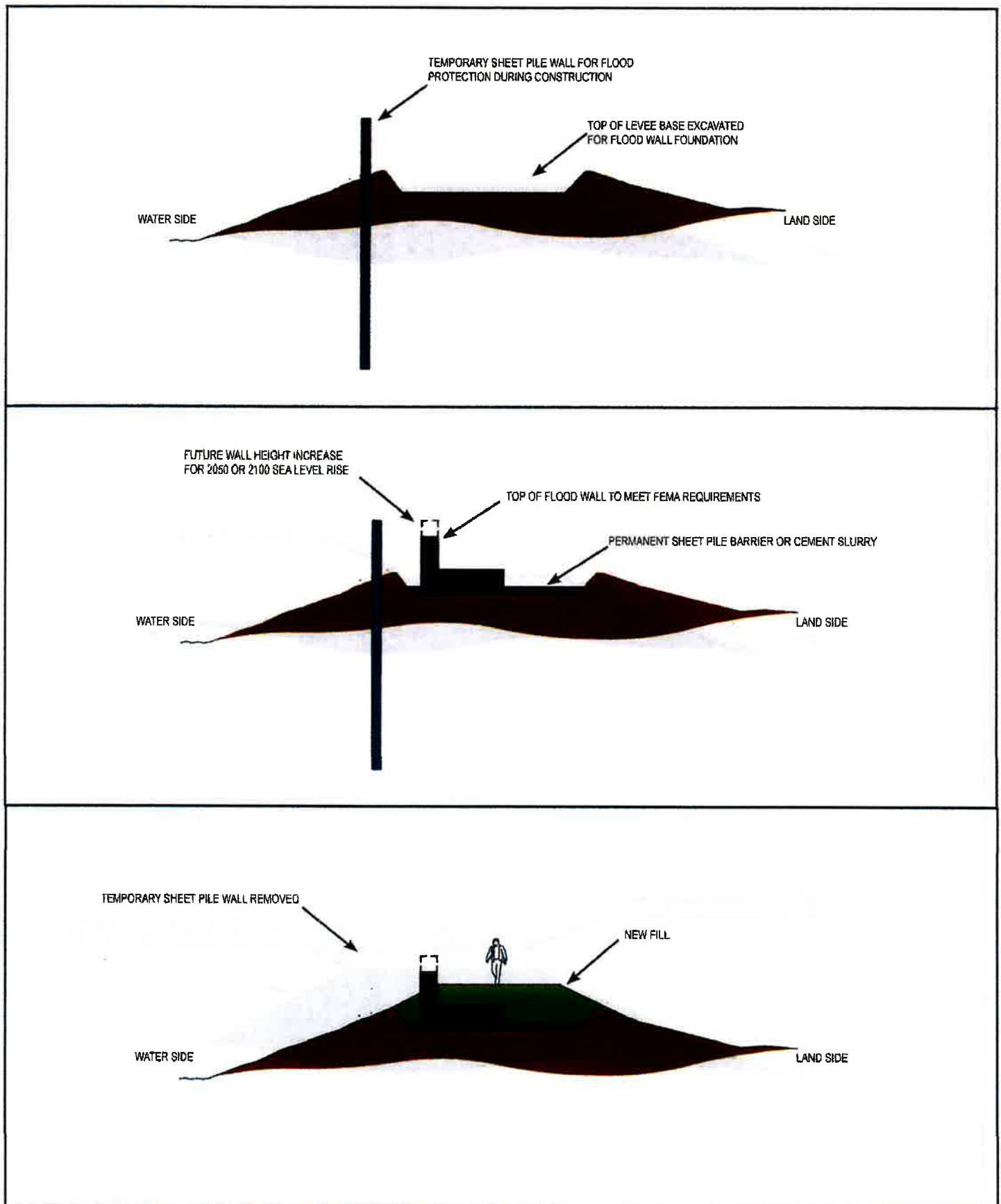


Figure 6. Typical Conventional Floodwall Cross Section
 Levee Protection Planning and Improvement Project CIP 301-657
 City of Foster City, San Mateo County, California

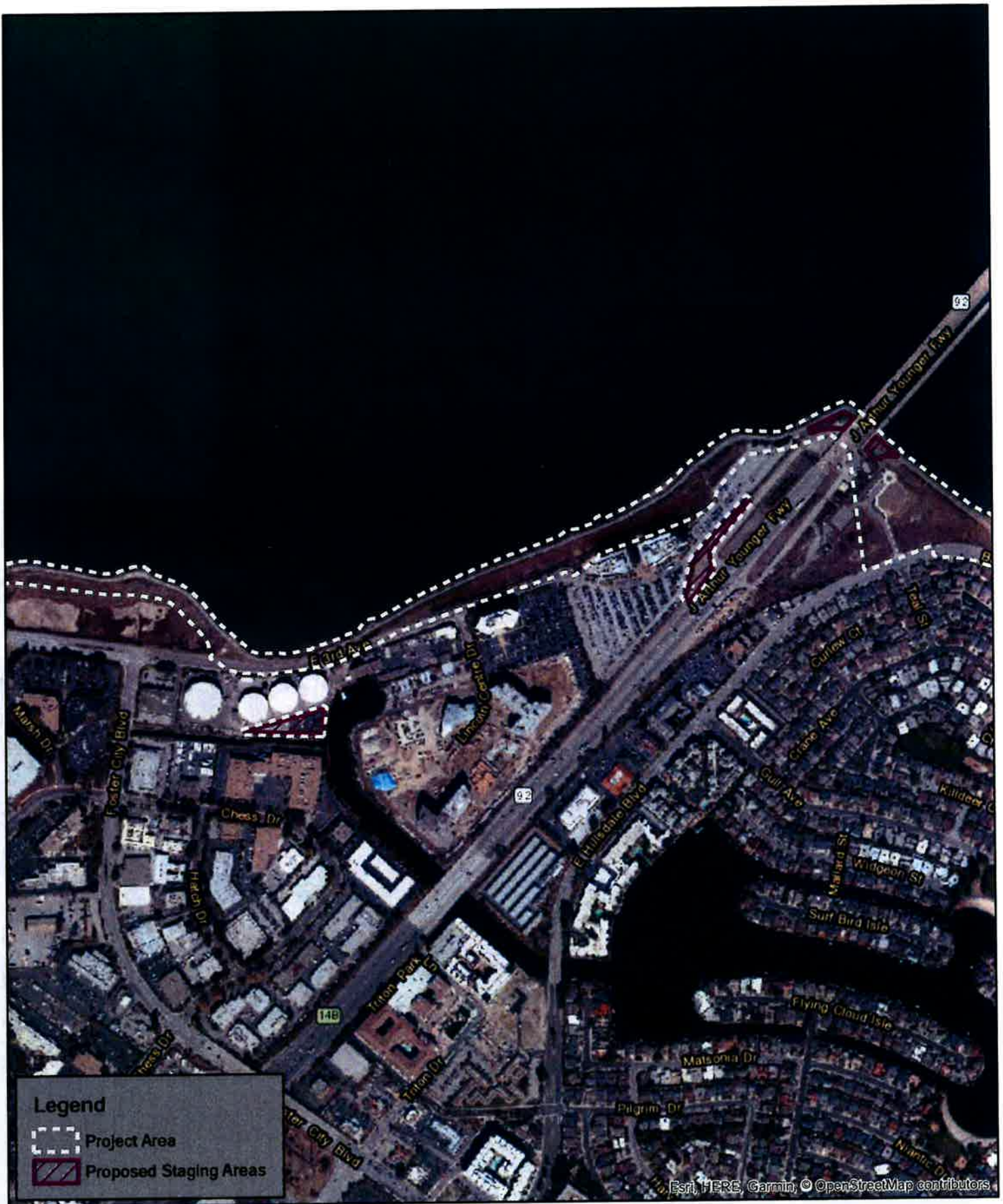


Figure 7. Staging Areas to the North
 Levee Protection Planning and Improvement Project CIP 301-657
 City of Foster City, San Mateo County, California

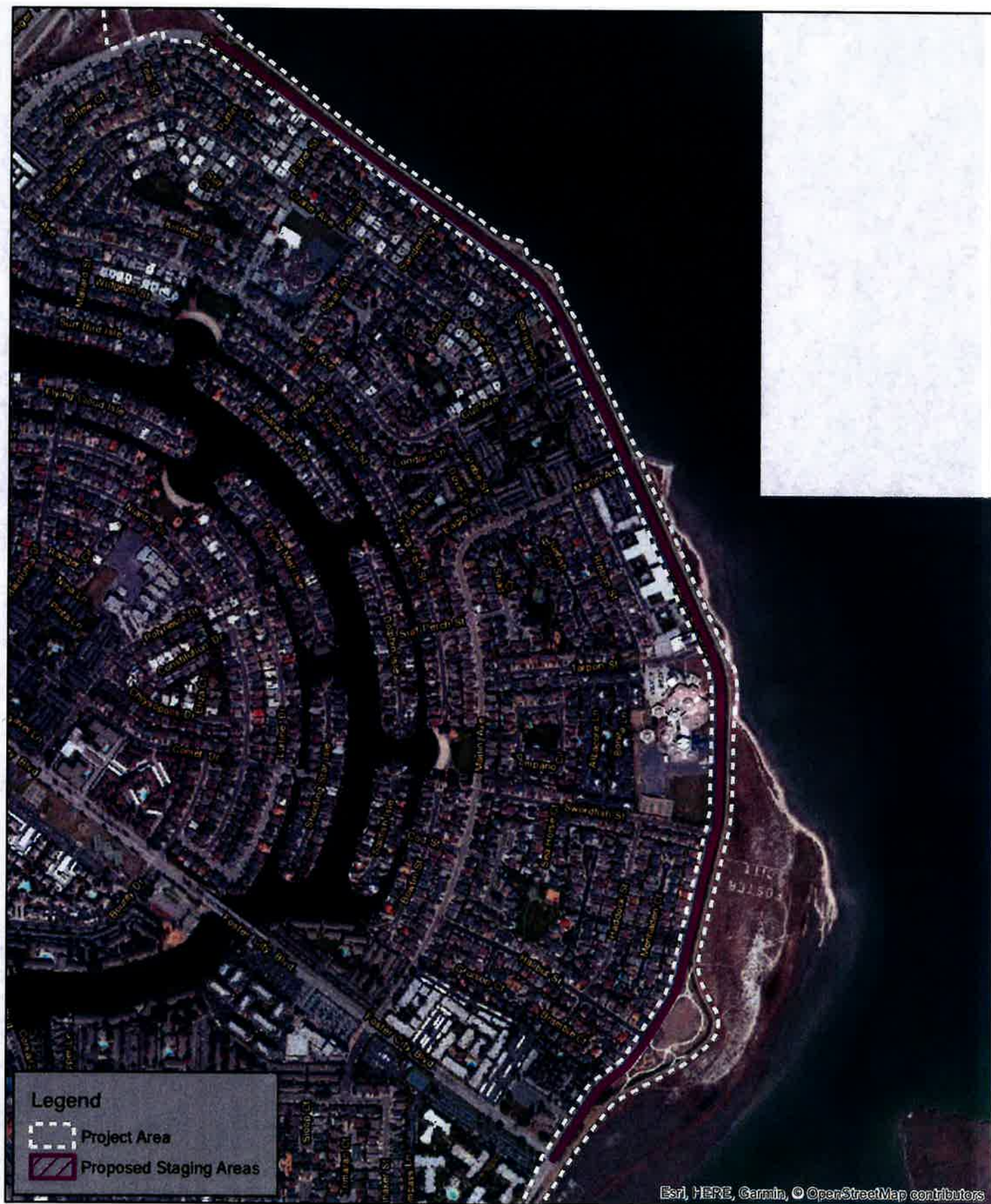


Figure 8. Staging Areas to the East

Levee Protection Planning and Improvement Project CIP 301-657
City of Foster City, San Mateo County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

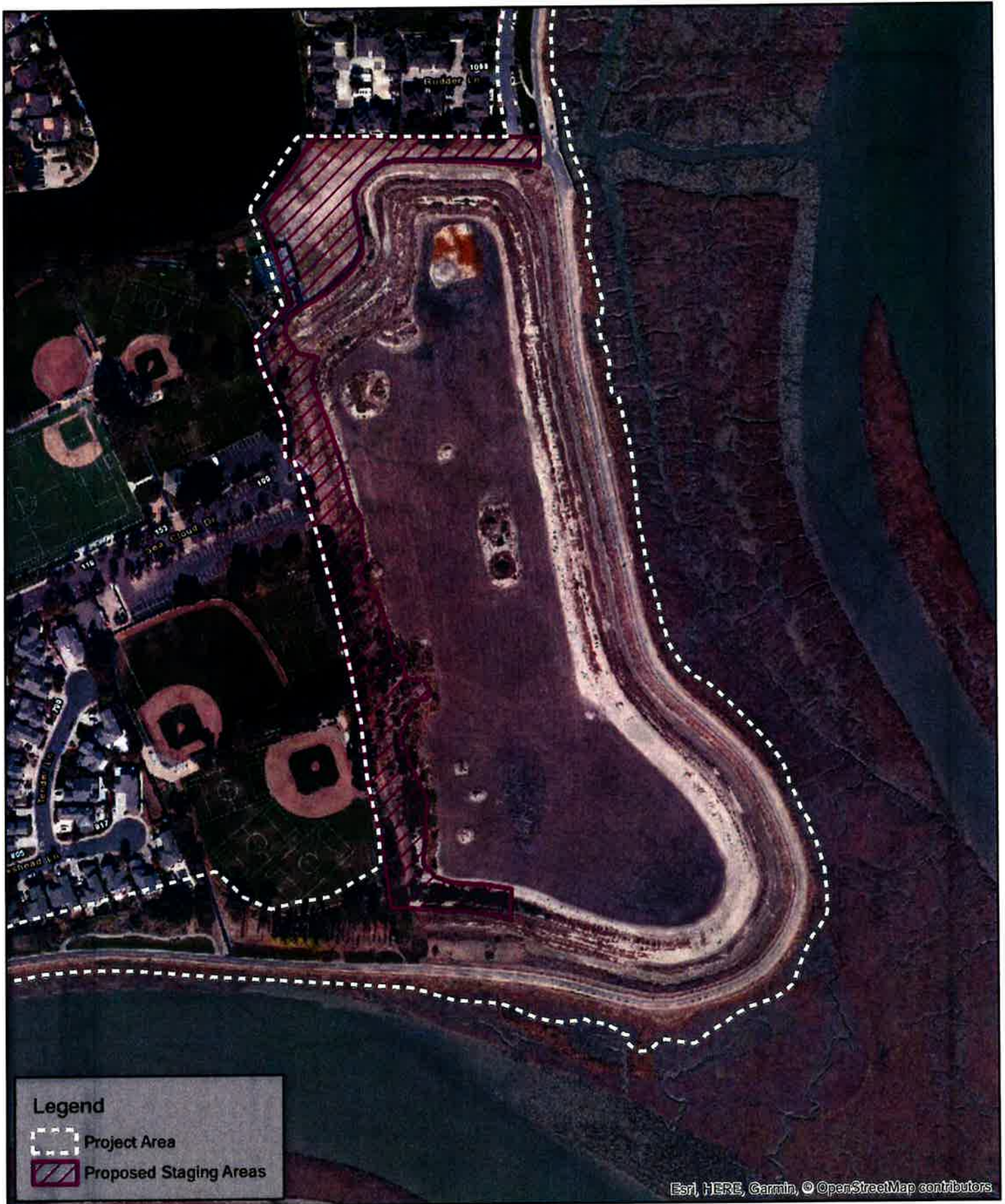
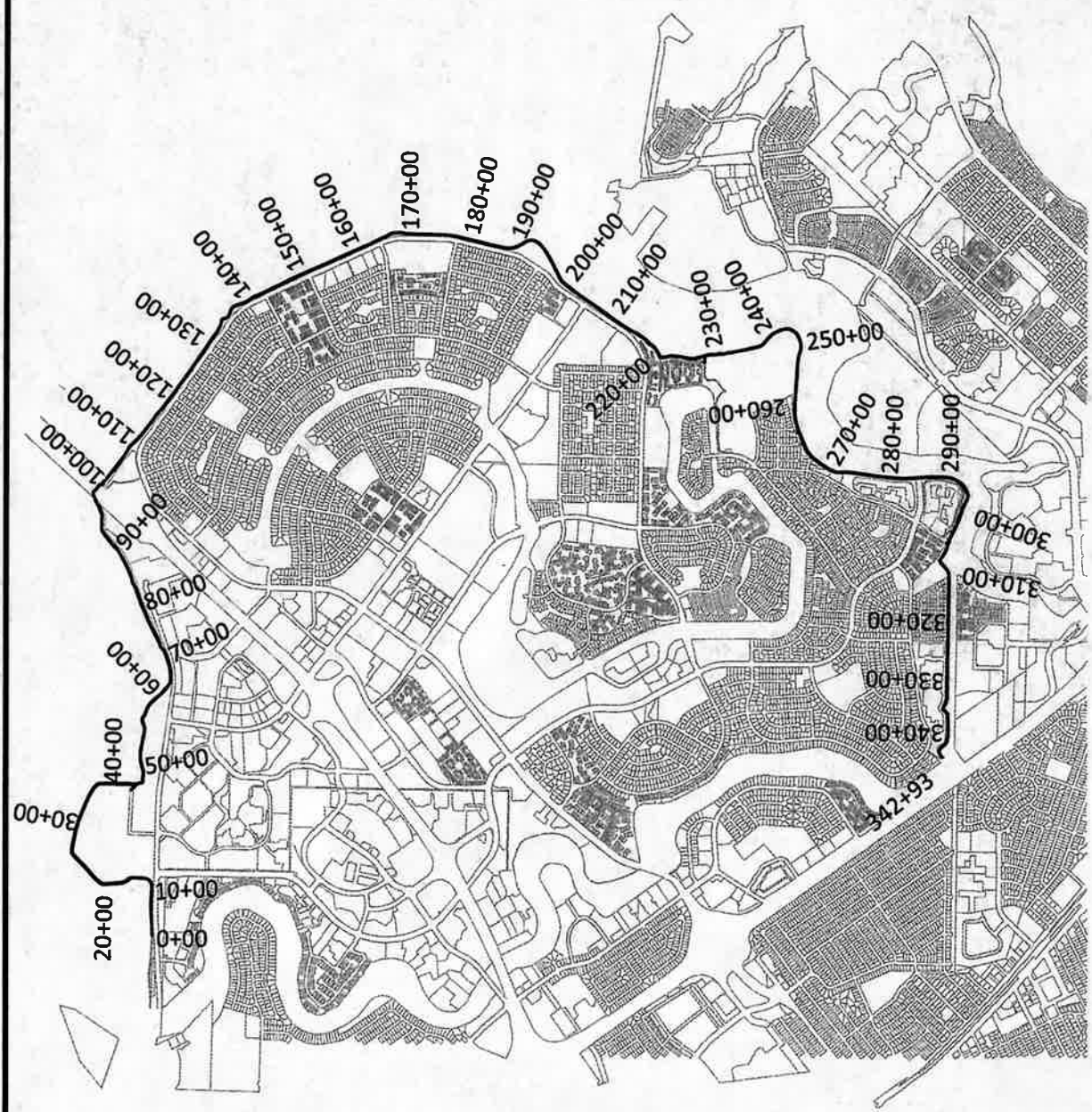
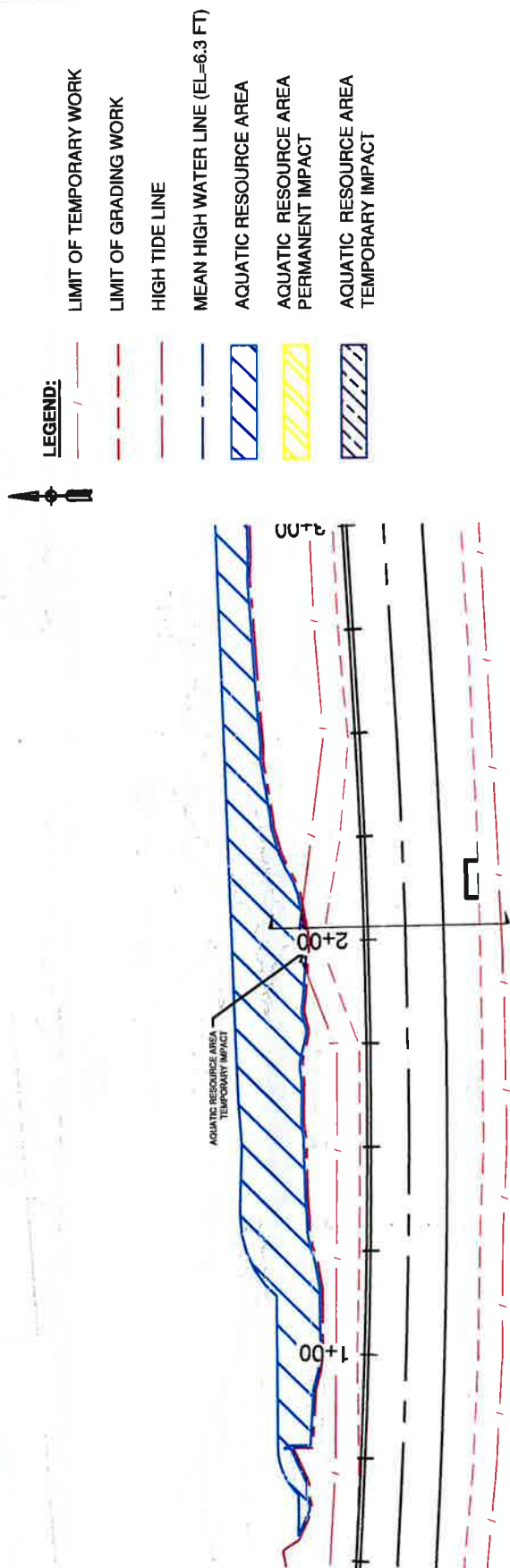


Figure 9. Staging Area to the South
Levee Protection Planning and Improvement Project CIP 301-657
City of Foster City, San Mateo County, California

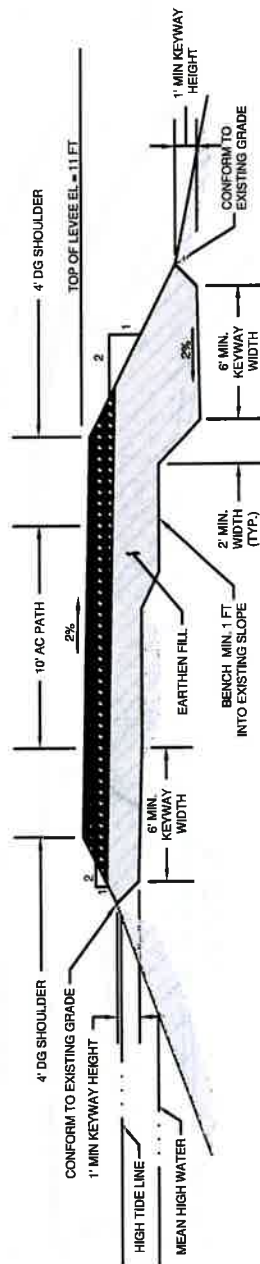
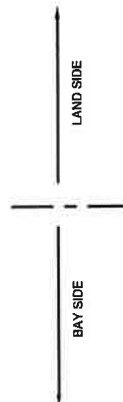
Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS



<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATUM: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <p>1. State of CA 2. Foster City</p> <p>DATE: 8/15/2018</p>	<p>Figure: 10 - Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94044</p> <p>APPLICANT'S AGENT: Terry Hufman, PhD Hufman-Broadway Group, Inc. 828 Mission Ave. San Rafael, CA 94901 415.385.1045 / hufman@h-bgroup.com</p>	<p>KEY SHEET</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>
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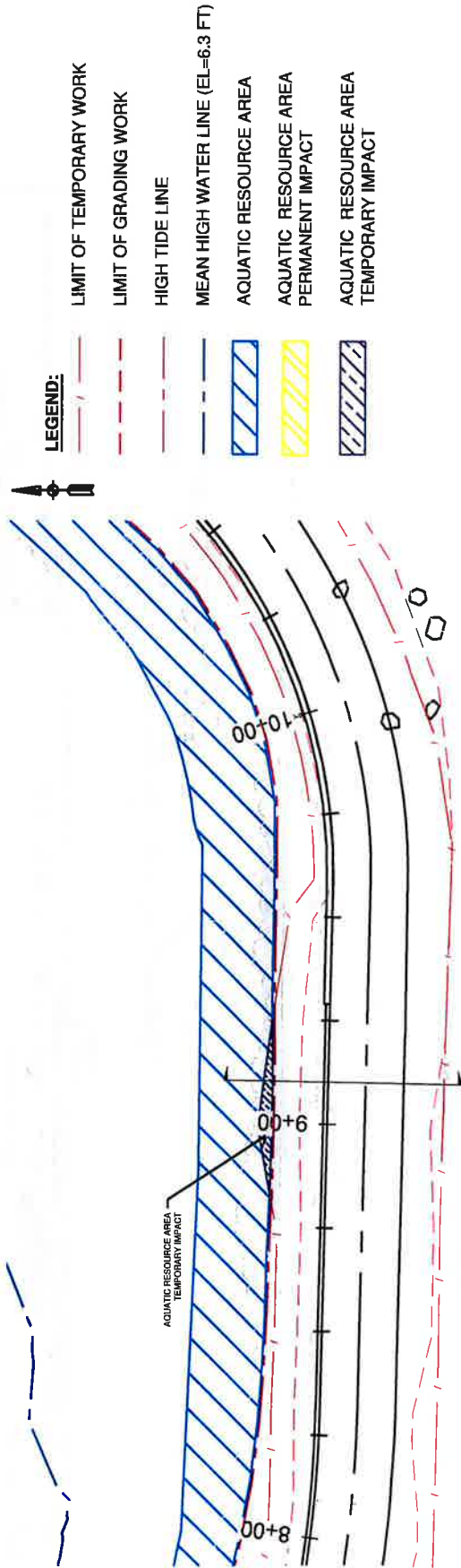


PLAN
SCALE: 1" = 40'

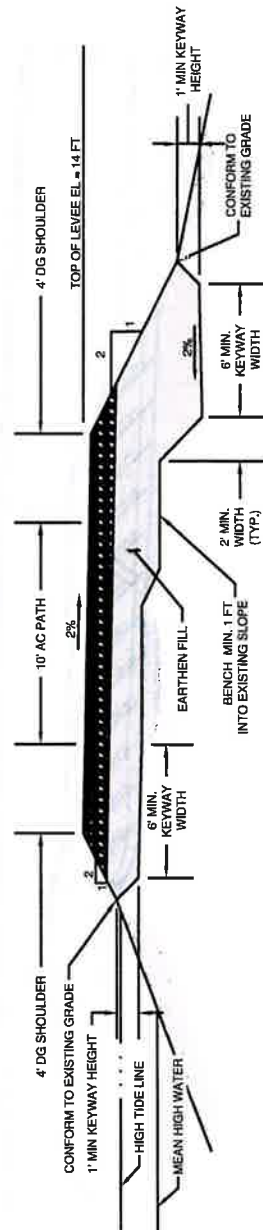
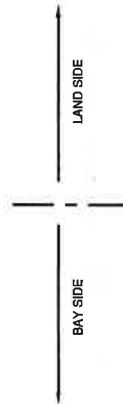


PROFILE
SCALE: NTS

<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATUM: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <p>1. State of CA</p> <p>2. Foster City</p> <p>DATE: 8/15/2018</p>	<p>Figure: 11 - Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com</p>	<p>STATION: 2+03</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>
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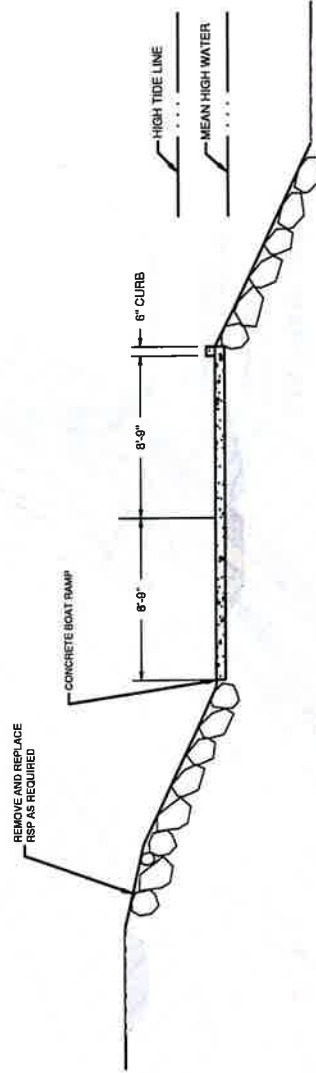
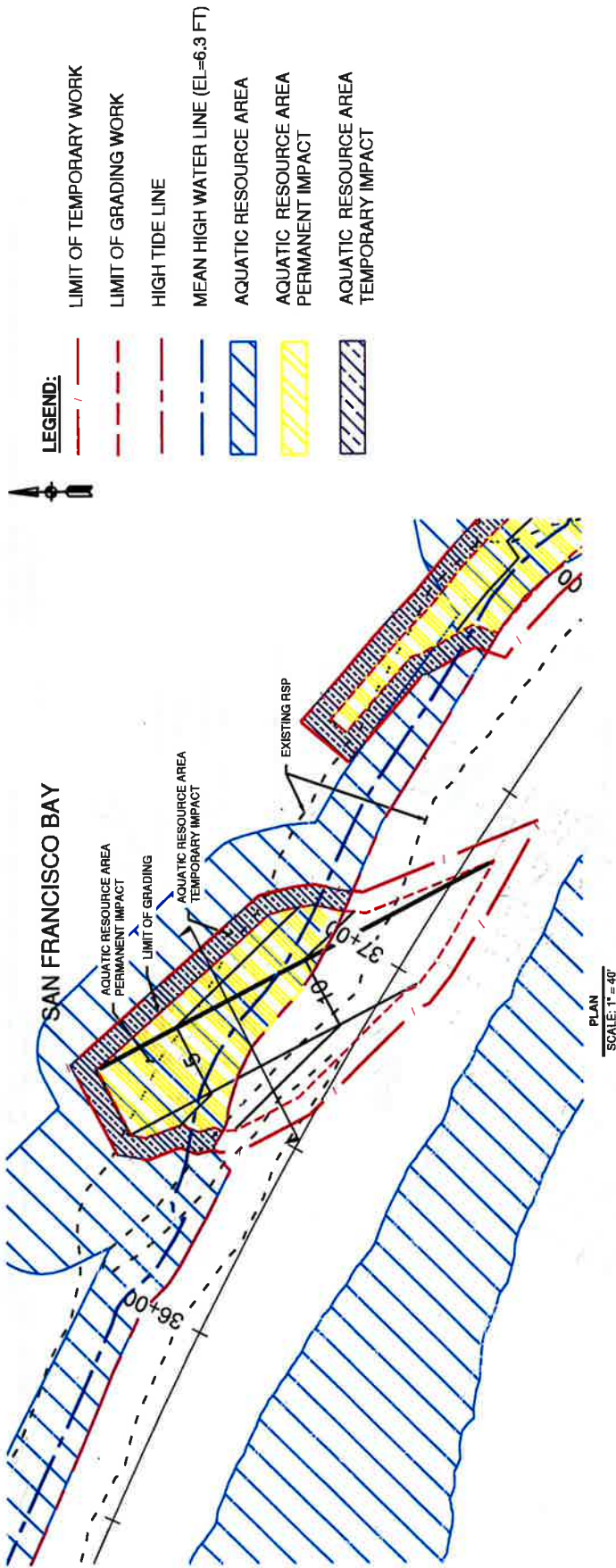


PLAN
SCALE: 1" = 40'



PROFILE
SCALE: NTS

PURPOSE: Rehabilitate levee system to retain FEMA accreditation. DATE: NAVD 88 ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City DATE: 8/15/2018	Figure: 12 - Levee Aquatic Resource Area Impact APPLICATION BY: City of Foster City/EIMD: 610 Foster City Boulevard, Foster City, CA 94404 APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com	STATION: 9+10 PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657) IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
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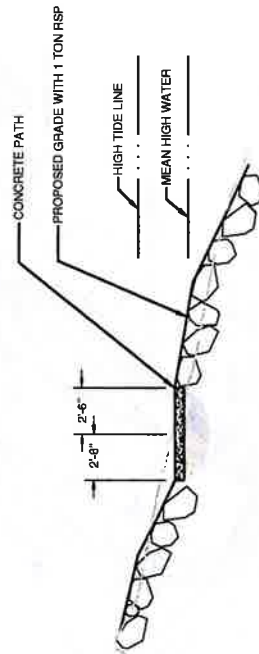
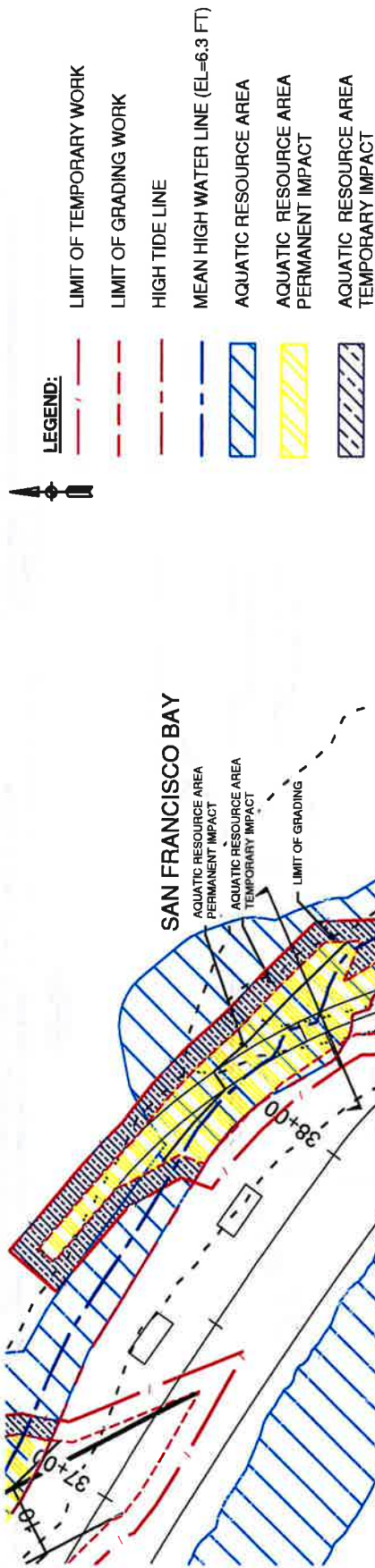


PROFILE
SCALE: NTS

STATION: 36+72
PROJECT NAME: Levee Protection Planning and Improvement Project
(CJP 301-657)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California

Figure: Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMID: 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / huffman@h-bgroup.com

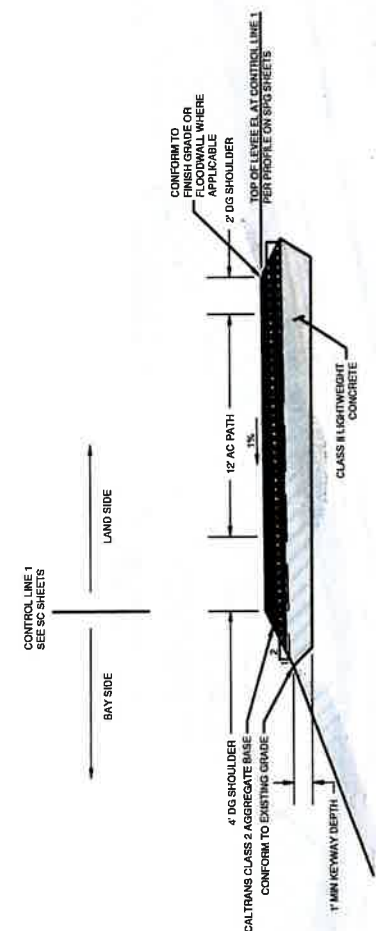
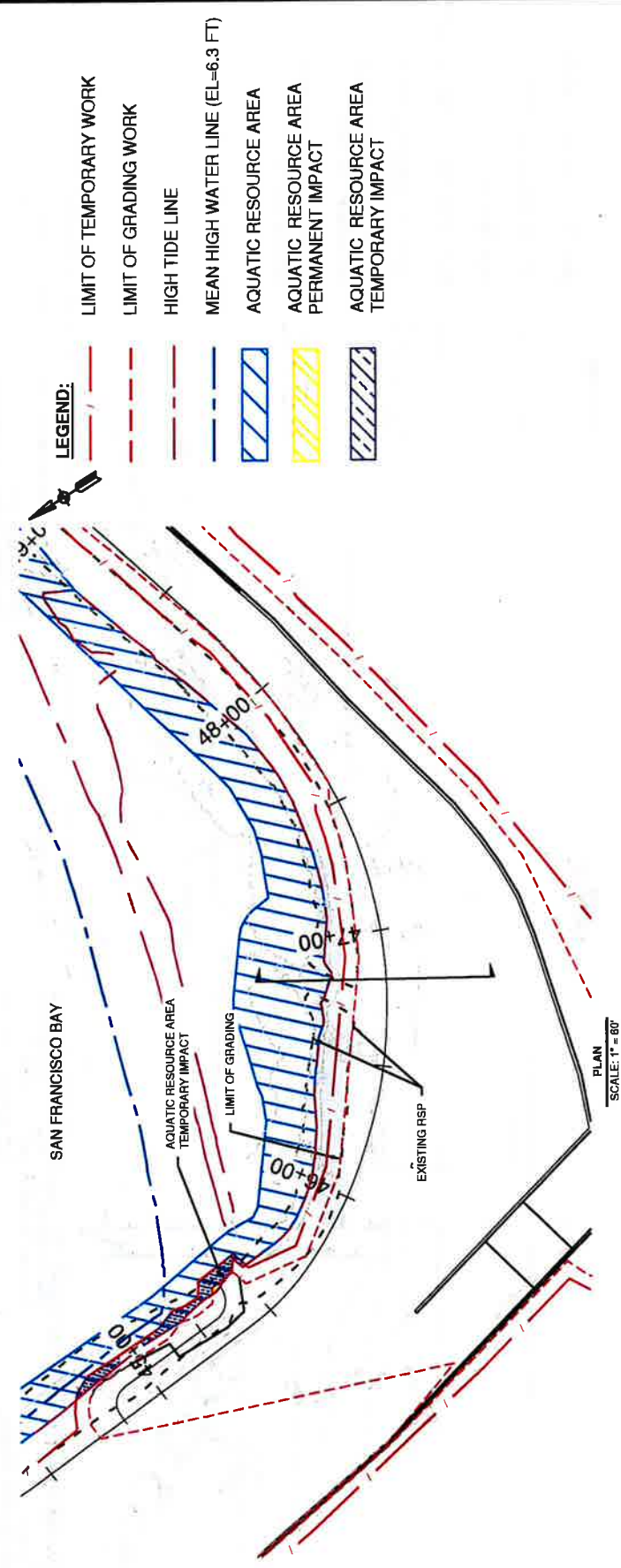
PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
1. State of CA 2. Foster City
DATE: 8/15/2018



STATION: 38+38
PROJECT NAME: Levee Protection Planning and Improvement Project
(CIP 301-657)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California

Figure: Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMID: 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / thuffman@h-bgroup.com

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATE: 8/15/2018
ADJACENT PROPERTY OWNERS:
1. State of CA
2. Foster City



PURPOSE: Rehabilitate levee system to retain FEMA accreditation.

DATE: NAVD 88

ADJACENT PROPERTY OWNERS:

1. State of CA
2. Foster City

DATE: 8/15/2018

Figure: Levee Aquatic Resource Area Impact

APPLICATION BY: City of Foster City/EMID: 610 Foster City Boulevard, Foster City, CA 94404

APPLICANT'S AGENT: Terry Hufman, PhD
Hufman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / thufman@h-bgroup.com

STATION: 46+82

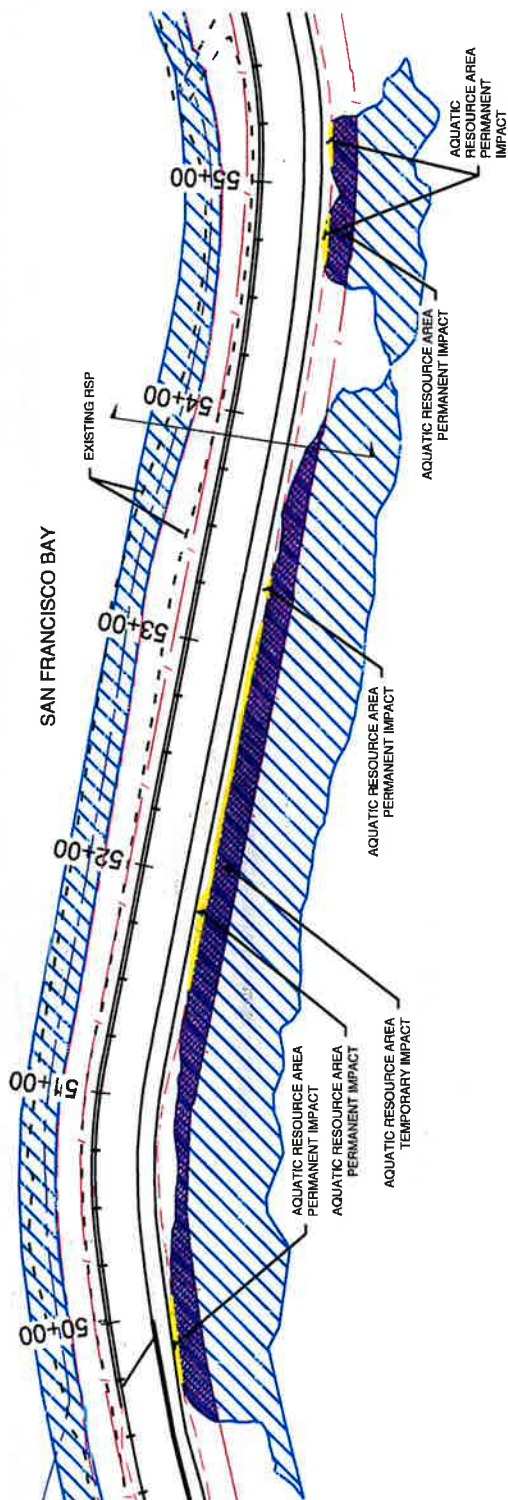
PROJECT NAME: Levee Protection Planning and Improvement Project (CJP 301-657)

IN: waters of the United States

AT: Adjacent to existing City Levee System

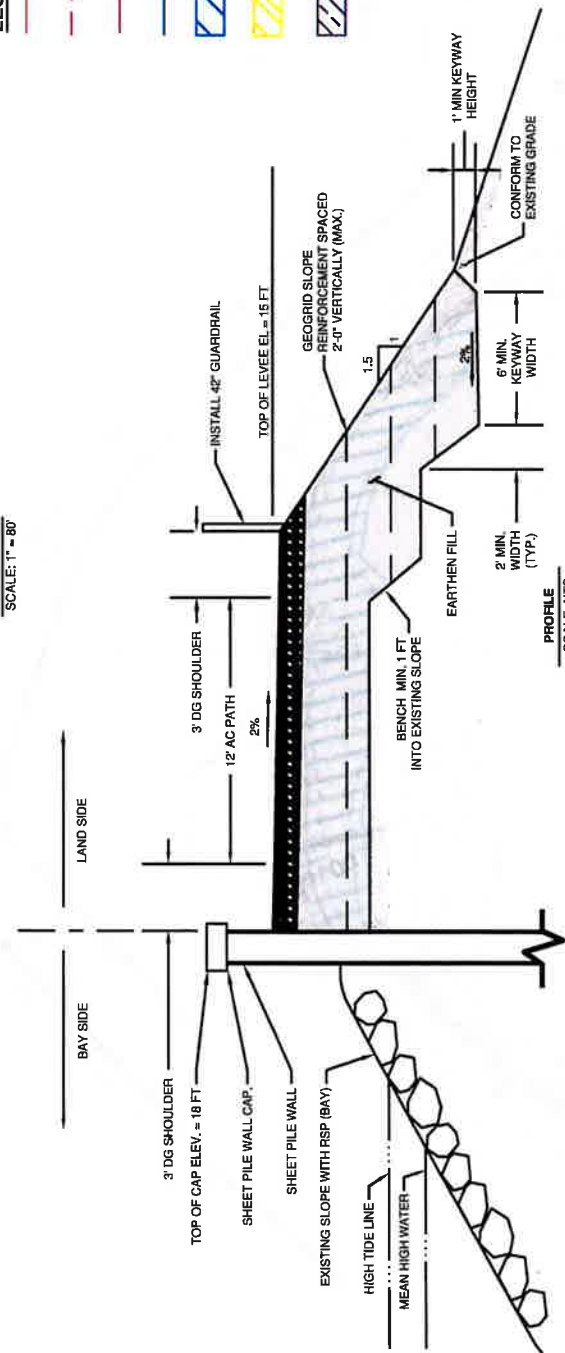
COUNTY OF: San Mateo

STATE: California



PLAN
SCALE: 1" = 80'

- LEGEND:**
- LIMIT OF TEMPORARY WORK
 - - - LIMIT OF GRADING WORK
 - - - HIGH TIDE LINE
 - - - MEAN HIGH WATER LINE (EL=6.3 FT)
 - [Blue Hatched] AQUATIC RESOURCE AREA PERMANENT IMPACT
 - [Yellow Hatched] AQUATIC RESOURCE AREA TEMPORARY IMPACT

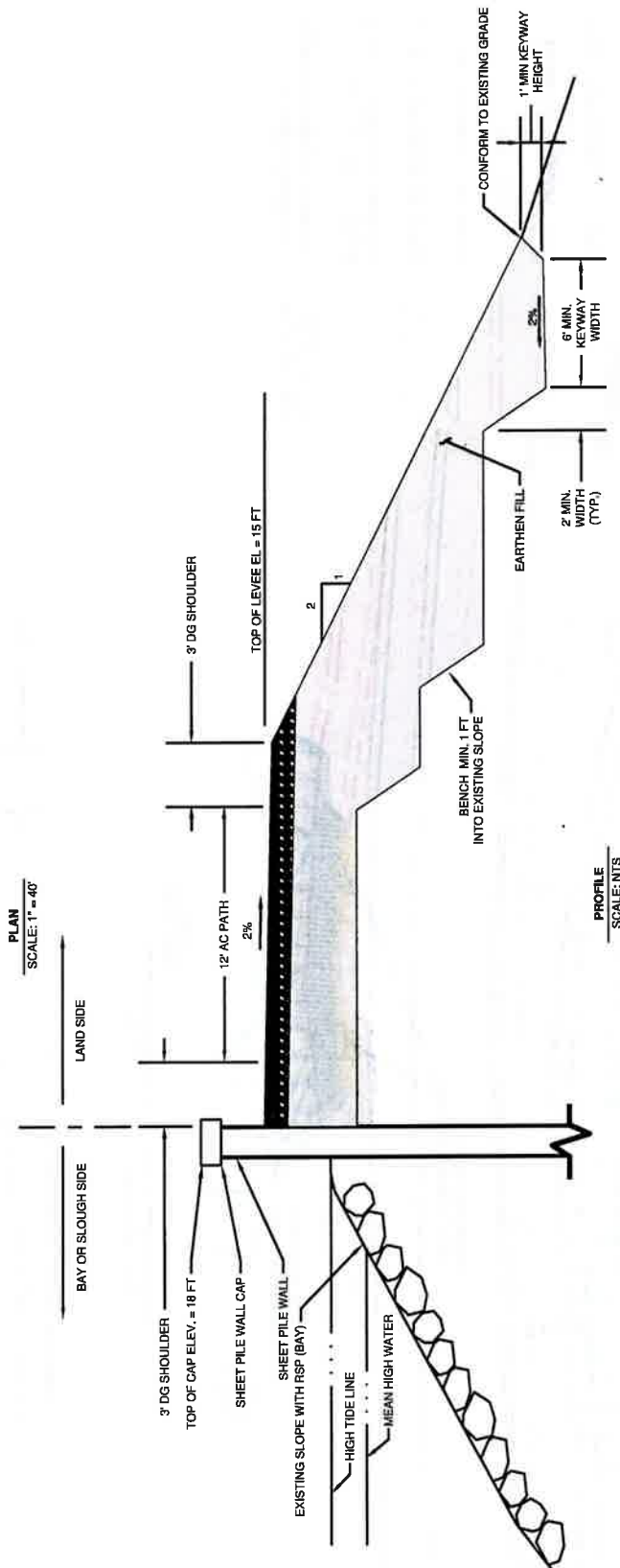
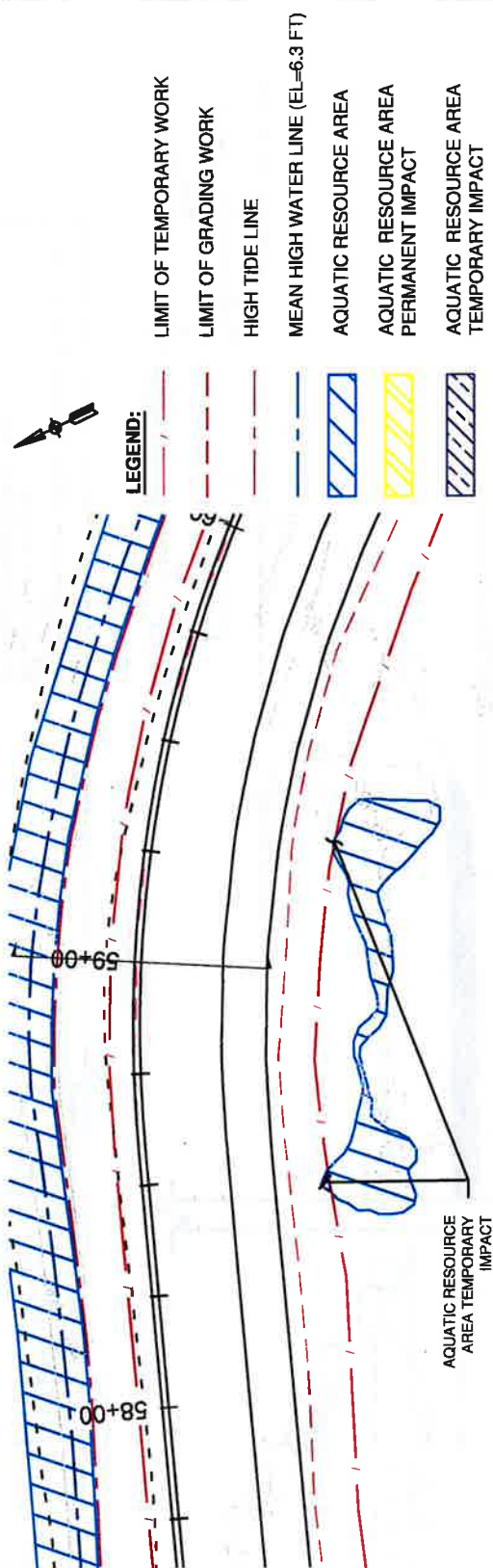


PROFILE
SCALE: NTS

STATION: 53+90
PROJECT NAME: Levee Protection Planning and Improvement Project
(CIP 301-657)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California

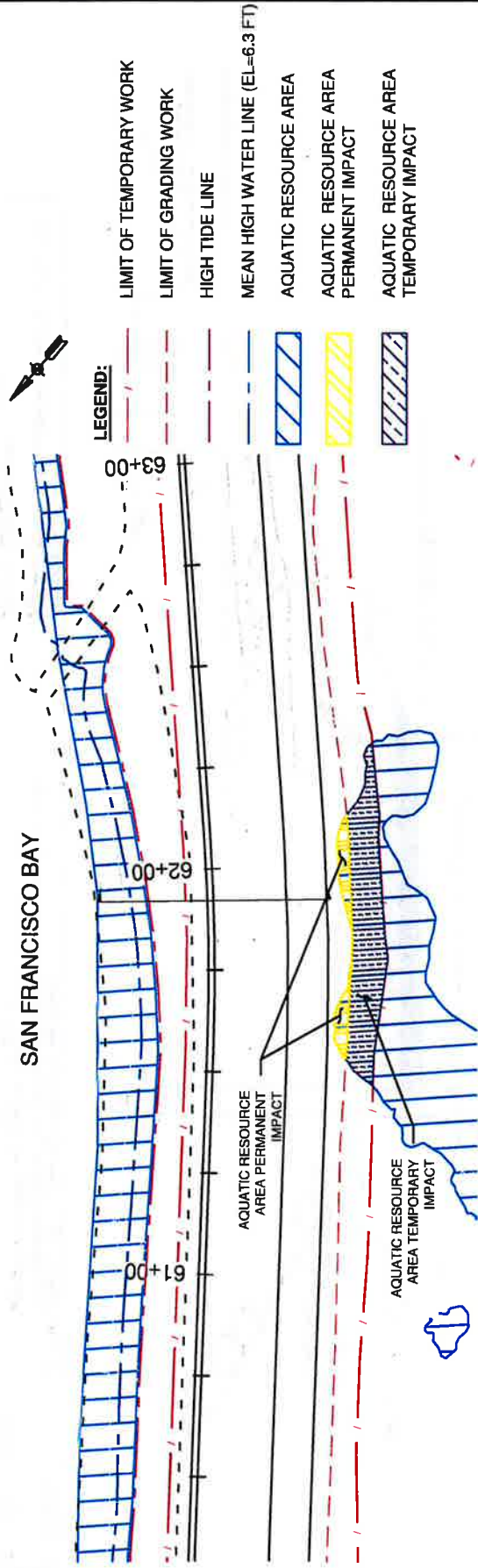
Figure: 16 - Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / thuffman@hbg-group.com

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
1. State of CA
2. Foster City
DATE: 8/15/2018



PURPOSE: Rehabilitate levee system to retain FEMA accreditation.	Figure: 17 - Levee Aquatic Resource Area Impact	STATION: 59+00
DATUM: NAVD 88	APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404	PROJECT NAME: Levee Protection Planning and Improvement Project
ADJACENT PROPERTY OWNERS:	APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@hbggroup.com	IN: waters of the United States
DATE: 8/15/2018	2. Foster City	AT: Adjacent to existing City Levee System
		COUNTY OF: San Mateo
		STATE: California

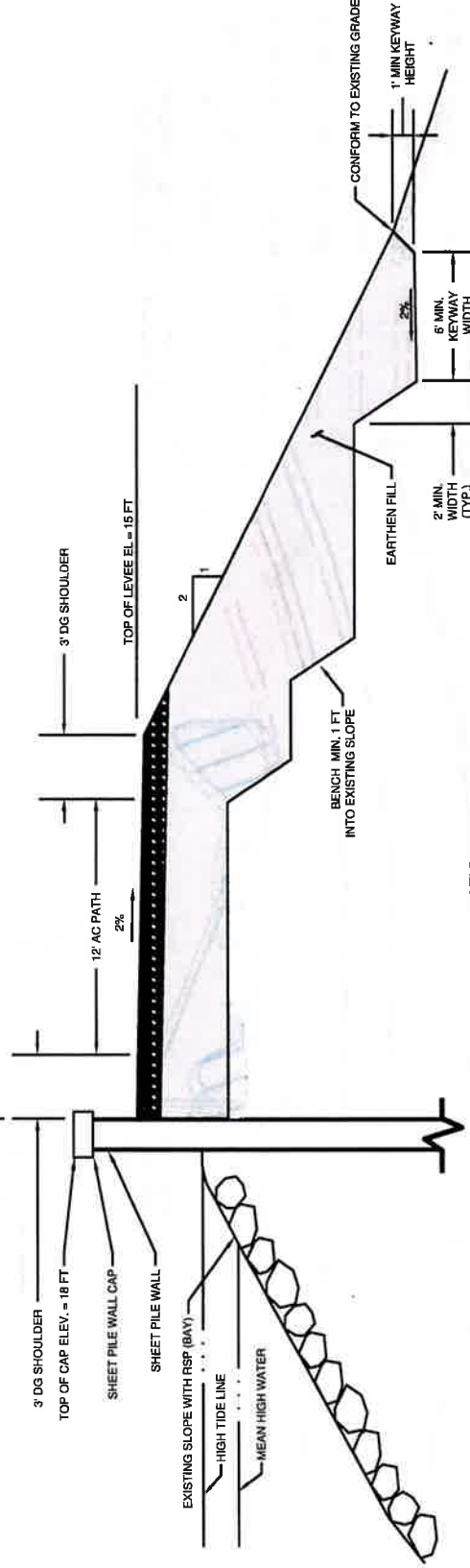
SAN FRANCISCO BAY



PLAN
SCALE: 1" = 40'

LAND SIDE

BAY OR SLOUGH SIDE



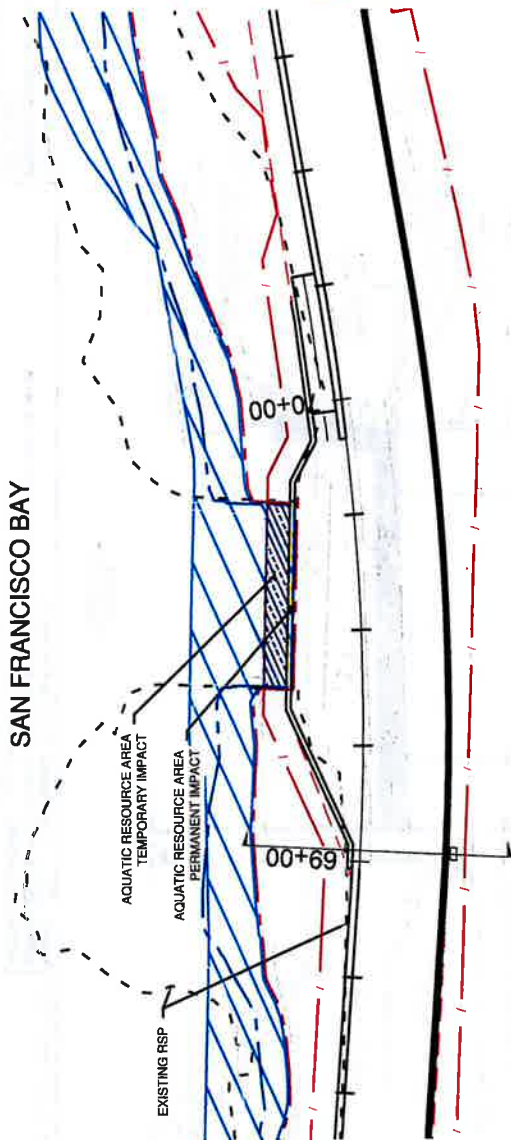
STATION: 61+81
PROJECT NAME: Levee Protection Planning and Improvement Project
(CIP 301-657)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California

Figure: 18 - Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / t Huffman@hbggroup.com

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
1. State of CA
2. Foster City
DATE: 8/15/2018

SAN FRANCISCO BAY

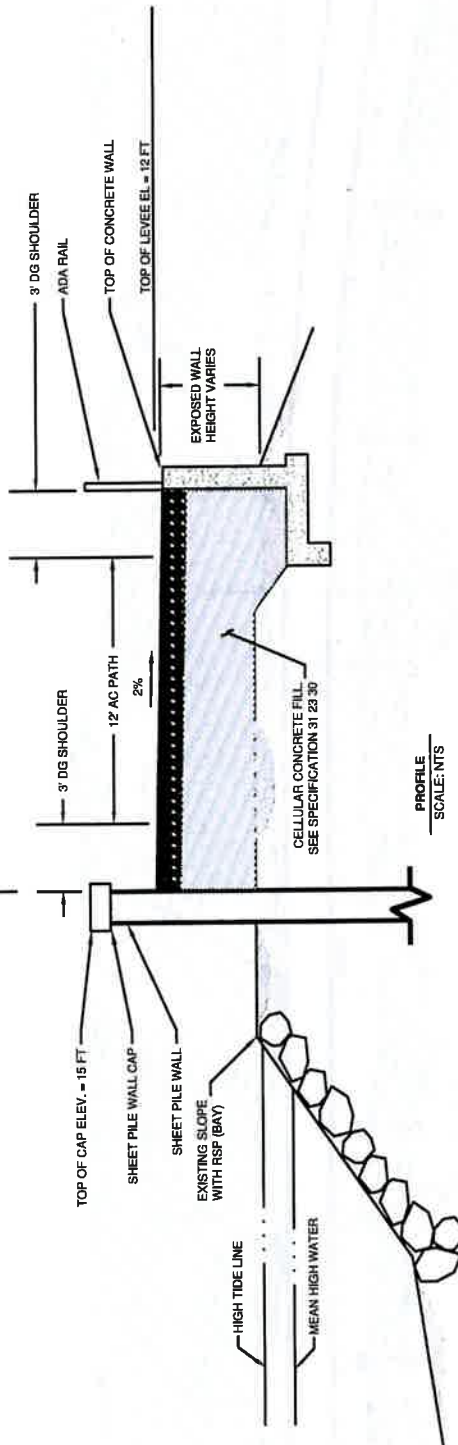
- LEGEND:**
- LIMIT OF TEMPORARY WORK
 - LIMIT OF GRADING WORK
 - HIGH TIDE LINE
 - MEAN HIGH WATER LINE (EL=6.3 FT)
 - AQUATIC RESOURCE AREA
 - AQUATIC RESOURCE AREA PERMANENT IMPACT
 - AQUATIC RESOURCE AREA TEMPORARY IMPACT



PLAN
SCALE: 1" = 40'

LAND SIDE

BAY SIDE



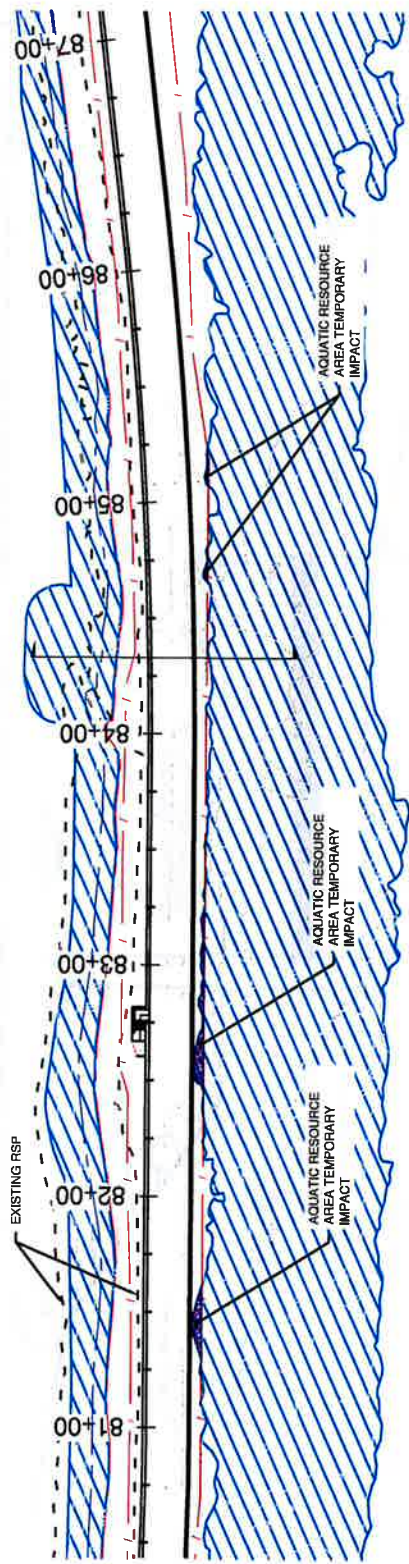
PROFILE
SCALE: NTS

STATION: 58+02
PROJECT NAME: Levee Protection Planning and Improvement Project
(CIP 301-857)
INT: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California

Figure: 19 - Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / t.huffman@hbg-group.com

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATE: 9/15/2018
ADJACENT PROPERTY OWNERS:
1. State of CA
2. Foster City

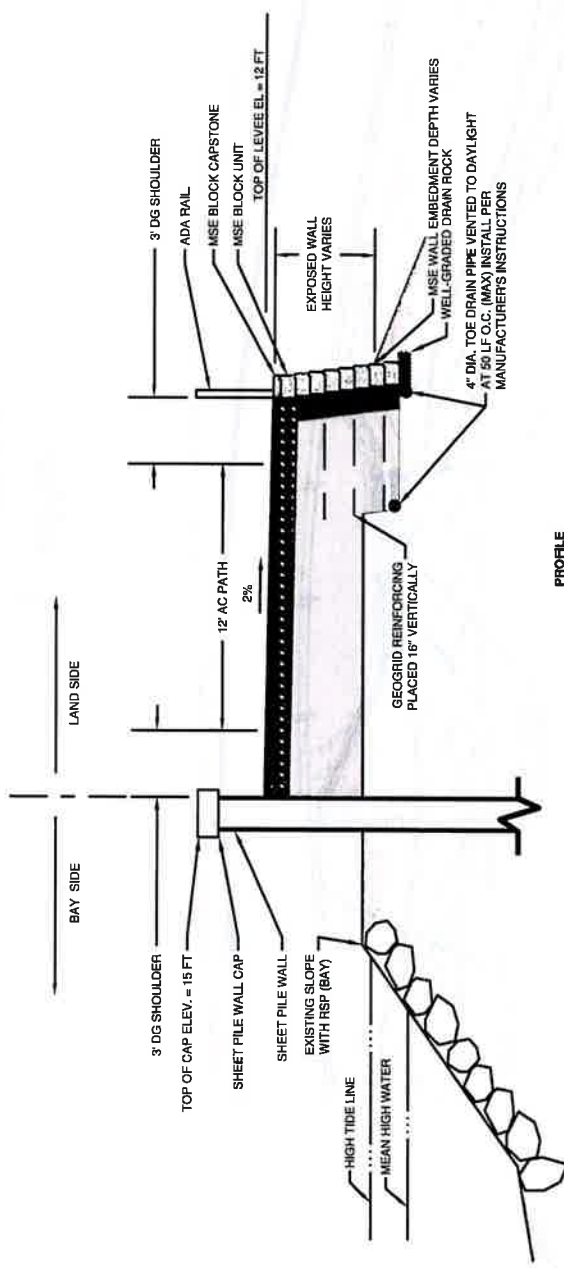
SAN FRANCISCO BAY



PLAN
SCALE: 1" = 80'

LEGEND:

- LIMIT OF TEMPORARY WORK
- - - LIMIT OF GRADING WORK
- - - HIGH TIDE LINE
- - - MEAN HIGH WATER LINE (EL=6.3 FT)
- [Blue Hatched Box] AQUATIC RESOURCE AREA
- [Yellow Hatched Box] AQUATIC RESOURCE AREA PERMANENT IMPACT
- [Diagonal Hatched Box] AQUATIC RESOURCE AREA TEMPORARY IMPACT



PROFILE
SCALE: NTS

STATION: 84+33
PROJECT NAME: Levee Protection Planning and Improvement Project
(CIP 301-657)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California

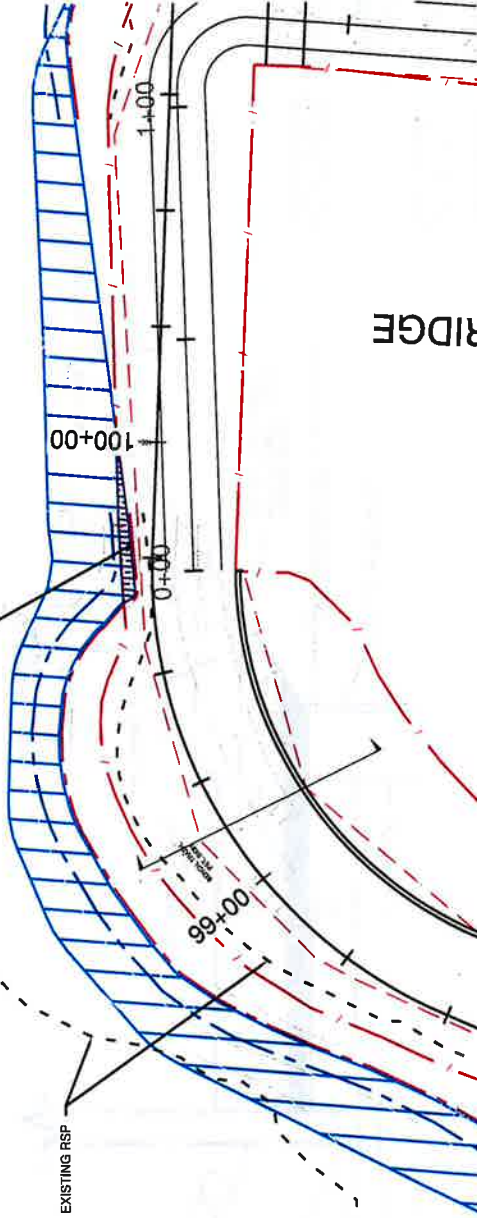
Figure: 20 - Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMD; 610 Foster City Boulevard, Foster City, CA 94404
APPLICANTS AGENT:
Terry Huffman, PhD
Huffman-Broadway Group, Inc.
826 Mission Ave
San Rafael, CA 94901
415.385.1045 / huffman@hbggroup.com

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
1. State of CA
2. Foster City
DATE: 8/15/2018



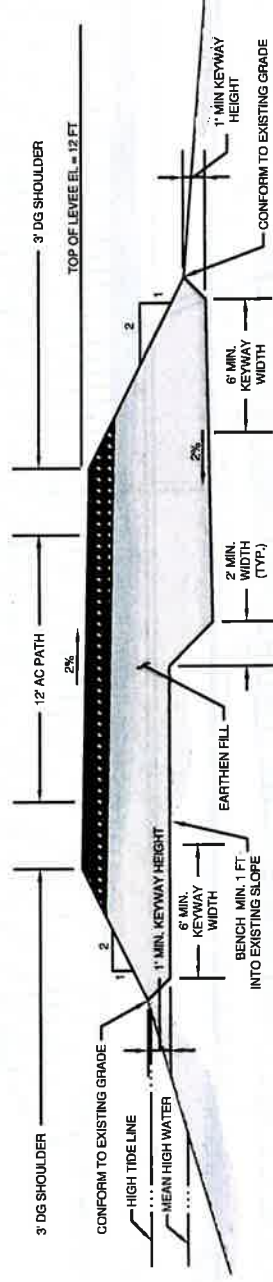
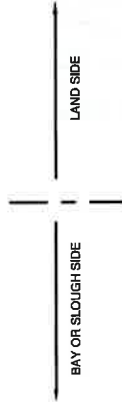
SAN FRANCISCO BAY

AQUATIC RESOURCE AREA
TEMPORARY IMPACT



PLAN
SCALE: 1" = 40'

- LEGEND:**
- LIMIT OF TEMPORARY WORK
 - LIMIT OF GRADING WORK
 - HIGH TIDE LINE
 - MEAN HIGH WATER LINE (EL=6.3 FT)
 - [Blue Hatched Box] AQUATIC RESOURCE AREA
 - [Yellow Hatched Box] AQUATIC RESOURCE AREA PERMANENT IMPACT
 - [Black Hatched Box] AQUATIC RESOURCE AREA TEMPORARY IMPACT

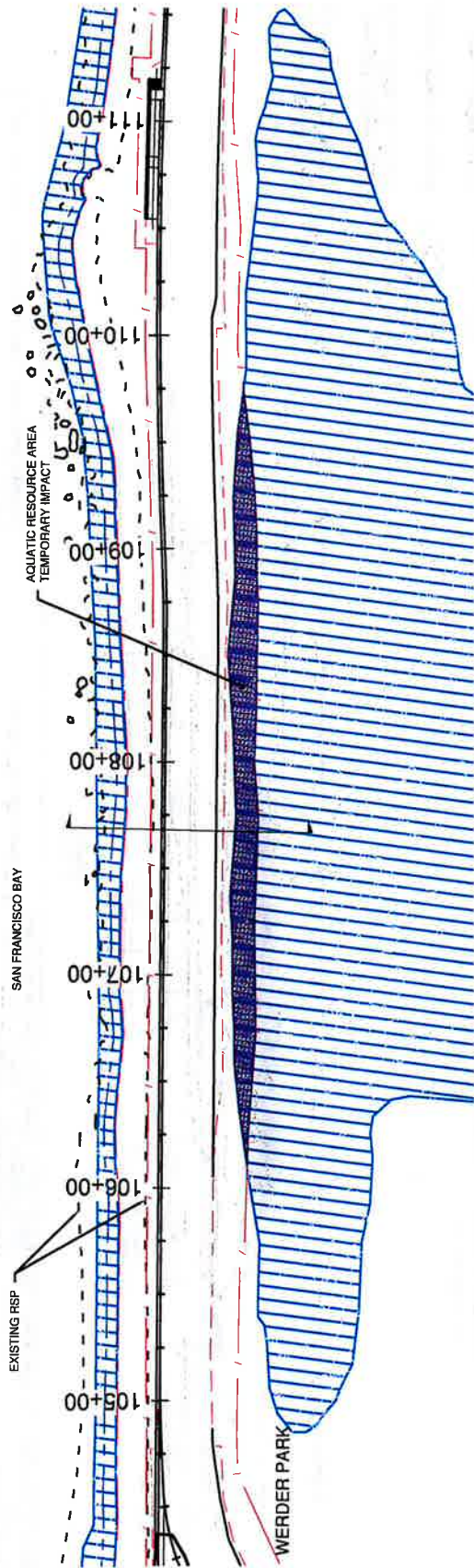


PROFILE
SCALE: NTS

PURPOSE: Rehabilitate levee system to retain FEMA accreditation. DATE: NAVD 88 ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City DATE: 8/15/2018	Figure: 21 - Levee Aquatic Resource Area Impact APPLICATION BY: City of Foster City/EMD; 610 Foster City Boulevard, Foster City, CA 94004 APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / t.huffman@hbggroup.com	STATION: 99+14 PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657) IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
	Schaaf & Wheeler	



SAN FRANCISCO BAY

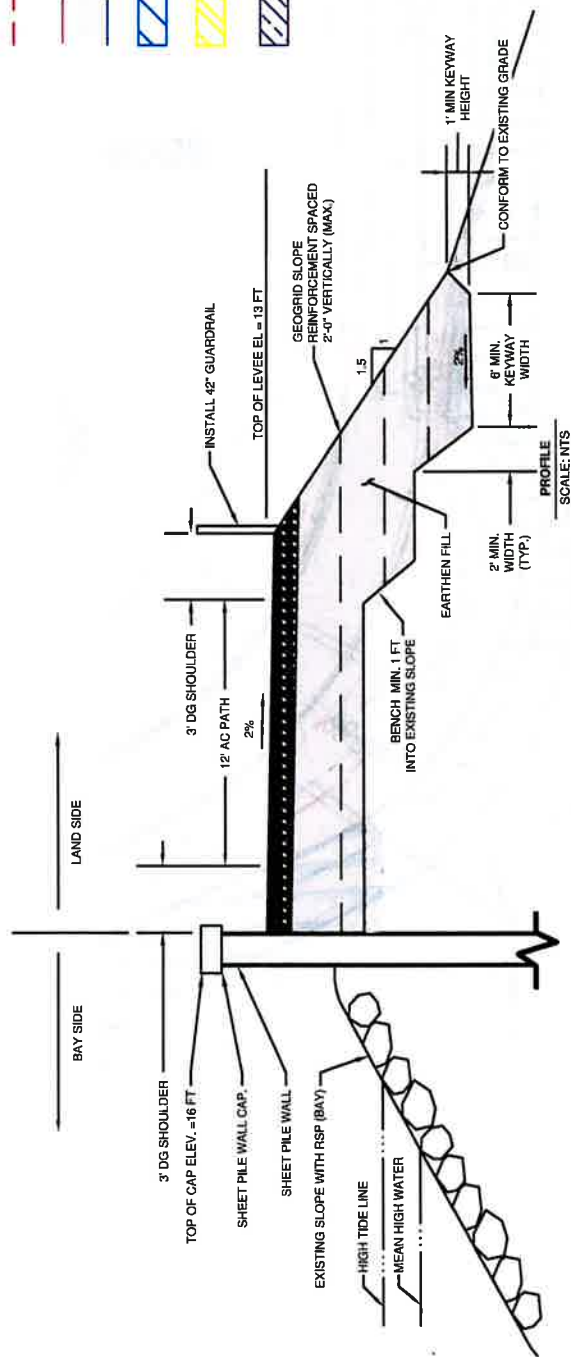


LEGEND:

- / — LIMIT OF TEMPORARY WORK
- - - LIMIT OF GRADING WORK
- - - HIGH TIDE LINE
- - - MEAN HIGH WATER LINE (EL=6.3 FT)
- [Blue Hatched Box] AQUATIC RESOURCE AREA
- [Yellow Hatched Box] AQUATIC RESOURCE AREA PERMANENT IMPACT
- [Purple Hatched Box] AQUATIC RESOURCE AREA TEMPORARY IMPACT

SCALE: 1" = 80'

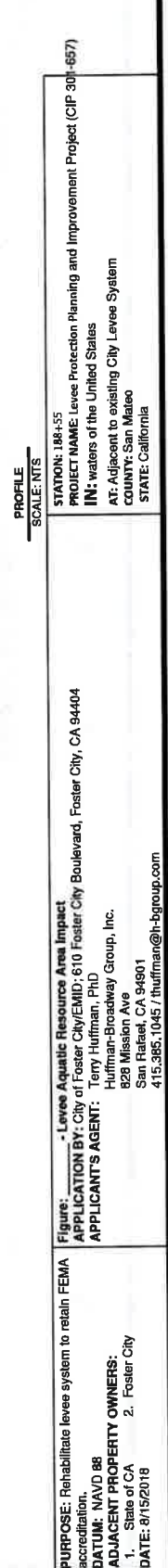
PLAN

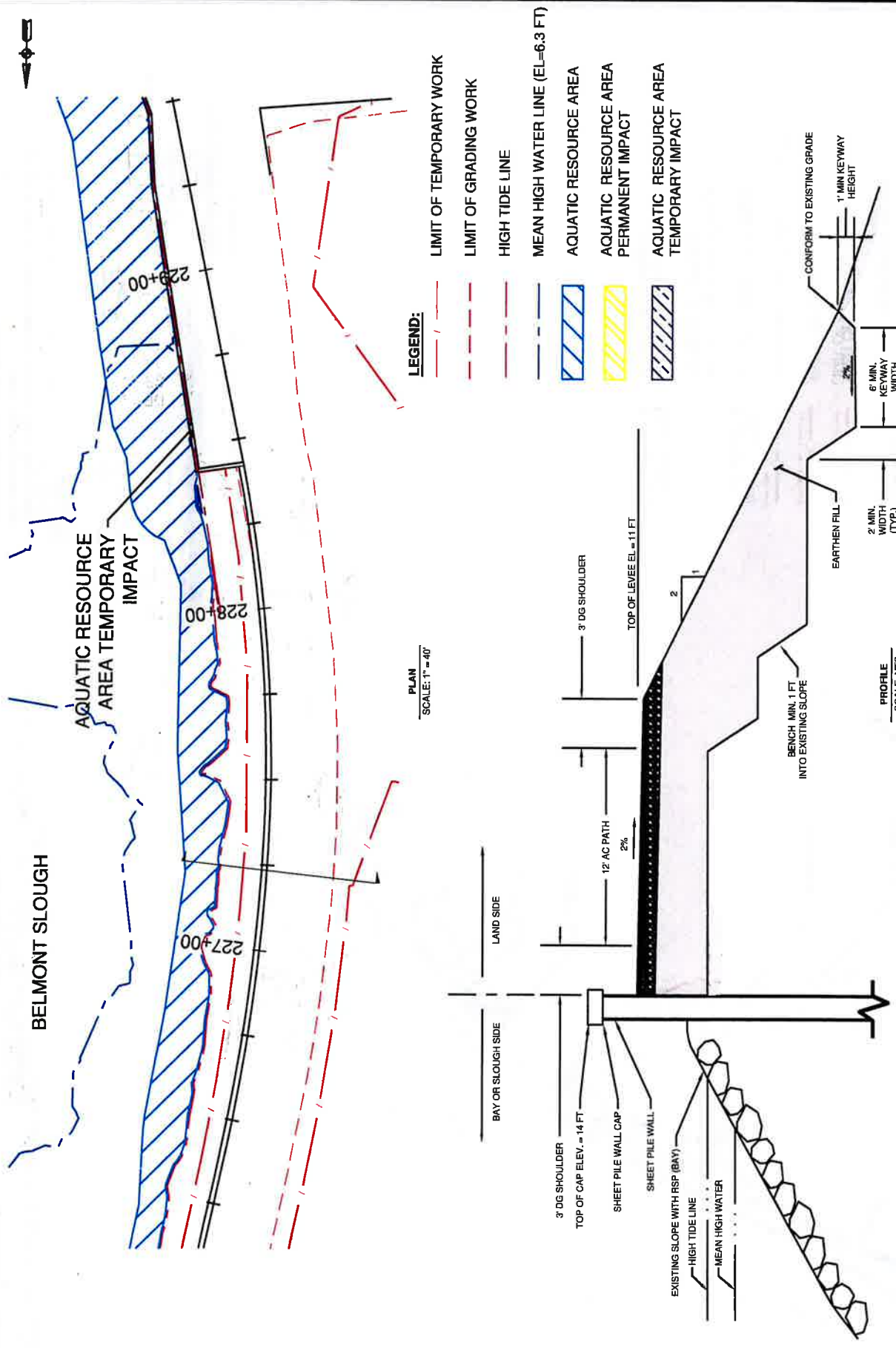


STATION: 107+88
PROJECT NAME: Levee Protection Planning and Improvement Project
(CJP 301-657)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California

Figure: 22 - Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Hufman, PhD
Hufman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / thufman@h-bgroup.com

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
1. State of CA
2. Foster City
DATE: 8/15/2018





PURPOSE: Rehabilitate levee system to retain FEMA accreditation.

DATE: NAVD 88

ADJACENT PROPERTY OWNERS:

1. State of CA
2. Foster City

DATE: 8/15/2018

Figure: 24 - Levee Aquatic Resource Area Impact

APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404

APPLICANT'S AGENT: Terry Hufman, PhD
Hufman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / thufman@h-bgroup.com

STATION: 227+23

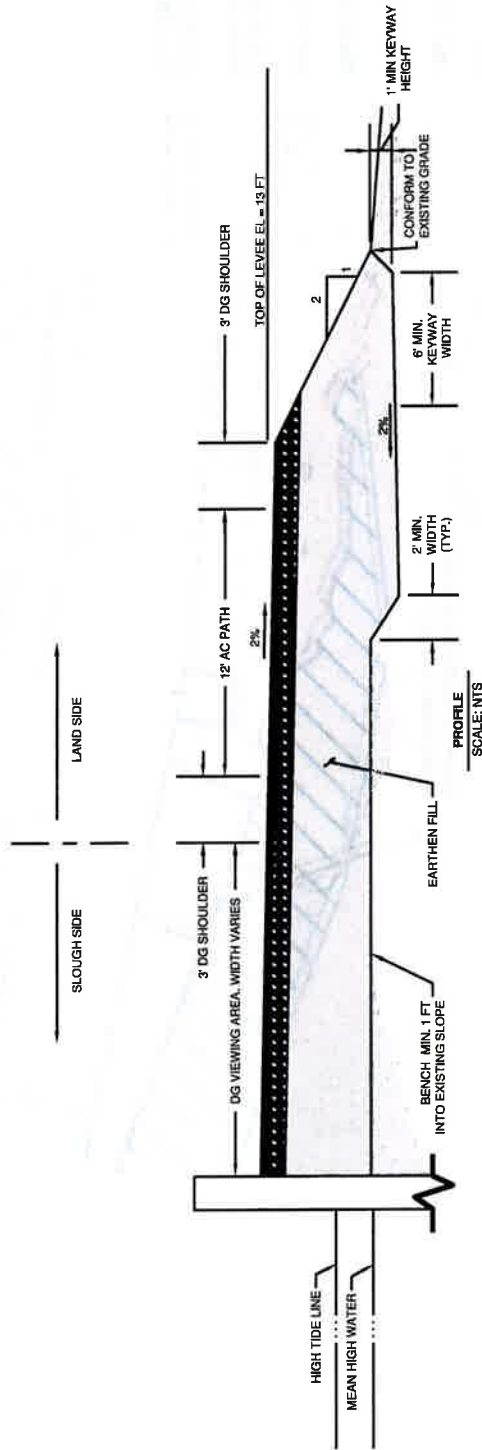
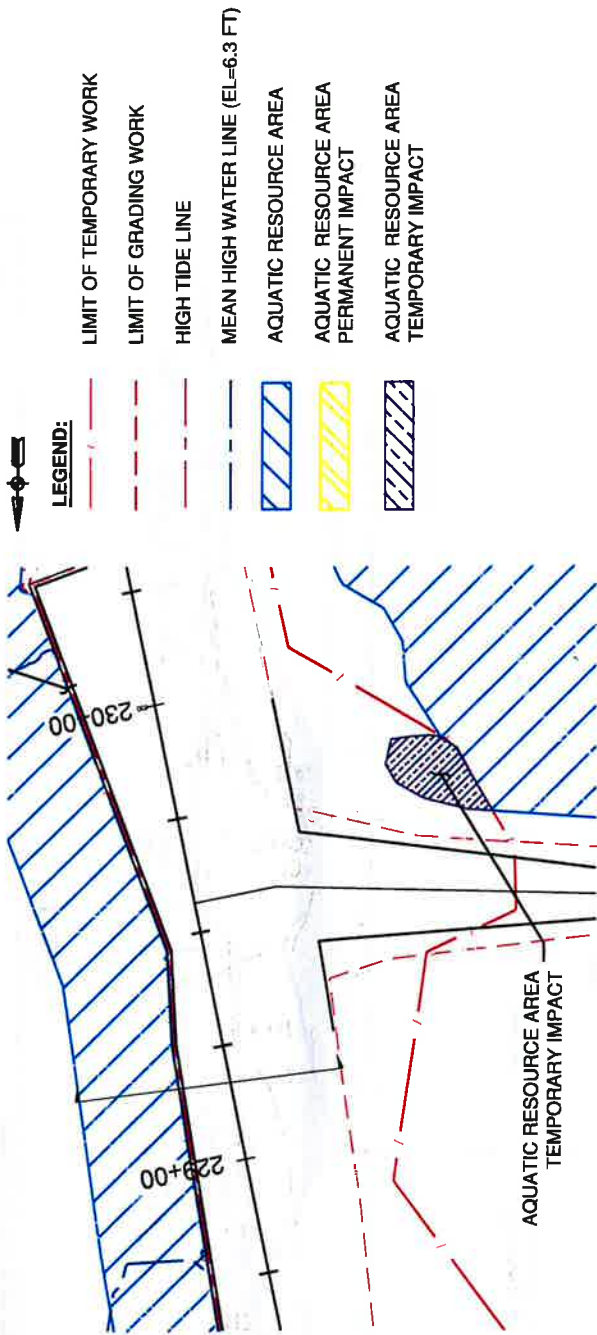
PROJECT NAME: Levee Protection Planning and Improvement Project
(CIP 301-657)

IN: waters of the United States

AT: Adjacent to existing City Levee System

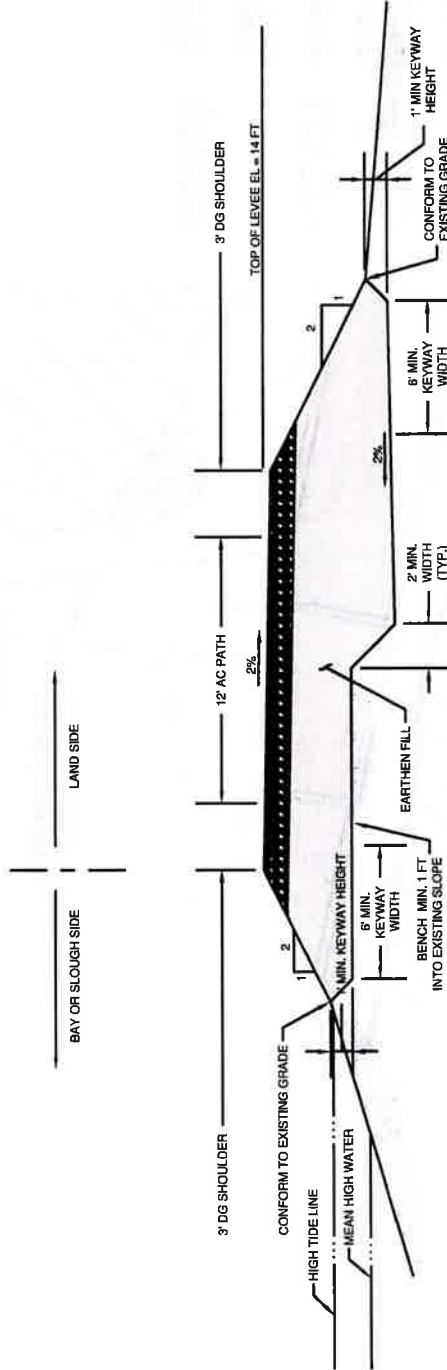
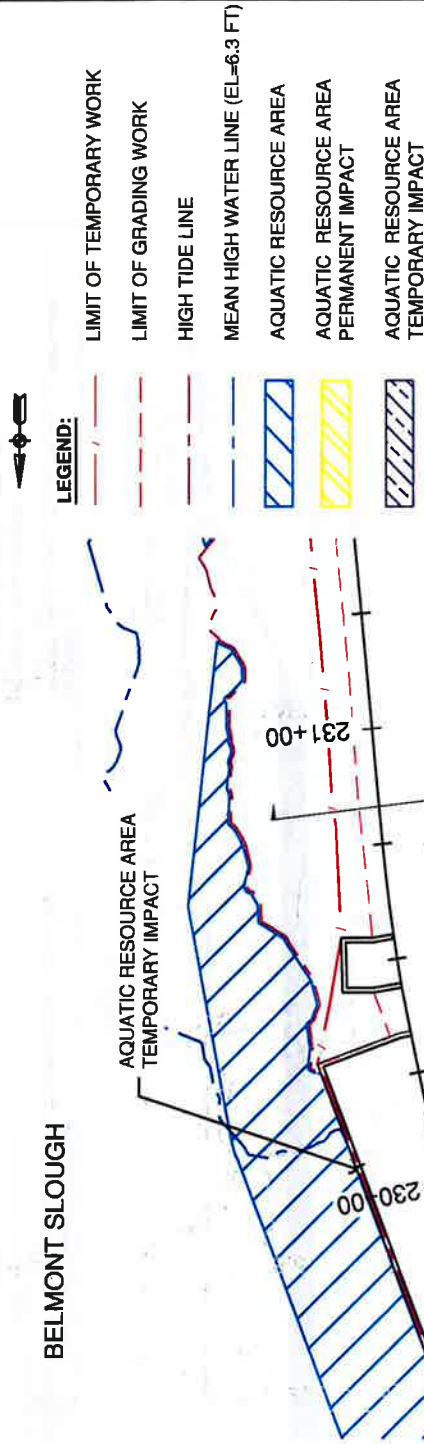
COUNTY OF: San Mateo

STATE: California

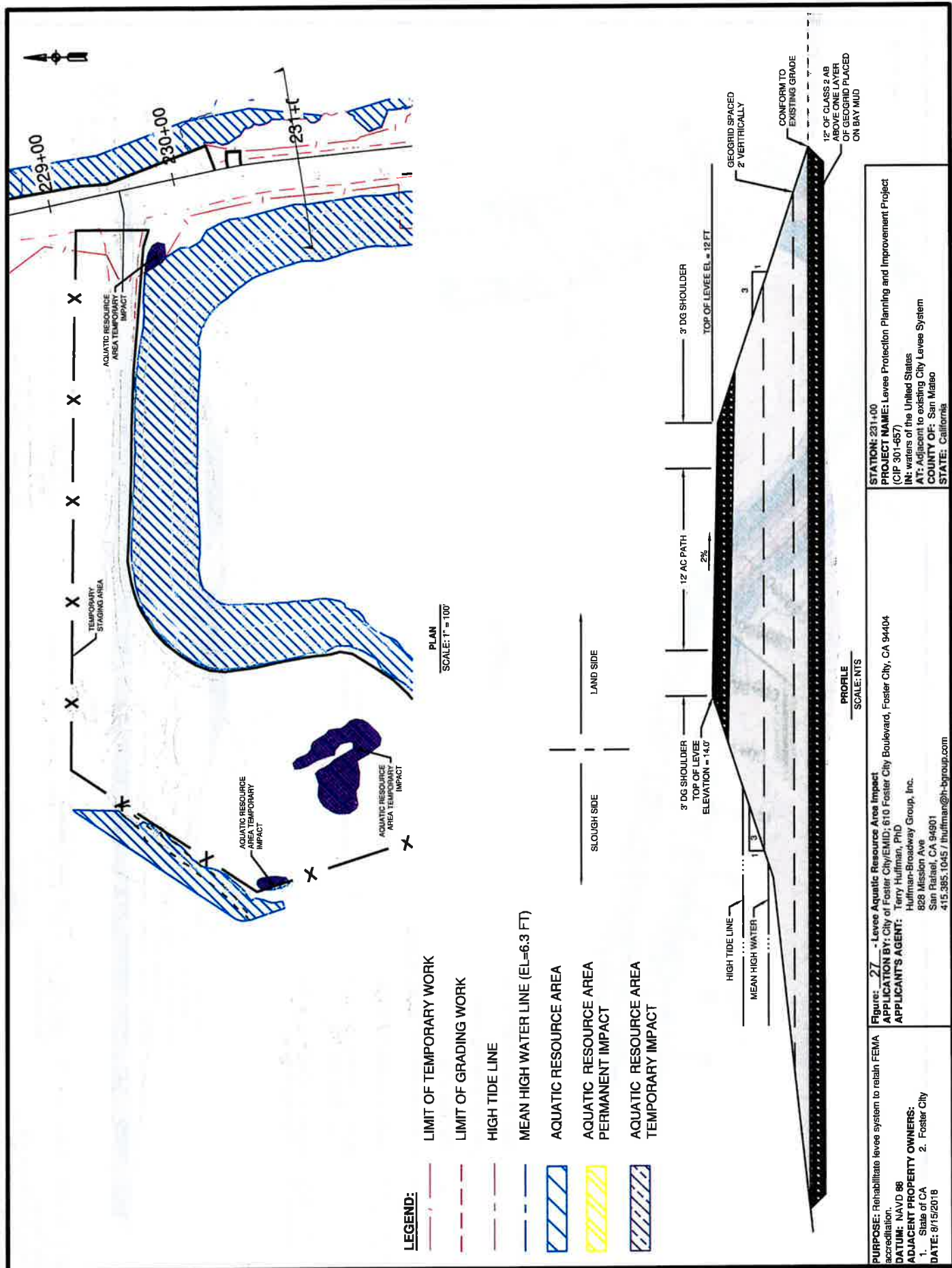


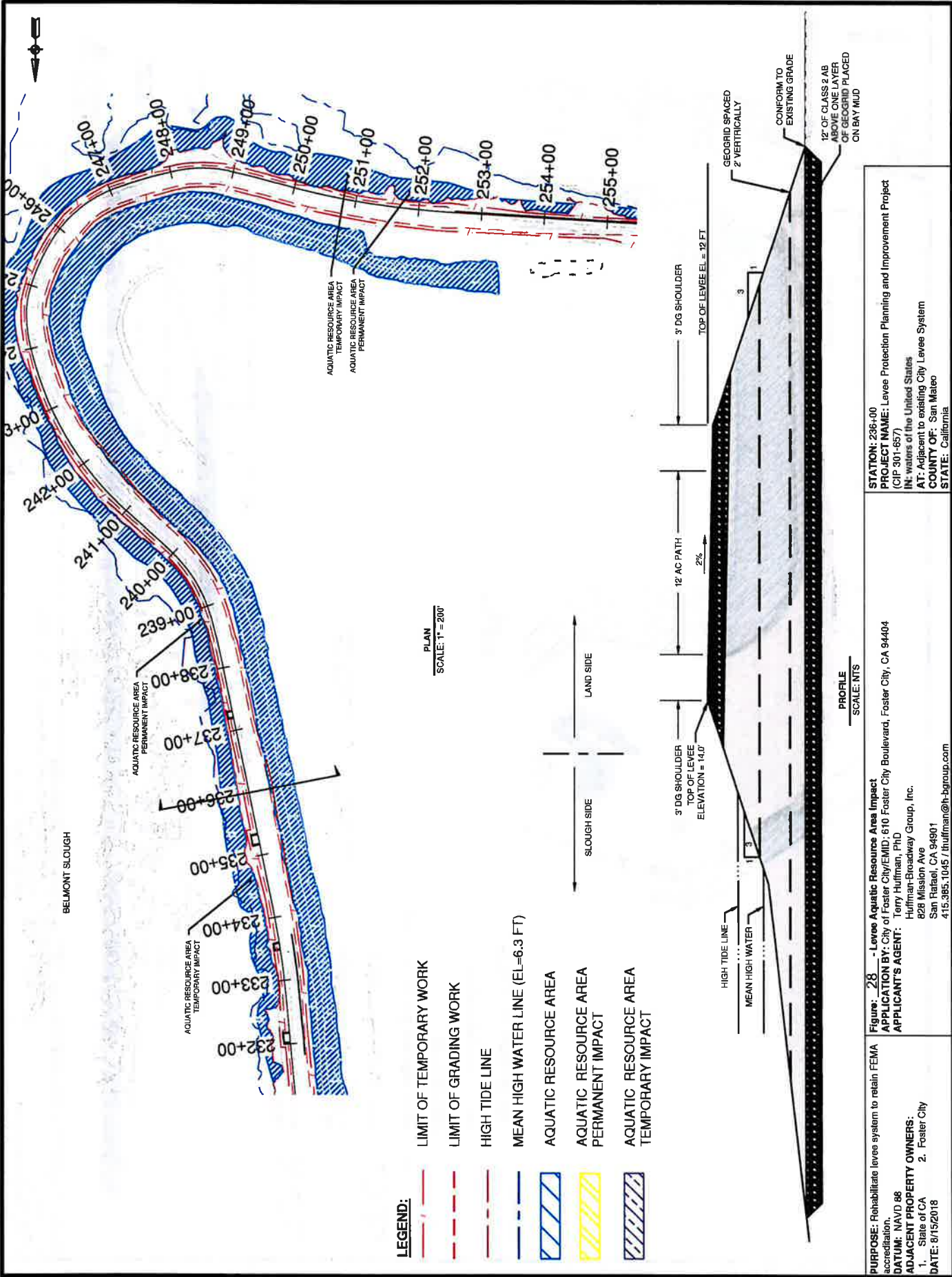
PURPOSE: Rehabilitate levee system to retain FEMA accreditation. DATUM: NAVD 88 ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City DATE: 8/15/2018	Figure: 25 Levee Aquatic Resource Area Impact APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404 APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / huffman@hbggroup.com	STATION: 229+17 PROJECT NAME: Levee Protection Planning and Improvement Project (CJP 301-657) IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
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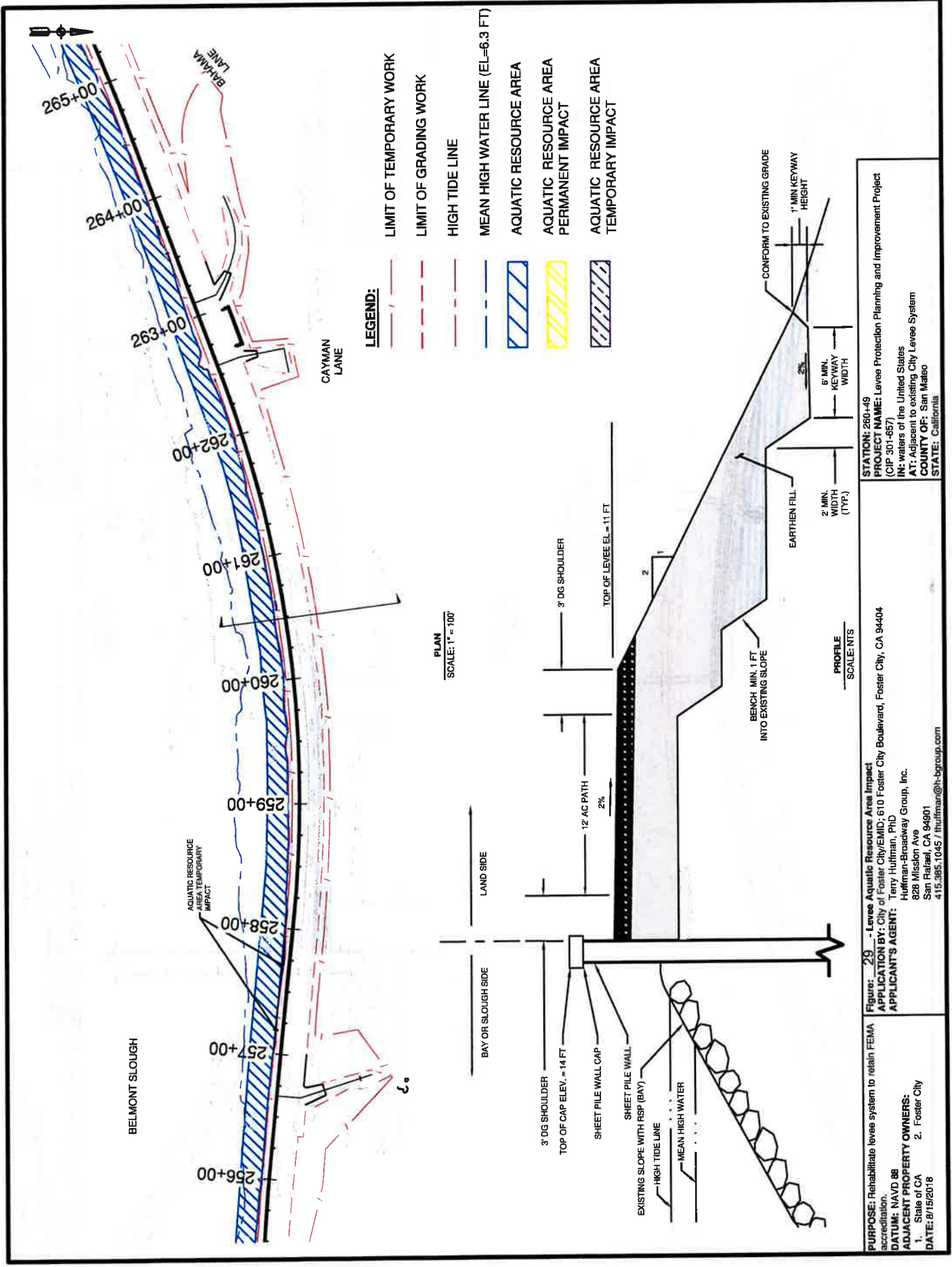
BELMONT SLOUGH

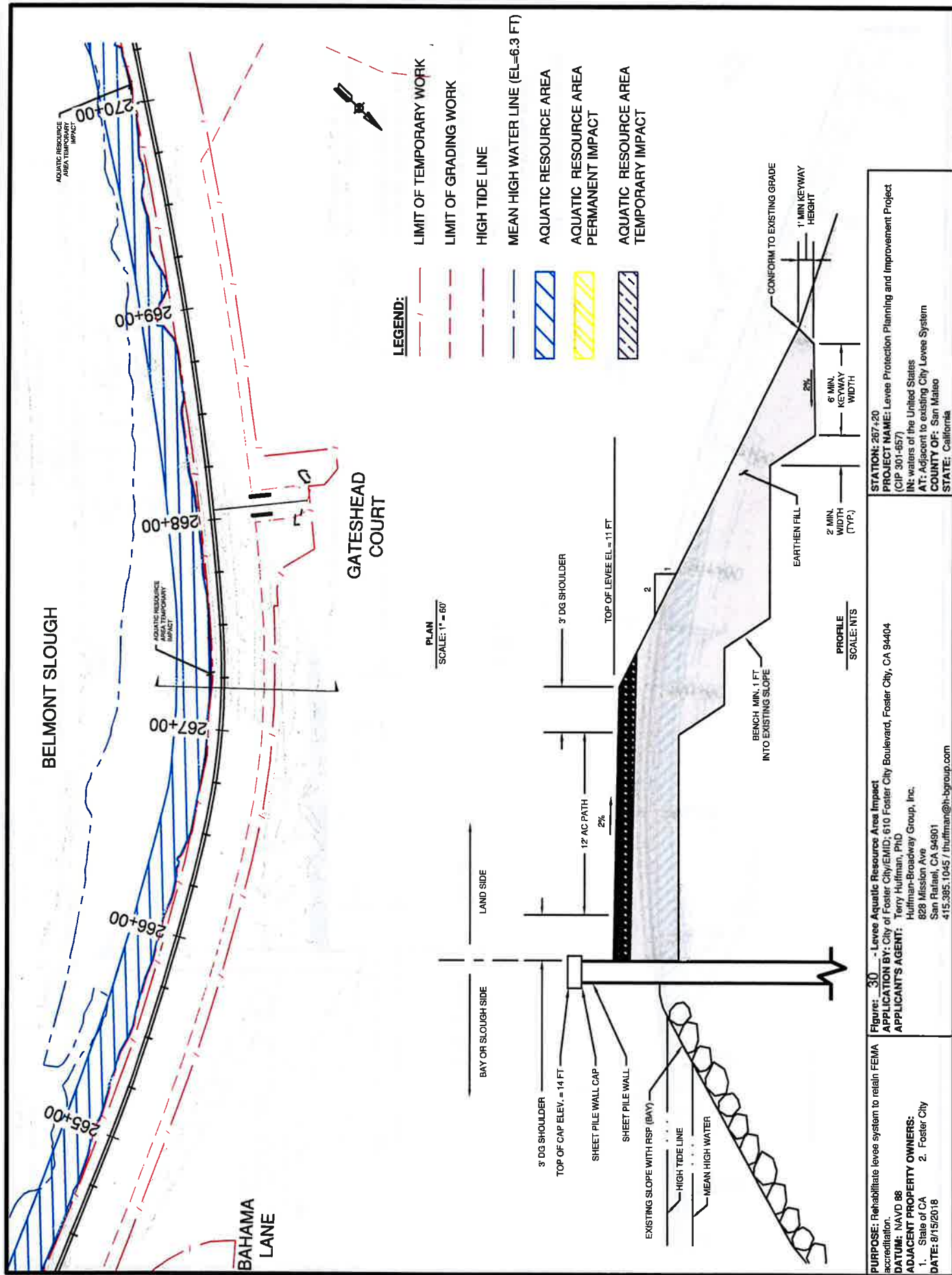


PURPOSE: Rehabilitate levee system to retain FEMA accreditation. DATUM: NAVD 88 ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City DATE: 8/15/2018	Figure: 26 - Levee Aquatic Resource Area Impact APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404 APPLICANT'S AGENT: Terry Hultman, PhD Hultman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thultman@h-bgroup.com	STATION: 230+80 PROJECT NAME: Levee Protection Planning and Improvement Project (CJP 301-657) IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
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PURPOSE: Rehabilitate levee system to retain FEMA accreditation.

DATE: 8/15/2018

ADJACENT PROPERTY OWNERS:

1. State of CA
2. Foster City

Figure: 30 - Levee Aquatic Resource Area Impact

APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404

APPLICANT'S AGENT: Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.395.1045 / huffman@hbgroup.com

STATION: 267+20

PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)

IN: waters of the United States

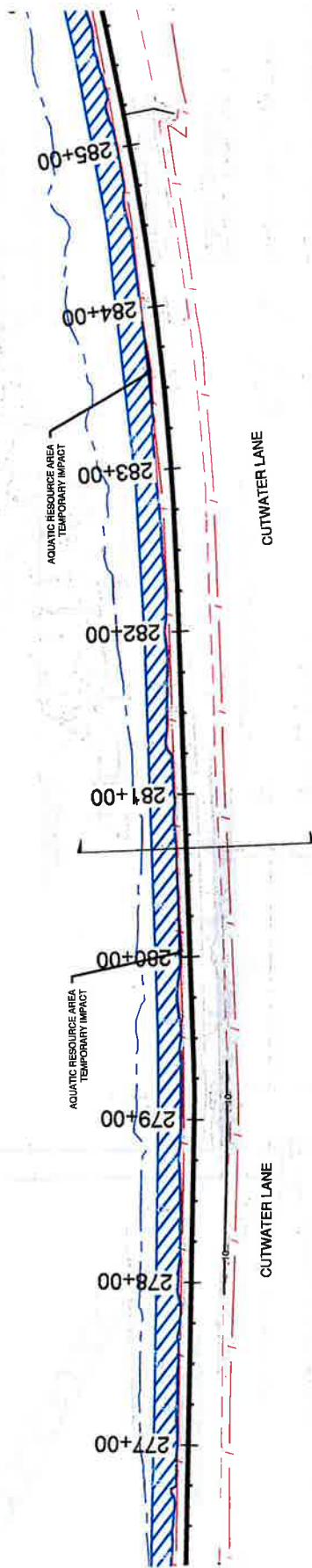
AT: Adjacent to existing City Levee System

COUNTY OF: San Mateo

STATE: California

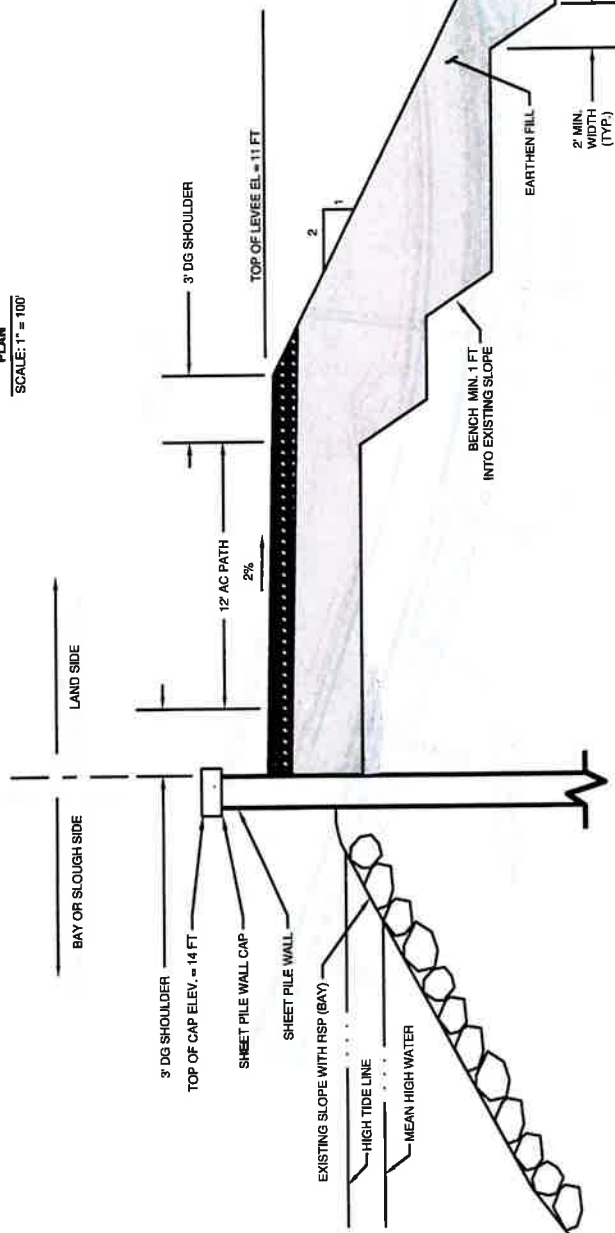


BELMONT SLOUGH



PLAN
SCALE: 1" = 100'

- LEGEND:**
- LIMIT OF TEMPORARY WORK (Red dashed line)
 - LIMIT OF GRADING WORK (Red dashed line)
 - HIGH TIDE LINE (Blue dashed line)
 - MEAN HIGH WATER LINE (EL=6.3 FT) (Blue dashed line)
 - AQUATIC RESOURCE AREA (Blue hatched area)
 - AQUATIC RESOURCE AREA PERMANENT IMPACT (Yellow hatched area)
 - AQUATIC RESOURCE AREA TEMPORARY IMPACT (Blue hatched area)



PROFILE
SCALE: 1" = 10'

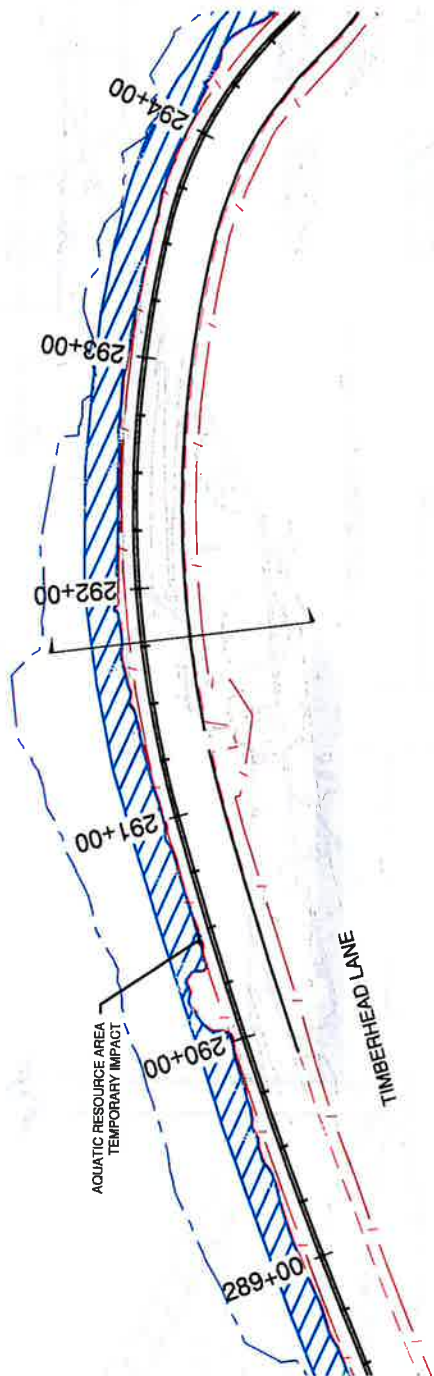
STATION: 280+67
PROJECT NAME: Levee Protection Planning and Improvement Project
(CIP 301-657)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California

Figure: 31 - Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMD; 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PHD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / thuffman@h-bgroup.com

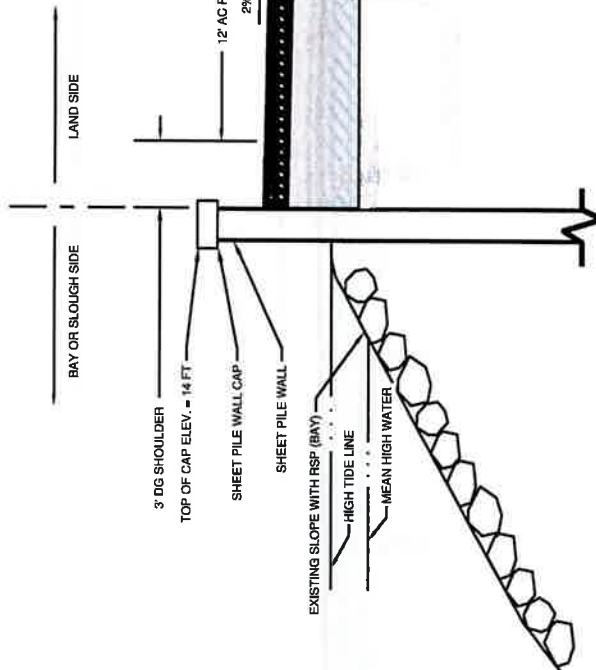
PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATE: 8/15/2018
ADJACENT PROPERTY OWNERS:
1. State of CA
2. Foster City



BELMONT SLOUGH



PLAN
SCALE: 1" = 80'



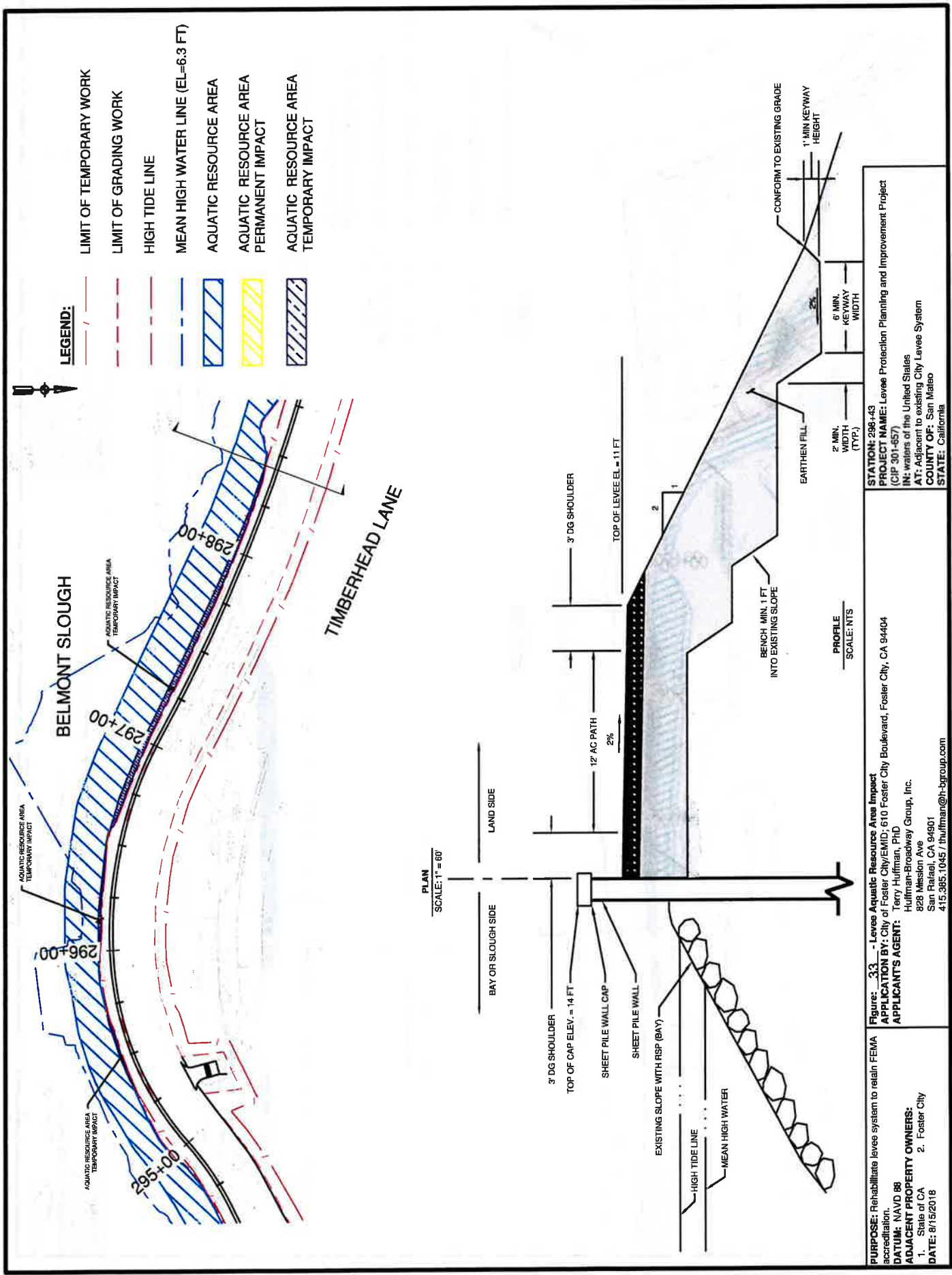
PROFILE
SCALE: NTS

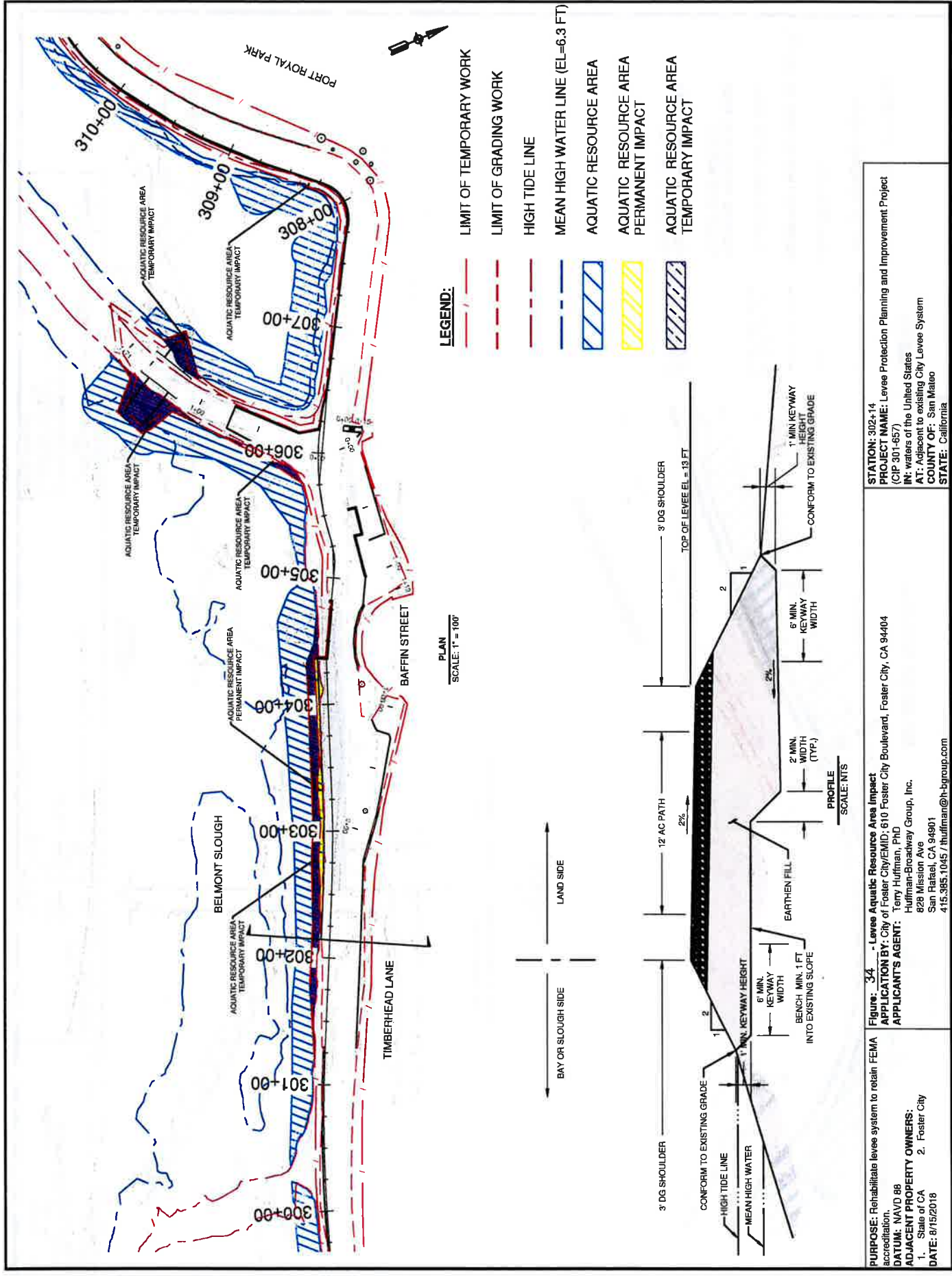
- LEGEND:**
- LIMIT OF TEMPORARY WORK
 - LIMIT OF GRADING WORK
 - HIGH TIDE LINE
 - MEAN HIGH WATER LINE (EL=6.3 FT)
 - AQUATIC RESOURCE AREA
 - AQUATIC RESOURCE AREA PERMANENT IMPACT
 - AQUATIC RESOURCE AREA TEMPORARY IMPACT

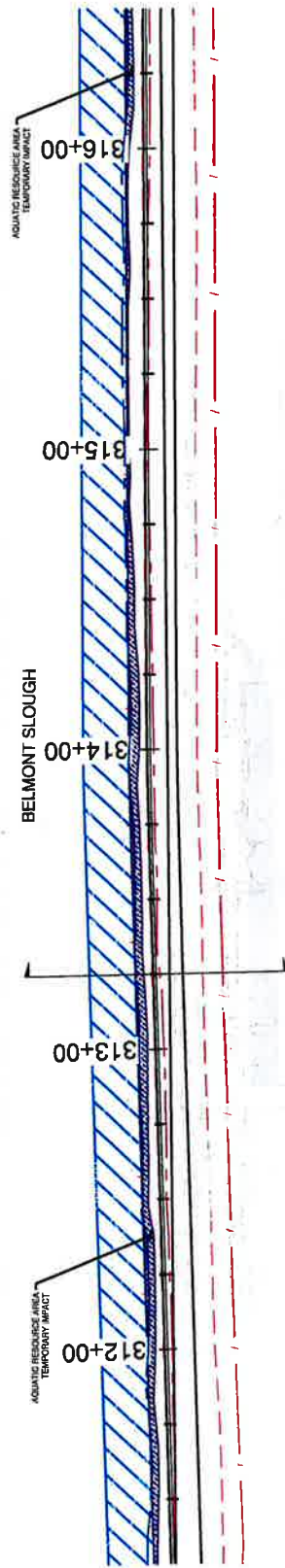
STATION: 291+77
PROJECT NAME: Levee Protection Planning and Improvement Project
(CIP 301-657)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California

Figure: 32 - Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / thuffman@h-bgroup.com

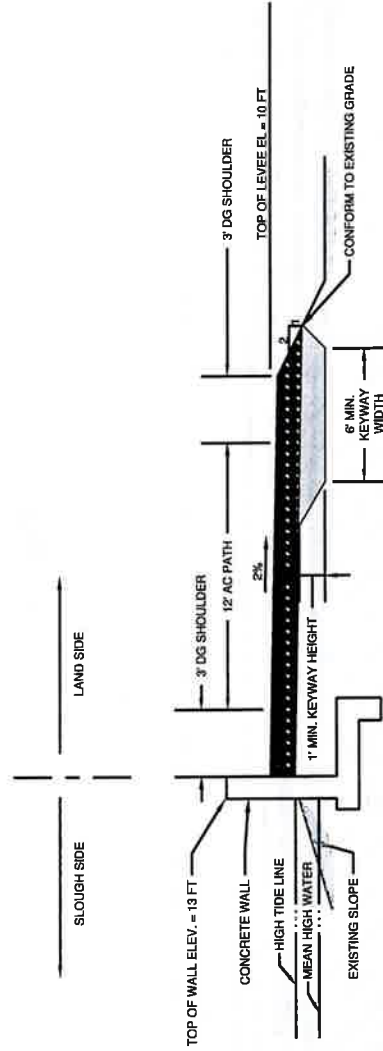
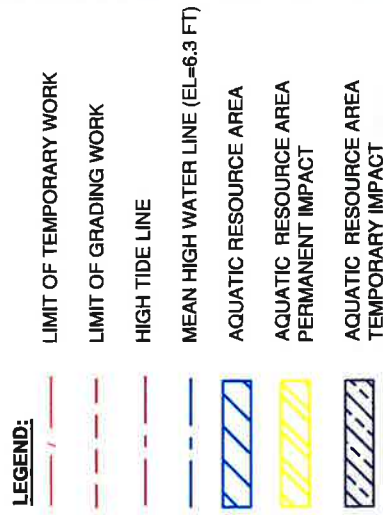
PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
1. State of CA
2. Foster City
DATE: 8/15/2018





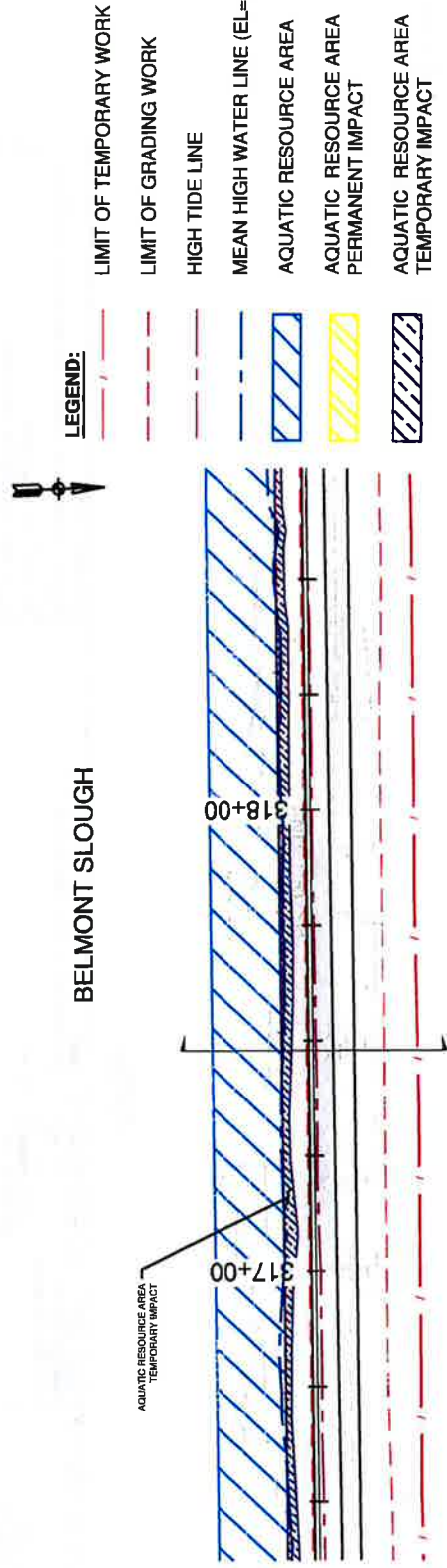


PLAN
SCALE: 1" = 60'

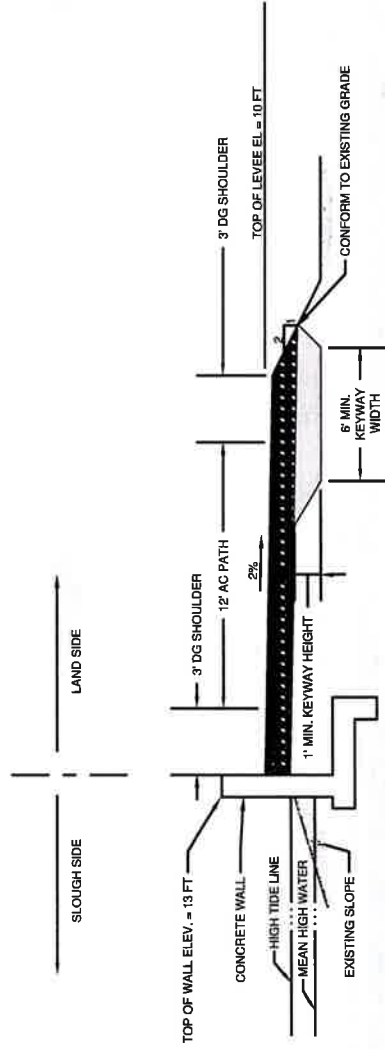


PROFILE
SCALE: NTS

<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATE: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <ol style="list-style-type: none">State of CAFoster City <p>DATE: 9/15/2018</p>	<p>Figure: 35 - Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID: 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / t.huffman@h-bgroup.com</p>	<p>STATION: 313+25</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>
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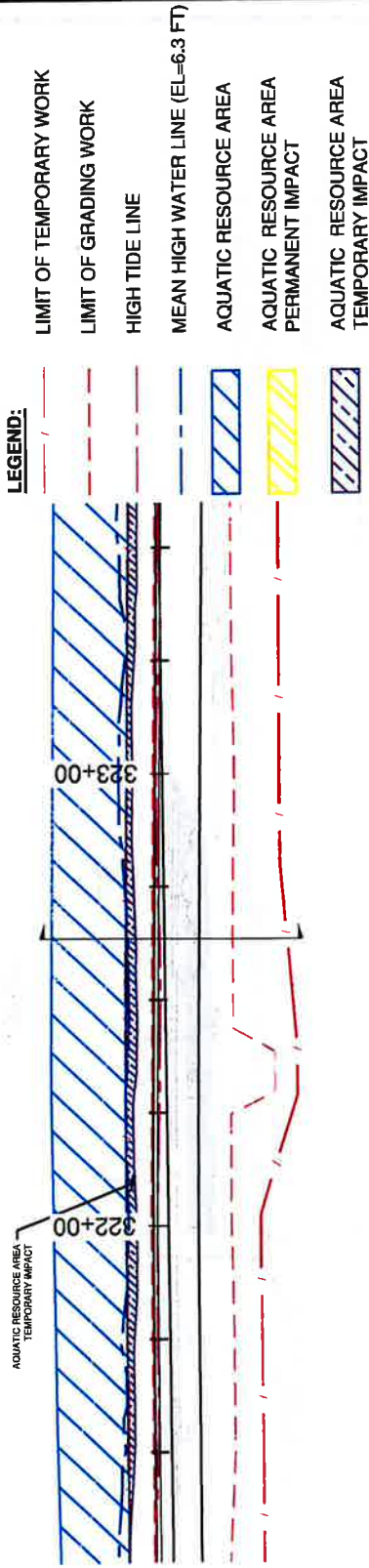
PLAN
SCALE: 1" = 40'



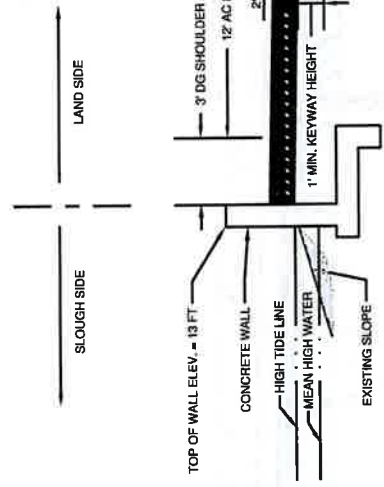
PROFILE
SCALE: NTS

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.	Figure: 36 - Levee Aquatic Resource Area Impact	STATION: 317+48 PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)
DATE: NAVD 88	APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404	INT: waters of the United States
ADJACENT PROPERTY OWNERS:	APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@hbg-group.com	AT: Adjacent to existing City Levee System
DATE: 8/15/2018		COUNTY OF: San Mateo STATE: California

BELMONT SLOUGH

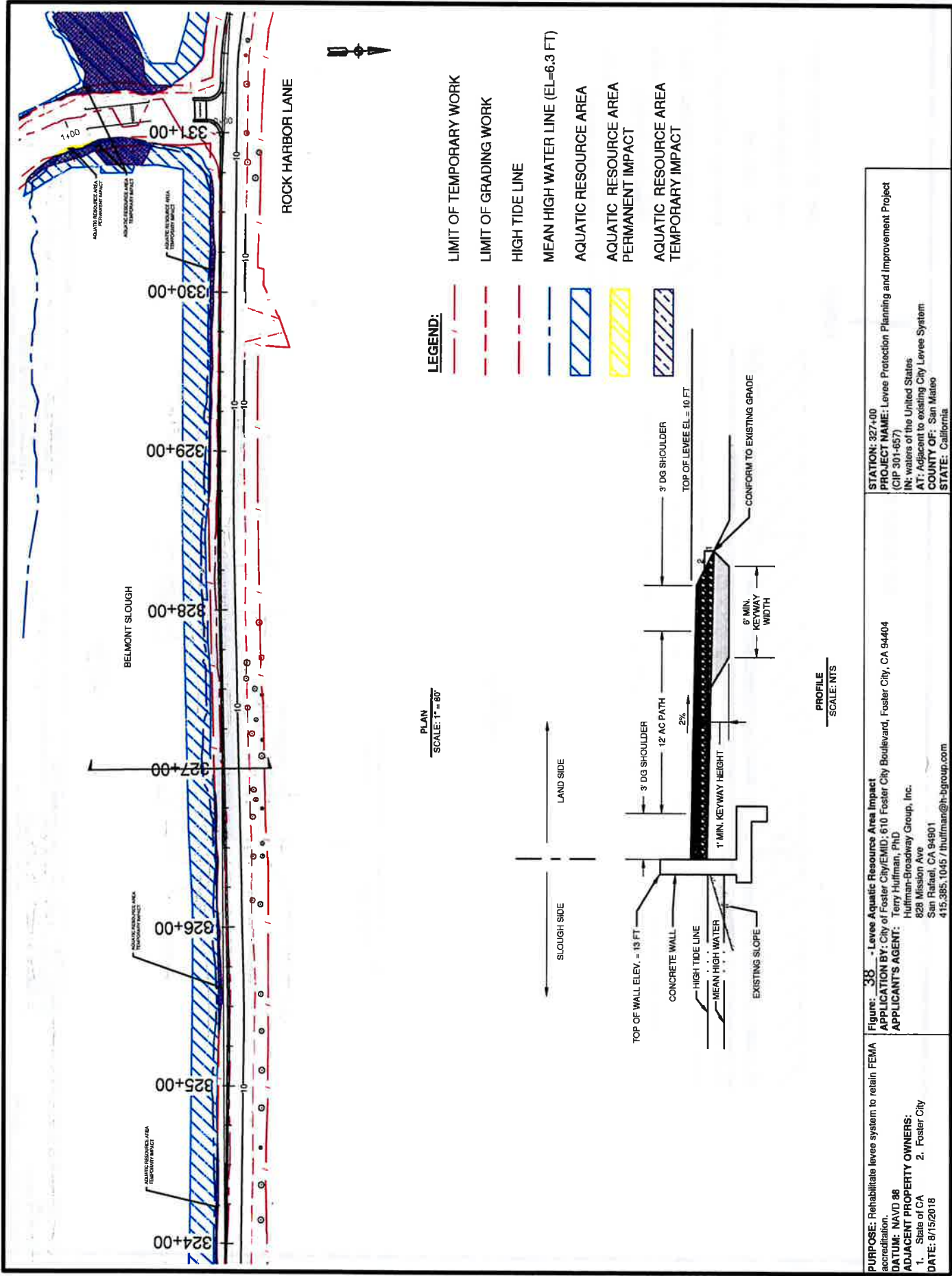


PLAN
SCALE: 1" = 40'



PROFILE
SCALE: NTS

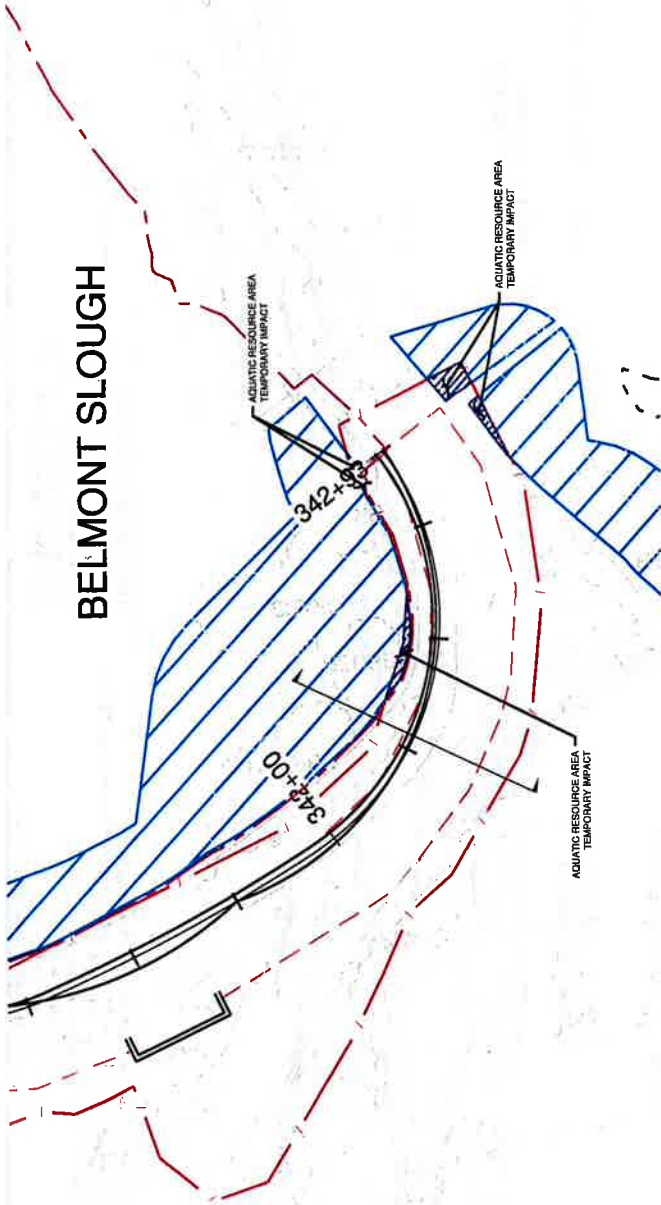
<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATE: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <ol style="list-style-type: none"> State of CA Foster City <p>DATE: 8/15/2018</p>	<p>Figure: 37 - Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID: 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1043 / t.huffman@h-bgroup.com</p>	<p>STATION: 322+65</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)</p> <p>INT: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>
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PURPOSE: Rehabilitate levee system to retain FEMA accreditation. DATUM: NAVD 88 ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City DATE: 8/15/2018	Figure: 38 - Levee Aquatic Resource Area Impact APPLICATION BY: City of Foster City/EMID: 610 Foster City Boulevard, Foster City, CA 94404 APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415-385-1045 / thuffman@h-bgroup.com	STATION: 327+00 PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657) IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
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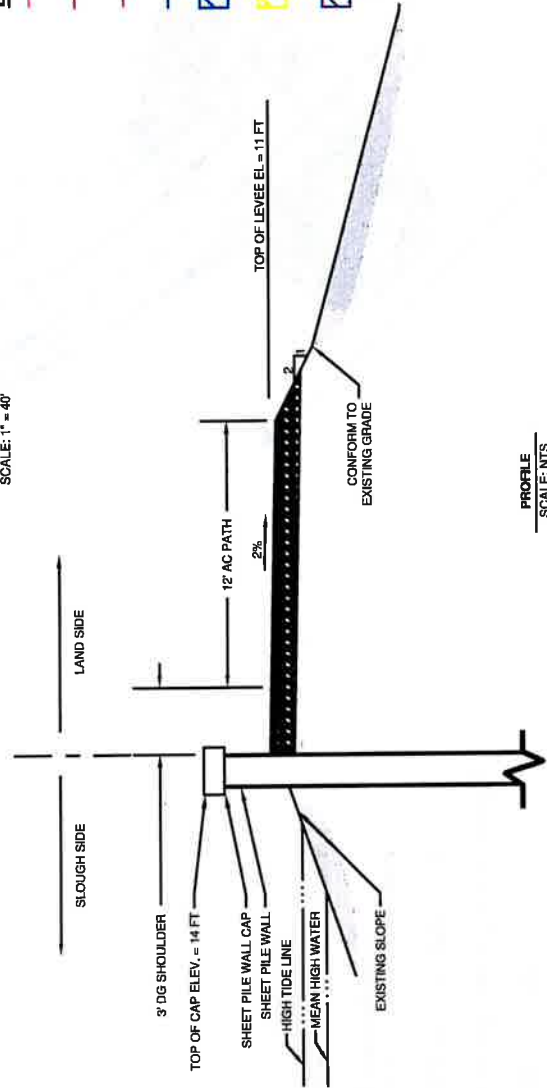


BELMONT SLOUGH



PLAN
SCALE: 1" = 40'

- LEGEND:**
- LIMIT OF TEMPORARY WORK
 - LIMIT OF GRADING WORK
 - HIGH TIDE LINE
 - MEAN HIGH WATER LINE (EL=6.3 FT)
 - AQUATIC RESOURCE AREA
 - AQUATIC RESOURCE AREA PERMANENT IMPACT
 - AQUATIC RESOURCE AREA TEMPORARY IMPACT

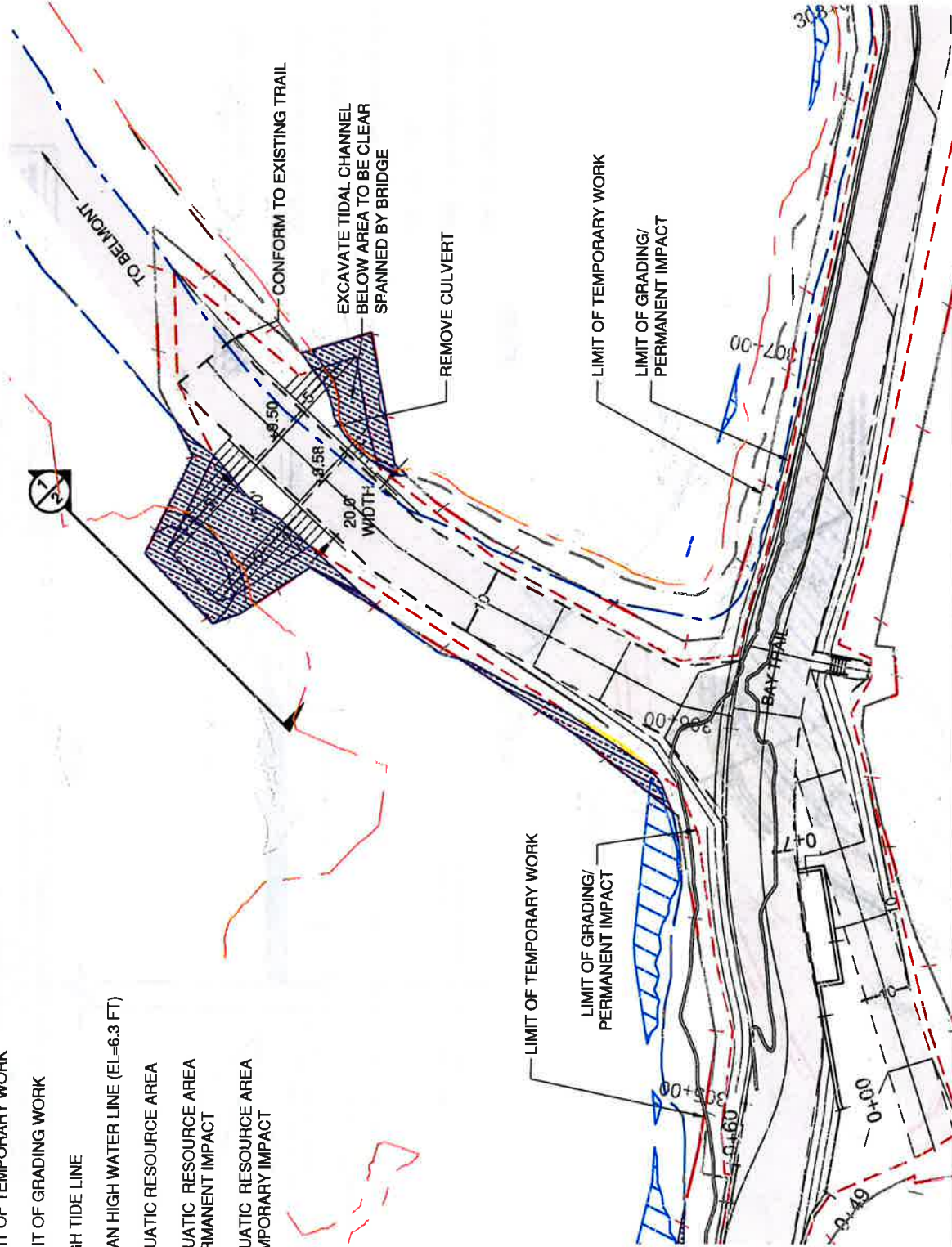


PROFILE
SCALE: 1" = 2'

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.	Figure: 39 - Levee Aquatic Resource Area Impact	STATION: 342+55
DATE: NAVD 88	APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404	PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-557)
ADJACENT PROPERTY OWNERS:	APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com	IN: waters of the United States
DATE: 8/15/2018		AT: Adjacent to existing City Levee System
		COUNTY OF: San Mateo
		STATE: California

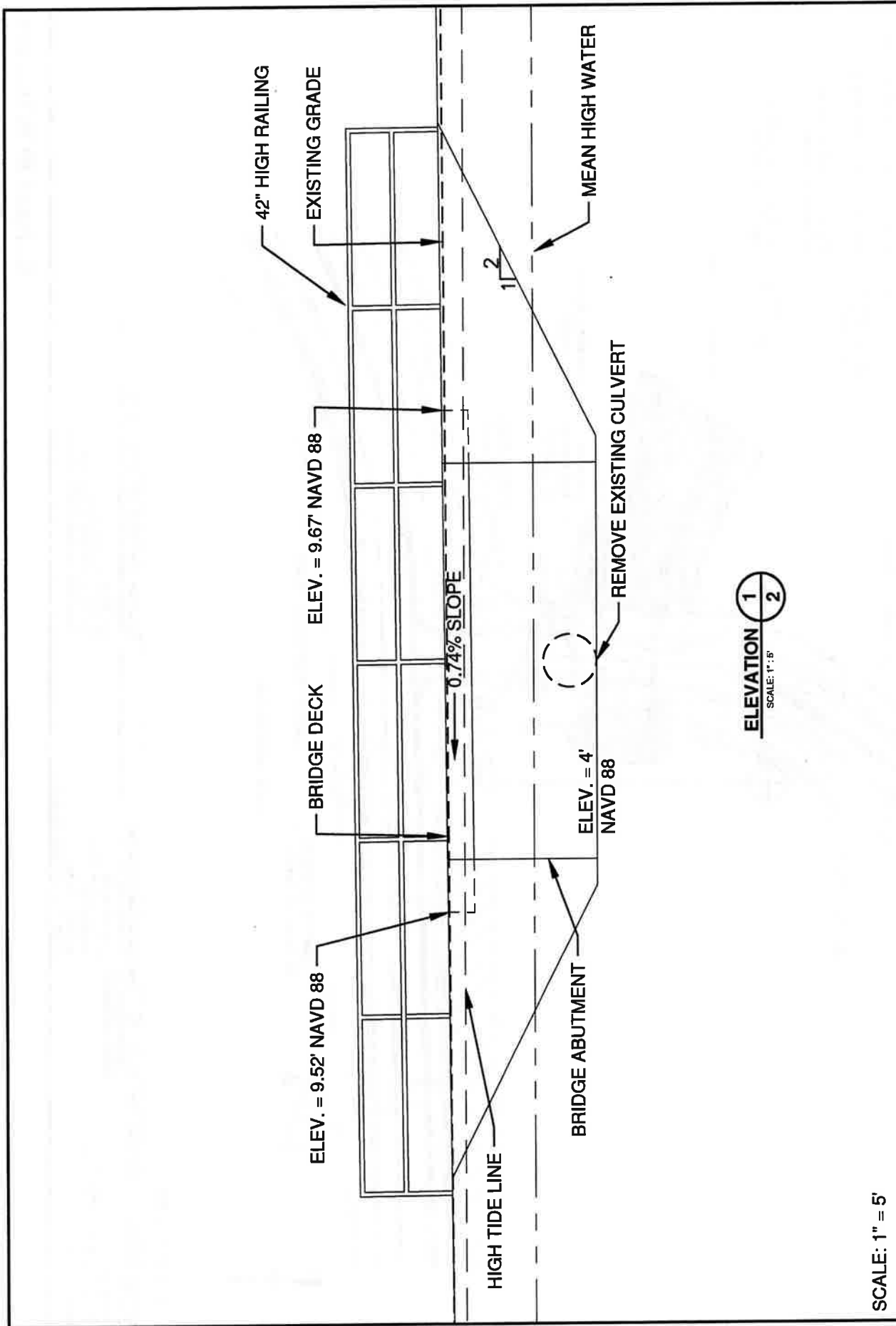
LEGEND:

- / — LIMIT OF TEMPORARY WORK
- - - LIMIT OF GRADING WORK
- - - HIGH TIDE LINE
- - - MEAN HIGH WATER LINE (EL=6.3 FT)
- ▨ AQUATIC RESOURCE AREA
- ▨ AQUATIC RESOURCE AREA PERMANENT IMPACT
- ▨ AQUATIC RESOURCE AREA TEMPORARY IMPACT

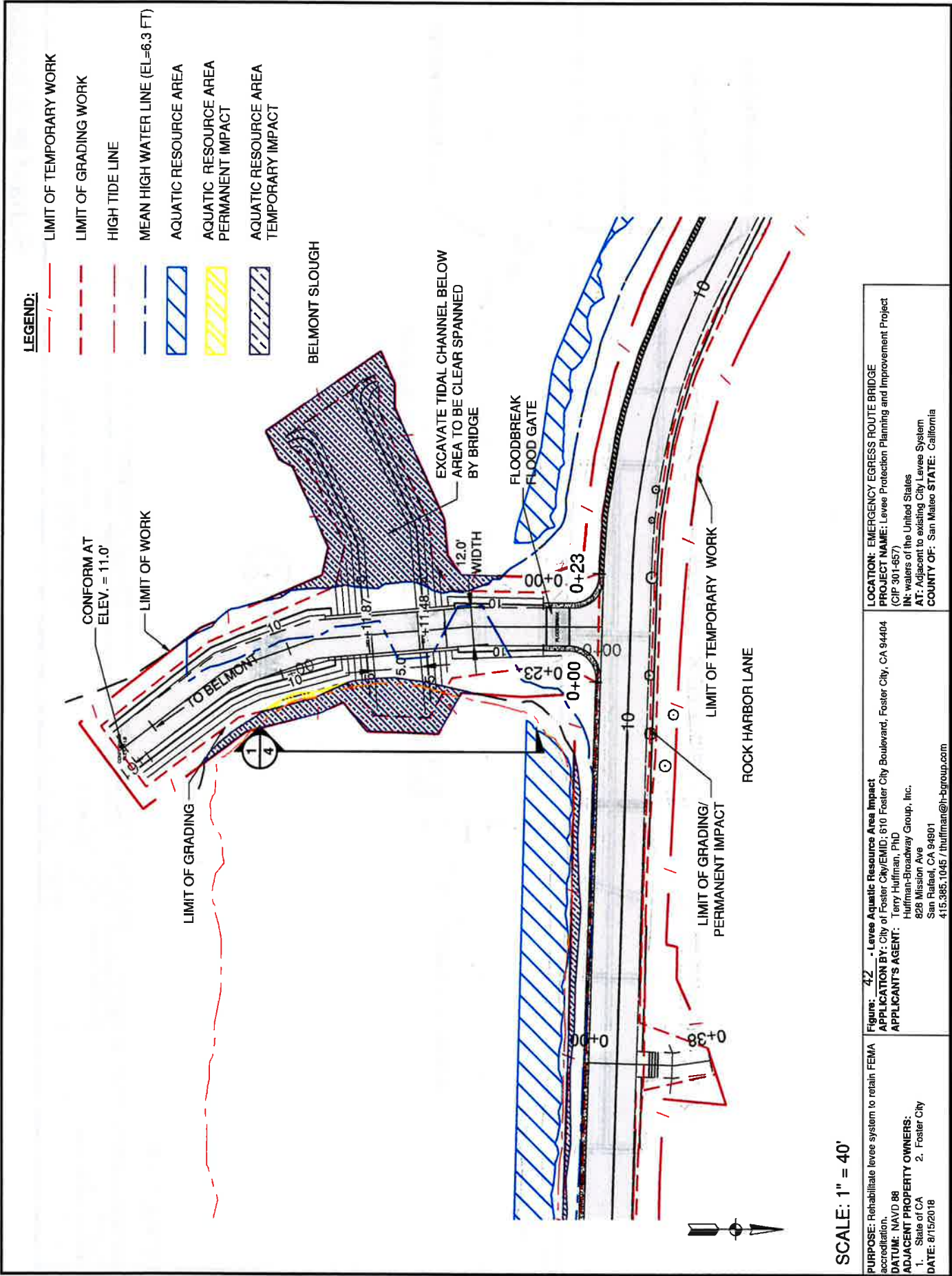


SCALE: 1" = 40'

<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p>	<p>Figure: 40 - Levee Aquatic Resource Area Impact</p>	<p>LOCATION: BAFFIN ST BRIDGE</p>
<p>DATUM: NAVD 88</p>	<p>APPLICATION BY: City of Foster City/EMID: 610 Foster City Boulevard, Foster City, CA 94404</p>	<p>PROJECT NAME: Levee Protection Planning and Improvement Project (CJP 301-657)</p>
<p>ADJACENT PROPERTY OWNERS:</p>	<p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com</p>	<p>IN: waters of the United States</p>
<p>DATE: 8/15/2018</p>	<p>1. State of CA</p>	<p>AT: Adjacent to existing City Levee System</p>
		<p>COUNTY OF: San Mateo STATE: California</p>

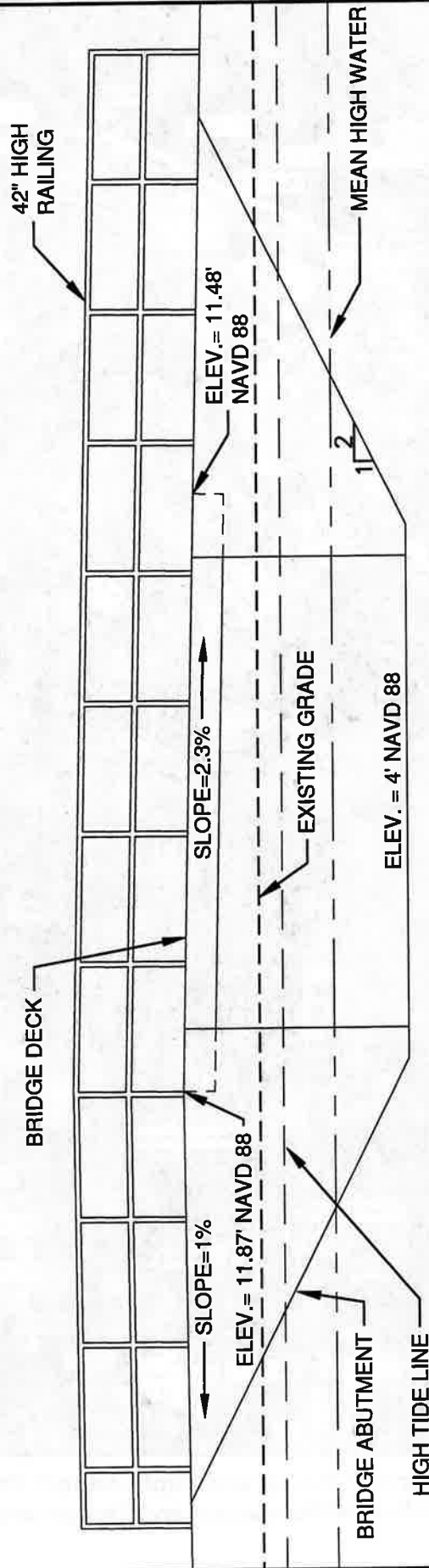


<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATE: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <ol style="list-style-type: none"> State of CA Foster City <p>DATE: 8/15/2018</p>	<p>Figure: 41</p> <p>APPLICATION BY: City of Foster City/EMID: 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com</p>	<p>LOCATION: BAFFIN ST BRIDGE</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-857)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo STATE: California</p>
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SCALE: 1" = 40'

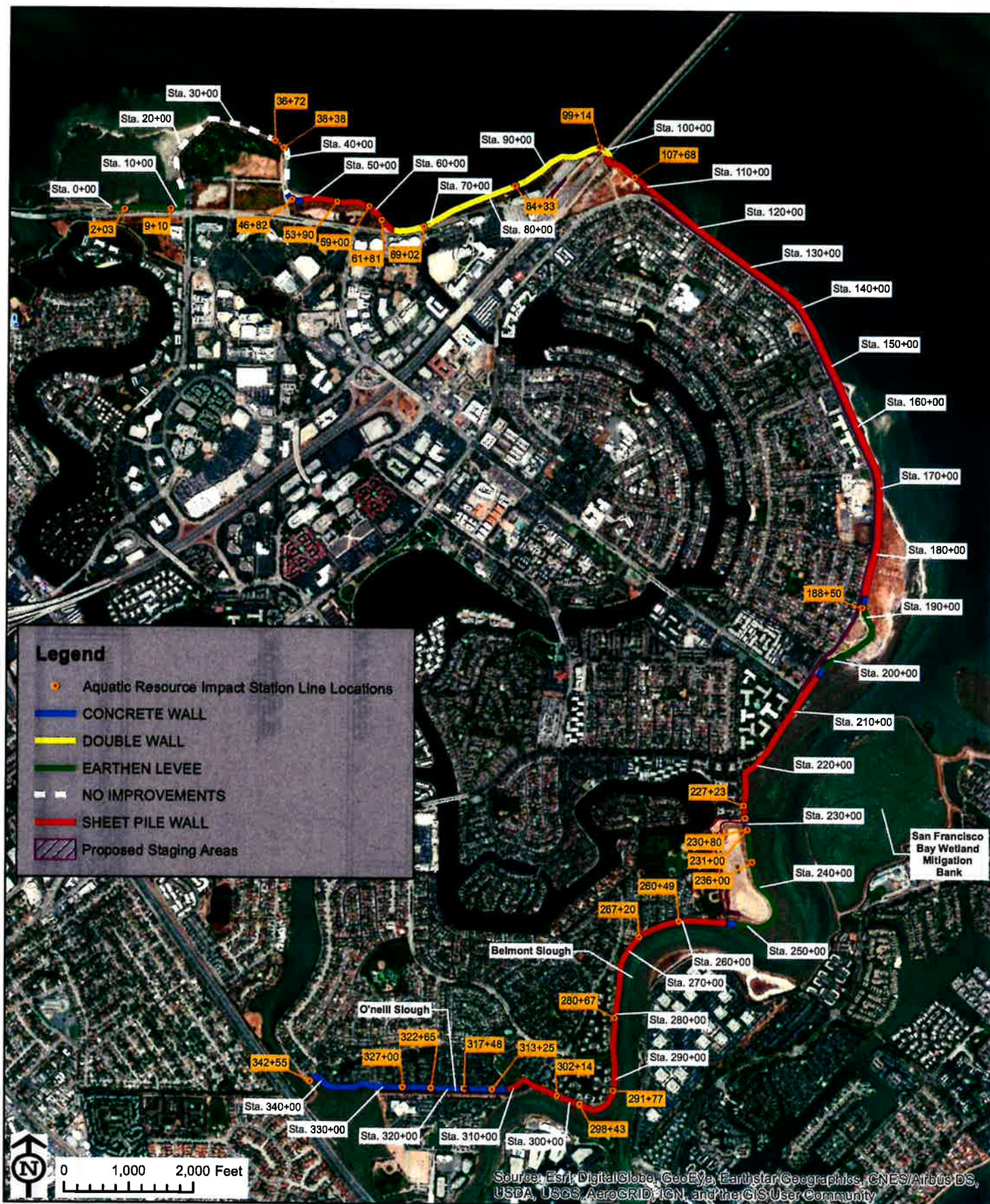
PURPOSE: Rehabilitate levee system to retain FEMA accreditation. DATUM: NAVD 88 ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City DATE: 8/15/2018	Figure: 4.2 - Levee Aquatic Resource Area Impact APPLICATION BY: City of Foster City/EMD; 610 Foster City Boulevard, Foster City, CA 94404 APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com	LOCATION: EMERGENCY EGRESS ROUTE BRIDGE PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657) IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
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ELEVATION $\frac{1}{4}$
SCALE: 1" = 5'

SCALE: 1" = 5'

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.	Figure: 43 - Levee Aquatic Resource Area Impact APPLICATION BY: City of Foster City/EMD; 610 Foster City Boulevard, Foster City, CA 94404 APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@hbggroup.com	LOCATION: EMERGENCY EGRESS ROUTE BRIDGE PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657) INT: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City		
DATE: 8/15/2018		



**Figure 2. Foster City Levee Protection Planning and Improvement Project
Levee Improvement Type and Location of Permanent and Temporary
Impacts to Aquatic Resources**

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

GAVIN NEWSOM
GOVERNORJARED BLUMENFELD
SECRETARY FOR
ENVIRONMENTAL PROTECTION

San Francisco Bay Regional Water Quality Control Board

Amended CLEAN WATER ACT SECTION 401 WATER QUALITY CERTIFICATION AND ORDER FOR THE

Foster City Levee Protection and Improvements Project San Mateo County

Sent via electronic mail: No hard copy to follow

Effective Date: ~~October 23, 2019~~ November 26, 2019
Place ID: 851477
Reg. Measure: 425529
Corps File No: 2015-00391S

Applicant: City of Foster City
 610 Foster City Boulevard
 Foster City, CA 94404
 Phone: (650) 286-3288
 Attn: Jeff Moneda (jmoneda@fostercity.org)

Agent: Huffman Broadway Group, Inc.
 828 Mission Avenue
 San Rafael, CA 94901
 Phone: (415) 925-2006
 Attn: Terry Huffman (thuffman@h-bgroup.com)

Water Board Staff: Tahsa Sturgis
 1515 Clay Street, Suite 1400
 Oakland, CA 94612
 Phone: (510) 622-2316
 Email: Tahsa.Sturgis@waterboards.ca.gov

JIM McGRATH, CHAIR | MICHAEL MONTGOMERY, EXECUTIVE OFFICER

1515 Clay St., Suite 1400, Oakland, CA 94612 | www.waterboards.ca.gov/sanfranciscobay

♻️ RECYCLED PAPER

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Certification and Order Coverage

This Clean Water Act (CWA) section 401 Water Quality Certification (Certification) and Order (Order) is issued to the City of Foster City (Permittee or City).

Pursuant CWA section 404, the Permittee requested authorization to fill and discharge to waters of the U.S. from the U.S. Army Corps of Engineers (Corps), Regulatory Branch, under a Nationwide Permit (NWP). The Corps determined the Project would be authorized under an Individual Permit and on October 4, 2018, issued a Public Notice (Corps File No. 2015-00391S for the Project to solicit comments from the public for consideration to determine whether to issue, modify, condition, or deny an Individual Permit pursuant to CWA section 404.

The Permittee applied to the San Francisco Bay Regional Water Quality Control Board (Water Board) requesting Certification verifying the Foster City Levee Protection and Improvements Project (Project) does not violate State water quality standards. The application for Certification was received on October 2, 2018 (Application). On March 11, 2019, the Water Board informed the Permittee that the Application was not yet complete and detailed what information was needed before the Application could be considered complete. The Permittee submitted supplemental information on July 16, 2019, through September 11, 2019. The following sections are derived from the Application and supplemental information.

1. Project

The Project will rehabilitate areas along the entire 34,300 linear feet of the City's levee system to regain Federal Emergency Management Agency (FEMA) accreditation.

1.1 Background

The levee surrounding the City was constructed in 1976 to protect against flooding. The existing flood levee system provides flood protection to approximately 9,000 individual property owners in the City. An additional 8,000 individual properties within the City of San Mateo are also protected, in part, by the City's levee system. The levee is also part of the Bay Trail.

Although the Permittee has made improvements to the levee since its initial construction to maintain its FEMA levee accreditation, FEMA conducted a coastal flood hazard study in 2014 that determined roughly 85 percent of the Permittee's levee system does not meet FEMA requirements. FEMA granted the Permittee a temporary "seclusion mapping" designation in 2015 to remain classified as Zone X low-risk area. However, the temporary designation was conditioned on progress to address the levee's deficiencies. If the City is designated by FEMA as a Flood Hazard Area, approximately 17,000 individual properties within the City and the City of San Mateo will be designated as a flood zone resulting in economic impacts and potential physical impacts large in magnitude and long in duration.

1.2 Site Description

The Project site includes the approximately 34,300-linear-foot levee system that surrounds the City along the Bayfront, narrow bands of land and vegetation or landscaping on either side of the existing levees, and proposed construction staging areas.

The site is bordered by the San Francisco Bay to the north and east, Belmont Slough to the southeast and south, and O'Neill Slough to the south. Land uses on the levee system's landward side consist of streets, residential uses, office and commercial uses, landscaped open space, and recreational uses, unimproved lots, muted tidal wetlands, and seasonal wetlands. The San Francisco Bay side of the City levee system consists mostly of fully tidal open water, slough channels, wetlands, and mud flats. O'Neil Slough is located on the City's south side and is currently a muted tidal channel due to a limited tidal exchange from a culvert blocked with sediment.

1.3 Construction Summary

The Project will rehabilitate the City's existing levee system to retain FEMA accreditation and account for sea level rise (SLR) estimates in the year 2050 and rehabilitate ancillary structures associated with the levee, including utilities, culverts, intake/outflow structures, and access ramps and trails. The Project will be constructed in one phase over at least two construction seasons.

Levee Rehabilitation

To meet current FEMA levee standards and retain FEMA levee accreditation, the existing levee must be raised up to 3.5 feet. To account for 2050 SLR, the levee must be raised between 0.5 and 7 feet. The existing levee will be raised by rehabilitating the levee with the following designs: 1) Earthen Levee; 2) Conventional Flood Wall; and 3) Sheet Pile Floodwall. In total, the three levee rehabilitation types will be installed along approximately 34,500 linear feet, as summarized in Table 1.¹

Table 1: Summary of the Project's levee rehabilitation types.	
Levee Rehabilitation Type	Length (ft)
Sheet Pile Floodwall	24,400
Conventional Floodwall	5,500
Earthen Levee	4,600
Total	34,500

Sheet Pile Floodwall

The sheet pile floodwall consists of 12- to 20-inch wide sheet pile varying in height above the finished grade. On the Bay Trail side, the earthen levee will be raised with additional fill in locations where the finished floodwall elevation is higher than 3.5 feet above the trail. The sheet pile wall will be installed at locations where there is insufficient right-of-way width or where an expanded levee footprint would fill wetland areas.

¹ The total length of levee rehabilitation types exceeds the existing levee systems length because floodwalls are locations will be installed in parallel to provide contiguous protection.

At some locations, riprap and concrete debris will be removed to prepare the work areas. The sheet piles will be installed using vibratory hammers, but other methods may be used depending on site constraints. The sheet piles will be driven approximately 10 to 20 feet below ground level, to provide adequate resistance against deflection from the tide and wave loads, as well as to protect against seepage. At locations where the sheet pile floodwall will need to accommodate tide gates or outflow structures, the piles will be driven close to the existing structure and an expansion joint will be installed on the existing structures' edge.

Conventional Floodwall

The conventional floodwall is a vertical concrete wall that varies in height above the finished grade, between 2.5 to 4 feet, and is between 8 to 14 inches thick. The wall's foundation will, in general, be as wide as its height. To construct the wall's foundation, the levee will be excavated at the top of the existing berm and a temporary sheet pile wall may be installed on the water side to ensure the existing flood protection is not compromised during construction. Additional earthen fill may be added to increase the trail's height to maintain and enhance trail views.

Earthen Levee

At locations where the earthen levee will be constructed, the existing levee will be excavated and conditioned to accept the new fill. Supplemental fill will be installed to account for the long-term settlement of the levee from the new fill's weight. The earthen levees will be constructed using conventional fill or a non-porous lightweight fill. Lightweight fill will minimize settlement and differential settlement.

Ancillary Structures

The Project also includes improvements to ancillary levee structures, including upgrading or constructing public access ramps and stairs, and replacing failing and nonfunctional culverts. In total, ~~ten-nine~~ public access ramps will be upgraded to comply with the American Disabilities Act (ADA) and allow safe entry to the Bay for emergency rescue watercraft boats, one public access ramp will be replaced with stairs, and a new access ramp will be installed near Shorebird Park. ~~Two-Three~~ stair structures will be constructed to facilitate access from the Bay Trail to the Bay. Lastly, two bridges will replace two existing culverts along O'Neil Slough. The bridges will be constructed at both ends of O'Neil Slough, opening the muted tidal channel to full tidal exchange. Existing riprap on the levee's outboard side will be rearranged within its existing footprint, in-kind (i.e., new riprap will not be installed in waters of the State).

2. Impacts to Waters of the State

The Water Board has independently reviewed the Project record to analyze impacts to water quality and the environment and designated beneficial uses within the Project's watershed.

2.1 Fill and Discharge

The Project will permanently impact 0.0890.097 acre and temporarily impact 0.59 acre of waters of the State, as summarized in Table 2.

Table 2: Summary of the Project's impacts to waters of the State.

Activity	Aquatic Resource Type	Impact Type	Permanent		Temporary	
			Linear Feet	Acres	Linear Feet	Acres
Levee Construction	Wetland	--	NA	0.039 0.047	NA	0.43
	Ocean/Bay/Estuary	--	NA	0.05	NA	0.04
O'Neil Slough	Wetland	--	NA	NA	NA	0.10
	Ocean/Bay/Estuary	--	NA	NA	NA	0.02
Subtotal	Wetland	--	NA	0.039 0.047	NA	0.53
	Ocean/Bay/Estuary	--	NA	0.05	NA	0.06
Total				0.089 0.097		0.59

2.2 Beneficial Uses

The San Francisco Bay Basin Water Quality Control Plan (Basin Plan) defines the beneficial uses of waters of the State. The Project will impact Lower San Francisco Bay, estuarine wetlands, and Belmont Slough. The Basin Plan assigns the following beneficial uses to these impacted waterbodies:

- **Lower San Francisco Bay**—industrial service supply, commercial and sport fishing, shellfish harvesting, estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, wildlife habitat, water contact recreation, noncontact water recreation, and navigation;
- **Estuarine Wetlands**—all those listed for Lower San Francisco Bay agricultural service supply and groundwater recharge; and
- **O'Neil Slough**—estuarine habitat, preservation of rare and endangered species, fish spawning, wildlife habitat, water contact recreation, and noncontact water recreation.

The Project is not anticipated to affect Lower San Francisco Bay's beneficial uses. Although some estuarine wetlands will be permanently impacted by Project activities, the Permittee will provide sufficient mitigation to offset these impacts to beneficial uses. The Project is anticipated to enhance O'Neil Slough's beneficial uses by restoring tidal exchange to the currently muted slough, thereby helping to restore the salt marsh habitat behind the levee and improving habitat for federally-listed endangered species such as the Ridgway's Rail (*Rallus obsoletus*).

3. Mitigation

The Permittee will mitigate the Project's permanent and temporary impacts to waters of the State, as summarized in Table 3.

Table 3: The compensatory mitigation activities by aquatic resource type.

Activity	Aquatic Resource Type	Mitigation Type	Method	Amount	
				Linear Feet	Acres
Wetland Mitigation Credits Purchase	Wetland	Mitigation Bank	Establishment	NA	0.05
Other Waters Mitigation Credits Purchase	Ocean/Bay/Estuary	Mitigation Bank	Establishment	NA	0.05
Restore to Pre-Project Condition	Wetland	Permittee Responsible	Re-establishment	NA	0.53
Restore to Pre-Project Condition	Ocean/Bay/Estuary	Permittee Responsible	Re-establishment	NA	0.06
Total				0.69 acre	

To mitigate the permanent loss of waters of the State that will occur from Project activities, the Permittee will purchase 0.05 acre of wetland creation mitigation credits and 0.05 acre of other waters creation mitigation credits from the San Francisco Bay Wetland Mitigation Bank in Redwood City, San Mateo County (see Condition 14).

To mitigate the Project's temporary impacts to waters of the State, the Permittee will restore the temporarily impacted areas to their pre-Project condition, or better. The Permittee will monitor these temporarily impacted areas for a minimum three-year period after they are restored to ensure the Project's temporary impacts are sufficiently mitigated (see Conditions 22 to 25 and 27).

To ensure the Project does not result in cumulative impacts to waters of the State that would restrict future SLR adaption strategies from incorporating nature-based alternatives, the Permittee will prepare and submit an adaption plan to the Water Board demonstrating that strategies to protect against SLR anticipated in the year 2100 will include nature-based alternatives that can be integrated into the Project (see Condition 26).

4. California EcoAtlas

Regional, state, and national studies have determined that tracking of mitigation and restoration projects must be improved to better assess the performance of these projects, following monitoring periods that last several years. To effectively carry out the State's Wetlands

Conservation Policy of no net loss to wetlands, the State needs to closely track both losses and successes of mitigation and restoration projects affecting wetlands and other waters of the State. The Water Board must also track project performance in Bay Area creeks subject to routine repair and maintenance activities, such as recurring instabilities. Therefore, we adopted the digital interactive mapping tool called *EcoAtlas*.^[1] *EcoAtlas* is a web-based tool that integrates maps, project plans, site conditions, restoration efforts, and other elements on a project-by-project basis based on data inputs. Accordingly, we require the Permittee to upload their Project information to *EcoAtlas* with the *Project Tracker* tool at <https://ptrack.ecoatlas.org> (see Condition 13). The San Francisco Estuary Institute developed *EcoAtlas* and maintains detailed instructions for *Project Tracker* on its website at <https://ptrack.ecoatlas.org/instructions>.

5. CEQA Compliance

The Permittee, as lead agency, evaluated and mitigated the Project's potentially significant impacts in accordance with California Environmental Quality Act (CEQA) requirements. The Project's environmental impacts were evaluated in both the *Foster City Levee Protection Planning and Improvements Project (CIP No. 301-657)*, *Draft Environmental Impact Report* (Urban Planning Partners Inc., November 2016) (DEIR) and *Foster City Levee Protection Planning and Improvements Project (CIP No. 301-657) Response to Comments Document* (Urban Planning Partners Inc., March 2017) (Response to Comments), which together constitute the Final EIR for the Project. On May 8, 2017, the Permittee's City Council reviewed, considered, and certified the Project's Final EIR and required implementation of mitigation measures identified therein. The Permittee filed a Notice of Determination corresponding to the Project with the County Clerk of San Mateo County and the Office of Planning and Research (State Clearinghouse No. 2016012012). The Water Board, as a responsible agency under CEQA, determined that the FEIR, in combination with the requirements in this Certification, appropriately addresses the Project's potentially significant impacts under the Water Board's purview.

6. Conditions

I, Michael Montgomery, Executive Officer, do hereby issue this Order certifying that any discharge from the proposed Project will comply with the applicable provisions of sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 303 (Water Quality Standards and Implementation Plans), 306 (National Standards of Performance), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act, and with other applicable requirements of State law. This discharge is also regulated under State Water Resources Control Board Order No. 2003-0017-DWQ, "General Waste Discharge Requirements for Dredge and Fill Discharges That Have Received State Water Quality Certification," which requires compliance with all conditions of this Order, including the following:

^[1] Source: California Wetlands Monitoring Workgroup (CWMW). *EcoAtlas*. Accessed March 12, 2019. <https://www.ecoatlas.org>. CWMW includes SFEI, State Board, U.S. EPA-Region IX, and other agencies with similar goals to track effects of projects in wetlands and other aquatic habitats.

6.1 Regulatory Compliance and Work Windows

1. **Design Conformance.** The Project work shall be constructed in conformance with the design plans attached to this Certification and Order (Att. A) and as described in the Application materials and herein. Any changes to these plans that may impact waters of the State must be accepted by the Executive Officer before they are implemented. To request Executive Officer acceptance, the Permittee shall submit the proposed revisions, clearly marked and described, to the Water Board staffer listed on the cover page of this Order. The Permittee shall not implement the proposed revisions until notified that they have been accepted by the Executive Officer;
2. **Corps Permit Compliance.** The Permittee shall adhere to the conditions of the Project's CWA Section 404 Individual Permit (Corps File No. 2015-00391S), issued by the Corps;
3. **USFWS Permit Compliance.** The Permittee shall adhere to shall adhere to the Terms and Conditions and the Reasonable and Prudent Measures in BO, issued by the U.S. Fish and Wildlife Service (USFWS);
4. **NMFS Permit Compliance.** The Permittee shall adhere to shall adhere to the Terms and Conditions and the Reasonable and Prudent Measures in the BO, issued by the National Marine Fisheries Service (NMFS);
5. **Special Status Species.** This Certification does not allow for the take, or incidental take, of any special status species. The Permittee shall use the appropriate protocols, as approved by USFWS, and NMFS (see Conditions 3 and 4) to ensure that Project activities do not impact the Beneficial Use of the Preservation of Rare and Endangered Species;
6. **Work Window.** Construction in waters of the State is restricted to the work window specified in the USFWS BO and NMFS BO, or to the end of any extension granted by USFWS, NMFS, and the Water Board. If any construction activities in waters of the State will occur after October 15, the Permittee shall submit a winterization plan to the Executive Officer for review and acceptance prior to initiating those activities (see Condition 9);
7. **Work Extension.** If the Permittee needs more time to complete the authorized activity, the work period may be extended on a day-to-day basis by the Executive Officer. To request an extension, the Permittee shall contact Tahsa Sturgis, Water Resource Control Engineer, at (510) 622-2316 or by email to Tahsa.Sturgis@waterboards.ca.gov. The Permittee shall also receive authorization from the NMFS and USFWS to extend the work period, as required by those agencies;
8. **No Precipitation Forecast.** Excavation for and placement of fill shall not begin unless a no precipitation forecast is obtained covering the entire construction phase for the Project sites to be worked on and the time necessary to implement erosion

control measures (see Condition 8). This forecast shall be documented by the Permittee upon request by Water Board staff;

9. **Precipitation and Construction Planning.** Precipitation forecasts shall be considered when planning construction activities. The Permittee shall monitor the 72-hour forecast from the National Weather Service at <http://www.nws.noaa.gov>. When there is a forecast of more than 40% chance of rain, or at the onset of unanticipated precipitation, the Permittee shall remove all equipment from waters of the State, implement erosion and sediment control measures (e.g., jute, straw, coconut fiber erosion control fabric, coir logs, straw), and cease all Project activities. If any construction activities will occur after October 15, a Winterization Plan shall be submitted to the Executive Officer for review and acceptance and contain, but not be limited to, the following:
 - a) **Activities and Timeline Description**—for any proposed activity that will begin or end after October 1, the activity and its respective construction timeline, from start to finish, shall be described in detail.
 - b) **Erosion Control Measures**—all erosion control measures shall be described in detail, including, but not limited to, the type of erosion control measure and its material, implementation timeline, and best management practices to be used during and after implementation;

6.2 General Construction

10. **Discharge Prohibition.** No unauthorized construction-related materials or wastes shall be allowed to enter into or be placed where they may be washed by rainfall or runoff into waters of the State. When construction is completed, any excess material shall be removed from the work area and any areas adjacent to the work area where such material may be discharged to waters of the State;
11. **Equipment Maintenance Prohibition.** No fueling, cleaning, or maintenance of vehicles or equipment shall take place within waters of the State, or within any areas where an accidental discharge to waters of the State may occur; and construction materials and heavy equipment must be stored outside of waters of the State. When work within waters of the State is necessary, best management practices shall be implemented to prevent accidental discharges;
12. **Beneficial Use Impacts.** All work performed within waters of the State shall be completed in a manner that minimizes impacts to beneficial uses and habitat; measures shall be employed to minimize disturbances along waters of the State that will adversely impact the water quality of waters of the State. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete Project implementation;

6.3 Pre-Construction Reporting and Other Requirements

13. **EcoAtlas Form.** The Permittee shall input Project information into *EcoAtlas* no later than 14 days from this Certification's issuance date, consistent with Section 4 herein. The Project information shall be added to the *Project Tracker* tool in *EcoAtlas* online at <https://ptrack.ecoatlas.org>. Instructions for adding information to *EcoAtlas* are available at <https://ptrack.ecoatlas.org/instructions>, or by contacting the Water Board staffer listed on the cover page of this Certification;

14. **Wetland Mitigation Bank Credits.** The Permittee shall purchase the mitigation credits described herein. The Permittee shall submit the following documentation, acceptable to the Executive Officer, to verify that those wetland creation mitigation credits and other waters creation mitigation credits have been purchased by the Permittee to mitigate the Project's permanent impacts:

1. *Purchase Agreement*—an executed Purchase Agreement ~~shall be~~ submitted to the Executive Officer on November 22, 2019 no later than 30 days following this Certification's issuance date.
2. *Bill of Sale*—a Bill of Sale demonstrating the mitigation credits specified in the Purchase Agreement have been purchased shall be submitted to the Executive Officer no later than 30 days prior to the start of construction.

The Purchase Agreement and Bill of Sale shall demonstrate that the Permittee has secured the purchase of no less than 0.05 acre of wetland mitigation credits and 0.05 acre of other waters creation mitigation credits. This requirement shall not be considered satisfied until the Executive Officer has accepted the Purchase Agreement and Bill of Sale. If the Permittee does not purchase the mitigation credits specified herein or the Project results in permanent impacts to waters of the State beyond those specified herein, additional compensatory mitigation may be required by the Executive Officer;

15. **Construction Stormwater Management General Permit.** The Permittee shall obtain coverage under the Statewide NPDES General Permit for Discharges of Stormwater Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ, as amended, and as may be subsequently reissued;

16. **Dewatering Plan.** The Permittee shall submit, acceptable to the Executive Officer, a dewatering plan, including the area to be dewatered, timing of dewatering, and method of dewatering to be implemented. The dewatering plan shall be submitted no later than 14 days prior to the start of any construction event that requires temporary dewatering of waters of the State. The dewatering plan shall include water quality monitoring and reporting sufficient to ensure all dewatering discharges and bypassed flows meet applicable receiving water limits and water quality objectives in the Basin Plan. All temporary dewatering methods shall be designed to have the minimum necessary impacts to waters of the State to isolate the immediate work area. All dewatering methods shall be installed such that natural flow is maintained upstream and downstream of the work area. Any temporary dams or diversions shall be

installed such that the diversion does not cause sedimentation, siltation, or erosion upstream or downstream of the work area. All dewatering methods shall be removed immediately upon completion of Project activities;

17. **Commencement of Construction.** The Permittee shall submit a Commencement of Construction Report acceptable to the Executive Officer. The Commencement of Construction Report shall be submitted no later than seven days prior to start of initial ground disturbance activities and notify the Water Board at least 48 hours prior to initiating in-water work and any stream diversions. Notification may be via telephone, email, delivered written notice, or other verifiable means. The Commencement of Construction shall be submitted in same timeframe specified herein for multiple construction seasons, if necessary;
18. **Photo-Documentation Points.** Prior to the start of construction, the Permittee shall establish a minimum of 20 photo-documentation points at the locations where waters of the State will be temporarily impacted, including along O'Neil Slough, in order to restore them to their pre-Project condition. At least 8 photo-documentation point shall be established along O'Neil Slough. The Permittee shall prepare a site map with the photo-documentation points clearly marked. Prior to and following construction, the Permittee shall photographically document the impacted waters of the State pre- and post-construction condition at the established photo-documentation points. The photographs shall be used to track the Project's construction impacts, temporarily impacted areas, revegetation success, and overall Project success. These post-construction photographs and map shall be submitted, along with the as-built and construction completion reports (See Conditions 19 and 20, respectively). Once monitoring beings, the photographs shall be updated annually and submitted with the annual monitoring reports (see Condition 27);

6.4 Active Construction and Post-Construction Reporting Requirements

19. **As-Built Report.** The Permittee shall prepare an as-built report acceptable to the Executive Officer. The as-built report shall be submitted to the Water Board no later than 60 days after completing Project construction activities, including revegetation, in any work season. The report shall include a description of the areas of actual disturbance during Project construction and the photographs and map specified in Condition 18. The report shall clearly identify and illustrate the Project site, the locations of permanent and temporary impacts, and the quantities of the planted species at each planting location. The as-built report shall include the 100 percent construction plans marked with the contractor's field notes that clearly depict any deviations made during construction from the designs reviewed by the Water Board;
20. **Project Construction Completion Report.** The Permittee shall submit a Notice of Project Construction Completion (Completion Notice) acceptable to the Executive Officer to notify the Water Board that the Project has been completed. The Completion Notice shall be submitted to the Water Board no later than 60 days after completing Project construction activities. The Completion Notice shall include the as-built report (see Condition 19), the post-construction photographs (see Condition

19), the date of the first Project-related disturbance of waters of the State occurred, CIWQS Place ID 851477, and the date construction was completed. The Completion Notice shall be sent via email to RB2-401Reports@waterboards.ca.gov, and by mail to the attention of 401 Certifications Reports (see address on the letterhead);

21. **Annual Project Status.** The Permittee shall submit an Annual Project Status Report acceptable to the Executive Officer. The Annual Project Status report shall be submitted each year by January 31 until the Project is completed, commencing the calendar year after this Certification's issuance. The report shall reference CIWQS Place ID 851477 and state whether Project construction activities have been initiated or delayed. The Annual Project Status Report shall continue until a Notice of Project Construction Completion is received (see Condition 20);

6.5 Mitigation and Monitoring Requirements

22. **Monitoring Period.** The Permittee shall monitor the temporarily impacted areas that will be restored to their pre-Project condition, or better, for a minimum three-year period. The Permittee shall monitor O'Neil Slough following culvert replacement for a minimum five-year period to demonstrate the Project's impacts have been sufficiently mitigated and to determine if any adverse direct or indirect impacts to beneficial uses occur following Project completion. The temporarily impacted areas shall be monitored and maintained in accordance with the schedule and procedures described in the Mitigation and Monitoring Plan (MMP) titled, *Aquatic Resources Mitigation Plan for the City of Foster City Levee Protection Planning & Improvement Project (CIP 301-657), Revision 1* (Huffman-Broadway Group, Inc., September 2019). The annual monitoring shall assess conditions at the Project site where the temporary impacts occurred as well as the overall Project success. If the monitoring indicates the restoration efforts have not adequately mitigated the temporary impacts and that the impacted areas are not anticipated to achieve pre-Project conditions, the Permittee shall document these observations in the annual reports and make remedial action recommendations, as necessary. Similarly, if the monitoring indicates O'Neil Slough has been or may be adversely affected by the Project, the Permittee shall document these observations in the annual reports and make remedial action recommendations, as necessary. If adverse impacts to waters of the State are observed during the monitoring period, including, but not limited to, inadequate restoration of the temporarily impacted areas, additional mitigation may be required by the Executive Officer, including but not limited to extension of the monitoring period (See Condition 20);
23. **Mitigation and Monitoring Plan Revision.** The Permittee shall revise the MMP to include specific monitoring procedures and performance and success criteria for O'Neil Slough that track the channel's geomorphology and habitat to confirm that the ecological uplift anticipated from restoring tidal action is realized and there are no adverse impacts to waters of the State associated with restoring tidal action. The revised MMP shall be submitted for Executive Officer approval no later than 90 days after this Certification's issuance. The revised MMP shall include, but not be limited to, the following: performance and success criteria that will enable the Permittee to

demonstrate the restored tidal action will create more tidal marsh habitat and improve O'Neil Slough's beneficial uses, metrics to evaluate whether adverse impacts to waters of the State have occurred or will occur during the monitoring period, and detailed monitoring procedures to assess whether the bank stability and channel morphology are not adversely affected by the restoration of tidal action;

24. **Performance Criteria.** The Permittee shall use the following performance criteria during the monitoring years 1 and 2, and any additional monitoring years that may be required by the Executive Officer, to determine whether the Project is likely to meet the final success criteria, specified in Condition 25:

- a) **Wetland Vegetation Plant Cover**—following revegetation of the temporarily impacted areas that contain waters of the State, the wetland indicator species in those areas shall obtain at least 20 percent cover in monitoring year 1 and 50 percent cover in monitoring year 2. The total percent cover of wetland indicator species at each temporarily impacted area shall include native vegetation planted and native or naturalized plant recruitment.
- b) **Wetland Vegetation Invasive Species**—invasive plant species rated as “high” or included as a “red alert” species by the California Invasive Plant Council and species rated as “high priority” by the Bay Area Early Detection Network shall not be more than 5 percent total cover in each temporarily impacted area in each monitoring year;
- c) **Wetland Delineation**—the temporarily impacted areas shall have at least one primary or two secondary wetland hydrology indicators within each quadrant sampled at each mitigation site in each monitoring year;

25. **Final Success Criteria.** In the final monitoring year, or at the end of any monitoring period extended by the Executive Officer, the following final success criteria shall be used to assess the Project's performance during the monitoring period and determine whether impacts to waters of the State have been successfully mitigated or corrective actions are necessary (see Condition 27):

- a) **Wetland Vegetation Plant Cover**—the wetland vegetation plant cover criterion shall be considered successfully obtained if each temporarily impacted area contains wetland indicator species with at least 80 percent total cover. The total percent cover of wetland indicator species at each temporarily impacted area shall include native vegetation planted and native or naturalized plant recruitment.
- b) **Wetland Vegetation Invasive Species**—the wetland vegetation invasive species criterion shall be considered successfully obtained if invasive plant species rated as “high” or included as a “red alert” species by the California Invasive Plant Council and species rated as “high priority” by the Bay Area Early Detection Network shall not be more than 5 percent total cover in each temporarily impacted area in each monitoring year. If the temporarily impacted areas contained more than 5 percent of wetland invasive species, as defined herein, in

any previous monitoring year but not the final monitoring year, the Permittee shall demonstrate the actions taken to reduce the invasive species' percent cover shall not be required in subsequent years or provide a maintenance plan to ensure the invasive species' percent cover shall not increase in the years following the end of the monitoring period;

- c) Wetland Delineation—the wetland delineation criterion shall be considered successfully completed if in the final monitoring year the temporarily impacted areas shall have at least one primary or two secondary wetland hydrology indicators within each quadrant sampled and a final delineation demonstrates that the temporarily impacted areas contain at least the same amount of wetlands, functions, and values as were observed prior to the Project (i.e., there is no loss of wetlands, functions, and values at these sites at the end of the monitoring period).

26. **SLR 2100 Adaptive Management Plan.** The Permittee shall prepare a long-term Sea Level Rise Adaptation Plan (SLR Adaptation Plan) acceptable to the Executive Officer that documents the Project's cumulative impacts and demonstrates that potential adaptation strategies, including, but not limited to, natural or nature-based offshore projects, to protect the City from projected SLR in the year 2100 can be integrated into the Project or to future levee rehabilitation projects. The SLR Adaptation Plan shall ensure that the Project does not limit nature-based adaptation strategies by its design or post-implementation impacts to water quality and beneficial uses of waters of the State. The SLR Adaptation Plan is necessary to protect the City's residents, infrastructure, and property from damage associated with SLR projections beyond the year 2050. The Permittee shall implement or ensure the implementation of relevant aspects of the SLR Adaptation Plan (e.g., the technical studies and the pilot project).

The plan is required pursuant to California Water Code (Water Code) sections 13267 and 13383. The SLR Adaptation Plan will help to ensure that future levee improvements subsequent to the Project can protect against more significant sea level rise while enhancing estuarine habitat and other beneficial uses. The burden of preparing the SLR Adaptation Plan is reasonably related to the need for preparing it because the Plan will provide valuable information about feasible levee improvement options and likely sea level rise projections, help to guide planning and strategy over the next half-century, and help to ensure that beneficial uses and values of the Bay are not compromised as the Permittee increases flood protection of the City.

The SLR Adaptation Plan shall be submitted to the Executive Officer no later than one year after this Certification's issuance date. To develop the SLR Adaptation Plan, the Permittee shall gather data and conduct technical studies to document the following: (1) sea level rise impacts and impacts from the likely sea level rise scenario in the year 2100 on waters of the State in the vicinity of the Project site, including existing terrestrial, intertidal, and subtidal habitat both outside of and interior to the levee; (2) feasible adaptation strategies, including nature-based adaptation strategies, to protect the City from anticipated sea level rise to 2100; and

(3) assurances that the current Project will not prevent nature-based adaptation strategies from being implemented to protect against future SLR.

The SLR Adaptation Plan shall include, but not be limited to, the following:

- a) Development by Experienced Professionals—SLR planning shall be developed by a qualified professional(s) with sufficient experience acceptable to the Executive Officer in SLR adaptation planning guidance (e.g., the 2018 State of California Sea-Level Rise Guidance from the Ocean Protection Council, and any subsequent updates thereto, Sea Change San Mateo County, San Francisco Bay Adaptation Atlas, Adapting to Rise Tides), San Francisco Bay coastal engineering and estuarine ecology, the development and implementation of natural and nature-based infrastructure, or comparable experience.
- b) Technical Studies—A summary of technical studies, data collected, and other information needed to develop phased SLR adaptation pathways through at least 2100. In executing these technical studies, we anticipate the Permittee will collaborate with other public and private entities that are collecting, analyzing, and synthesizing relevant data in the region. Such entities could include the U.S. Geological Survey (USGS), Don Edwards San Francisco Bay National Wildlife Refuge, and the San Francisco Estuary Institute. At minimum, the technical studies shall include the following:
 1. Characterization of shoreline and offshore topography/bathymetry and sediment sources, sinks, and transport mechanisms.
 2. Assessment of how SLR post-2050 and other local/regional SLR adaptation projects could cumulatively influence local hydrology, wave environment, sediment transport, and shoreline/offshore geomorphology.
 3. Assessment of opportunities to protect and improve the long-term beneficial uses of San Francisco Bay along the Foster City shoreline, including enhancements to terrestrial, intertidal, and subtidal habitats.

These technical studies provide necessary information about ambient Bay water quality and the Project's potential cumulative impacts. In lieu of developing these technical reports, itself, the Permittee may elect to provide funding to the USGS' data collection efforts in the vicinity of the Project, or comparable data collection efforts from a third-party, to fulfill this requirement. To exercise this funding option, the Permittee shall submit a funding proposal acceptable to the Executive Officer. The funding proposal shall document the amount that the Permittee shall contribute to the USGS' data collection efforts and detail the data that will be collected by the USGS. The Permittee shall not provide funding to the USGS to satisfy this requirement until the Executive Officer has reviewed and accepted the funding proposal.

- c) Nature Based Alternatives—an evaluation of the feasibility of utilizing nature-based infrastructure (including coarse shoreforms) as a significant component of

adaptation strategies, including as pilot projects, consistent with guidance in the 2019 San Francisco Bay Shoreline Adaptation Atlas. Nature-based alternatives and all other alternatives shall consider the City's location in the Bay, site-specific shoreline conditions and processes, and cumulative impacts of various regional and local SLR adaptation plans and projects.

- d) Pilot Project—to further evaluate nature-based alternatives, as part of the SLR Adaptation Plan, the Permittee shall detail and implement a pilot project that can inform future SLR adaptation strategies that the Permittee may implement to protect against projected SLR to the year 2100. The pilot project's scope, design alternatives, permit considerations, funding mechanism, and a reasonable implementation timeline shall be submitted to the Executive Officer for acceptance. The Permittee may collaborate with other parties to implement the pilot project.
- e) Implementation Timeline—timeline for implementation future SLR adaptation projects based on clearly identified thresholds and triggers for planning and construction.
- f) Funding Mechanisms—a description of potential adaptation funding mechanisms, including but not limited to financial assurances that planning and development of the post-2050 project will be funded by the Permittee and with grants.
- g) Plan Revisions—a mechanism to allow for the SLR Adaptation Plan to be improved and updated as SLR science, regulations, and adaptation planning frameworks evolve over time;

27. **Annual Monitoring Reports.** The Permittee shall submit annual monitoring reports, acceptable to the Executive Officer, by January 31 following each monitoring year. The first monitoring year commences in the calendar year after completing the Project. At the time of this Certification and Order, the Project completion is anticipated in 2023. Therefore, the first annual monitoring report shall be due on January 31, 2025, unless the Project or restoration of temporarily impacted areas is completed at a different time. Annual monitoring is required pursuant to Water Code sections 13267 and 13383. Annual reports shall include, but not be limited to, the following:

- a) Photographs—photographs taken during the monitoring year from the photo-documentation points specified in Condition 18. The photographs shall include captions that state the photograph's point of view, photo-documentation point location, and date photographed.
- b) Environmental Drivers—each monitoring report shall describe precipitation events or periods of drought that occurred at the site during the monitoring year. The effects of the Project and environmental drivers (e.g., precipitation events, drought events) on site conditions shall be described in reference to the monitoring year's precipitation events.

- c) **Cumulative Monitoring**—each annual report shall summarize all data from previous monitoring reports in addition to the current year's monitoring data, including the need for, and implementation of, any remedial actions. Monitoring data may include all relevant qualitative and quantitative data necessary to determine whether the performance criteria specified in Condition 24 are being met. The final monitoring report shall document the overall effect of the Project and whether the final success criteria specified in Condition 25 were met

The overall Project and mitigation success shall be determined by, and acceptable to, the Executive Officer. If monitoring indicates that beneficial uses have been, or have the potential to be, adversely affected, the Permittee shall, in consultation with the appropriate agencies, identify remedial measures to be undertaken, including compensatory mitigation and extension of the monitoring and reporting period until the final success criteria are met. If a Corrective Action Plan is required and approved by the Executive Officer, the Permittee shall implement all remedial measures identified therein. Annual monitoring reports shall reference CIWQS Place ID 851477 and shall be submitted via email to RB2-401Reports@waterboards.ca.gov, and by mail to the attention of 401 Certifications Reports (see the address on the letterhead);

6.6 Administrative and General Compliance

28. **Site Access**. The Permittee shall grant Water Board staff or an authorized representative, upon presentation of credentials and other documents as may be required by law, permission to: (1) enter upon the Project site or compensatory mitigation site(s) where a regulated facility or activity is located or conducted, or where records are kept; (2) have access to and copy any records that are kept and are relevant to the Project or the requirements of this Order; (3) inspect any facilities, equipment, practices, or operations regulated or required under this Order; and (4) sample or monitor for the purposes of assuring Order compliance;
29. **Certification and Order at Site**. A copy of this Order shall be provided to any consultants, contractors, and subcontractors working on the Project. Copies of this Order shall remain at the Project site for the duration of this Order. The Permittee shall be responsible for work conducted by its consultants, contractors, and any subcontractors;
30. **Ownership Change Notification**. The Permittee shall provide a signed and dated notification to the Water Board of any change in ownership or interest in ownership of any Project area at least 10 days prior to the transfer of ownership. The purchaser shall also submit a written request to the Water Board to be named as the permittee in an amended order. Until this Order has been modified to name the purchaser as the permittee, the Permittee shall continue to be responsible for all requirements set forth in this Order;
31. **Water Quality Violations Notification**. The Permittee shall notify the Water Board of any violations of water quality standards, along with the cause of such violations,

as soon as practicable (ideally within 24 hours). Notification may be via telephone, email, delivered written notice, or other verifiable means;

32. **Discharge Change Notification.** In accordance with Water Code section 13260, the Permittee shall file with the Water Board a report of any material change or proposed change in the ownership, character, location, or quantity of this waste discharge. Any proposed material change in operation shall be reported to the Executive Officer at least 30 days in advance of the proposed implementation of any change. Changes to discharges include, but are not be limited to, significant new soil disturbances, proposed expansions of development, or any change in drainage characteristics at the Project site. For the purpose of this Order, this includes any proposed change in the boundaries of the area of wetland/waters of the State to be impacted;
33. **Submittal of Reports.** Where this Certification requires submittal of reports, including plans, reports, or related information, the submitted reports shall be acceptable to the Executive Officer.
34. **Individual Waste Discharge Requirements.** Should new information come to our attention that indicates a water quality problem with this Project, the Water Board may issue Waste Discharge Requirements pursuant to Water Code sections 13263 and/or 13377 and 23 CCR section 3857;
35. **Expiration.** This Order shall continue to have full force and effect regardless of the expiration or revocation of any federal license or permit issued for the Project;

6.7 Standard Conditions

36. **Certification and Order Modification.** This Order is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to Water Code sections 13320 and 13330 and 23 CCR section 3867;
37. **Hydroelectric Facilities.** This Order does not apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license, unless the pertinent certification application was filed pursuant to 23 CCR subsection 3855(b) and that application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought;
38. **Application Fee.** This Certification and Order is conditioned upon full payment of the required fee, including annual fees, as set forth in 23 CCR section 3833. The required \$9,022.24 Application fee, calculated using the 2017/2018 Water Quality Certification Dredge and Fill Application Fee Calculator, Category A – Dredge and Fill Discharges, was received by the Water Board in two payments, \$1,638 on October 3, 2018, and \$7,384.24 on August 30, 2019;

6.8 Annual Fees

39. **Annual Fee.** In accordance with 23 CCR section 2200, the Permittee shall pay an annual fee to the Water Board each fiscal year (July 1 – June 30) until Project

construction activities are completed and an acceptable Notice of Project Construction Completion is received by the Water Board. If monitoring is required, the Permittee shall pay an annual fee to the Water Board until monitoring activities are completed and an acceptable Notice of Mitigation Monitoring Completion is received by the Water Board (Note: the Annual Post Discharge Monitoring Fee may be changed by the State Water Board; at the time of Certification it was \$1,638 per year).

This Order applies to the Project as proposed in the application materials and designs referenced above in the conditions of Certification. Be advised that failure to implement the Project in conformance with this Order is a violation of this Certification. Any violation of Certification conditions is a violation of State law and subject to administrative civil liability pursuant to Water Code sections 13350, 13385, or 13399.2. Failure to meet any condition of this Certification may subject the Permittee to civil liability imposed by the Water Board to a maximum of \$25,000 per day of violation and/or \$25 for each gallon of waste discharged in violation of this action above 1000 gallons. Any requirement for a report made as a condition to this Certification (e.g., conditions 19-21 and 30-32) is a formal requirement pursuant to Water Code sections 13267 and 13383, and failure or refusal to provide, or falsification of such required report, is subject to civil liability as described in Water Code section 13268 and criminal liability under 13387. The burden, including costs, of these reports bears a reasonable relationship to the need for the report and the benefits to be obtained. Should new information come to our attention that indicates a water quality problem with this Project, the Water Board may issue Waste Discharge Requirements.

If you have any questions concerning this Order, please contact Tahsa Sturgis of my staff at (510) 622-2316 or Tahsa.Sturgis@waterboards.ca.gov. All future correspondence regarding this Project should reference the CIWQS Place ID No. indicated at the top of this letter.

Sincerely,



Digitally signed by
Michael Montgomery
Date: 2019.11.26 14:19:43
-08'00'

Michael Montgomery
Executive Officer

Attachment A: Project Maps and Engineering Design Plans

cc: SWRCB, DWQ, stateboard401@waterboards.ca.gov

Water Board:

Victor Aelion, victor.aelion@waterboards.ca.gov

Christina Toms, christina.toms@waterboards.ca.gov

BCDC, Walt Deppe, walt.deppe@bcdcc.ca.gov

U.S. EPA, Region IX:

Jennifer Siu, siu.jennifer@epa.gov

Luisa Valiela, valiela.luisa@epa.gov

Corps, SF Regulatory Branch:

Katerina Galacatos, katerina.galacatos@usace.army.mil

Naomi Schowalter, naomi.a.schowalter@usace.army.mil

Attachment A:

Project Maps and Photographs, and Engineering Design Plans

Foster City Levee Protection and Improvements Project

City of Foster City

San Mateo County

~~October~~ November 2019



Figure 1. Location Map

Levee Protection Planning and Improvement Project CIP 301-657
City of Foster City, San Mateo County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS



Figure 3. Aerial Imagery

Levee Protection Planning and Improvement Project CIP 301-657
City of Foster City, San Mateo County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

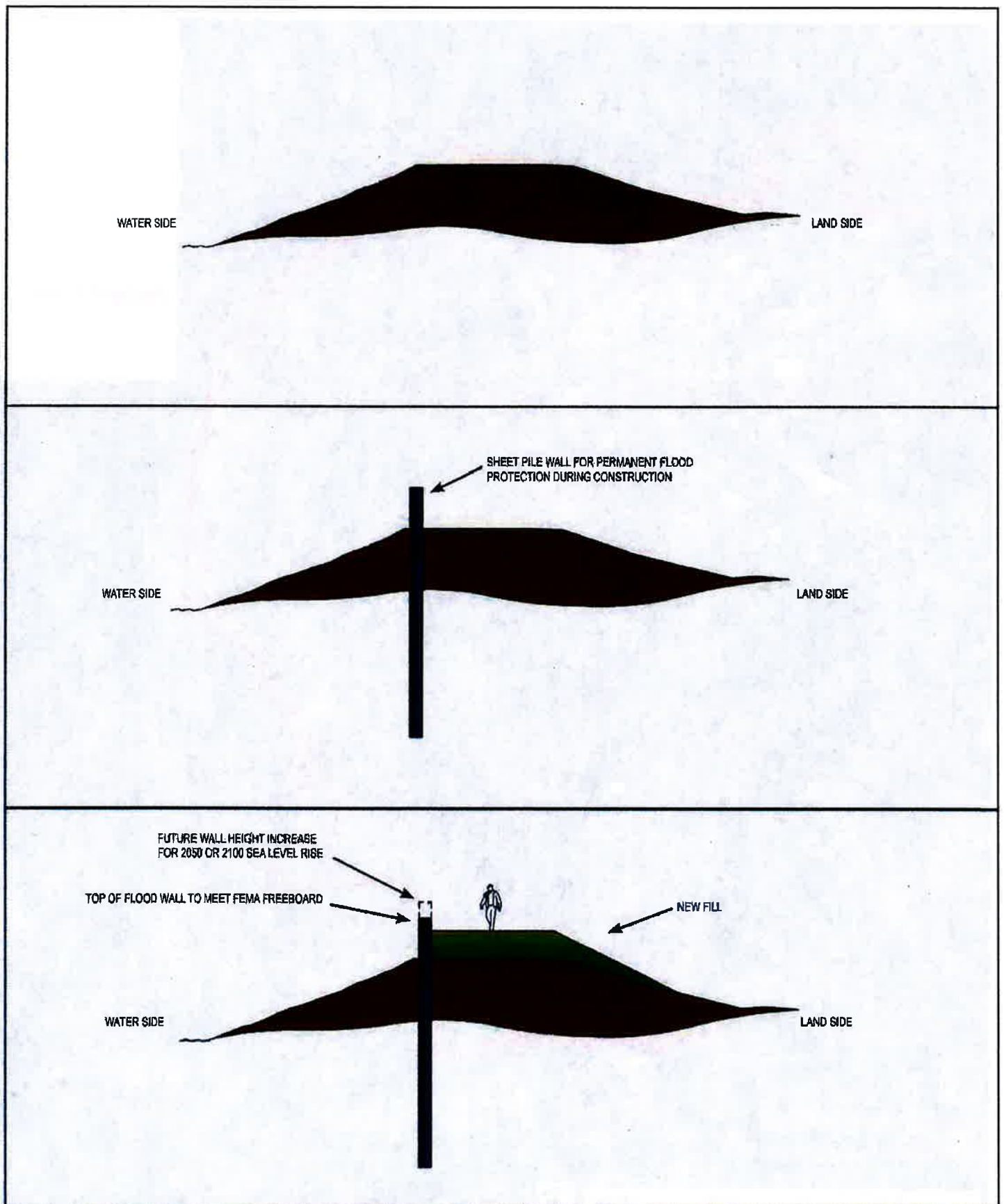


Figure 4. Typical Sheet Pile Flood Wall Cross Section
Levee Protection Planning and Improvement Project CIP 301-657
City of Foster City, San Mateo County, California

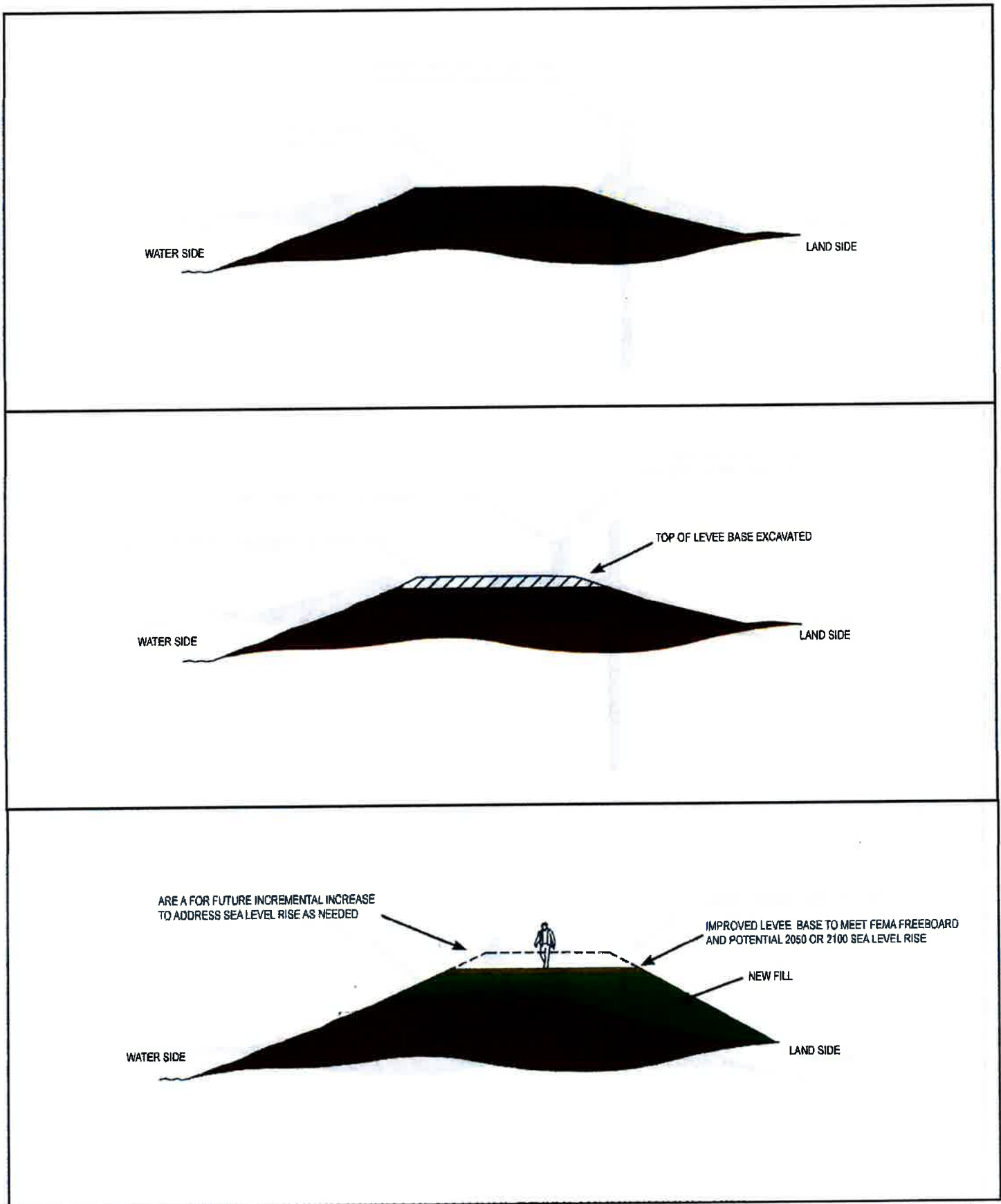


Figure 5. Typical Earthen Levee Cross Section
 Levee Protection Planning and Improvement Project CIP 301-657
 City of Foster City, San Mateo County, California

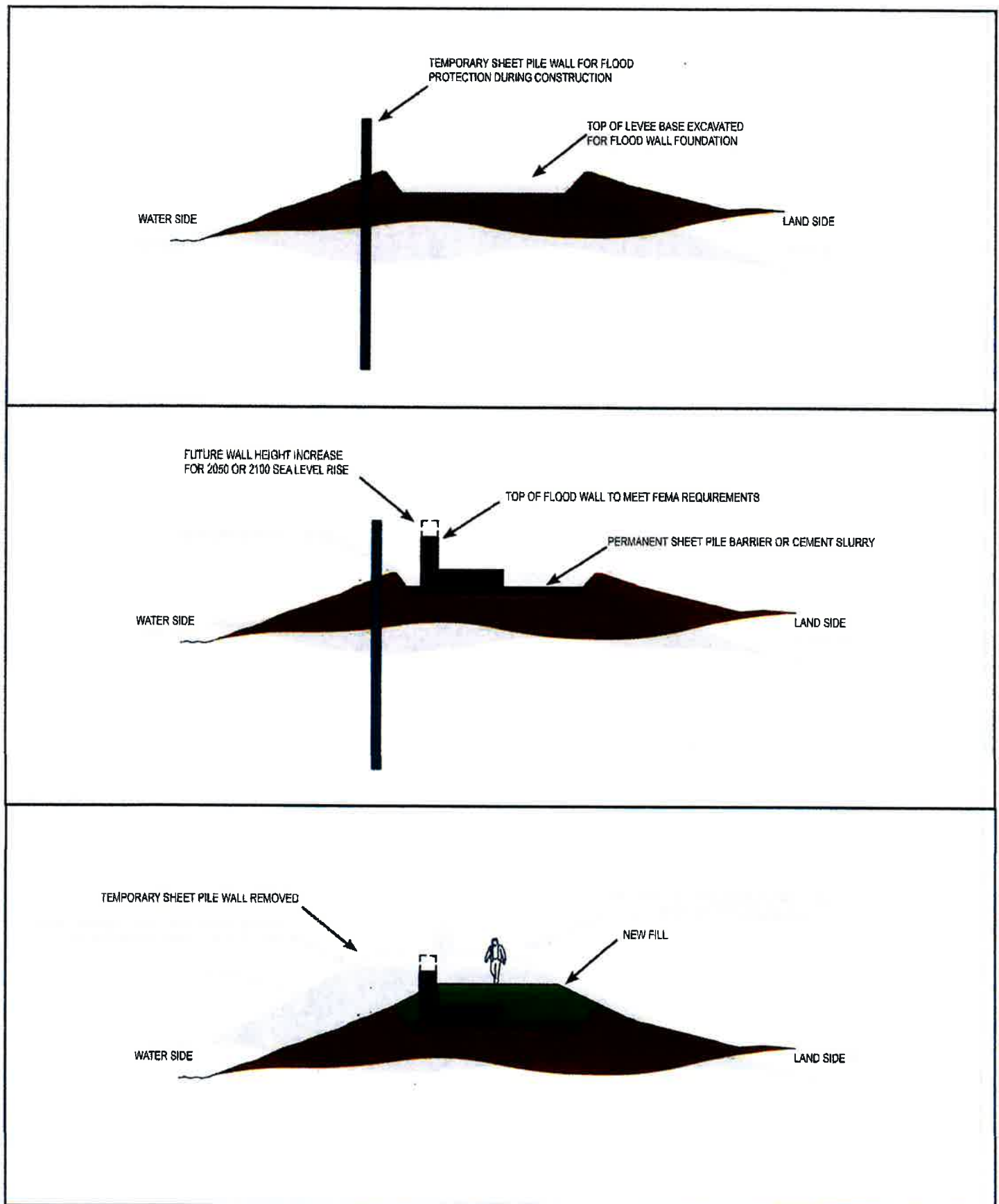


Figure 6. Typical Conventional Floodwall Cross Section
Levee Protection Planning and Improvement Project CIP 301-657
City of Foster City, San Mateo County, California



PURPOSE: Rehabilitate levee system to retain FEMA accreditation.

DATUM: NAVD 88

ADJACENT PROPERTY OWNERS:

1. State of CA 2. Foster City

DATE: 6/15/2018

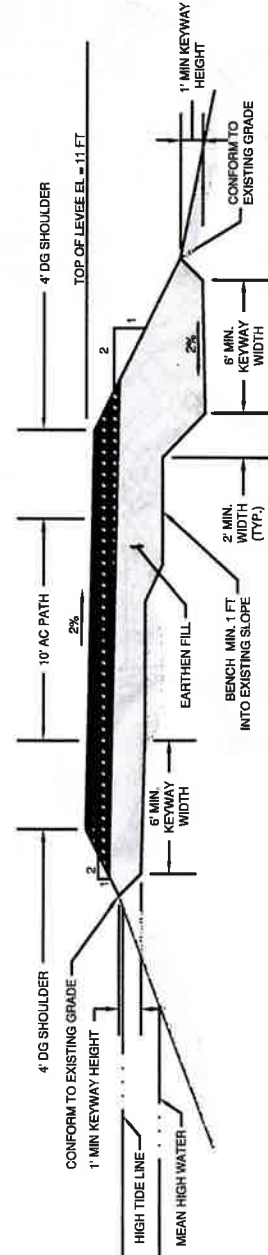
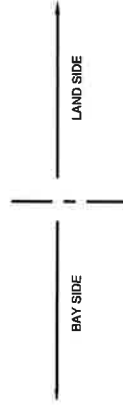


LEGEND:

- / — LIMIT OF TEMPORARY WORK
- - - LIMIT OF GRADING WORK
- - - HIGH TIDE LINE
- - - MEAN HIGH WATER LINE (EL=6.3 FT)
- ▨ AQUATIC RESOURCE AREA
- ▨ AQUATIC RESOURCE AREA PERMANENT IMPACT
- ▨ AQUATIC RESOURCE AREA TEMPORARY IMPACT



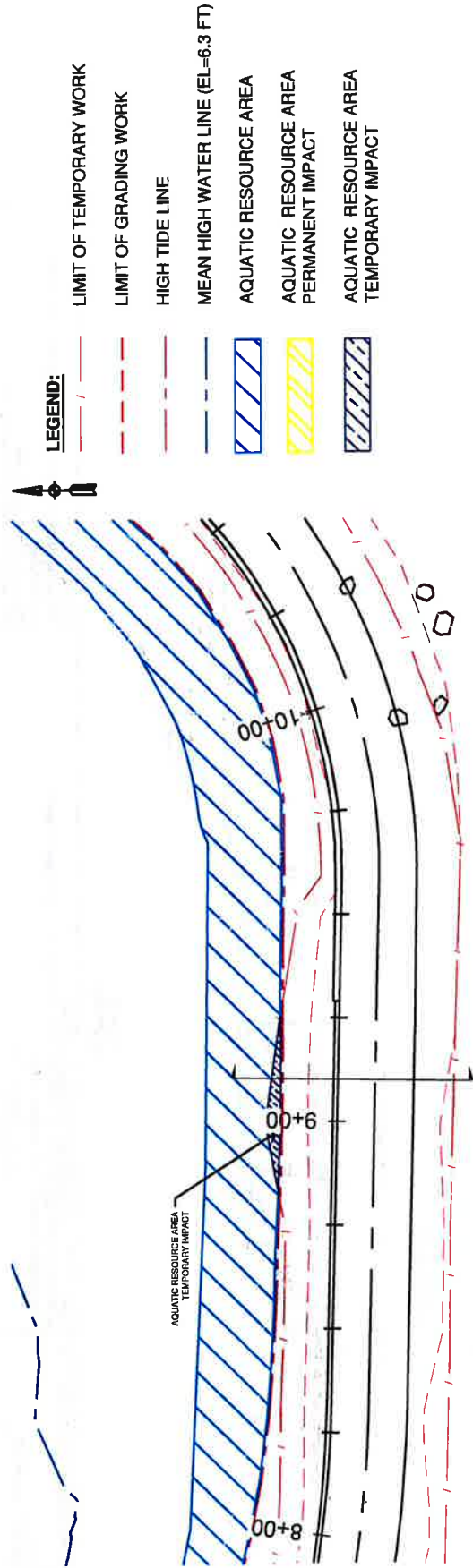
PLAN
SCALE: 1" = 40'



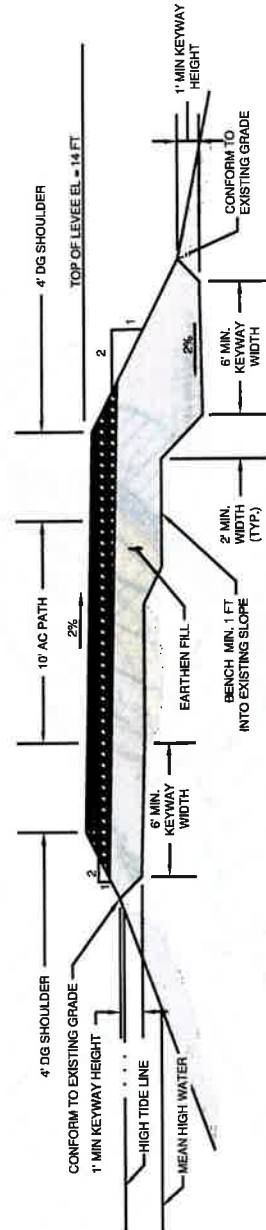
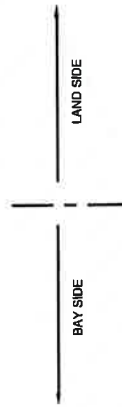
PROFILE
SCALE: 1" = 4'

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
1. State of CA
2. Foster City
DATE: 8/15/2018

Figure: 11 - Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMD; 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.395.1045 / huffman@hbgroup.com

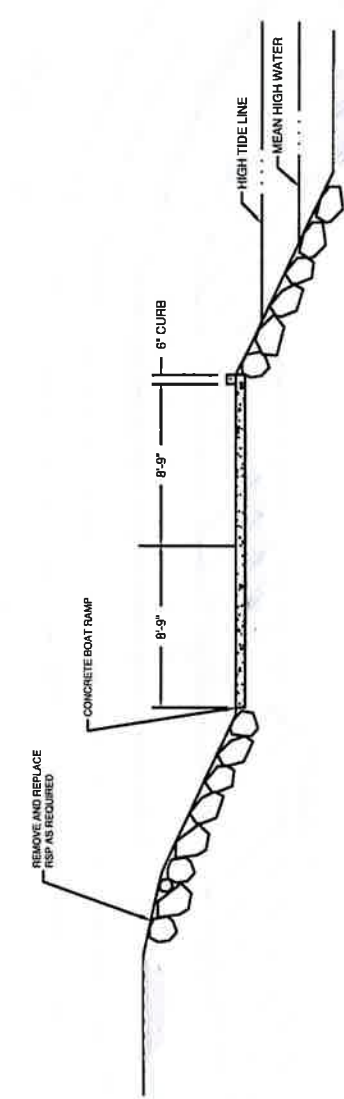
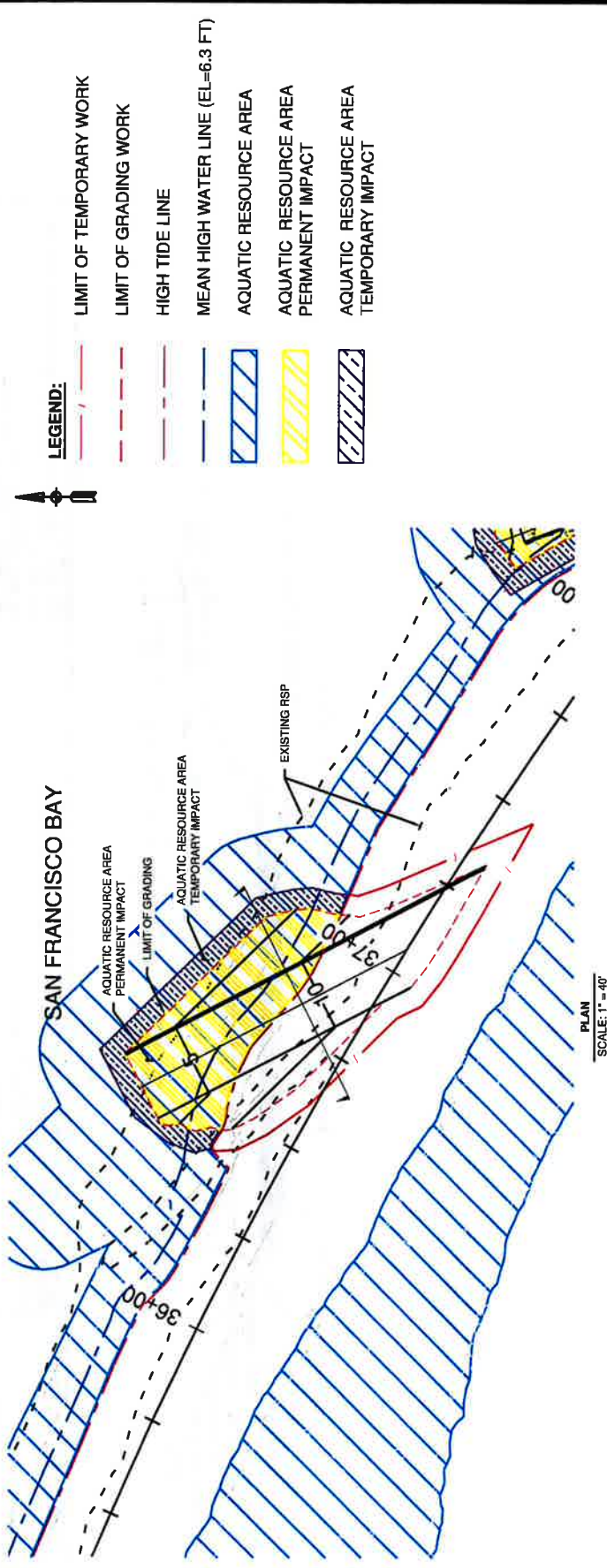


PLAN
SCALE: 1" = 40'

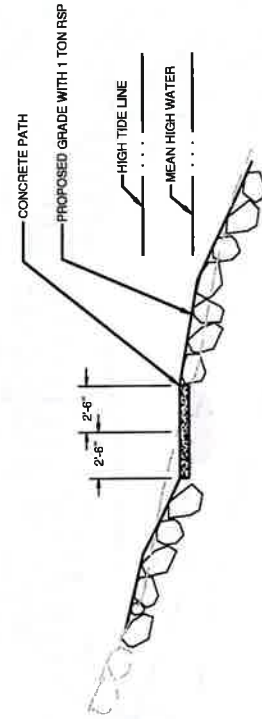
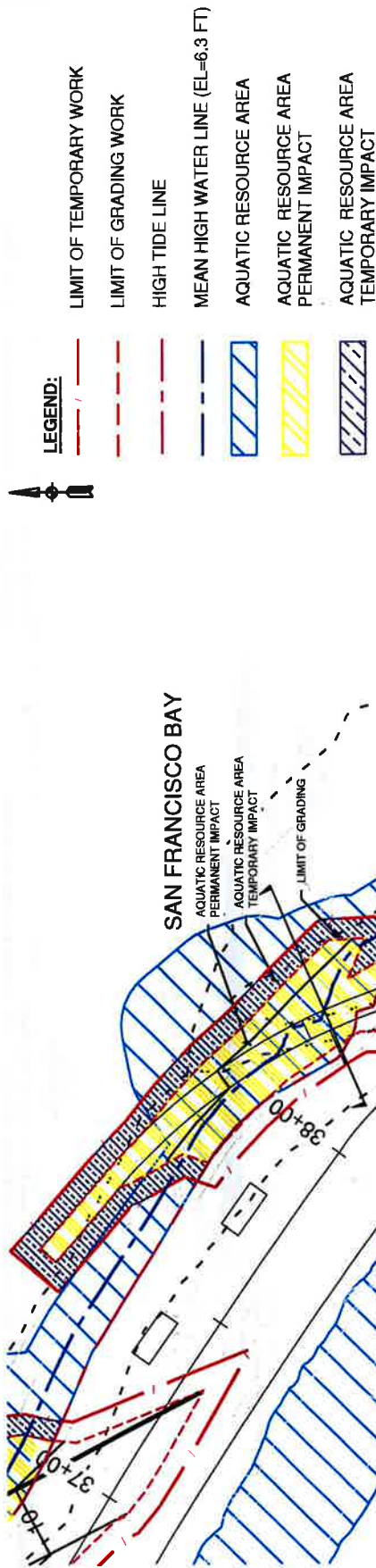


PROFILE
SCALE: NTS

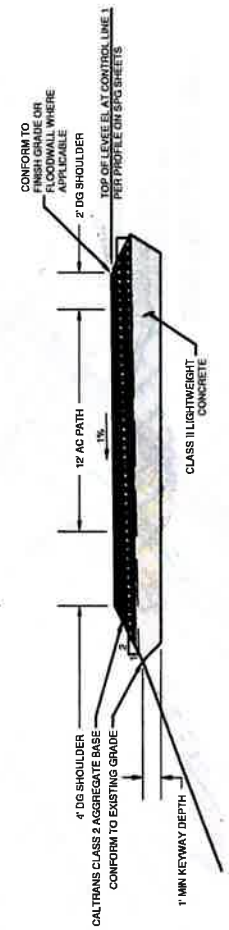
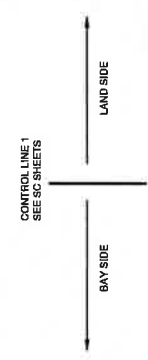
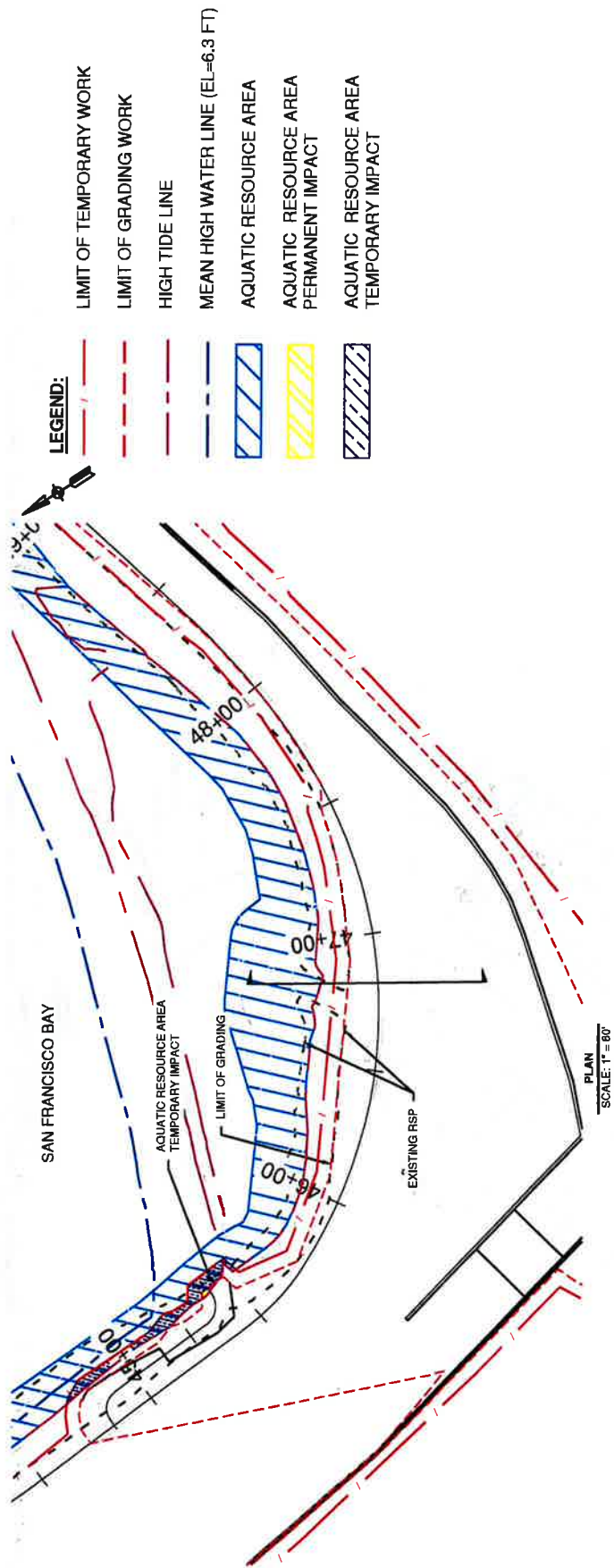
<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATUM: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <p>1. State of CA 2. Foster City</p> <p>DATE: 8/15/2016</p>	<p>Figure: 12 - Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 829 Mission Ave San Rafael, CA 94901 415.395.1045 / thuffman@h-bgroup.com</p>	<p>STATION: 9+10</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 304-857)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>
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PURPOSE: Rehabilitate levee system to retain FEMA accreditation. DATE: NAVD 88 ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City DATE: 8/15/2018	Figure: 13 - Levee Aquatic Resource Area Impact APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404 APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave. San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com	STATION: 36+72 PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657) IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
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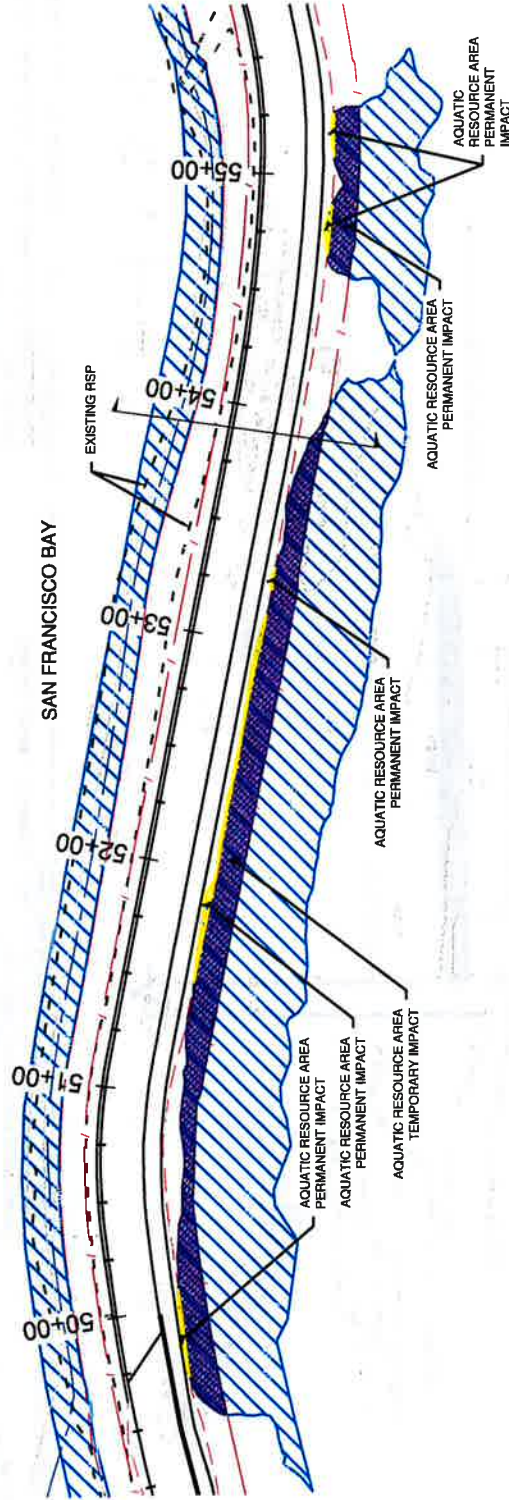
PURPOSE: Rehabilitate levee system to retain FEMA accreditation. DATUM: NAVD 88 ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City DATE: 8/15/2018	Figure: Levee Aquatic Resource Area Impact APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94004 APPLICANT'S AGENT: Terry Hultman, PhD Hultman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thultman@h-bgroup.com	STATION: 38+38 PROJECT NAME: Levee Protection Planning and Improvement Project (CJP 301-657) IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
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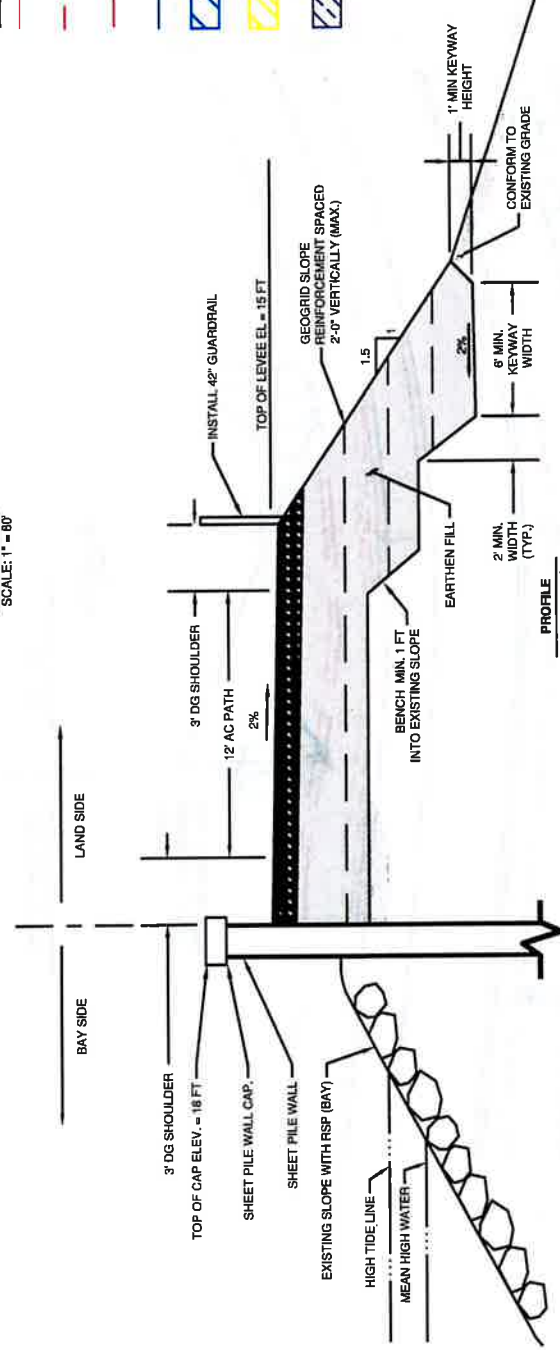
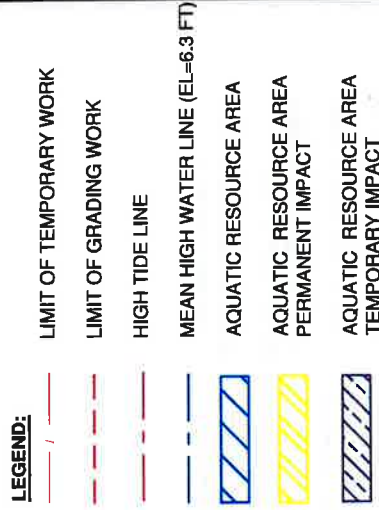
PROFILE
SCALE: NTS

- LEGEND:**
- LIMIT OF TEMPORARY WORK
 - - - LIMIT OF GRADING WORK
 - - - HIGH TIDE LINE
 - - - MEAN HIGH WATER LINE (EL=6.3 FT)
 - ▨ AQUATIC RESOURCE AREA
 - ▨ AQUATIC RESOURCE AREA PERMANENT IMPACT
 - ▨ AQUATIC RESOURCE AREA TEMPORARY IMPACT

PURPOSE: Rehabilitate levee system to retain FEMA accreditation. DATE: NAVD 88 ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City DATE: 9/19/2018	Figure: - Levee Aquatic Resource Area Impact APPLICATION BY: City of Foster City/EMID: 610 Foster City Boulevard, Foster City, CA 94404 APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com	STATION: 46+82 PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-557) IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
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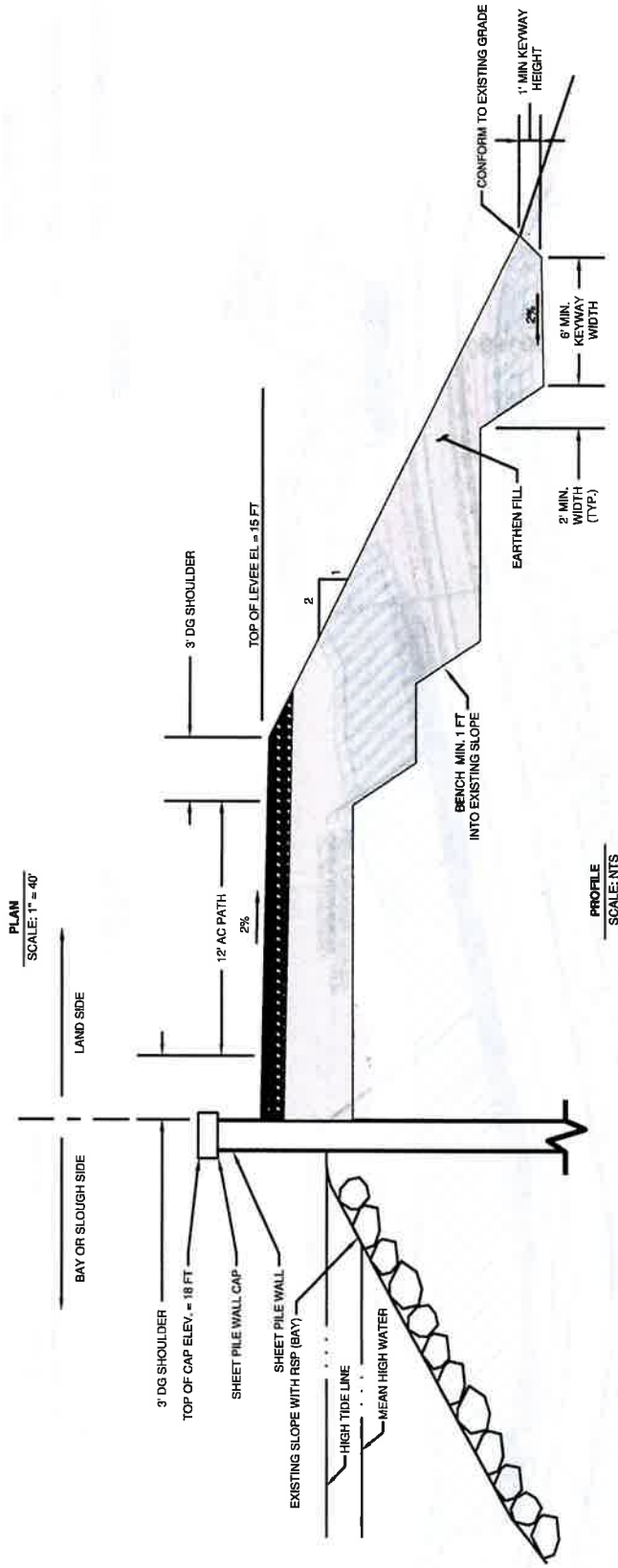
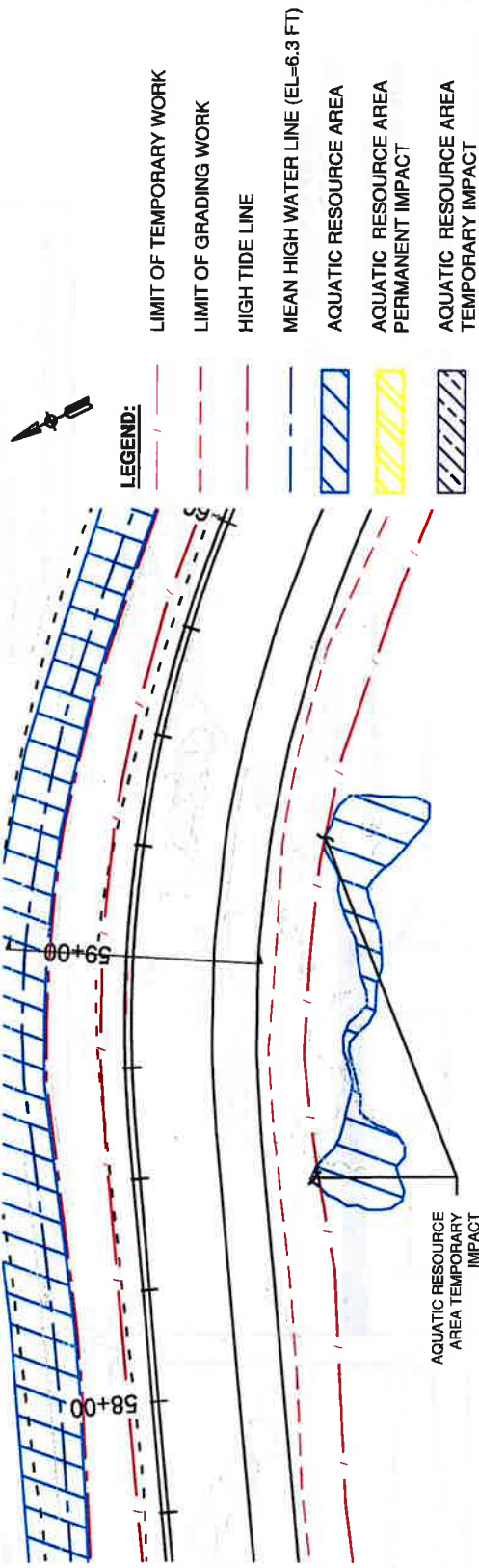


PLAN
SCALE: 1" = 80'

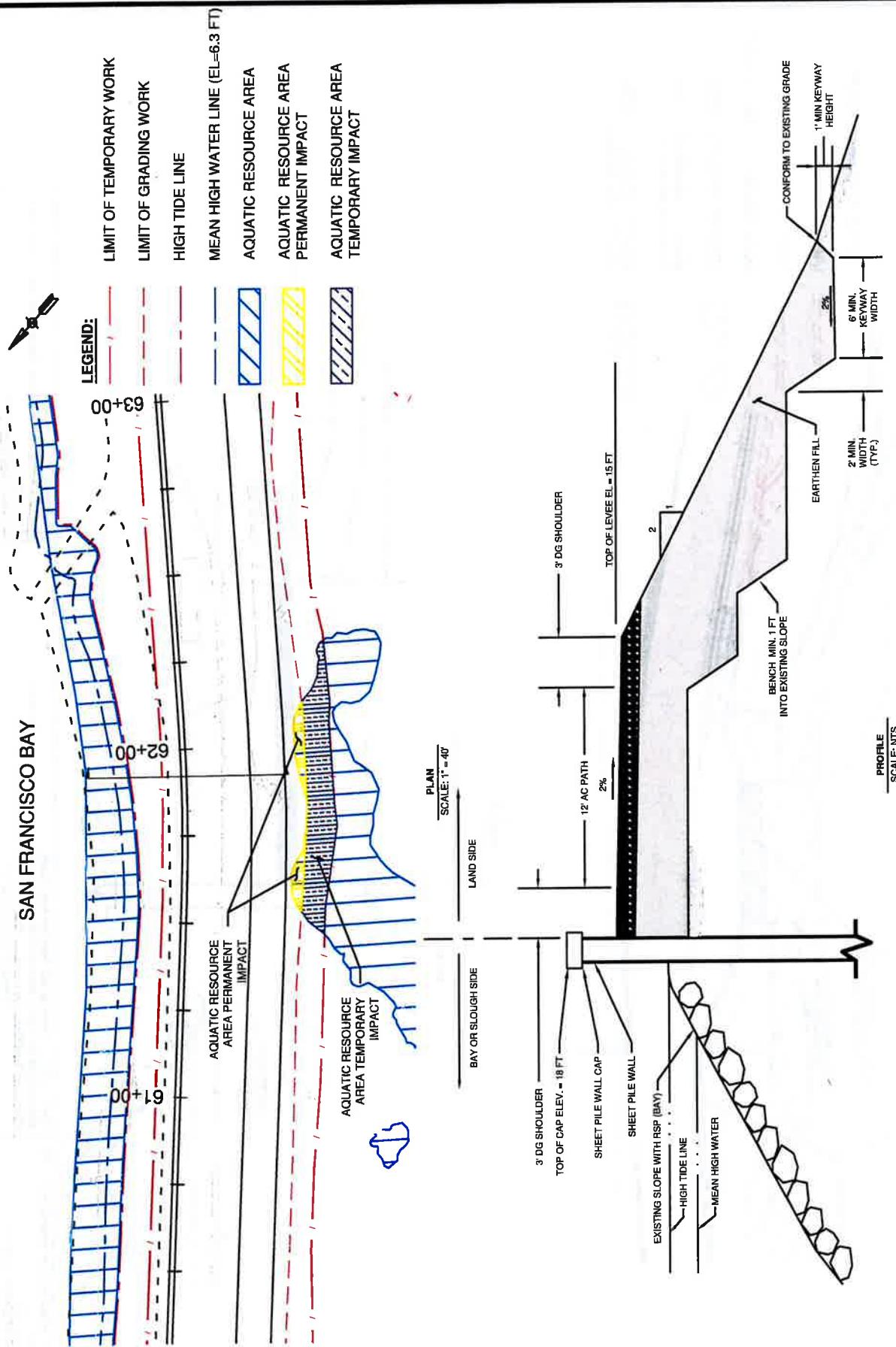


PROFILE
SCALE: NTS

<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATUM: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <ol style="list-style-type: none">State of CAFoster City <p>DATE: 8/15/2018</p>	<p>Figure: 16 - Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT:</p> <p>Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.365.1045 / thuffman@hbgroup.com</p>	<p>STATION: 53+30</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>
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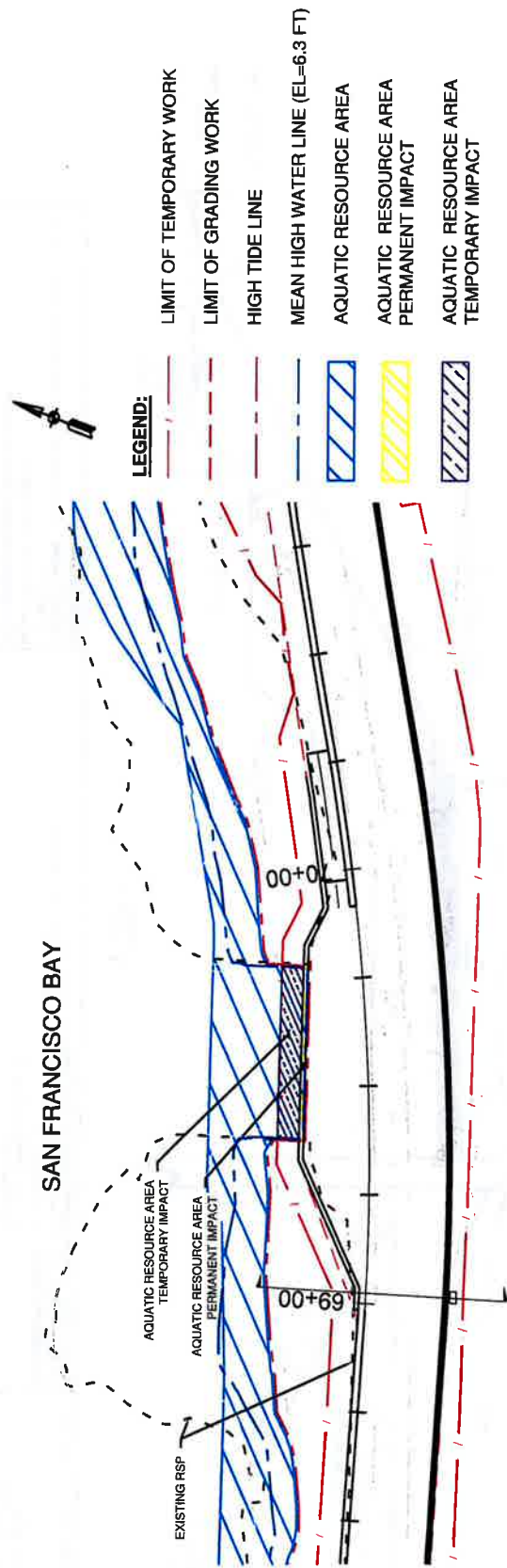
PURPOSE: Rehabilitate levee system to retain FEMA accreditation.	Figure: 17 - Levee Aquatic Resource Area Impact	STATION: 59+00
DATUM: NAVD 88	APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404	PROJECT NAME: Levee Protection Planning and Improvement Project
ADJACENT PROPERTY OWNERS:	APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.365.1045 / thuffman@h-bgroup.com	IN: waters of the United States
DATE: 8/15/2018		AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California



STATION: 61+81
PROJECT NAME: Levee Protection Planning and Improvement Project
(CIP 301-157)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California

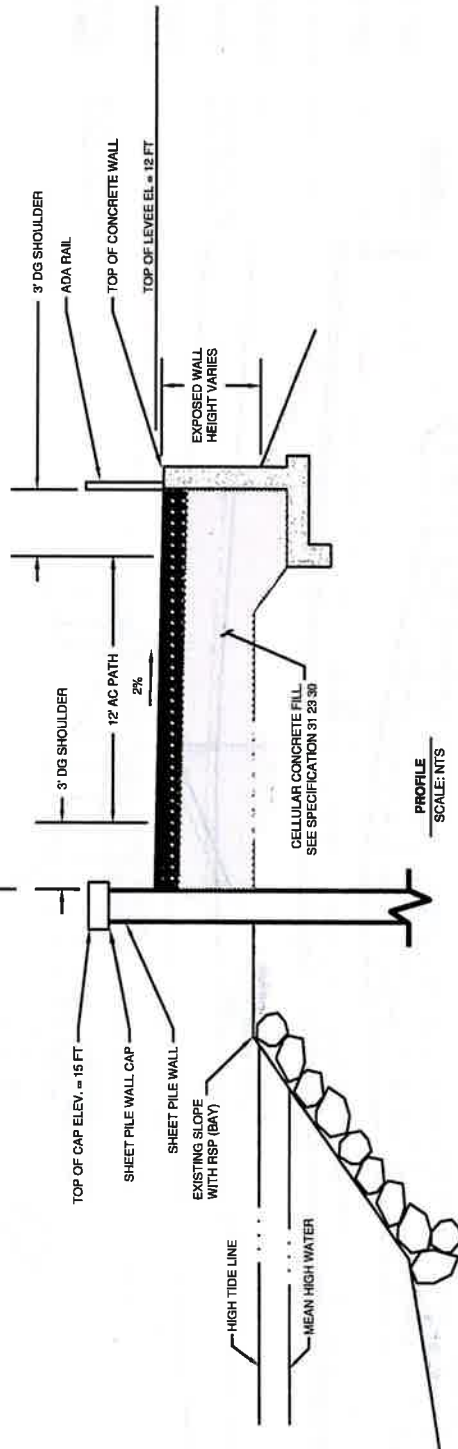
Figure: 18 - Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMD: 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / thuffman@h-bgroup.com

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATE: 8/15/2018
ADJACENT PROPERTY OWNERS:
1. State of CA
2. Foster City



PLAN
SCALE: 1" = 40'

LAND SIDE
BAY SIDE



PROFILE
SCALE: NTS

SAN FRANCISCO BAY

LEGEND:

- LIMIT OF TEMPORARY WORK
- LIMIT OF GRADING WORK
- HIGH TIDE LINE
- MEAN HIGH WATER LINE (EL=6.3 FT)
- AQUATIC RESOURCE AREA
- AQUATIC RESOURCE AREA PERMANENT IMPACT
- AQUATIC RESOURCE AREA TEMPORARY IMPACT

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.

DATUM: NAVD 88

ADJACENT PROPERTY OWNERS:

1. State of CA
2. Foster City

DATE: 8/15/2018

Figure: 19 - Levee Aquatic Resource Area Impact

APPLICATION BY: City of Foster City/EMD; 610 Foster City Boulevard, Foster City, CA 94404

APPLICANT'S AGENT: Terry Huffman, PhD

Huffman-Broadway Group, Inc.

828 Mission Ave.

San Rafael, CA 94901

415.385.1045 / huffman@hbggroup.com

STATION: 69+02

PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)

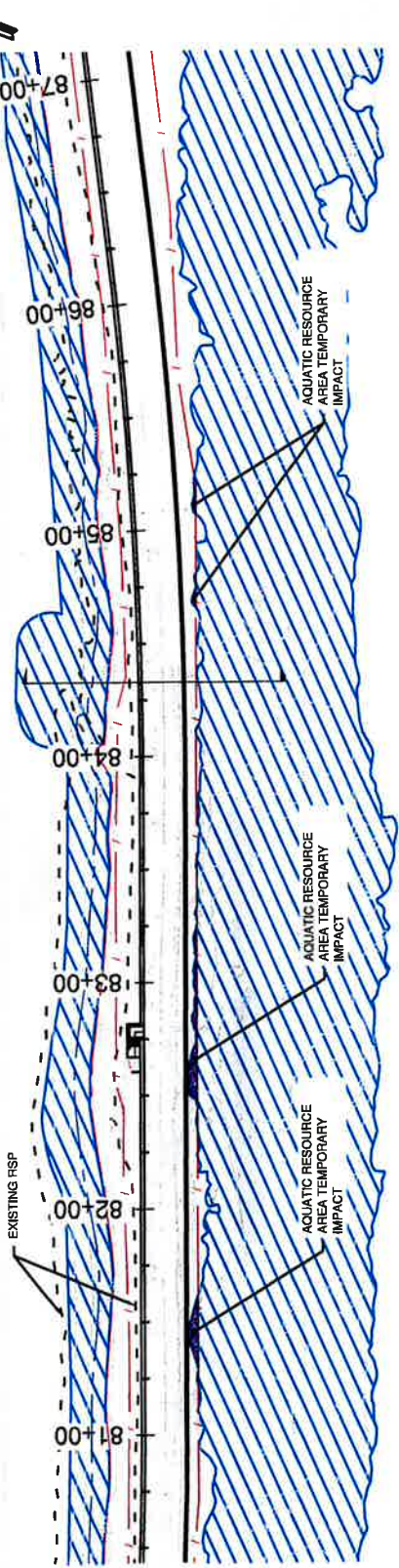
IN: waters of the United States

AT: Adjacent to existing City Levee System

COUNTY OF: San Mateo

STATE: California

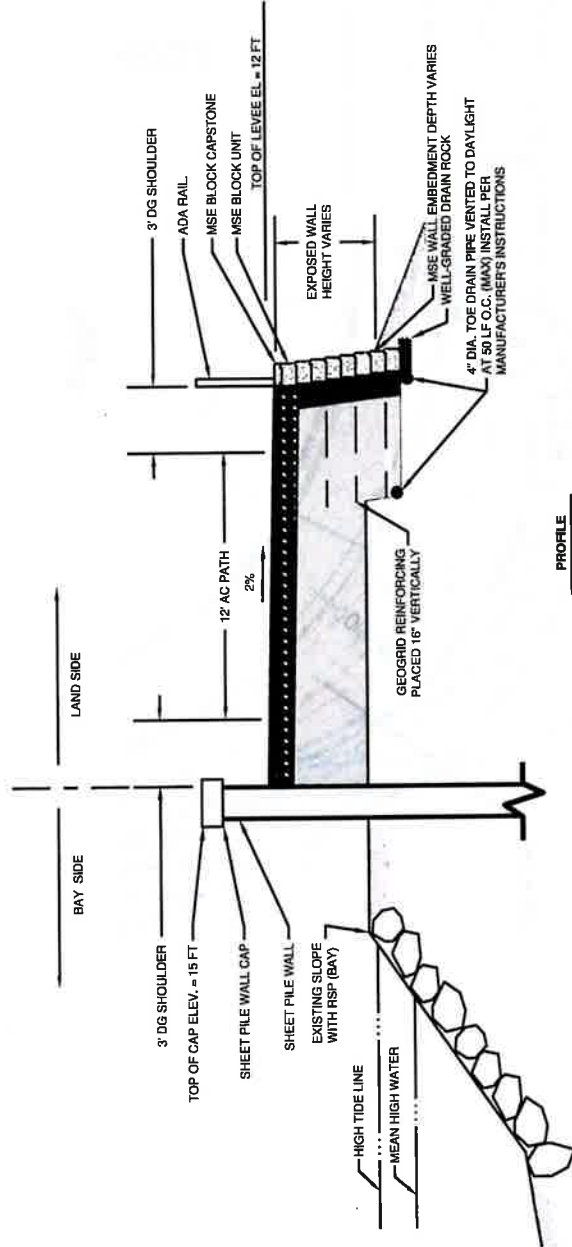
SAN FRANCISCO BAY



LEGEND:

- LIMIT OF TEMPORARY WORK
- - - LIMIT OF GRADING WORK
- - - HIGH TIDE LINE
- - - MEAN HIGH WATER LINE (EL=6.3 FT)
- [Blue Hatched Box] AQUATIC RESOURCE AREA
- [Yellow Hatched Box] AQUATIC RESOURCE AREA PERMANENT IMPACT
- [Green Hatched Box] AQUATIC RESOURCE AREA TEMPORARY IMPACT

PLAN
SCALE: 1" = 80'



PROFILE
SCALE: NTS

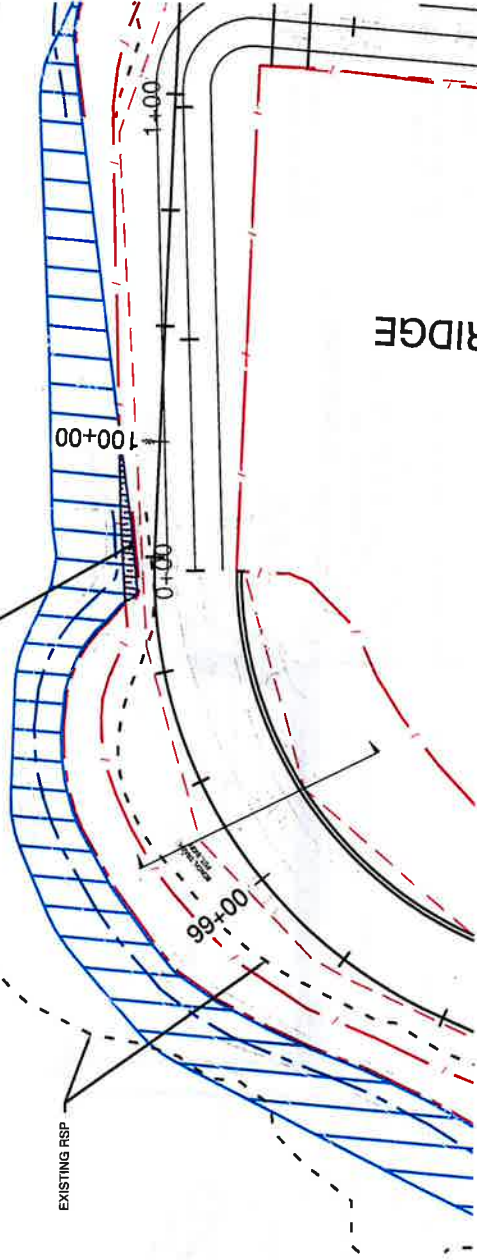
<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATE: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <p>1. State of CA</p> <p>2. Foster City</p> <p>DATE: 8/15/2018</p>	<p>Figure: 20 - Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@hbggroup.com</p>	<p>STATION: 84+33</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>
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SAN FRANCISCO BAY



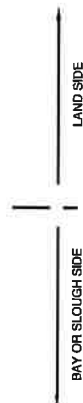
EXISTING RSP

AQUATIC RESOURCE AREA
TEMPORARY IMPACT



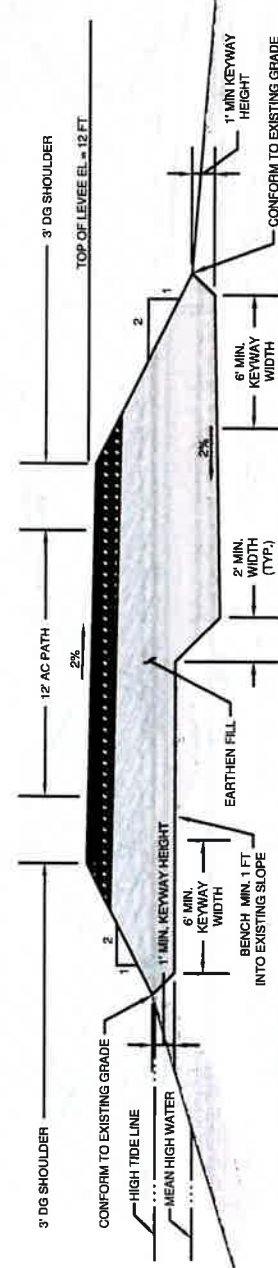
PLAN
SCALE: 1" = 40'

- LEGEND:**
- LIMIT OF TEMPORARY WORK
 - - - LIMIT OF GRADING WORK
 - - - HIGH TIDE LINE
 - - - MEAN HIGH WATER LINE (EL=6.3 FT)
 - [Blue Hatched Box] AQUATIC RESOURCE AREA
 - [Yellow Hatched Box] AQUATIC RESOURCE AREA PERMANENT IMPACT
 - [Black Hatched Box] AQUATIC RESOURCE AREA TEMPORARY IMPACT



LAND SIDE

BAY OR SLOUGH SIDE

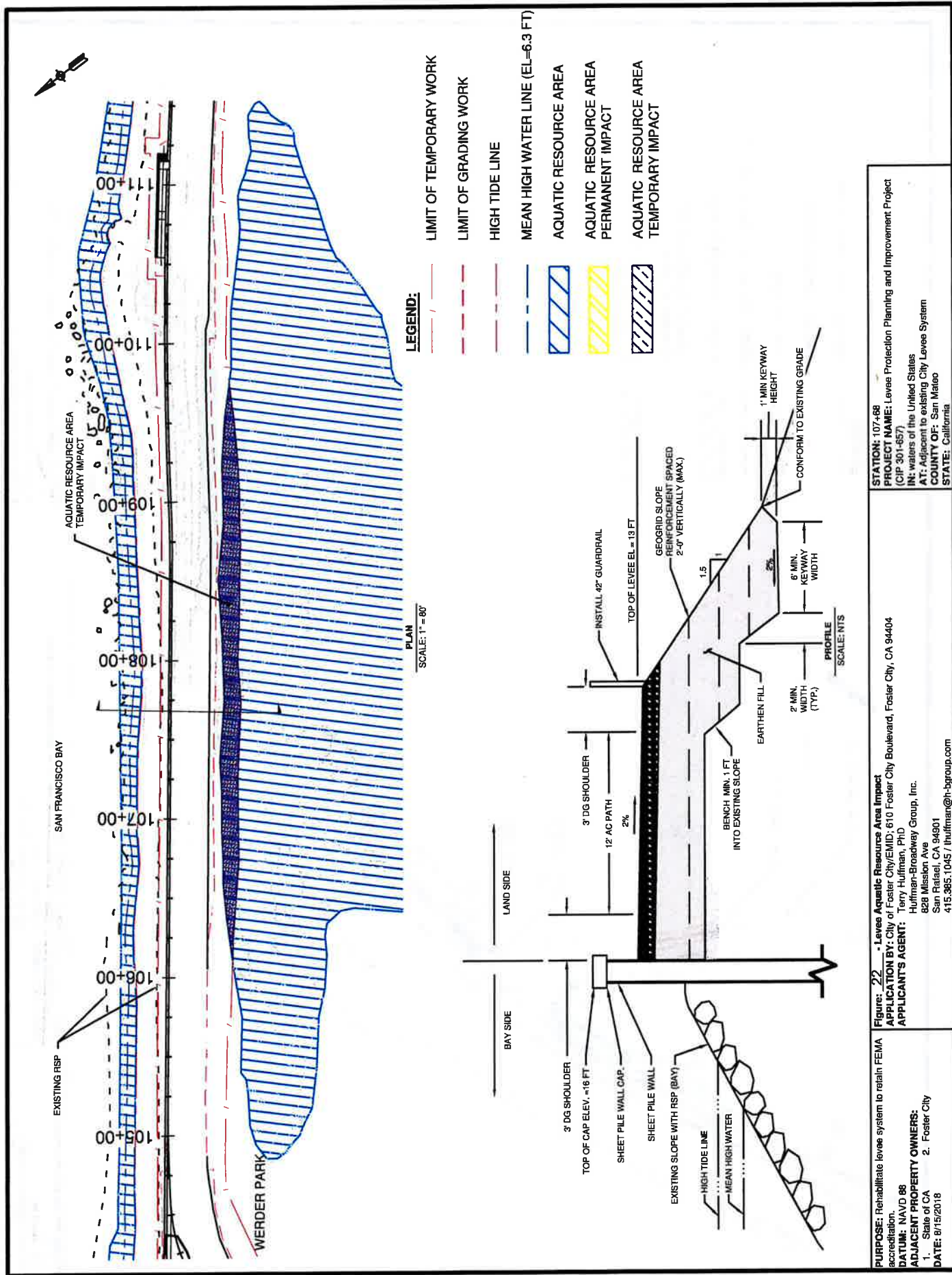


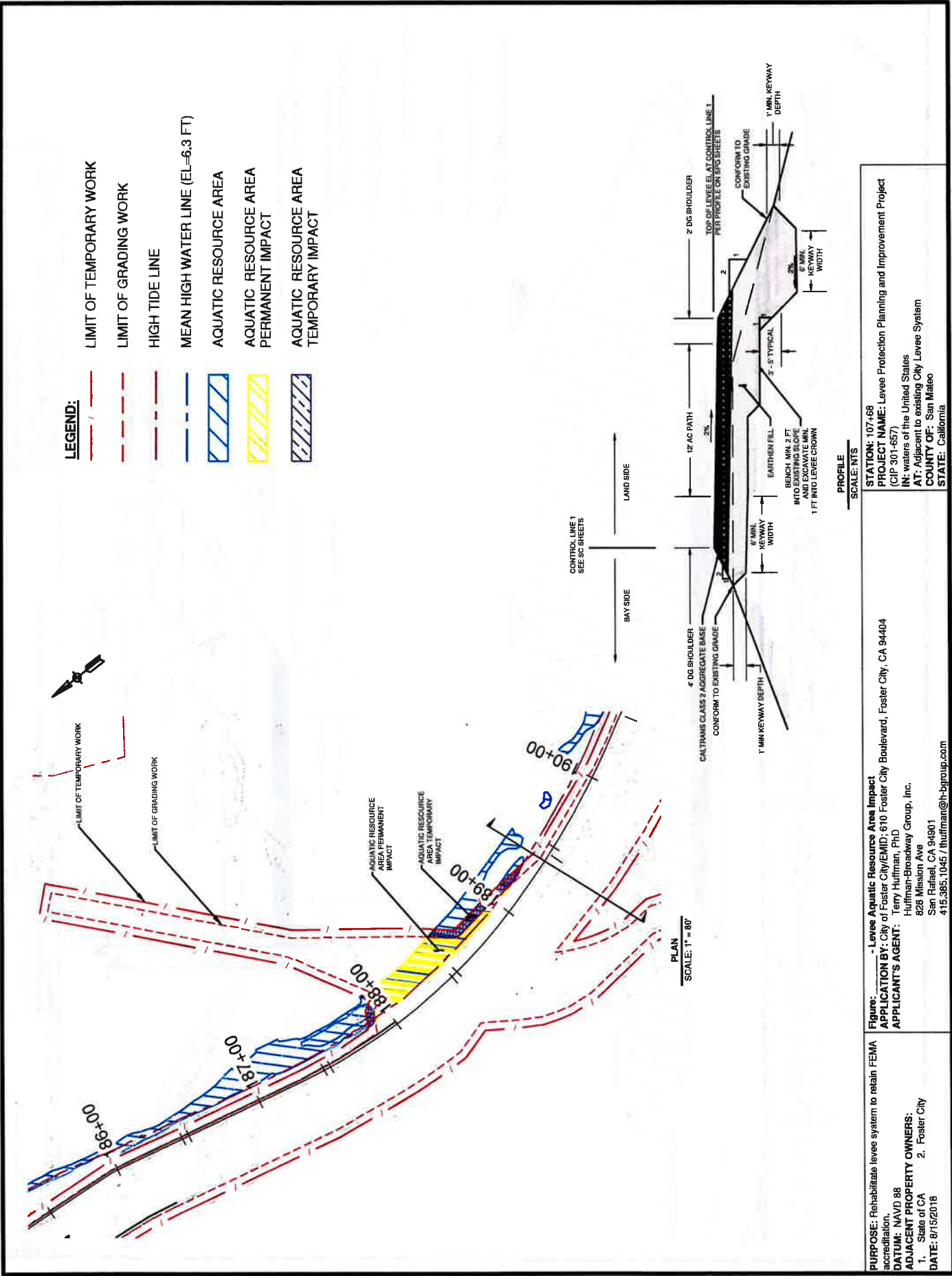
PROFILE
SCALE: NTS

STATION: 99+14
PROJECT NAME: Levee Protection Planning and Improvement Project
(CIP 301-657)
INT: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California

Figure: 21 - Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / thuffman@h-bggroup.com

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATE: 8/15/2018
ADJACENT PROPERTY OWNERS:
1. State of CA
2. Foster City







BELMONT SLOUGH

AQUATIC RESOURCE
AREA TEMPORARY
IMPACT

227+00

228+00

229+00

PLAN
SCALE: 1" = 40'

LEGEND:

- LIMIT OF TEMPORARY WORK
- LIMIT OF GRADING WORK
- HIGH TIDE LINE
- MEAN HIGH WATER LINE (EL=6.3 FT)
- [Blue Hatched Box] AQUATIC RESOURCE AREA
- [Yellow Hatched Box] AQUATIC RESOURCE AREA PERMANENT IMPACT
- [Black Hatched Box] AQUATIC RESOURCE AREA TEMPORARY IMPACT

LAND SIDE

BAY OR SLOUGH SIDE

3' DG SHOULDER

TOP OF CAP ELEV. = 14 FT

SHEET PILE WALL CAP

SHEET PILE WALL

EXISTING SLOPE WITH RSP (BAY)

HIGH TIDE LINE

MEAN HIGH WATER

3' DG SHOULDER

TOP OF LEVEE EL = 11 FT

2

1

BENCH MIN. 1 FT
INTO EXISTING SLOPE

EARTHEN FILL

2' MIN.
WIDTH
(TYP.)

6' MIN.
KEYWAY
WIDTH

1' MIN KEYWAY
HEIGHT

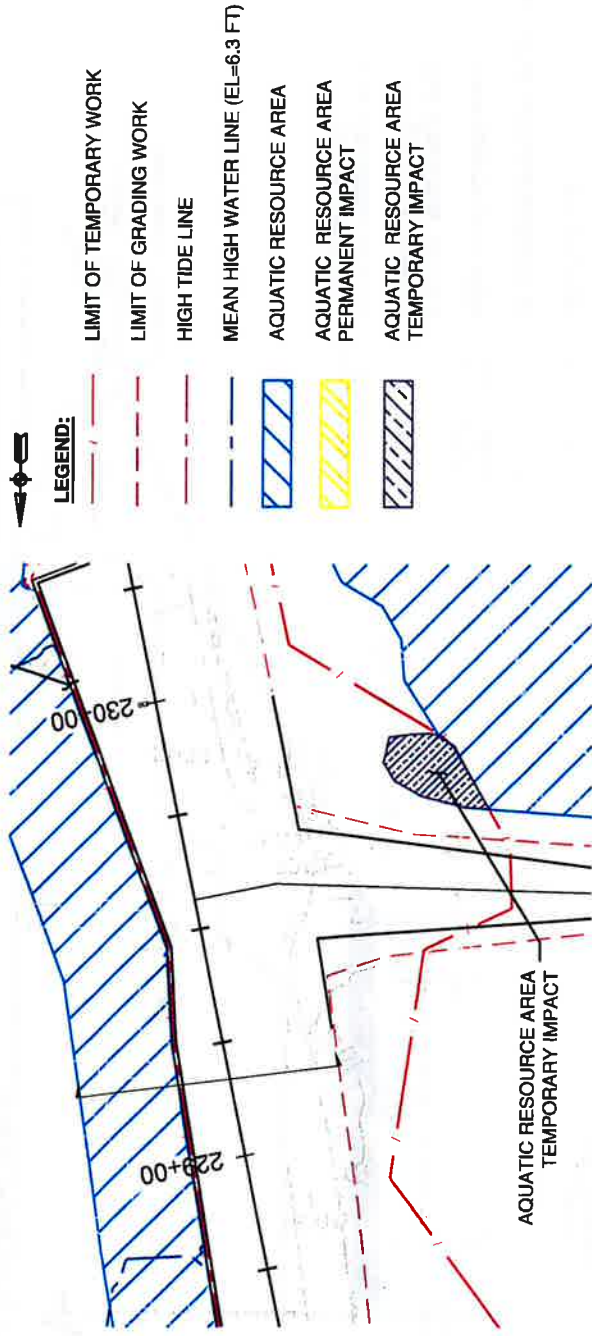
CONFORM TO EXISTING GRADE

PROFILE
SCALE: NTS

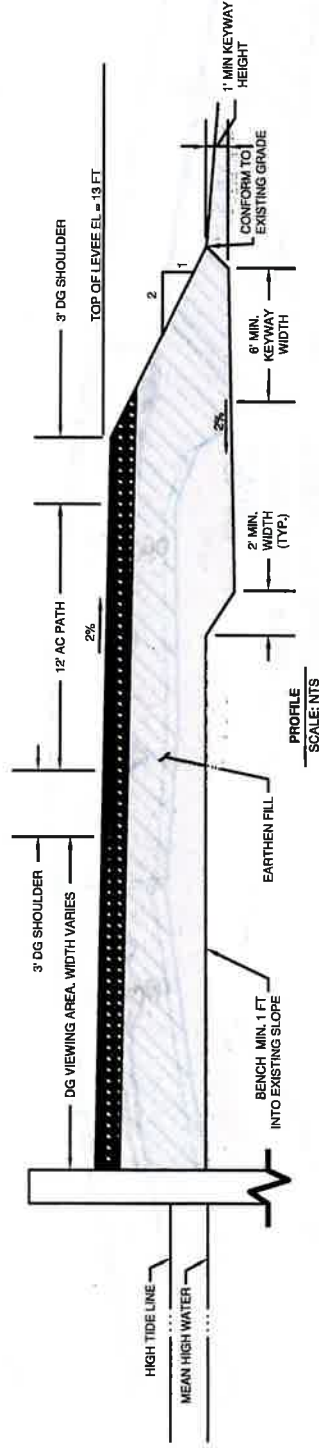
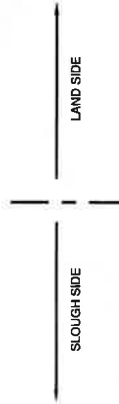
STATION: 227+23
PROJECT NAME: Levee Protection Planning and Improvement Project
(CIP 301-657)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California

Figure: 24 - Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMD; 610 Foster City Boulevard, Foster City, CA 94404
Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / t.huffman@hbgroup.com

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATE: NAVD 88
ADJACENT PROPERTY OWNERS:
1. State of CA
2. Foster City
DATE: 8/15/2018



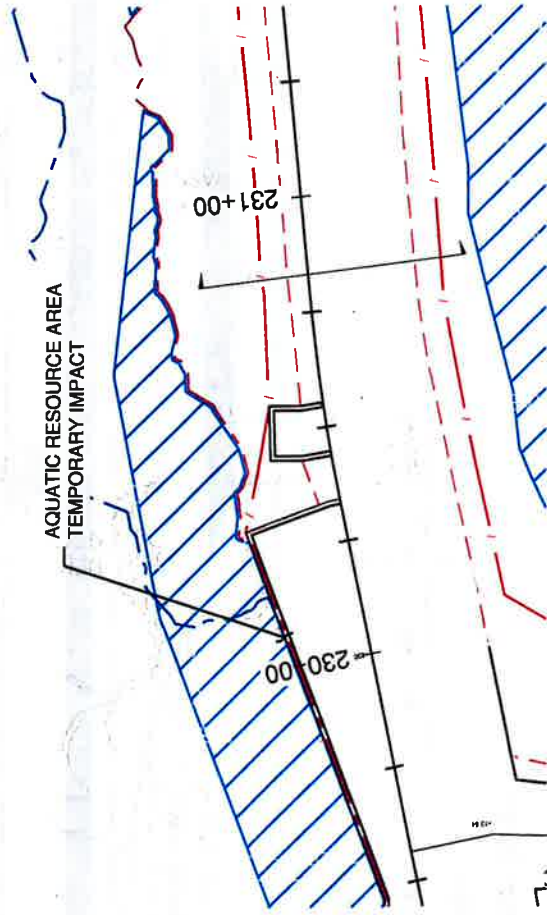
PLAN
SCALE: 1" = 40'



PROFILE
SCALE: NTS

<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATUM: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <ol style="list-style-type: none"> 1. State of CA 2. Foster City <p>DATE: 8/15/2018</p>	<p>Figure: 25 - Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.386.1045 / thuffman@h-bgroup.com</p>	<p>STATION: 229+17</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>
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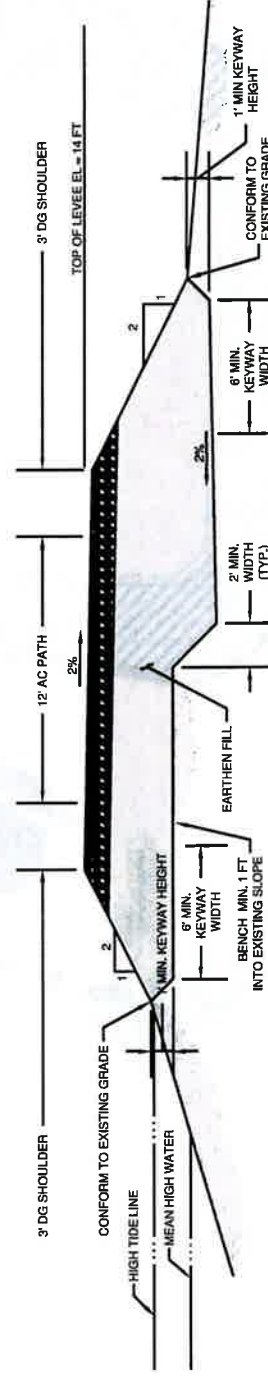
BELMONT SLOUGH



PLAN
SCALE: 1" = 40'

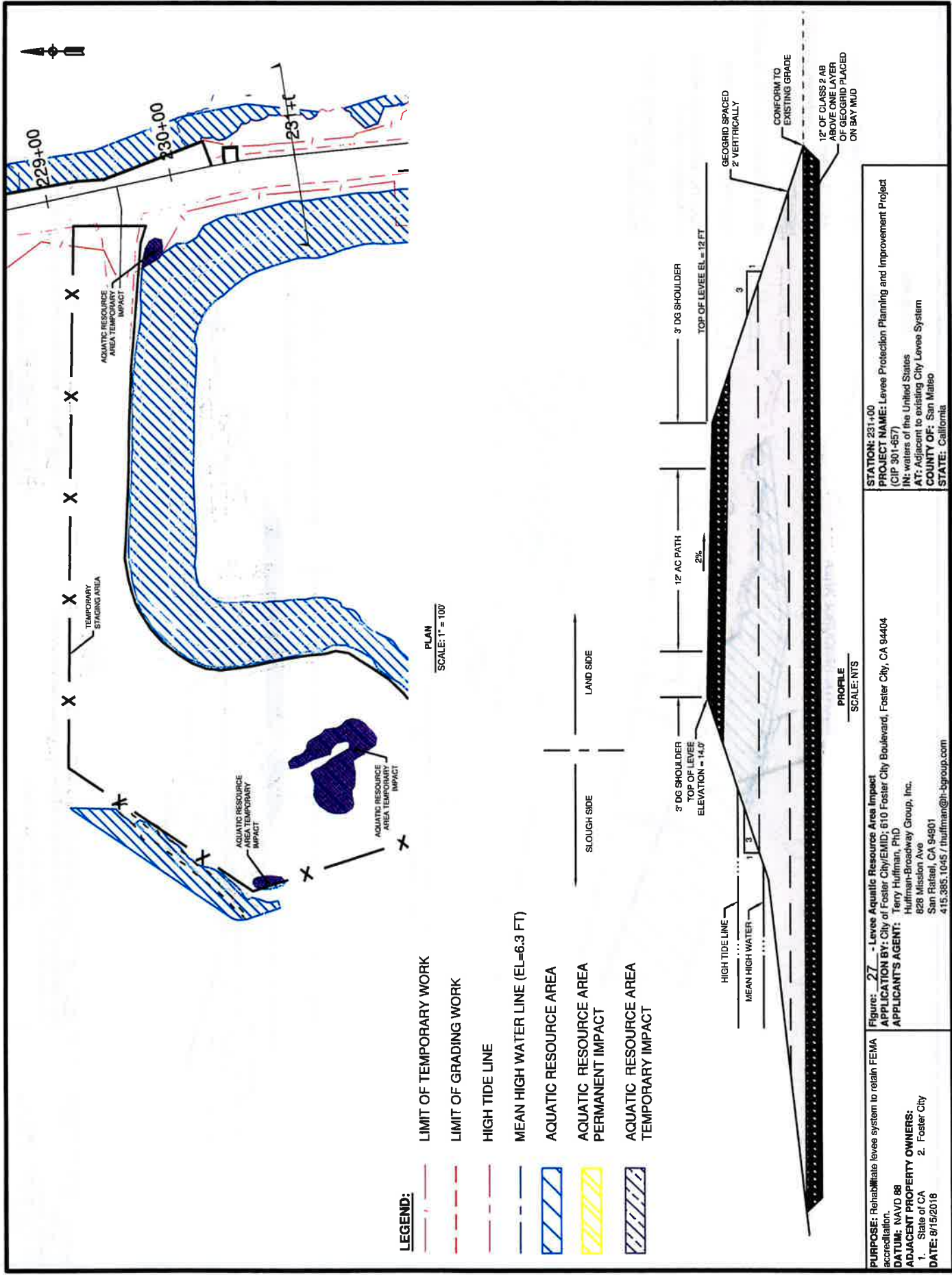
BAY OR SLOUGH SIDE

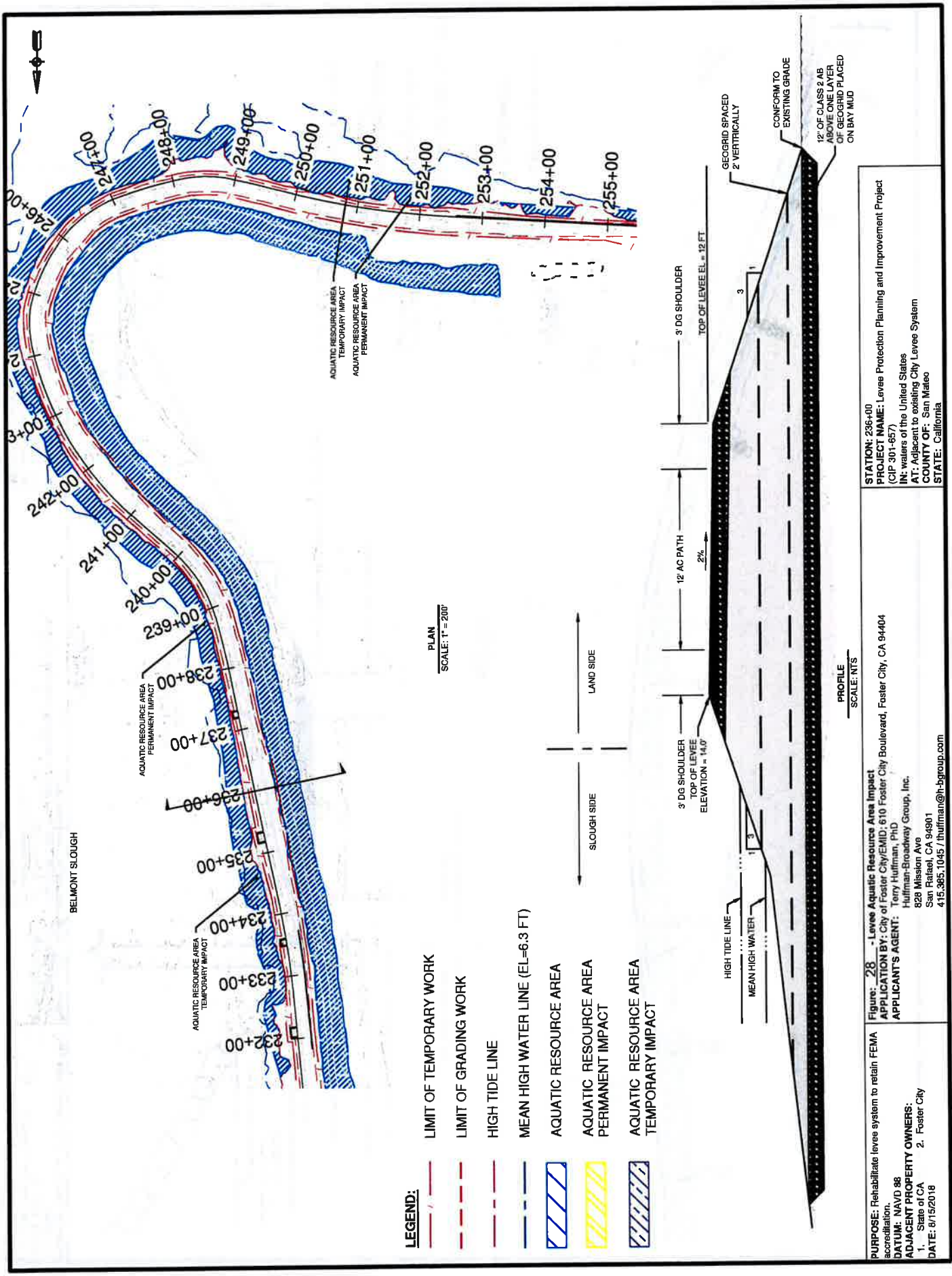
LAND SIDE



PROFILE
SCALE: NTS

<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATE: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <ol style="list-style-type: none"> State of CA Foster City <p>DATE: 8/15/2018</p>	<p>Figure: 26 - Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / terry@huffman-bgroup.com</p>	<p>STATION: 230+80</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CJP 301-657)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>
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PURPOSE: Rehabilitate levee system to retain FEMA accreditation.

DATE: 8/15/2018

ADJACENT PROPERTY OWNERS:

- State of CA
- Foster City

Figure: 28 - Levee Aquatic Resource Area Impact

APPLICATION BY: City of Foster City/EMD, 610 Foster City Boulevard, Foster City, CA 94404

APPLICANT'S AGENT: Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / thuffman@h-bgroup.com

STATION: 236+00

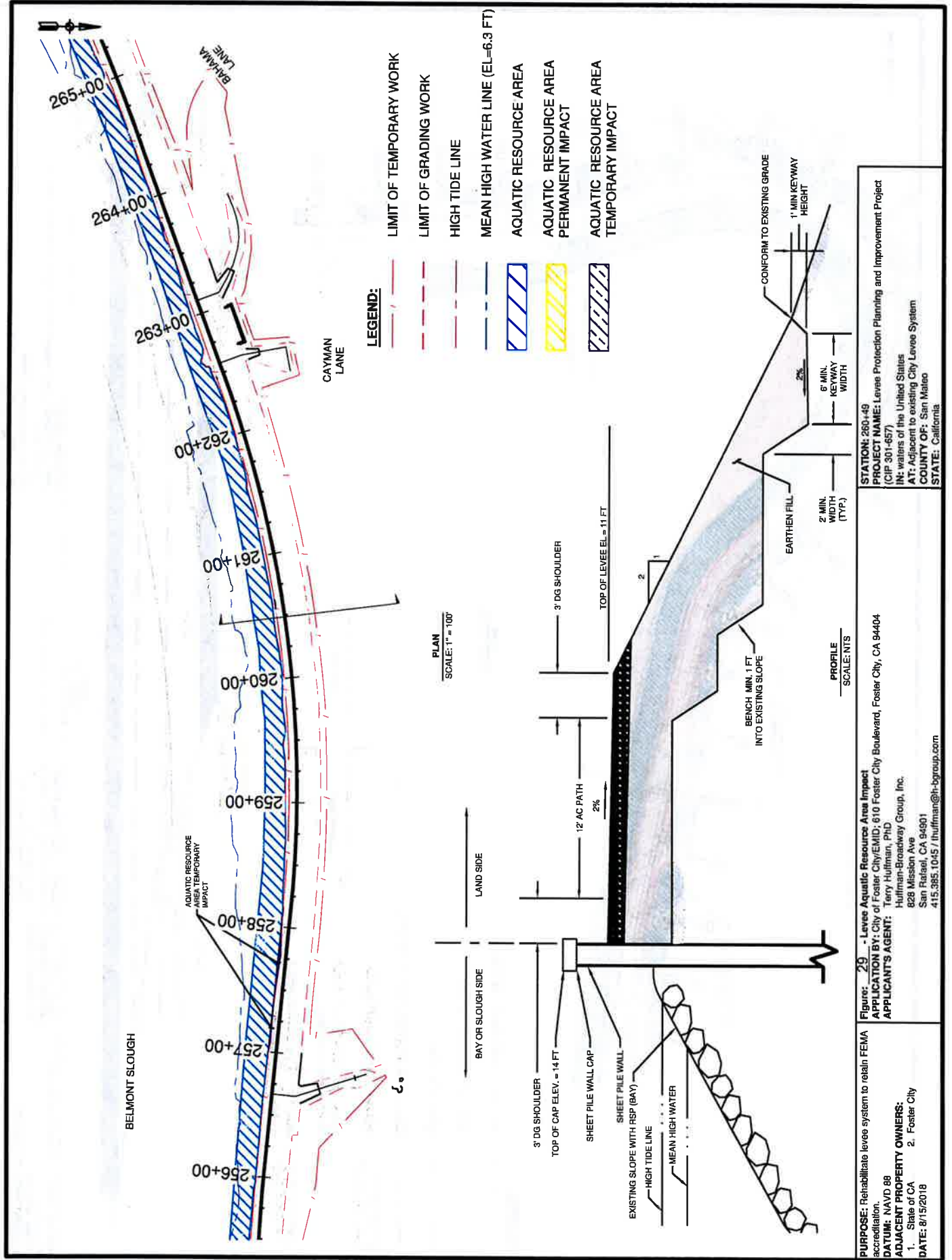
PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)

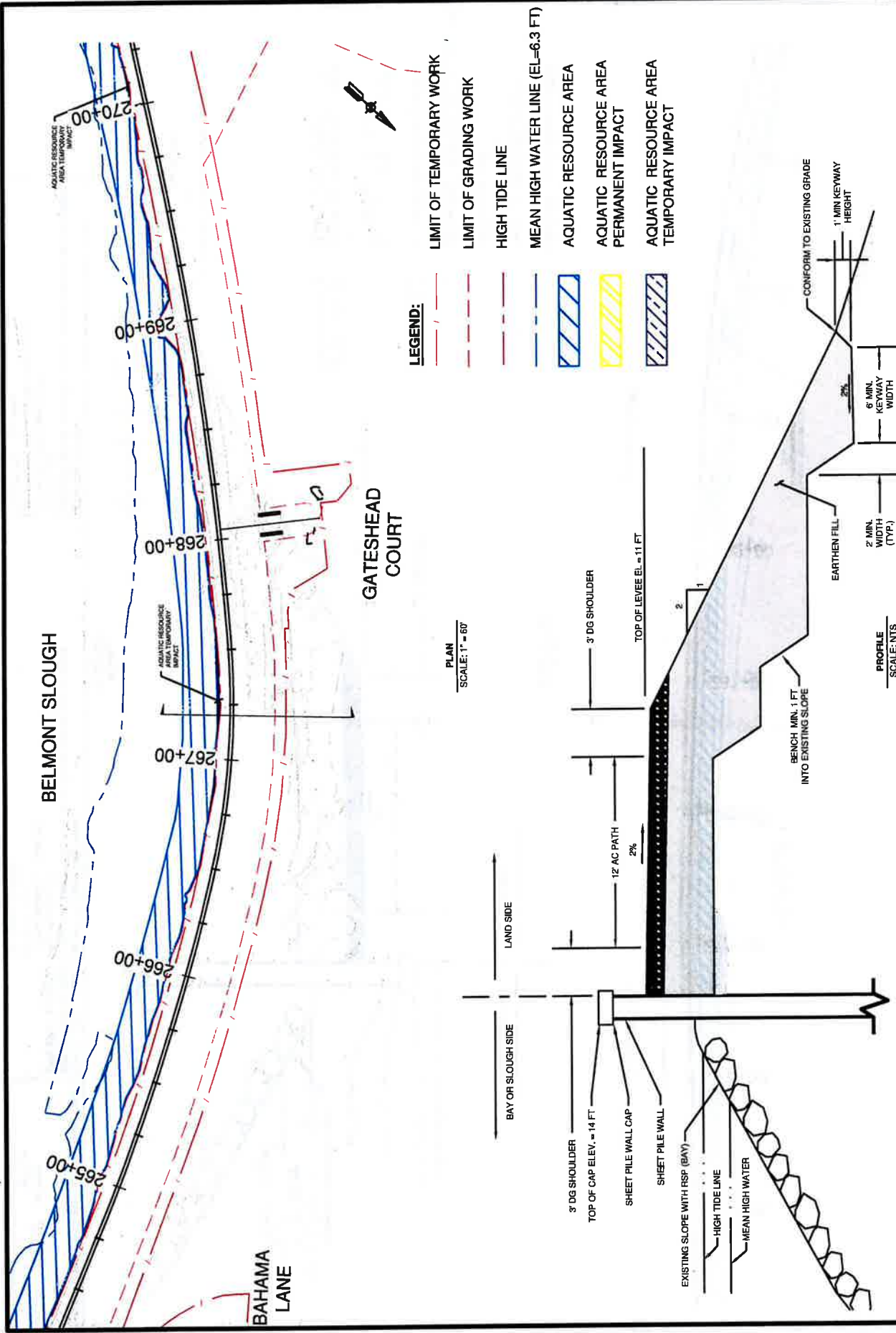
IN: waters of the United States

AT: Adjacent to existing City Levee System

COUNTY OF: San Mateo

STATE: California

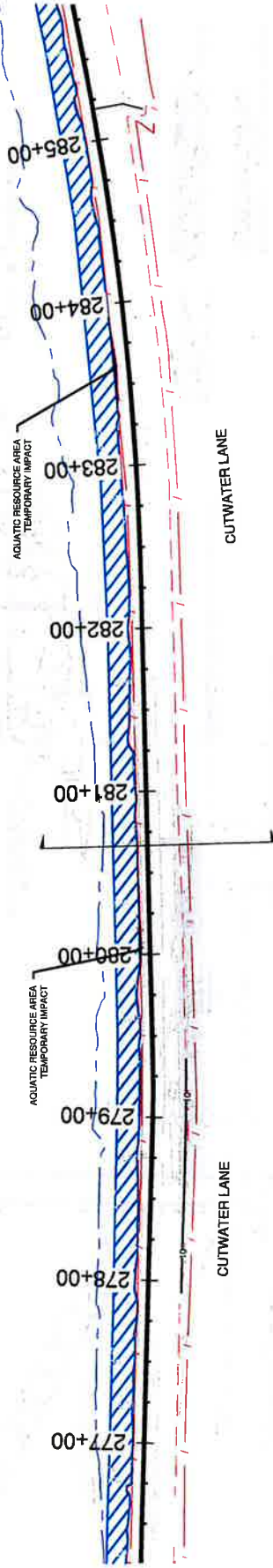




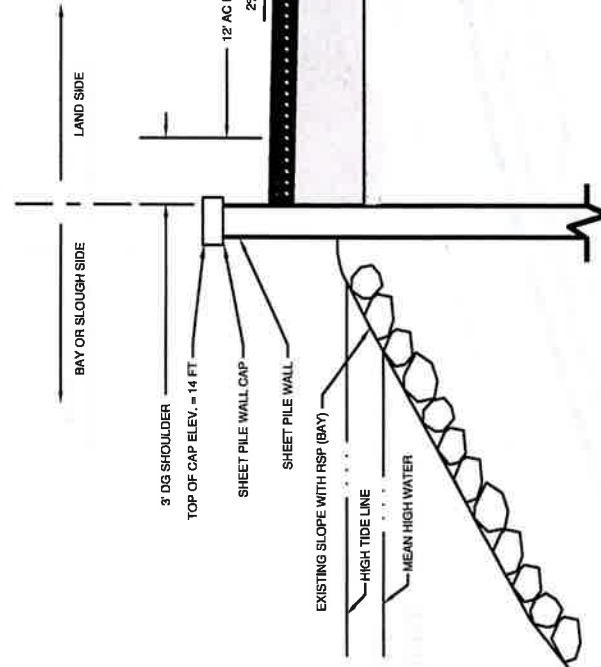
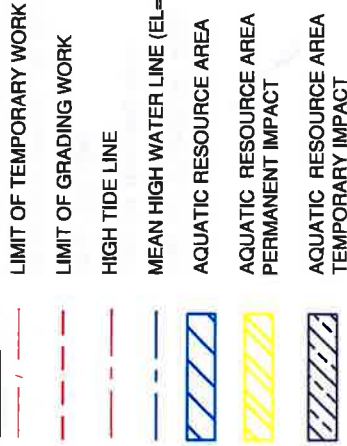
<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATE: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <p>1. State of CA 2. Foster City</p> <p>DATE: 8/15/2016</p>	<p>Figure: 30 - Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID, 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.395.1045 / thuffman@hbggroup.com</p>	<p>STATION: 267+20</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>	<p>PLAN SCALE: 1" = 60'</p> <p>PROFILE SCALE: NTS</p>
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BELMONT SLOUGH



PLAN
SCALE: 1" = 100'

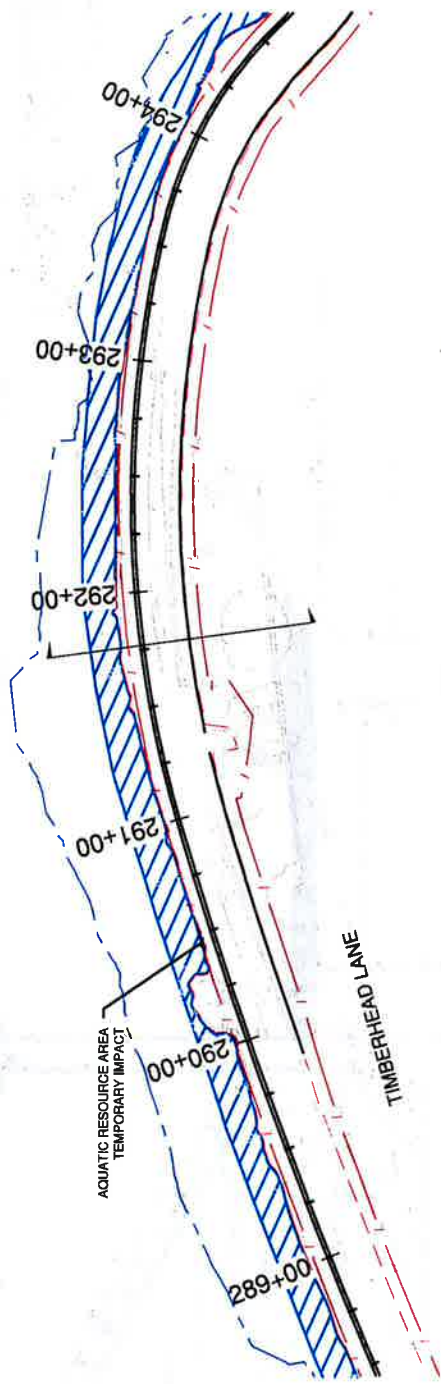


PROFILE
SCALE: NTS

<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATUM: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <ol style="list-style-type: none">1. State of CA2. Foster City <p>DATE: 8/15/2018</p>	<p>Figure: 31 - Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com</p>	<p>STATION: 280.67</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>
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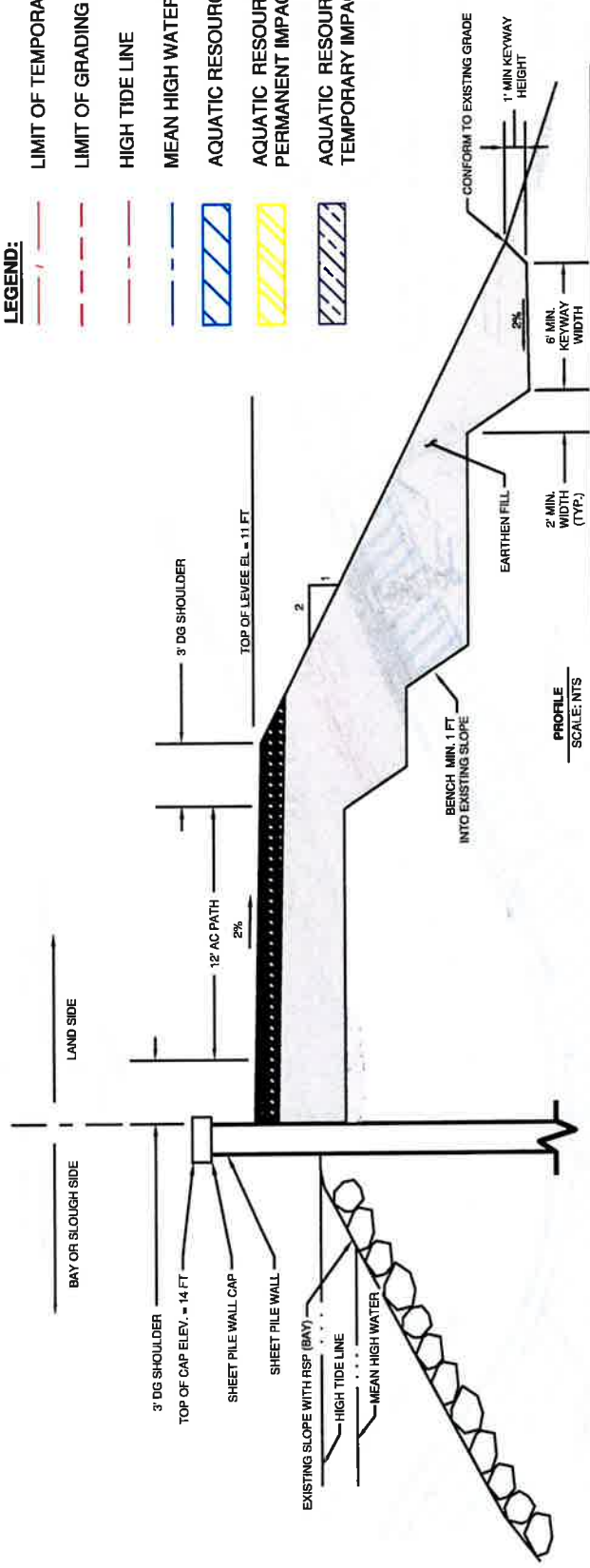


BELMONT SLOUGH



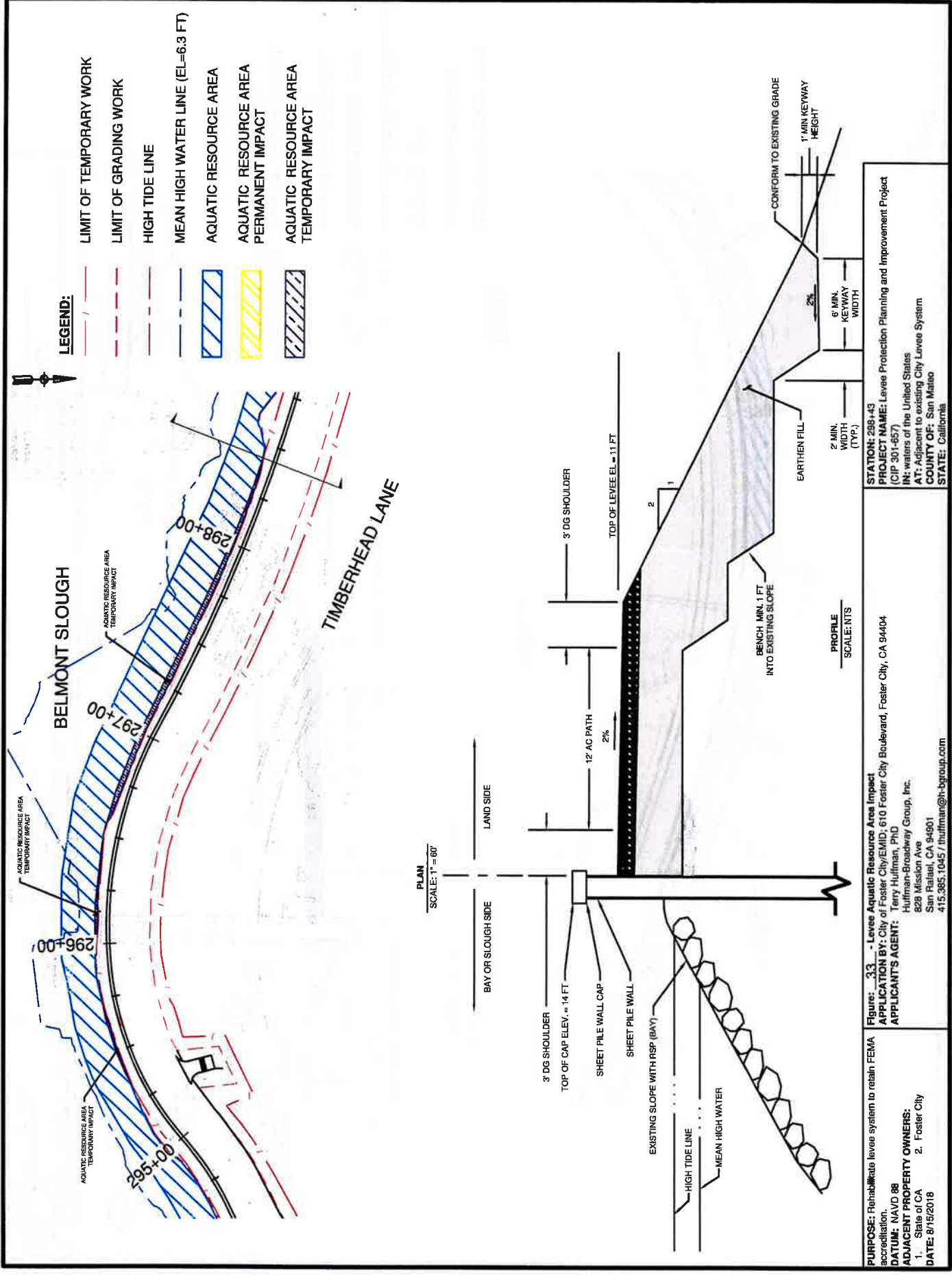
PLAN
SCALE: 1" = 80'

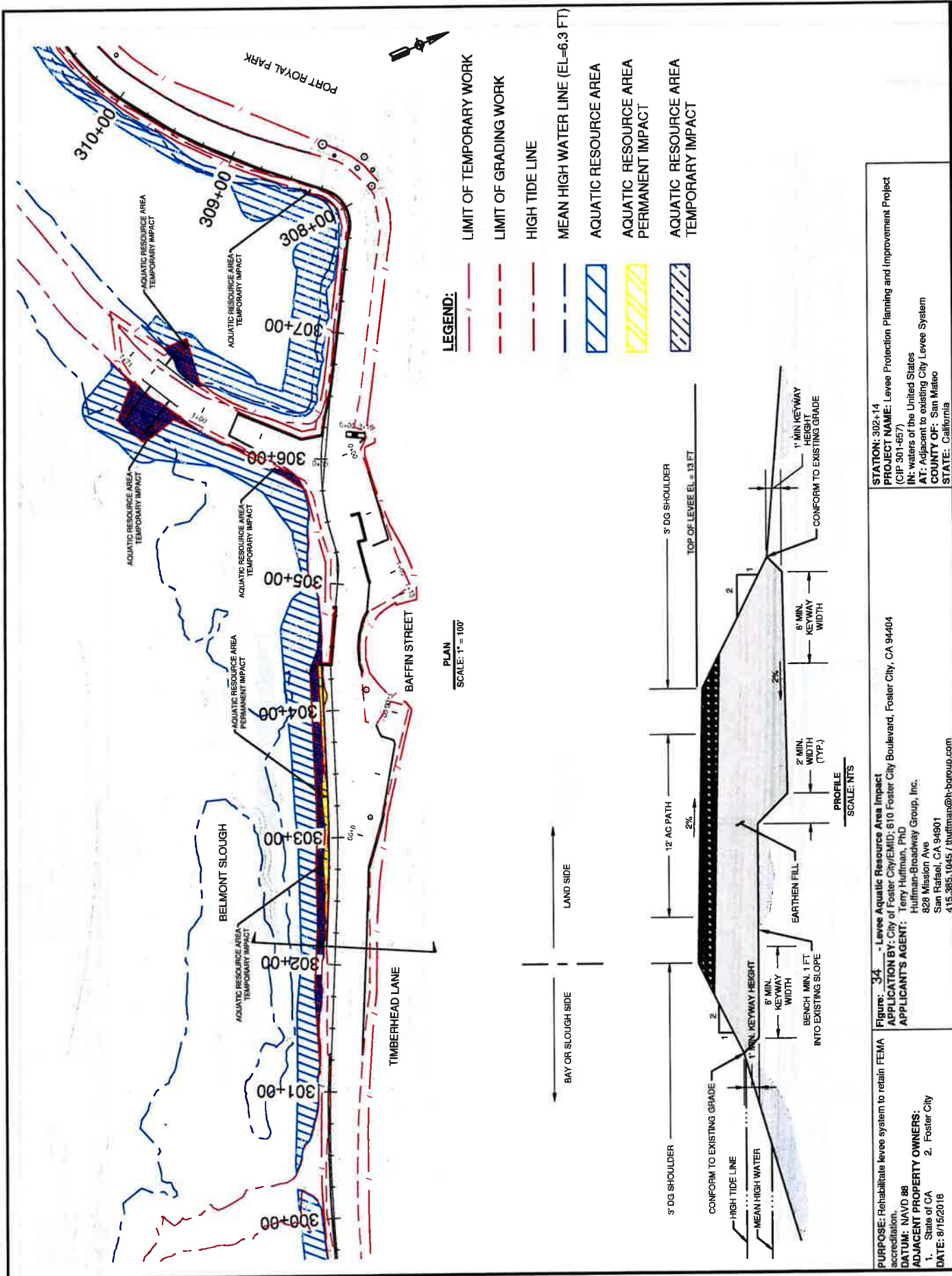
- LEGEND:**
- LIMIT OF TEMPORARY WORK
 - LIMIT OF GRADING WORK
 - HIGH TIDE LINE
 - MEAN HIGH WATER LINE (EL=6.3 FT)
 - AQUATIC RESOURCE AREA
 - AQUATIC RESOURCE AREA PERMANENT IMPACT
 - AQUATIC RESOURCE AREA TEMPORARY IMPACT



PROFILE
SCALE: NTS

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.	Figure: 32 - Levee Aquatic Resource Area Impact	STATION: 291+77
DATE: NAVD 88	APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404	PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)
ADJACENT PROPERTY OWNERS:	APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com	IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
DATE: 8/15/2018		





PURPOSE: Rehabilitate levee system to retain FEMA accreditation.

DATE: 8/15/2018

ADJACENT PROPERTY OWNERS:

- State of CA
- Foster City

APPLICANT'S AGENT: Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / thuffman@h-bgroup.com

Figure: 34 - Levee Aquatic Resource Area Impact

APPLICATION BY: City of Foster City/EMID: 610 Foster City Boulevard, Foster City, CA 94044

STATION: 302+14

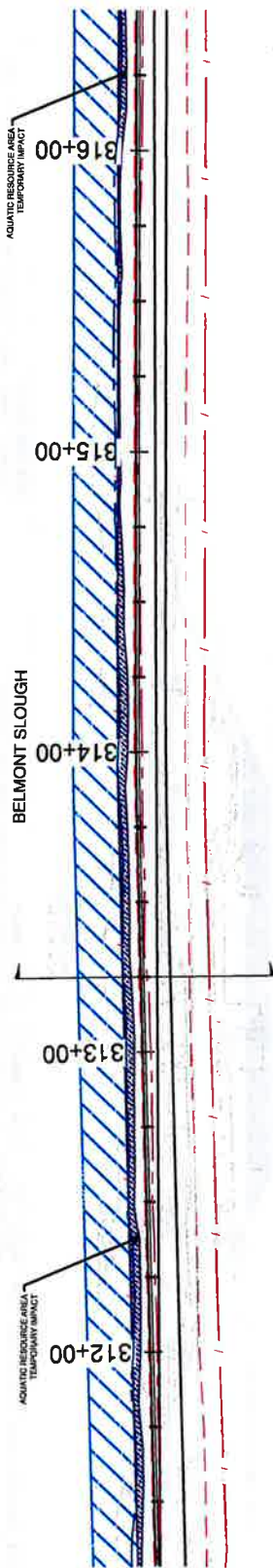
PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)

IN: Waters of the United States

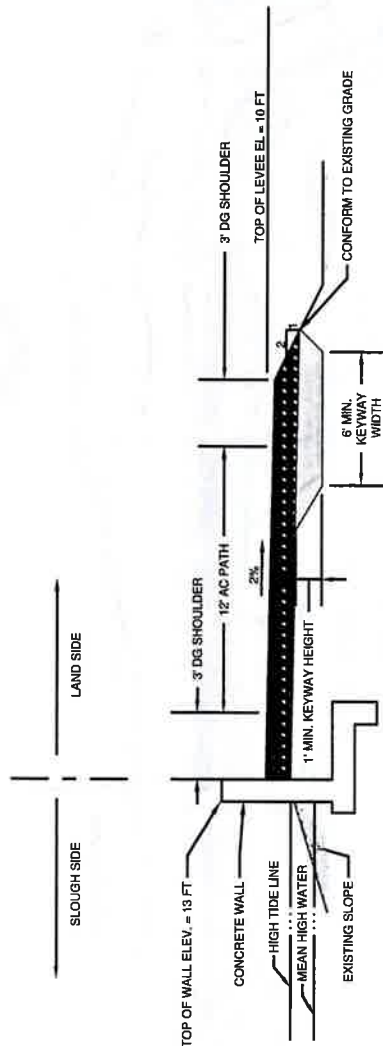
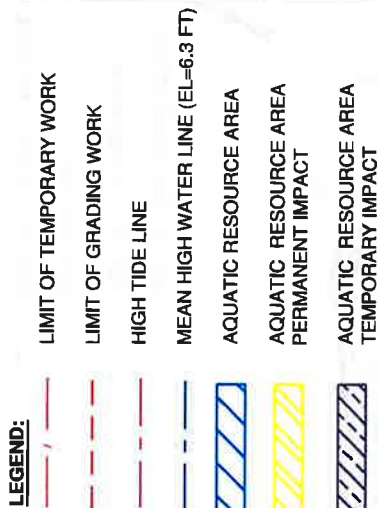
AT: Adjacent to existing City Levee System

COUNTY OF: San Mateo

STATE: California



PLAN
SCALE: 1" = 60'



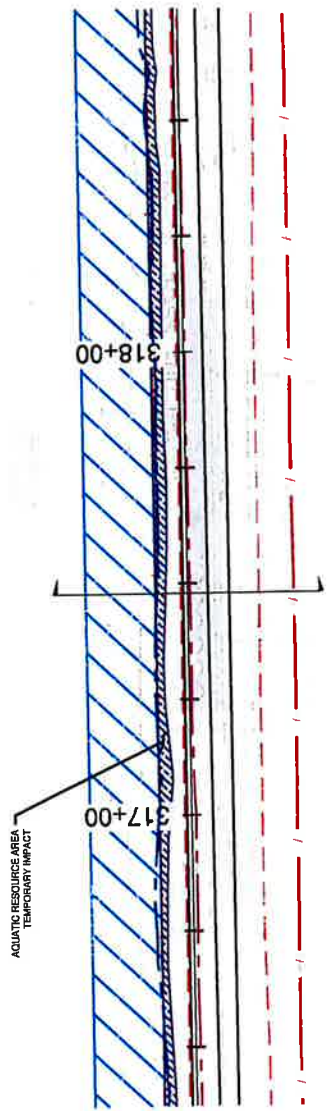
PROFILE
SCALE: NTS

<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATE: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <ol style="list-style-type: none"> 1. State of CA 2. Foster City <p>DATE: 8/15/2018</p>	<p>Figure: 35 - Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / huffman@h-bgroup.com</p>	<p>STATION: 313+25</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CJP 301-657)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>
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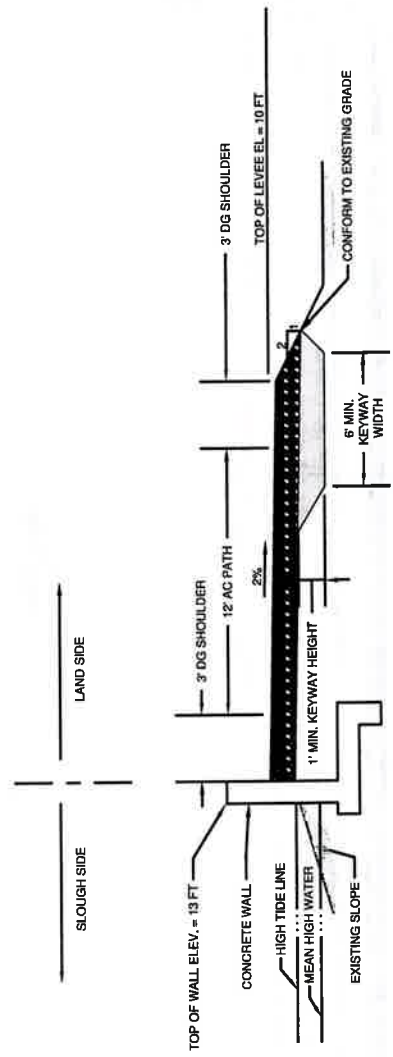
BELMONT SLOUGH

LEGEND:

- LIMIT OF TEMPORARY WORK
- LIMIT OF GRADING WORK
- HIGH TIDE LINE
- MEAN HIGH WATER LINE (EL=6.3 FT)
- ▨ AQUATIC RESOURCE AREA
- ▨ AQUATIC RESOURCE AREA PERMANENT IMPACT
- ▨ AQUATIC RESOURCE AREA TEMPORARY IMPACT



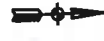
PLAN
SCALE: 1" = 40'



PROFILE
SCALE: NTS

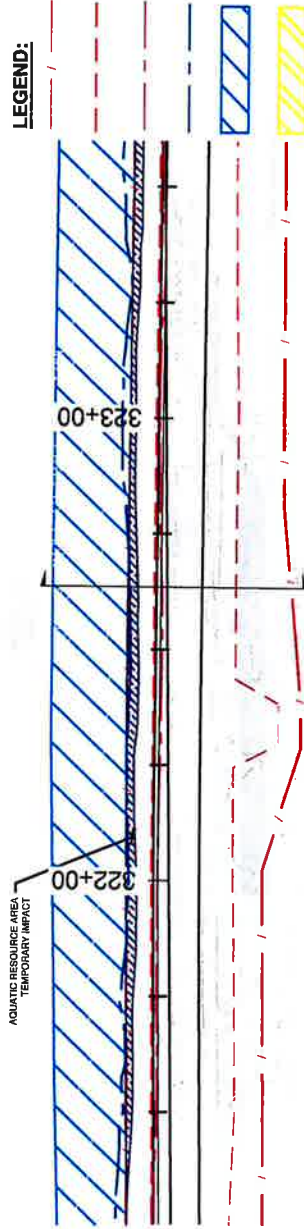
<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATUM: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <ol style="list-style-type: none"> 1. State of CA 2. Foster City <p>DATE: 8/15/2018</p>	<p>Figure: 36 - Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID, 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT:</p> <p>Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.395.1045 / thuffman@hbggroup.com</p>	<p>STATION: 317+48</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>
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BELMONT SLOUGH

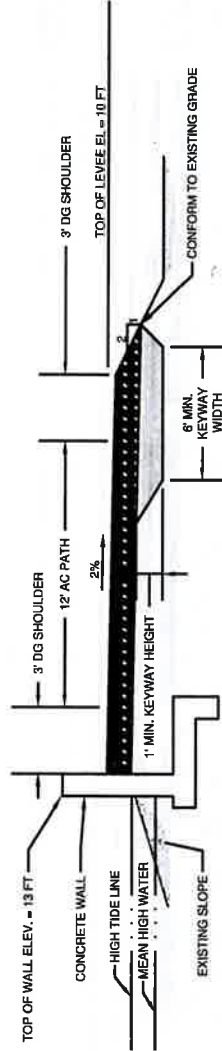
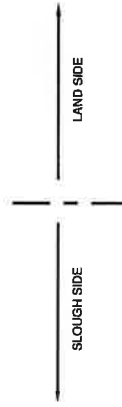


LEGEND:

- LIMIT OF TEMPORARY WORK
- - - LIMIT OF GRADING WORK
- - - HIGH TIDE LINE
- - - MEAN HIGH WATER LINE (EL=6.3 FT)
- AQUATIC RESOURCE AREA
- AQUATIC RESOURCE AREA PERMANENT IMPACT
- AQUATIC RESOURCE AREA TEMPORARY IMPACT



PLAN
SCALE: 1" = 40'



PROFILE
SCALE: NTS

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.

DATE: 8/15/2018

ADJACENT PROPERTY OWNERS:

1. State of CA
2. Foster City

Figure: 37 - Levee Aquatic Resource Area Impact

APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404

APPLICANT'S AGENT: Terry Huffman, PhD

Huffman-Broadway Group, Inc.

828 Mission Ave

San Rafael, CA 94901

415.385.1045 / thuffman@h-bgroup.com

STATION: 322+65

PROJECT NAME: Levee Protection Planning and Improvement Project

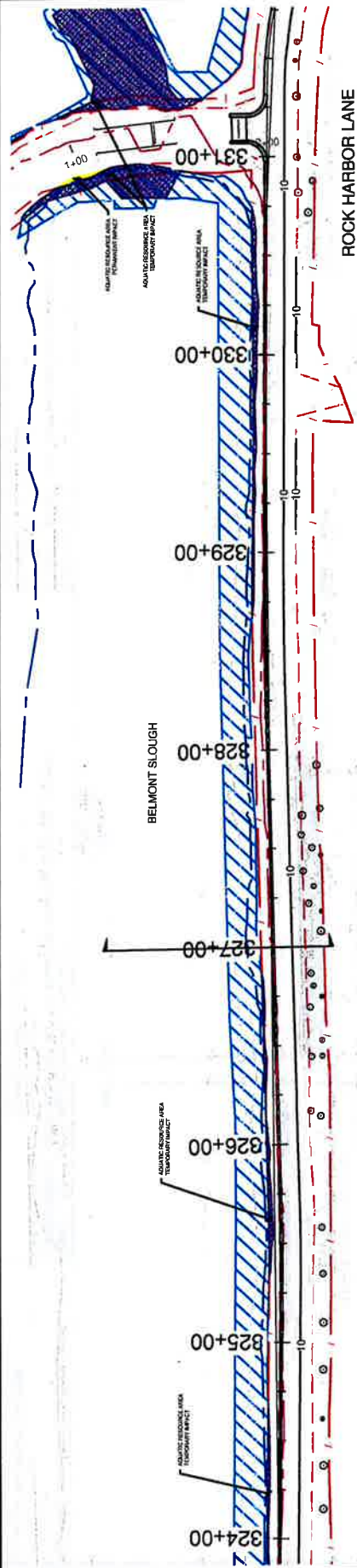
(CIP 301-657)

IN: waters of the United States

AT: Adjacent to existing City Levee System

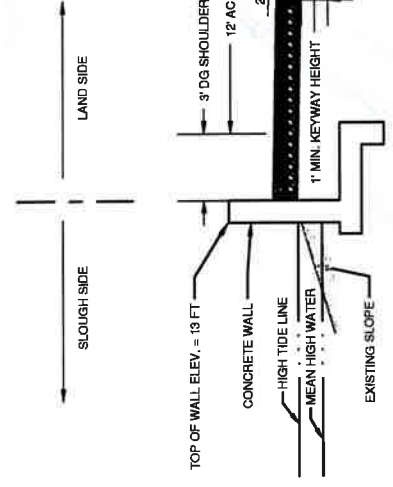
COUNTY OF: San Mateo

STATE: California



PLAN
SCALE: 1" = 80'

- LEGEND:**
- LIMIT OF TEMPORARY WORK
 - LIMIT OF GRADING WORK
 - HIGH TIDE LINE
 - MEAN HIGH WATER LINE (EL=6.3 FT)
 - AQUATIC RESOURCE AREA
 - AQUATIC RESOURCE AREA PERMANENT IMPACT
 - AQUATIC RESOURCE AREA TEMPORARY IMPACT

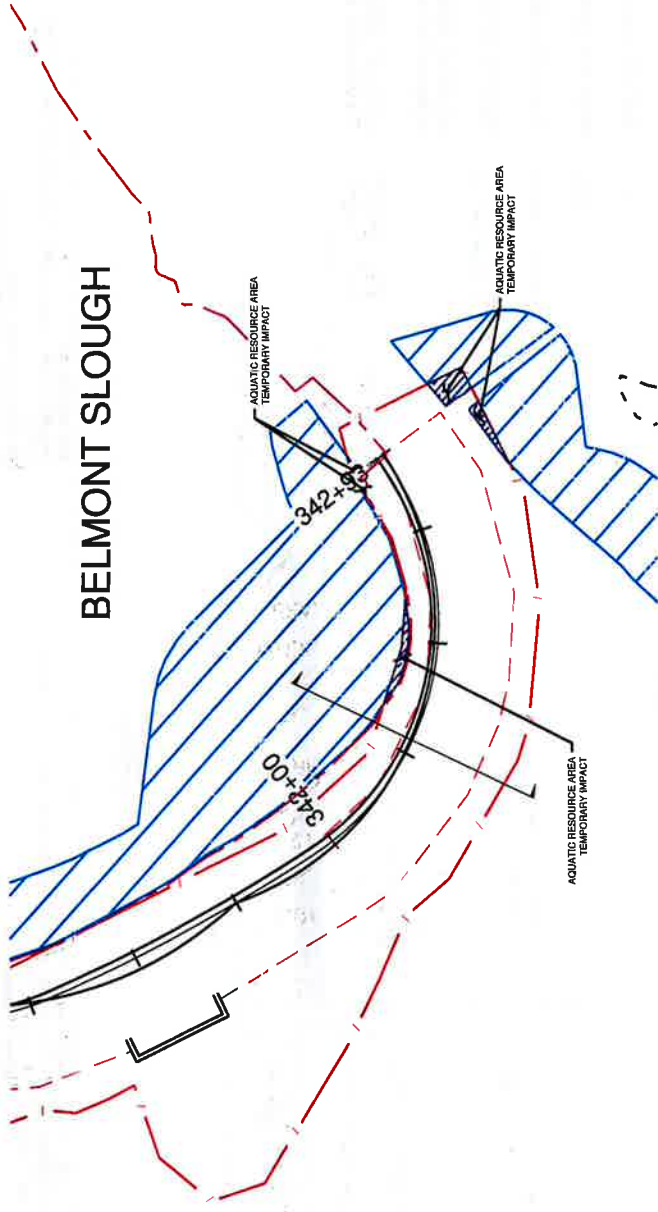


PROFILE
SCALE: NTS

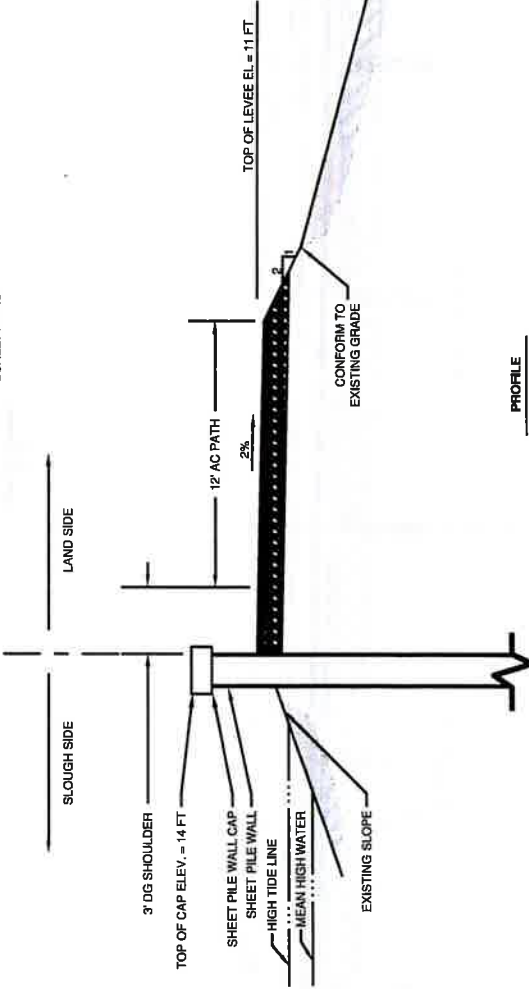
<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATUM: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <ol style="list-style-type: none"> 1. State of CA 2. Foster City <p>DATE: 8/15/2018</p>	<p>Figure: 36 - Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMD, 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PHD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com</p>	<p>STATION: 327+00</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-557)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>
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BELMONT SLOUGH



PLAN
SCALE: 1" = 40'



PROFILE
SCALE: NTS

LEGEND:

- LIMIT OF TEMPORARY WORK
- LIMIT OF GRADING WORK
- HIGH TIDE LINE
- MEAN HIGH WATER LINE (EL=6.3 FT)
- AQUATIC RESOURCE AREA
- AQUATIC RESOURCE AREA PERMANENT IMPACT
- AQUATIC RESOURCE AREA TEMPORARY IMPACT

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.

DATE: NAVD 88

ADJACENT PROPERTY OWNERS:

- State of CA
- Foster City

DATE: 8/15/2018

Figure: 39 - Levee Aquatic Resource Area Impact

APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404

APPLICANT'S AGENT: Terry Huffman, PhD

Huffman-Broadway Group, Inc.

828 Mission Ave
San Rafael, CA 94901
415.395.1045 / thuffman@hb-group.com

STATION: 342+55

PROJECT NAME: Levee Protection Planning and Improvement Project

(CIP 301-857)

IN: waters of the United States

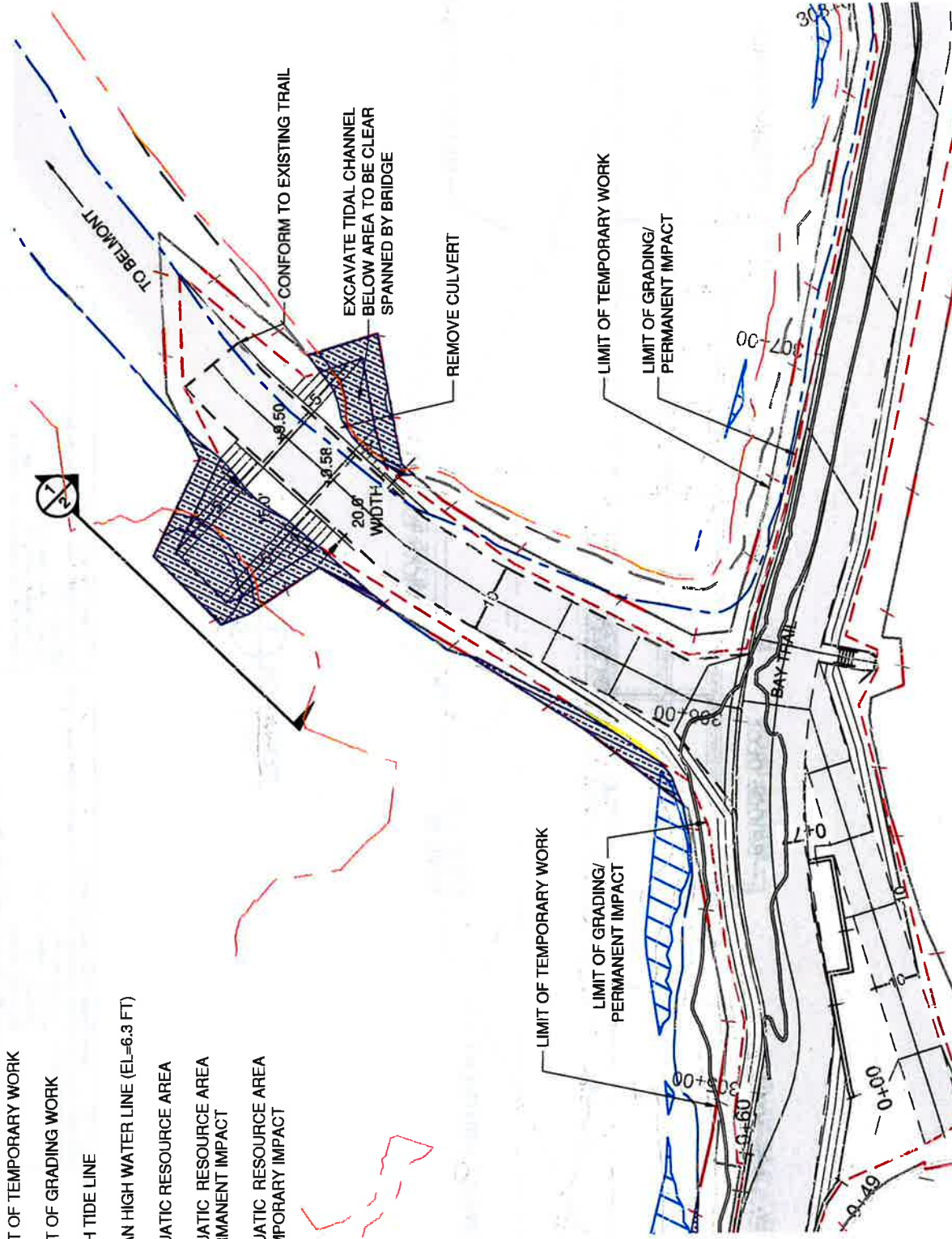
AT: Adjacent to existing City Levee System

COUNTY OF: San Mateo

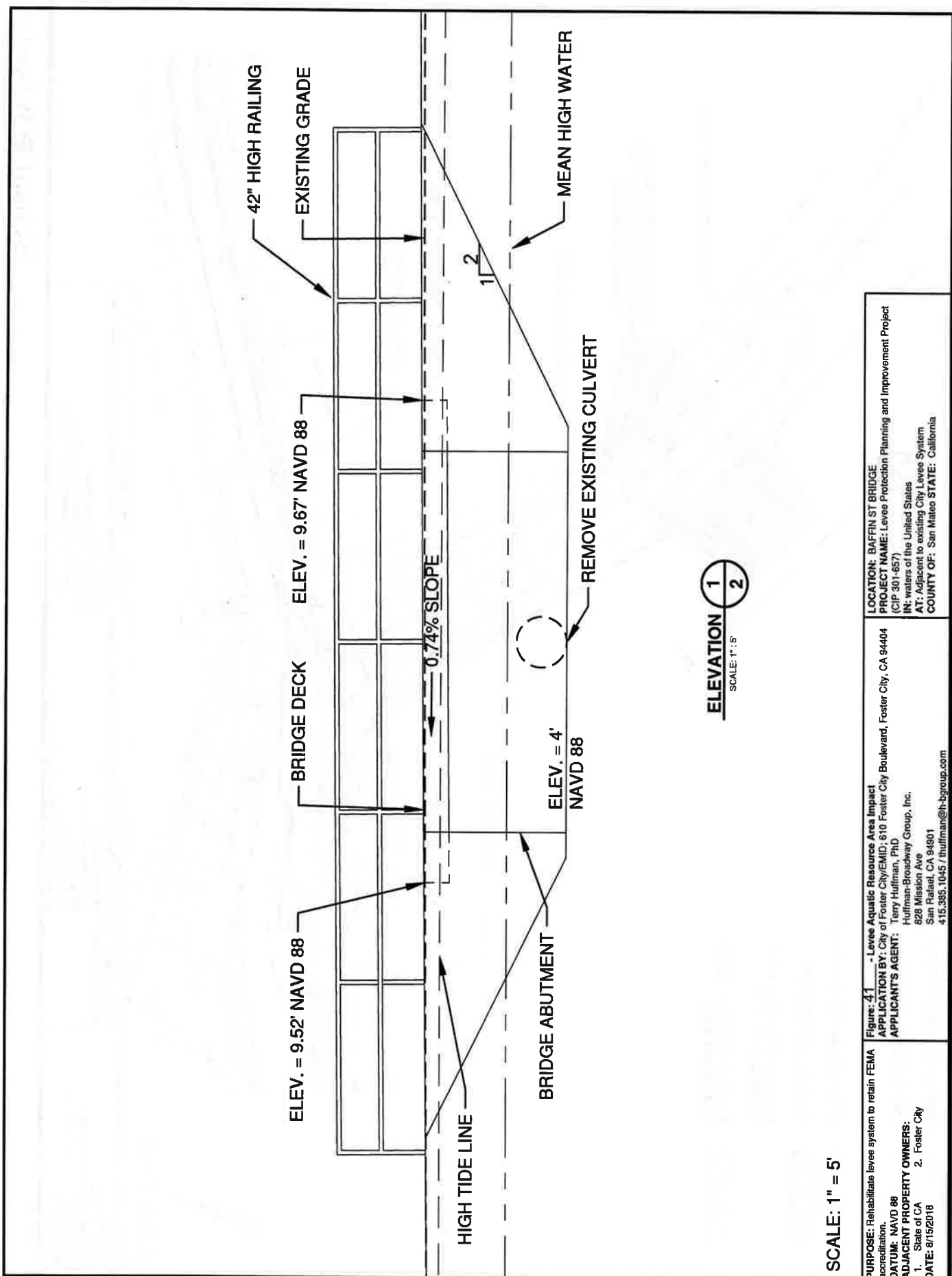
STATE: California

LEGEND:

- LIMIT OF TEMPORARY WORK
- - - LIMIT OF GRADING WORK
- - - HIGH TIDE LINE
- - - MEAN HIGH WATER LINE (EL=6.3 FT)
- ▨ AQUATIC RESOURCE AREA
- ▨ AQUATIC RESOURCE AREA PERMANENT IMPACT
- ▨ AQUATIC RESOURCE AREA TEMPORARY IMPACT



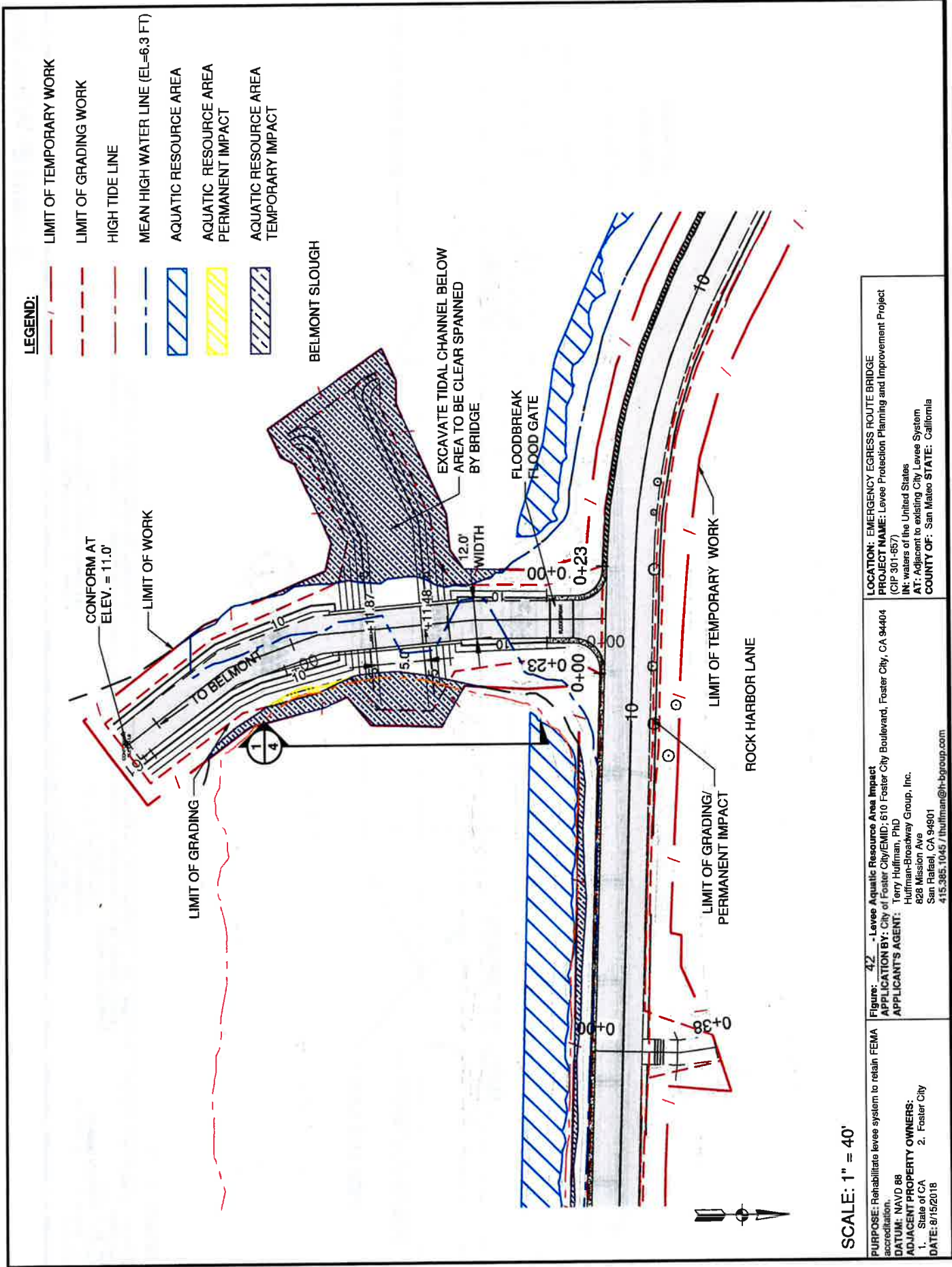
PURPOSE: Rehabilitate levee system to retain FEMA accreditation. DATUM: NAVD 88 ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City DATE: 8/15/2018	Figure: 40 - Levee Aquatic Resource Area Impact APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404 APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com	LOCATION: BAYVIEW ST BRIDGE PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657) IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
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ELEVATION 1
 SCALE: 1" = 5'
 2

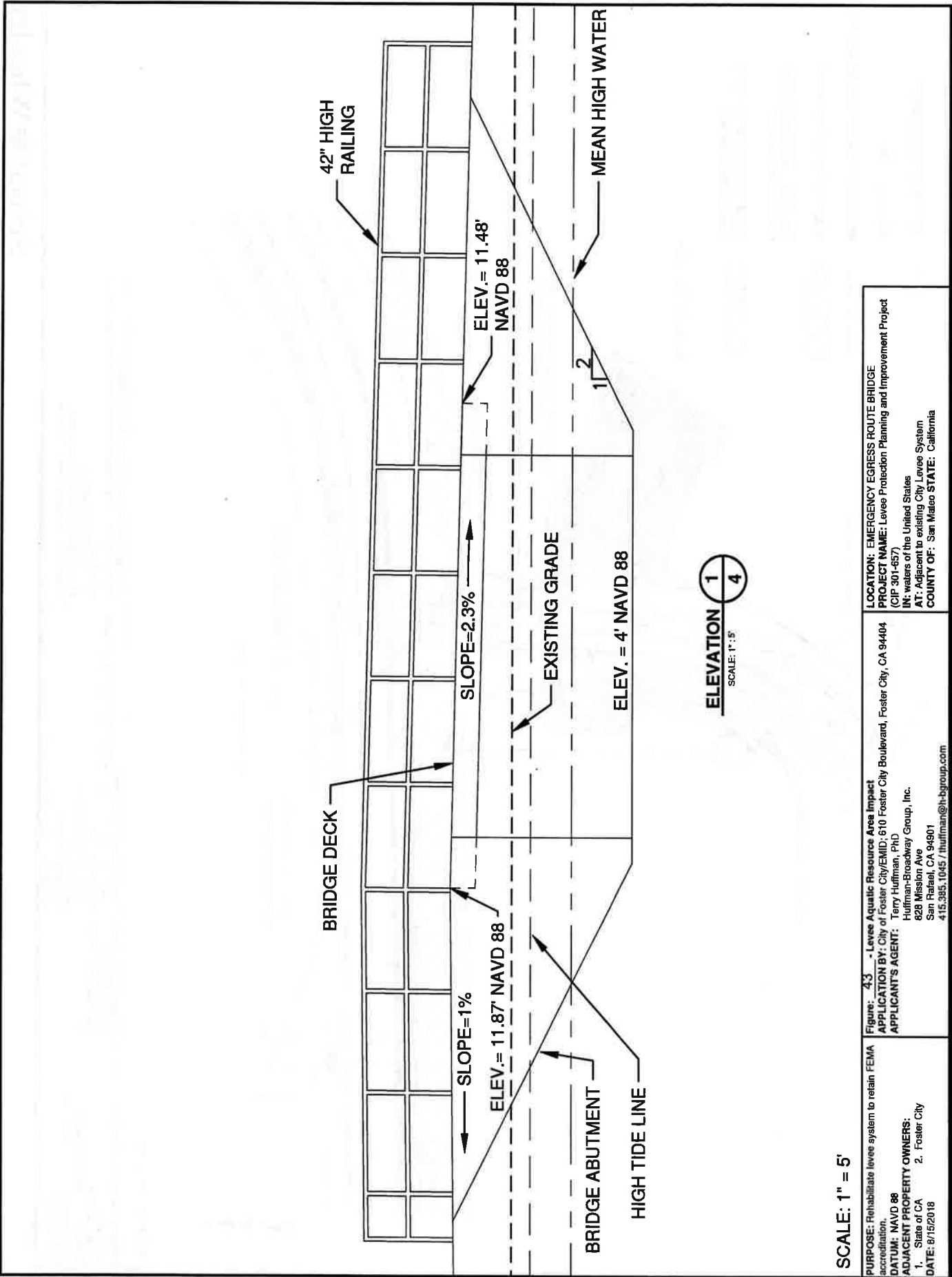
SCALE: 1" = 5'

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.	Figure: 4.1 APPLICATION BY: City of Foster City/EMID, 610 Foster City Boulevard, Foster City, CA 94404 APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com	LOCATION: BAFFIN ST BRIDGE PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-857) IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
DATUM: NAVD 88 ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City		
DATE: 8/15/2018		



SCALE: 1" = 40'

<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATE: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <ol style="list-style-type: none"> State of CA Foster City <p>DATE: 8/15/2018</p>	<p>Figure: 4.2 - Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com</p>	<p>LOCATION: EMERGENCY EGRESS ROUTE BRIDGE</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-857)</p> <p>INT: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo STATE: California</p>
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SCALE: 1" = 5'

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.	Figure: 43 - Levee Aquatic Resource Area Impact	LOCATION: EMERGENCY EGRESS ROUTE BRIDGE
DATE: NAVD 88	APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404	PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)
ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City	APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 628 Mission Ave San Rafael, CA 94901 415.395.1045 / thuffman@h-bgroup.com	INT: waters of the United States AT: Adjacent to existing City Levee System
DATE: 8/15/2018		COUNTY OF: San Mateo STATE: California



United States Department of the Interior

FISH AND WILDLIFE SERVICE
San Francisco Bay-Delta Fish and Wildlife Office
650 Capitol Mall, Suite 8-300
Sacramento, California 95814



In reply refer to:
08FBDT00-2019-F-0036

OCT 02 2019

Acting Regulatory Chief
U.S. Army Corps of Engineers
San Francisco District
450 Golden Gate Ave.
San Francisco, California 94102

Subject: Formal Consultation on the Foster City Levee Protection Planning and Improvements Project in San Mateo County, California (Corps File No: 2015-00391S)

Dear Acting Regulatory Chief:

This letter is in response to the U.S. Army Corps of Engineers' (Corps) October 29, 2018, letter requesting to initiate informal consultation with the U.S. Fish and Wildlife Service (Service) for the federally endangered salt marsh harvest mouse (*Reithrodontomys raviventris*)(SMHM) and the endangered California clapper rail (*Rallus longirostris obsoletus*)(CCR) on the Foster City Levee Protection Planning and Improvements Project (project) located in Foster City, San Mateo County, California. The Corps has determined that the proposed project may affect, but is not likely to adversely affect the SMHM and the CCR. The Corps' letter was received by the Service's San Francisco Bay-Delta Office on November 2, 2018. After review of the biological assessment (BA) and supplemental information, the Service determined the project may affect and is likely to adversely affect the SMHM and CCR and that formal consultation is warranted. This response and biological opinion is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act), and in accordance with the implementing regulations pertaining to interagency cooperation (50 CFR 402).

Recent genetic analyses of rail species resulted in a change in the common name and taxonomy of the large, "clapper-type" rails (*Rallus longirostris*) of the west coast of North America to Ridgway's rail (*Rallus obsoletus*) (Maley and Brumfield 2013; Chesser *et al.* 2014). Thus the California clapper rail (*Rallus longirostris obsoletus*) is now referred to in the scientific community as the California Ridgway's rail (*Rallus obsoletus obsoletus*). The change in the common name and taxonomy of the California clapper rail, however, does not change the listing status of the species under the Act and will be referred to by the original name in this document.

In reviewing this project, the Service has relied upon: (1) the Corps' letter to the Service dated October 29, 2018 requesting informal consultation and the attached October 2018, *Foster City Levee Protection Planning and Improvements Project (CIP 301-657) Foster City, California* BA for the project prepared by Huffman-Broadway Group, Inc. (consultant); (2) the May 21, 2019, updated project description sent by the consultant to the Service via electronic mail (email); (3)

additional telephone and email communication between the Corps, the Service, the City of Foster City Estero Municipal Improvement District (the City, applicant), and the consultant; and (4) other information available to the Service.

CONSULTATION HISTORY

November 2, 2018	The Service received the Corps' October 29, 2018, letter requesting informal consultation for the project.
March 11, 2019	The Service attended a site visit to discuss the project and consultation.
April 15, 2019	The Service sent an email to the Corps and the consultant transmitting comment on the BA and the appropriateness of formal consultation. The email also informed them that the applicant's proposal to purchase wetland credits from the San Francisco Bay Wetland Mitigation Bank cannot be used to mitigate impacts to SMHM habitat as the bank is not a Service-approved species bank.
April 25, 2019	The consultant sent a revised project description to the Service via email which included increases to total length of the proposed levee, increases to the total length of proposed sheet pile installation, changes in flood wall height, removal of a culvert replacement and of a new culvert from the project description, additional minimization measures, updated dates of construction, a newly proposed pilot channel, an increase in temporary impacts acreage, and an added area to the restoration/enhancement and creation of the muted tidal channel.
May 21, 2019	The consultant sent a revised project description to the Service via email which included reductions in permanent and temporary impacts and modifications to the overall acreages for the restoration/enhancement and creation of habitats in the muted tidal channel.
June 10, 2019	The consultant sent an email to the Service responding to the Service's April 15, 2019, email comments including the agreement that formal consultation would be consistent with similar projects.
August 10, 2019	The consultant sent an email to the Service clarifying actions in the project description and confirming that no night work was proposed.
September 9, 2019	The consultant sent an email to the Service providing additional proposed conservation measures for SMHM.

BIOLOGICAL OPINION

Description of the Proposed Action

The City proposes to rehabilitate 31,300 linear feet of the Foster City levee system to retain Federal Emergency Management Agency accreditation and to account for projected sea level rise to 2050. For planning purposes, the levee is divided into 3 distinct segments. Segment 1 begins at the northwestern end of the project near the East 3rd Avenue and Anchor Road intersection and follows along East 3rd Avenue to the San Mateo Bridge. Segment 2 begins at the San Mateo Bridge and continues along the shoreline to the south end of Shorebird Park near the start of Belmont Slough. Segment 3 begins at the north end of Belmont Slough to O'Neill Slough and the tidegate near Highway 101.

Sheet Pile Flood Wall

The sheet pile floodwall design will be composed of sheet pile 30 - 32 inches wide, 13.5 - 19 inches in depth, and will vary in height above the finish grade on the bay side depending on the location along the levee segment. The total length of sheet pile installed will be approximately 19,700 - 23,170 feet. On the trail side, the earthen levee will be raised with additional fill in locations where the finished floodwall elevation is higher than 3.5 feet above the trail. Depending on the location, preparation of the work site may require the removal of riprap and concrete debris. Sheet piles will be pushed into the bay mud where feasible, but where the substrate is too hard for this method, the sheet piles will be driven using vibratory hammers. The sheet piles will be driven sufficiently deep to provide adequate resistance against deflection from the tide, wave loads, and seepage protection. It is anticipated that the sheet piles will be driven approximately 10 - 20 feet underground.

The process of tying sheet piles into the tide gate or at the outflow structures begins with driving the sheet piles close to the existing structure and installing an expansion joint on the edge of the existing structure. Reinforced concrete will then be poured between the edge of the sheet piles and the structure.

Earthen Levee

The top of the existing levee will be excavated and conditioned to accept new engineered fill. The earthen levee will range from 13.5 - 15.5 feet in elevation and range in total length from 4,590 - 7,990 feet. The weight of the new fill will result in long-term settlement of the levee and supplemental fill will be placed during construction to account for future settlement. The base of the improved earthen levee will be expanded to support additional fill that may be placed in the future years to provide protection against future seal level rise. Conventional fill or lightweight fill may be used for the earthen levees. Lightweight fill will require the use of sheet pile barriers to minimize seepage.

Conventional Floodwall Design

The conventional floodwall design will be composed of a vertical wall that varies in height from 2.5 - 7 feet above the finish grade and 8 - 14 inches wide. The total length will be approximately 3,450 feet. The floodwall will be constructed of concrete and the wall design includes a

foundation that is generally as wide as the height for adaptive sea level rise protection. The foundation construction will require levee excavation at the top of the existing berm. A temporary sheet pile will be installed on the water side to ensure that the flood protection provided by the existing levee during construction is not compromised as a result of excavation for the foundation. Modification to existing levee sections below new floodwalls will be necessary if seepage is an issue. A slurry made of either cement or soil-cement mixture in situ or a permanent sheet pile barrier will be installed to prevent seepage. An additional earthen fill may be added to increase the height of the trail and reduce the relative height of the wall to enhance views of the San Francisco Bay and to ensure that the maximum wall height does not exceed 3.5 feet from the grade adjacent to the San Francisco Bay Trail (Bay Trail). After completion, if the City wanted to increase the wall height to adapt to future sea level rise, the base of the conventional floodwall structure will be designed to accommodate an increased wall height.

Access Ramps

Six access ramps will be deconstructed and constructed using conventional construction equipment and techniques. The demolition and rehabilitation of two of the access ramps that are below the high tide line will require dewatering of the work area. Dewatering will be accomplished by building a temporary cofferdam on the bay side of the levee during low tide. The location of the cofferdam will be within a 5-foot offset from the grading limit.

Staircases

Three staircases will be constructed. One will be constructed to maintain access to an existing public picnic area once the levee is raised on the Bay Trail at Station 82+82, another will be built within a concrete floodwall from Werder Pier to the shoreline at Station 102+79, and the last will be constructed opposite an access ramp from the Bay Trail to the shoreline near the Instrument Landing System Inner Marker at Station 111+12.

Lagoon Outfall Structure

The lagoon outfall structure will be deconstructed and then reconstructed. The deconstruction will begin by placing temporary flood protection measures around the lagoon outfall work area on the land side. Existing fencing, handrails, and concrete blocks on top of the original intake walls will be removed. An extension of the wall will be installed on top of the existing intake wall once the outfall walls are demolished down to the original concrete portion of the wall and will be a part of the concrete floodwall that will be constructed on the bay side of the levee. After the new wall extensions have cured, fill will be placed on the land side of the lagoon outfall and then will be paved. Work may occur below the high tide line which will include the construction of forms in order to shape and contain the new concrete fill.

Lagoon Intake Structure

The lagoon intake structure will be deconstructed and then reconstructed. The deconstruction will begin by placing temporary flood protection measures around the lagoon intake work area. Existing fencing, handrails, and concrete blocks on top of the original intake walls will be removed. An extension of the wall will be installed on top of the existing intake wall once the outfall walls are demolished down to the original concrete portion of the wall. After the

extension wall has cured, the lagoon intake gate stems will be raised to accommodate the increase in fill. New fill will be placed in 10-inch lifts behind the new wall on the land side on top of the levee. Amenities and handrails will be installed last. Work may occur below the high tide line which will include the construction of forms in order to shape and contain the new concrete fill.

Baffin Street Bridge

An approximately 30-inch diameter culvert extends under the Bay Trail from Belmont Slough into a non-tidal/muted tidal channel. This culvert will be replaced with a free spanning bridge to restore unobstructed tidal flows to the wetlands and improve the trail to provide safe emergency vehicle access. Implementation will require the placement of a sheet pile cofferdam on each side of the bridge location extending out about 5 feet from the toe of the slope. Once the cofferdams are in place, the work site will be dewatered and the old culvert and levee segment under the culvert will be excavated. A portion of the channel will be excavated to approximately 4 feet below grade. Concrete bridge abutments will be constructed on each side of the channel.

Emergency Egress Route Bridge at Station 331+00

The access trail at this location will be rehabilitated by raising the levee and replacing a portion of the levee trail with a free spanning bridge. Implementation will require the placement of a cofferdam on each side of the bridge location. Once the cofferdams are in place, the work site will be dewatered and the levee segment will be excavated. A channel will be excavated to approximately 4 feet below grade. Concrete bridge abutments will be constructed on each side of the channel and the new bridge constructed.

Staging Areas

The contractor will use six staging areas. Five will occur in developed areas such as asphalt-paved parking lots, gravel-covered parking lots, or a mixture of both. The sixth will occur in a ruderal vegetated upland of approximately 3.8 acres with salt grass vegetation nearby. Please refer to the BA for exact locations of the staging areas.

Equipment

The project will utilize heavy equipment such as backhoe/excavators, graders, bulldozers, cranes, sheet pile vibratory hammer, concrete mixers, dump trucks, and soil compact rollers. It will also utilize light duty trucks, passenger vehicles and various hand tools such as jackhammers and cutoff saws.

Scheduling/ Phasing

Proposed levee improvements will be constructed over 1.5 - 2 years. Project work is anticipated to begin during the spring of 2020 and be completed by the end of 2022 or early 2023.

Conservation Measures

Please refer to the project BA and the May 21, 2019, updated Engineering Form 4345 Application Continuation Sheet for standard best management practices, spill prevention plans, storm water pollution prevention plans, and other general conservation measures. The following conservation measures are with regard to SMHM and CCR.

1. Levee construction in Segment 3 will be conducted between September 1 and January 31 to avoid the nesting season of the CCR. If construction work is proposed after January 31 or prior to September 1, protocol surveys of CCR will be conducted to determine the extent and location of nesting CCR. Results of the protocol level breeding surveys will be submitted to the Service for a determination of whether work proposed within 700 feet of a CCR nest can occur. Reinitiation of this consultation may be required.
2. A Service-approved biological monitor will be present during any construction work such as earthen fill placement, wall installation, and restoration of temporary impacts to marsh habitat. The Service-approved biological monitor will have the authority to halt construction if a listed species is at risk or when non-compliant actions occur.
3. Prior to commencement of construction of the bridges, pickleweed (*Salicornia* sp.) and other vegetation will be removed from the areas that will be impacted using hand tools. Prior to removal, a Service-approved biologist will walk the work zone to ensure no SMHM nests exist.
4. If a SMHM or CCR is observed at any time during construction, work will not be initiated or will be stopped immediately by the Service-approved biological monitor until the SMHM or CCR leaves the vicinity of the work area of its own accord. If the SMHM or CCR does not leave the work area, work will remain halted unless the Service is contacted and has given authorization for work to proceed. The Service-approved biological monitor will direct the contractor on how to proceed accordingly in such situations. The Service-approved biological monitor or any other persons at the site will not pursue, capture, or handle any SMHM or CCR observed.
5. Prior to the commencement of construction activity in areas adjacent to salt marsh where suitable habitat is present, the Service-approved biological monitor shall conduct preconstruction surveys for that day to ensure that SMHM or CCR are not present within the work area.
6. Prior to the start of construction activities and after vegetation removal, exclusion fencing will be placed around the outboard side of the defined work area where suitable habitat is present to prevent SMHM from entering the work area. The fence shall be made of a material that doesn't allow SMHM to climb through or over and the bottom shall be buried so that SMHM cannot crawl under. All support for the fence shall be placed on the inboard side.
7. All project personnel will receive environmental training from the Service-approved biological monitor prior to the initiation of any on-site construction work. Training will include proper identification of CCR and SMHM, their occurrence near the project area,

their legal protections, circumstances under which CCR or SMHM may be encountered, and the various measures being implemented to reduce potential impacts to the species.

8. The general contractor, working with the Service-approved biological monitor, will ensure that construction work is scheduled to avoid extreme high tides when there is potential for SMHM to move to higher, drier grounds. All equipment will be staged on existing roadways away from the project site when not in use.
9. All personnel and any equipment will be required to stay within the designated work sited and access corridors to perform job-related tasks and will not be allowed to enter adjacent salt marsh wetlands, drainages, and habitat of listed species. Pets will not be allowed on or near the work site. Firearms will not be allowed in or near the work sites. All trash will be placed in closed containers and properly disposed of offsite on a daily basis. No fires will be permitted in the work sites.
10. Interpretative signage will be placed along the Bay Trail to encourage public awareness of wetlands ecology, endangered species life histories, species/predator interactions, and how predation of sensitive species can be minimized. Additional signs will be placed at various points to remind users of the Bay Trail with respect to a prohibition on dogs within the project area during the construction phase of the project.
11. Appropriate erosion control materials such as silt fence and straw rolls will be installed as needed during construction within the project area. Erosion control devices will be free of nylon mesh that could entrap animals.
12. Vegetation shall be planted along the outboard side of the sheet pile wall in all areas adjacent to salt marsh habitats to provide high tide refuge and cover for SMHM and CCR. Within 1 year after installation of sheetpile wall in locations adjacent to SMHM habitat, shrubs shall be planted approximately 1-3 feet from the sheetpile wall on the outboard side of the levee, in clusters of a minimum of three shrubs, and spaced a maximum of 100 feet apart from the edge of each cluster. Shrubs shall be installed prior to the rainy season (approximately October / December) and shall be native plants such as marsh gum plant (*Grindellia stricta* var. *angustifolia*) near the edge of the high tide line, and big salt bush (*Atriplex lentiformis*) and coyote bush (*Baccharis pilularis*) above the high tide line. Shrub species and installation locations shall be directed under the guidance of a biologist, and installation shall be monitored by the biologist to ensure no SMHM are impacted. Plantings shall be monitored for a minimum of 1 year and any shrubs that do not survive shall be replaced after the first year with the same species, or depending on site conditions, a more suitable native shrub species.
13. Night work is not anticipated and will be avoided to the fullest extent feasible.

Action Area

The Action Area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The Action Area for this section 7 consultation encompasses all areas that may be directly or indirectly affected as a result of activities for the project and the broader area that, while outside the construction zone,

may be directly or indirectly affected by vibrations, noise, dust, or movement associated with the proposed project. The total Action Area is approximately 153 acres and consists of: (1) 31 acres of the construction footprint along the Foster City levee system, the associated structures that are modified by the project, and the buffer/erosion control areas; (2) 10 acres of the temporary staging areas; and (3) 112 acres of CCR nesting habitat within 200 meters (656 feet) of construction activities where CCR may be affected from visual and noise disturbance.

ANALYTICAL FRAMEWORK for the JEOPARDY DETERMINATION

Section 7(a)(2) of the Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

The jeopardy analysis in this biological opinion considers the effects of the proposed Federal action, and any cumulative effects, on the rangewide survival and recovery of the listed species. It relies on four components: (1) the *Status of the Species*, which describes the rangewide condition of the species, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which analyzes the condition of the species in the Action Area, the factors responsible for that condition, and the relationship of the Action Area to the survival and recovery of the species; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the species; and (4) the *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the Action Area on the species.

Status of Species

California Clapper Rail

The status of California clapper rail and information about its biology, ecology, distribution, and current threats is available in the *Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (Service 2013). This document can be found at:

https://www.fws.gov/sfbaydelta/documents/tidal_marsh_recovery_plan_v1.pdf.

Critical habitat has not been designated for this species.

Salt Marsh Harvest Mouse

There are two subspecies of the salt marsh harvest mouse: the northern subspecies (*R. r. halicoetes*) and the southern subspecies (*R. r. raviventris*). Both subspecies are listed as endangered. The status of the salt marsh harvest mouse and information about its biology, ecology, distribution, and current threats is available in the *Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (Service 2013). This document can be found at: https://www.fws.gov/sfbaydelta/documents/tidal_marsh_recovery_plan_v1.pdf. Critical habitat has not been designated for this species.

Environmental Baseline

The project area is located on the outer shoreline levee system that encircles Foster City, California and is part of the larger Bay Trail that circumnavigates the San Francisco Bay. Foster City is primarily a dense residential and commercial development that is along the western shoreline of the South San Francisco Bay. It is bordered on the west and south by the cities of San Mateo, Belmont, and Redwood City which are also densely developed for residential and commercial use. Foster City itself has a man-made constructed enclosed boating channel within the center for residential use and the Bay Trail along the outer levee system is a multi-use trail for recreational hiking, biking, skating, and dog-walking that experiences continual human presence. Feral animals such as house cats are also present in considerable numbers as domesticated pets become loose or are abandoned and then reproduce. Habitat for the SMHM and CCR is primarily located in Segment 3 and in a portion of Segment 2 along Shorebird Park as described in the *Description of the Proposed Action*. Although SMHM has not been recorded to occur within the Action Area, focused trapping efforts or other surveys have not been conducted. SMHM have been found in nearby Bair Island to the south and suitable habitat between Bair Island and the Action Area could provide corridors for SMHM to migrate into the strips of suitable tidal marsh habitats within the Action Area that are along the outer shoreline of Belmont Slough adjacent to the San Francisco Bay. It is likely that CCR are present within the Action Area as CCR are documented to occupy the tidal marsh habitats of Belmont Slough and suitable nesting habitat is present.

Effects of the Proposed Action

Salt Marsh Harvest Mouse

Equipment noise, vibration, and increased human activity may interfere with normal behaviors. These behaviors include feeding, sheltering, movement between refugia and foraging grounds, and other essential behaviors of SMHM. Intolerable levels of disturbance that may force individual SMHM to flush from cover or prevent them from seeking available cover could expose them to a predation risk that otherwise would not occur. Areas surrounding the suitable habitat could provide the refugia and shelter needed by the SMHM temporarily during the duration of construction and the applicant's proposed conservation measures minimize adverse effects on the SMHM. Installing an exclusion fence, employing a Service-approved biologist, conducting preconstruction surveys, and conducting environmental awareness training for construction personnel will likely minimize adverse effects by reducing the likelihood of SMHM from coming in contact with construction equipment or personnel. Limiting construction activities to avoid high tide events will provide SMHM opportunities to find high ground and shelter without the potential threat of coming in contact with construction equipment or personnel. Planting vegetation along the outboard side of the sheet pile wall will provide some replacement of high tide refugia for the SMHM that would otherwise be removed through installation of the sheet pile wall.

There will be permanent impacts to 0.03 acre of tidal marsh habitat from the conversion of estuarine intertidal emergent wetland to estuarine intertidal unconsolidated shoreline when the pilot channels are excavated at the bridge crossings. This is considered to be a minor impact as the habitat is on the edge of a larger habitat zone and close to a manmade structure. Although it is considered to be permanent because of the length of time it will remain as unconsolidated

shoreline (> 2 years), the impacted area will likely recruit marsh vegetation over time. Temporary impacts of 0.25 acre around edges of suitable habitat throughout Segment 3 are anticipated due to the erosion control buffer.

Additional impacts to SMHM are possible from installation of the sheet piles along the levee system. Upland transition areas provide important refugial habitat during extreme high tides and the sheet pile has the potential to prevent SMHM from finding suitable vegetated higher elevation refugial areas when they are forced from the marsh plain. To minimize the potential loss of high tide refugia, the City is proposing to revegetate areas that could provide high tide refugia and the necessary cover on the outboard side of the sheet wall near areas of suitable SMHM habitat. The sheet pile itself could provide perching sites for raptors (falcons, hawks) or corvids (ravens, crows) who could then hunt for prey such as SMHM. Predator perching prevention devices are not proposed for the project as it was assumed by the applicant that the continuous human presence on the Bay Trail would discourage or deter raptors and corvids from utilizing the sheet pile walls as hunting perches. It is unknown whether the continuous human presence on the Bay Trail will deter predatory birds from perching. Corvids are known to become easily habituated around humans and would likely not be deterred and raptors may become habituated over time.

California Clapper Rail

No work is planned to occur in the intertidal salt marsh CCR nesting habitat; however, the applicant did not provide a requested noise analysis, so it is anticipated that any CCR occupying habitat within the extent of surrounding marsh near construction (approximately 200 meters) would likely be subject to noise and visual disturbance. Equipment noise, vibration, and increased human activity may interfere with normal behaviors. These behaviors include feeding, sheltering, movement between refugia and foraging grounds, and other essential behaviors of CCR. Intolerable levels of disturbance may force individual CCR to flush from cover or prevent them from seeking available cover and could expose them to a predation risk that otherwise would not occur. Noise or other construction disturbance during the CCR breeding season (February 1-August 31) could result in the loss of breeding activity or nest abandonment and the loss of all eggs and chicks in the nest. Work is currently planned to occur outside of the nesting season (September 1 – January 31) to minimize adverse effects to breeding and the additional conservation measures such as environmental awareness training and the use of a Service-approved biologist will minimize adverse effects outside of the breeding season for CCR.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the Action Area considered in this biological opinion. Future Federal actions unrelated to the proposed project are not considered in this section, because they require separate consultation pursuant to section 7 of the Act. The Service is not aware of specific projects that might affect the SMHM and CCR in the Action Area that are currently under review by State, county, or local authorities.

Conclusion

After reviewing the current status of the SMHM and CCR, the environmental baseline for the Action Area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the SMHM and CCR. This is based on the project being primarily completed along the levee system and developed portions of the project site, the majority of disturbance effects to the intertidal salt marsh habitats within the Action Area are small in size and temporary, permanent impacts are small in size and are near developed structures, and implementation of conservation measures.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act, provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Corps so that they become binding conditions of any grant or permit issued to the applicants, as appropriate, for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Corps must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

Amount or Extent of Take

The Service anticipates incidental take of individual SMHM and CCR will be difficult to detect or quantify because of the variable, unknown size of any resident population over time, and their elusive and cryptic behavior. Due to the difficulty in quantifying the number of CCR and SMHM that will be taken as a result of construction of the proposed project, the Service is quantifying incidental take in the form of:

1. Harm, by impairing essential behaviors such as foraging or predator evasion, of all SMHM within suitable habitat of the Action Area.
2. Harm, by the loss of 0.03 acre of suitable habitat for SMHM that is proposed to be permanently impacted in the Action Area.
3. Harm, by impairing essential behaviors such as foraging or predator evasion, of all CCR within the 112 acres of intertidal salt marsh habitat which includes all CCR within the extent of the tidal marsh near construction areas (~ 200 meters).

Upon implementation of the reasonable and prudent measures, incidental take associated with the project will become exempt from the prohibitions described under section 9 of the Act.

Effect of the Take

In the accompanying biological opinion, the Service determines that the levels of take are not likely to result in jeopardy to the SMHM and CCR.

Reasonable and Prudent Measure

The following reasonable and prudent measure is necessary and appropriate to minimize the effects of the proposed project to the SMHM and CCR:

1. The Corps through the applicant and its contractors will minimize the potential for harm of SMHM and CCR.

Term and Condition

In order to be exempt from the prohibitions of section 9 of the Act, the Corps shall ensure that the applicant and its contractors comply with the following term and condition, which implements its respective reasonable and prudent measure described above. This term and condition is non-discretionary.

1. Term and Condition 1 implements Reasonable and Prudent Measure 1:
 - a. The applicant shall minimize the potential for harm or other forms of take of the SMHM and CCR from project related activities by implementation of the *Conservation Measures* as described in the BA and in the *Description of the Proposed Action* in this biological opinion.
 - b. The Corps shall ensure that the applicant and its contractors comply with the *Reporting Requirements* below.
 - c. The applicant shall educate and inform personnel involved in the project as to the *Conservation Measures* and *Term and Condition* in this biological opinion.

Reporting Requirements

In order to monitor whether the amount or extent of incidental take anticipated from implementation of the project is approached or exceeded, the Corps through the applicant shall adhere to the following reporting requirements. Should this anticipated amount or extent of incidental take be exceeded, the Corps must reinitiate formal consultation as per 50 CFR §402.16.

1. The Service must be notified within 24 hours of the finding of any injured or dead listed species or any unanticipated damage to its habitat associated with the proposed project. Injured listed species shall be cared by a licensed veterinarian or other qualified person. Notification will be made to Jana Affonso, the Assistant Field Supervisor of the Endangered Species Division at the San Francisco Bay-Delta Fish and Wildlife Office, 650 Capitol Mall, Suite 8-300, Sacramento, California 95814 or by telephone at (916) 930-2664, and must include the date, time, and precise location of the individual/incident clearly indicated on a U.S. Geological Survey 7.5 minute quadrangle or other maps at a finer scale, as requested by the Service, and any other pertinent information. When an injured or dead individual of the listed species is found, the applicant through the Corps shall follow the steps outlined in the *Disposition of Individuals Taken* section below.
2. Sightings of any listed or sensitive animal species shall be reported to the Service and the California Natural Diversity Database (<https://www.wildlife.ca.gov/Data/BIOS>).

Disposition of Individuals Taken

Injured listed species must be cared for by a licensed veterinarian or other qualified person(s), such as the Service-approved biologist. Dead individuals must be sealed in a resealable plastic bag containing a paper with the date and time when the animal was found, the location where it was found, and the name of the person who found it, and the bag containing the specimen frozen in a freezer located in a secure site, until instructions are received from the Service regarding the disposition of the dead specimen. The Service contact persons are Jana Affonso, the Assistant Field Supervisor of the Endangered Species Division at: San Francisco Bay-Delta Fish and Wildlife Office, 650 Capitol Mall, Suite 8-300, Sacramento, California 95814 or by telephone at (916) 930-2664; and the Resident Agent-in-Charge of the Service's Office of Law Enforcement, 5622 Price Way, McClellan, California 95562, at (916) 569-8444.

REINITIATION – CLOSING STATEMENT

This concludes formal consultation for the Foster City Levee Protection Planning and Improvements Project. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is

exceeded, any additional take will not be exempt from the prohibitions of section 9 of the Act, pending reinitiation.

Please address any questions or concerns regarding this response to Brian Hansen, Endangered Species Biologist, at Brian_Hansen@fws.gov or (916) 930-5642 or Kim Squires, Section 7 Coordinator, at Kim_Squires@fws.gov. Please refer to Service file number 08FBDT00-2019-F-0036 in any future correspondence regarding this project.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Kaylee Allen', with a stylized flourish extending to the right.

Kaylee Allen
Field Supervisor

LITERATURE CITED

- Chesser, R.T., R.C. Banks, C. Cicero, J.L. Dunn, A.W. Kratter, I.J. Lovette, A.G. Navarro-Sigüenza, P.C. Rasmussen, J.V. Remsen, Jr., J.D. Rising, D.F. Stotz, and K. Winker. 2014. Fifty-fifth supplement to the American Ornithologists' Union *Check-list of North American Birds*. Auk 131: in press.
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- U.S. Fish and Wildlife Service. 2013. Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California. Sacramento Fish and Wildlife Office, Sacramento, California. xviii + 605 pp. http://www.fws.gov/sacramento/ES/Recovery-Planning/Tidal-Marsh/es_recovery_tidal-marsh-recovery.htm.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404-4731

August 28, 2019

Refer to NMFS No: WCRO-2018-00327

James Mazza
Acting Regulatory Branch Chief
San Francisco District, U.S. Army Corps of Engineers,
450 Golden Gate Avenue, 4th Floor, Suite 0134
San Francisco, California 94102-3406

Re: Endangered Species Act Section 7(a)(2) Concurrence Letter and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Foster City Levee Protection Project in San Mateo County, California (Corps File No. 2015-00391S)

Dear Mr. Mazza:

On October 29, 2018, NOAA's National Marine Fisheries Service (NMFS) received your request for a written concurrence that the U.S. Army Corps of Engineers' (Corps) proposed authorization of the Foster City Levee Protection Project (Project) under Section 404 of the Clean Water Act of 1973 (33 U.S.C. Section 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. Section 403) is not likely to adversely affect species listed as threatened or endangered or critical habitats designated under the Endangered Species Act (ESA). This response to your request was prepared by NMFS pursuant to section 7(a)(2) of the ESA, implementing regulations at 50 CFR 402, and agency guidance for preparations of letters of concurrence.

NMFS also reviewed the proposed action for potential effects on essential fish habitat (EFH) designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), including conservation measures and any determination made regarding the potential effects of the action. This review was pursuant to section 305(b) of the MSA, implementing regulations at 50 CFR 600.920, and agency guidance for use of the ESA consultation process to complete EFH consultation.

This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). A complete record of this consultation is on file at NMFS North-Central Coast Office in Santa Rosa, California.

Proposed Action and Action Area

Foster City (City) is a planned community constructed on engineered landfill in the marshes of San Francisco Bay during the 1960's, and currently supports a population of over 30,000 residents. The City proposes to rehabilitate 5.9 miles of the City's 6.5-mile levee system by raising the elevation of the levee to meet current Federal Emergency Management Agency (FEMA) standards, retain FEMA accreditation, and provide protection for the anticipated sea level elevation of year 2050. Along existing levees, the Project will install sheet pile floodwall, earthen levee, and conventional



floodwall to reinforce the levee system. The Project also includes rehabilitating ancillary structures associated with the levee system, including access ramps, bridges, culverts, tide gates, utilities, and trails, so they will continue to function as originally designed and meet current local, state and federal regulatory requirements.

The Project will be constructed over a three-year period with in-water work restricted to the period between June 1 and November 30. Staging areas for all Project activities will be located in upland areas away from San Francisco Bay and tidal slough waters. The equipment that may be used for the construction activities will include a vibratory pile driver, sheet pile installation equipment, backhoe/excavator, bulldozer and crane; grader, crane trucks, concrete mixer, concrete pump, soil compactor roller, man-operated compactor, jackhammer, a cutoff saw, dump and flatbed trucks, and hand tools.

Levee System Protection

Levee improvement construction activities will occur on top of the existing levee system in dry conditions. Steel sheet pile floodwall will be installed over a distance between 3.74 miles (19,770 feet) and 4.38 miles (23,170 feet). Earthen levee will be installed between 0.86 miles (4,590 feet) and 1.50 miles (7,990 feet). The lengths proposed for sheet pile floodwall and earthen levee are presented as a range because the City has not made a final determination regarding a reach 0.64 miles (3,400 feet) long where the Project will install either sheet pile floodwall or earthen levee. The remaining 0.65 miles (3,450 feet) of the City's 5.9-mile (31,300 feet) levee repairs will be protected by installation of conventional concrete floodwalls on top of the levee.

The sheet pile floodwall design will be composed of sheet pile up to 20 inches wide, and will vary in height above the finish grade on the San Francisco Bay side depending on the location along the levee segment. To install sheet piles, a vibratory hammer will be used to place the sheets to depths of 10-20 feet. Driving will occur up to eight hours per day, six days per week, and spread over a duration of three years (approximately 250 work days total). There will be at least a 12-hour break between consecutive pile driving days. Approximately 100 linear feet of sheet pile will be installed per day. The distance from the proposed sheet piles to the Bay shore will vary along its length, and will be approximately 13 feet at its closest. Earthen levee protection methods consist of raising the existing earthen levee and expanding the levee with fill in various locations. Conventional concrete floodwall will be composed of a vertical wall that varies in height above the finish grade. All levee improvement construction activities for all three types of levee improvement methods (sheet pile floodwall, earthen levee, conventional concrete floodwall) will not occur in water, they will occur on top of the existing levee at upland elevations.

To ensure that the level of flood protection provided by the existing levee during construction is not compromised because of excavation for the foundation, a temporary sheet pile wall will be installed by vibratory hammer in dry conditions on the Bay side. Silt fences and straw wattles will be deployed as needed to contain loose sediment. Depending on the location, preparation of the work site may require the removal of riprap and concrete debris. In various locations, trails adjacent to levee improvements will be improved through fill and paving. The majority of improvement work will occur at upland elevations significantly above mean higher high water (MHHW). A total of 0.17 acres of the construction activities described above will occur in tidal marsh and tidal mudflat (see Table 1 below). The placement of concrete, steel rebar, and engineered fill material will occur in

0.06 acres of tidal habitat to raise the levee elevation and install concrete bridge abutments for the two freespan bridges (see *Ancillary Structures – Bridge Installation* below).

Table 1. Acres of tidal habitat affected by project activities. For additional detail, see the Mitigation and Monitoring Plan (July 2019).

Activities	Short-term or Long-term Effect	Tidal Marsh Acres ('Estuarine Intertidal Emergent Wetland' in BA and MMP)	Tidal Mudflat Acres ('Estuarine Intertidal Unconsolidated Shore' in BA and MMP)	Total Area (acres) and Nature of Effect (Disturbance or Restoration)
Levee System Protection				
Installation and removal of temporary sheet piles, silt fences, and straw waddles	Short-term	0.14	0.03	0.17 disturbance
Installation of levee protection structures in various locations; including freespan bridge abutments	Long-term	0.03	0.03	0.06 disturbance
Ancillary structures – Access Ramps				
Temporary sheet pile cofferdams	Short-term	n/a	0.07	0.07 disturbance
Reconfiguration of existing concrete path and rock riprap	Long-term	n/a	n/a	0.05 disturbance to artificial concrete and rock area
Ancillary structures – Bridge Installation at O'Neill Slough remnant channel				
Temporary sheet pile cofferdams	Short-term	n/a	0.12	0.12 disturbance
Removal of earthen levee and one culvert	Short-term	0.10	0.02	0.12 disturbance
Excavate and Place sediment for beneficial reuse in remnant channel	Short-term	n/a	1.0	1.0 disturbance
Installation of two freespan bridges creating full tidal exchange	Long-term	3.17	2.13	5.3 restoration
Subtotals	Short-term disturbance	0.24	1.24	1.48 disturbance
Subtotals	Long-term disturbance	0.03	0.03	0.06 disturbance
Subtotals	Long-term restoration	3.17	2.13	5.3 restoration

Ancillary Structures – Access Ramps

Six existing access ramps will be upgraded to allow for pedestrian and emergency rescue watercraft access. Project activities for four of those access ramps will occur above the high tide line (*i.e.*, above ordinary high water). The other two access ramps include portions below MHHW and will be widened from approximately 3 feet wide to a respective 17 feet and 5 feet wide. To facilitate ramp widening, both ramp work areas will be isolated from Bay waters with temporary cofferdams (described below). Approximately 0.05 acres of existing riprap and concrete path will be removed from below MHHW within the footprint of the cofferdams during construction, and will be replaced with a new concrete path and return the riprap that was removed along the access ramps. No new riprap will be imported for use in these locations. Rock size varies from quarter-ton to one-ton rock. The new access ramp alignment will be graded, compacted, and filled with sediment, base rock, rebar, and poured concrete. The rock riprap and sediment fill underneath will be placed to match the existing approximate 2:1 (horizontal:vertical) slope. The existing access ramps will be deconstructed and new ramps constructed using conventional construction equipment.

To isolate the work area from Bay waters, temporary sheet pile cofferdams will be constructed for the two access ramps. The cofferdams will cover an area approximately 0.07 acres (0.05 acres Access Ramp 1; and 0.02 acres Access Ramp 2), and will be installed for approximately one month each. It will take one day to install each cofferdam.

Ancillary Structures – Bridge Installation

The Project will restore tidal marsh and mudflat habitat by installing two freespan bridges at each end of the 5.3-acre O'Neill Slough remnant channel to allow full tidal exchange. The remnant channel is connected to Bay waters on the west end through an existing culvert, and the east end terminates at an earthen levee. The east end of the channel near Baffin Street will be excavated, and the existing culvert and pedestrian pathway will be replaced with a new bridge (Baffin Street Bridge) over the new tidal channel. The west end's existing earthen levee and pedestrian pathway will be excavated, and a new bridge (Emergency Egress Bridge) will be constructed over the new tidal channel for pedestrian access and an emergency route for vehicles. The excavated channels to allow tidal exchange under both bridges will be approximately 15 feet wide under each bridge, and 35 feet wide in the excavated slough channel. The length of each channel will be approximately 80 feet long. The total area excavated will be 0.12 acres. Concrete abutments for both bridges will be constructed in the same footprint of the excavated earthen levees on each side of the new tidal channels. For both bridges, the base of the abutments will enter the sediment at the new channel bottom at 4 feet NAVD88. All deconstruction and construction activities will take place from the top of the levee.

Excavated sediment (462 cubic yards) from both the east culvert and west levee ends of the channel will be assessed for placement in the O'Neill Slough remnant channel as beneficial reuse to augment the natural sedimentation accretion process. Placement will occur over approximately 1 acre of the 5.3-acre channel along the margin at low tide when no water is present. Before placement, the excavated sediment will first be deemed suitable using standards of the San Francisco Bay Dredged Material Management Office (DMMO) for the beneficial reuse of dredge material. If the sediment is determined to be contaminated or not suitable for other reasons then the excavated material will be disposed at an appropriate landfill.

To isolate the work areas from Bay waters, temporary sheet pile cofferdams will be constructed for the two bridge locations. The cofferdams will cover a 0.12-acre area (0.04 acres at Baffin Street Bridge, and 0.08 acres at Emergency Egress Bridge), and will be installed for approximately five months each. It will take one day to install the cofferdam at the Baffin Street Bridge and up to three days at the Emergency Egress Bridge.

Ancillary Structures – Water Control Structures

The Project will extend the life of the intake and outflow structures of Foster City's manmade inner lagoon by raising the elevation of the levee at those structures. The lagoon's intake structure is composed of three slide gates on the Bay side of the lagoon that coincide with three 3.5-foot diameter culverts. The culverts are approximately 500 feet long that connect San Francisco Bay via Belmont Slough to Foster City's inner lagoon. Three flap gates on the lagoon side of the culverts prevent backflow of water from the lagoon to Belmont Slough. Bay water is allowed to passively enter the lagoon through the intake by gravity (*i.e.*, no pumping) two to three times during summer and fall months (June-October) to raise water levels lost due to evaporation, and improve water quality and aesthetics. One or two of the slide gates are partially or fully raised during a high tide, adding Bay water to the lagoon. Trash bars are installed at the Belmont Slough face of the intake structure to minimize the amount of floating debris that enters the lagoon.

Outflow pumps on the north end of the lagoon are operated at least once a month for 30 minutes to ensure functional operation and discharge lagoon water directly to the San Francisco Bay. Before major winter storm events, the lagoon's water level is lowered by the outflow pumps through two 5.5-foot diameter steel pipes into a concrete forebay with box culverts connecting to the Bay. Flap gates are installed on the Bay side of the discharge pipes to prevent tidal water backflow into the lagoon. Foster City lagoon discharge is regulated under the San Francisco Bay Region Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit, Order No. R2-2015-0049, NPDES Permit No. CAS612008. Additional details regarding the operation of the lagoon can be found in the 1993 Foster City Lagoon Management Plan.

The deconstruction of the lagoon outfall on the lagoon side of the levee and the inner lagoon intake on the Bay side of the levee will begin by placing temporary forms around both work areas at upland elevations to maintain existing flood protection. Outfall and intake walls will be demolished down to the original concrete portion of the wall, and extensions of the walls will be installed on top. After the new wall extensions have cured, sediment fill will be placed on the land side on top of the levee of the lagoon outfall and intake structures, followed by pouring of concrete. No work will occur on the gates themselves. No work is anticipated below the high tide line. All deconstruction and construction activities will occur on the land side and take place from the top of the levee.

Conservation Measures

The measures described below will be undertaken by the City during Project construction and post-construction to avoid and minimize environmental effects:

- 1) The majority of work will occur on top of the levee in dry conditions. Work will be conducted in a six-foot buffer on each side of the wall or extent of new earthen levee fill. Silt curtains, straw waddles, and similar sediment controls will be used during levee improvement, access ramp, and freespan bridge building activities.

2) The following conservation measures apply to the four temporary cofferdams at the bridge and access ramp locations:

- To minimize sound levels during sheet pile installation, steel sheet piles will be vibrated or hydraulically pressed in depending on the configuration of the substrate.
- To prevent fish entrainment during installation, the sheet piles will be installed beginning from the upslope end, and the final piece will be slowly placed from the upslope end. A biologist will be on site to ensure there are no fish within the work zone prior to the cofferdam being sealed. Cofferdams will be removed during one period of low tide when the cofferdam will not be encroached by tidal waters.
- To prevent fish entering cofferdams during construction activities, the height of the cofferdam walls will be higher than extreme high tide to prevent water overtopping during high tide.
- To minimize suspended sediment levels in water being pumped out of the cofferdams, water seeping into the cofferdams will be pumped to a settling tank or settling basins. Water will then be slowly pumped through a filtration bag and discharged as sheet flow over vegetated slopes near the top of the levee slope approximately five feet above MHHW. Before removing temporary cofferdams the suspended sediment will be allowed to settle before removing the cofferdams.

3) Best Management Practices (BMPs) to prevent sediment and hazardous materials from entering Bay waters will be employed to protect the water quality of adjacent wetlands and waters, including San Francisco Bay, from untreated construction stormwater runoff. More details regarding BMP implementation and associated monitoring will be included in the Project's Standard Urban Stormwater Mitigation Plan/Storm Water Low Impact Development plan to treat stormwater before it is discharged from the construction site. The plan will be subject to the San Francisco Regional Water Quality Control Board (SFRWQCB) approval (Construction General Permit, Order No. 2009-0009-DWQ, NPDES No. CAS000002).

4) Areas disturbed during construction activities will be restored to pre-project contours and, if appropriate, planted or hydro-seeded with native wetland vegetation. Site restoration performance and maintenance monitoring will occur for a five-year period after affected areas are restored to pre-project contours.

5) To help compensate for artificial fill effects to tidal wetland habitat in the action area, the Project will purchase credits in the San Francisco Bay Wetland Mitigation Bank in Redwood Shores¹ on a 1:1 basis. Credits will account for long-term effects to 0.06 acres of aquatic resources from artificial fill (0.03 acres of 'intertidal unconsolidated shore' ('tidal mudflat' hereafter) and 0.03 acres of 'intertidal emergent wetland' ('tidal marsh' hereafter) credits. More details regarding mitigation credits are described in the Project's monitoring and mitigation plan (MMP), dated July 2019. In

¹ The proposed project is located within the service area for the San Francisco Bay Wetland Mitigation Bank, which qualifies as compensatory mitigation for project impacts to tidal waters and wetlands and is located near Redwood City, California. For more information, please see the Corps Regulatory In-lieu Fee and Bank Information Tracking System (RIBITS) website link: https://ribits.usace.army.mil/ribits_apex/f?p=107:2

2008, NMFS assessed the effects of the San Francisco Bay Wetland Mitigation Bank in Redwood Shores in a combined ESA section 7 and EFH consultation (NMFS PCTS number SWR-2008-740).

There are no interrelated or interdependent activities associated with this Project.

Action Area

The action area for the Project includes approximately 5.9 miles of existing levees surrounding Foster City along the San Francisco Bay shoreline, including narrow bands of land, vegetation, landscaping, or Bay waters on either side of the existing levees, and proposed construction staging areas. The Project site starts at the Foster City/City of San Mateo boundary in the north (adjacent to East 3rd Avenue), extends parallel to Beach Park Boulevard and Belmont Slough to the east and southeast, and ends adjacent to U.S. Highway 101 in the south at the City of San Mateo/City of Belmont boundary. The existing levee consists of both raised earthen levees and raised earthen levees with concrete floodwalls. The existing elevation of levee berms and concrete walls ranges from approximately 11 to 13 feet above the North American Vertical Datum of 1988 (NAVD88). MHHW in the action area is 6.2 feet NAVD88. The margin along the Bay shoreline of the levee consists of primarily rock riprap shoreline stabilization. In the intertidal margin along the rock riprap there exists intertidal mudflat and tidal marsh habitat, where the typical San Francisco Bay benthic and pelagic invertebrates inhabit (*e.g.*, clams and snails, crustaceans, worms).

The O'Neill Slough remnant channel historically connected O'Neill Slough on the west end with Belmont Slough on the east end. The existing culvert on the east end has resulted in a muted tidal connection between the remnant channel and Belmont Slough. The earthen levee completely separates the tidal connection with O'Neill Slough on the west end. As a result, habitat conditions in the remnant channel of O'Neill Slough are highly degraded with excessive algal growth, high summer temperatures, low dissolved oxygen, and low prey resource productivity.

The Foster City inner lagoon is a manmade estuary extending from north to south in a meandering alignment, and the average depth is approximately six feet deep. Its surface area is approximately 232 acres, and has an average water surface elevation of 1.6 feet NAVD88. The lagoon ranges in width from about 200 feet wide along most of its length to over 1000 feet at the lake near East Hillsdale Boulevard. As described above, there is an intake-only tide gate structure between the lagoon and Belmont Slough, which connects with San Francisco Bay approximately 0.75 miles from the intake structure. The intake is opened for a gravity flow of Bay water during one tidal cycle two to three times during summer and fall months, which creates a potential for larval and juvenile estuarine fish to enter the lagoon. Foster City monitors dissolved oxygen, pH levels, temperature, and other water quality parameters under the NPDES permit (described above) and in accordance with the Foster City Lagoon Management Plan (LMP). Recent water quality data for the past year, collected by the Estero Municipal Improvement District, show some areas of the lagoon becoming hypoxic at less than 5 milligrams per liter (mg/L) during summer and fall months, and winter and spring months are typically above 5 mg/L. The LMP states that the lagoon seasonally experiences problems with excessive aquatic weed growth, algae blooms, and excessively high bacteria levels that prevent or diminish recreational use.

Action Agency's Effects Determination

Regarding the ESA, the Corps has determined that the proposed Project may affect, but is not likely to adversely affect (NLAA) listed species and their critical habitat. This determination is based on

the majority of construction activities being located in upland areas, small in-water work areas and associated work window restrictions, installation of cofferdams during low tide, and additional conservation measures.

Available information indicates the following listed species' Distinct Population Segments (DPS) under the jurisdiction of NMFS may be affected by the proposed Project:

Central California Coast steelhead DPS (*Oncorhynchus mykiss*)

threatened (71 FR 834; January 5, 2006);

critical habitat (70 FR 52488; September 2, 2005);

North American green sturgeon southern DPS (*Acipenser medirostris*)

threatened (71 FR 17757; April 7, 2006);

critical habitat (74 FR 52300; October 9, 2009).

The life history of steelhead is summarized by NMFS (1996; 2016). Central California Coast (CCC) steelhead use the San Francisco Bay primarily as a migration corridor, passing through the Bay on their way to the ocean to rear as juveniles or to upstream areas to spawn as adults. Adult steelhead typically begin their upstream migrations in early December, and juvenile steelhead migrate downstream through estuary during the late winter and spring months (Fukushima and Lesh 1998).

The life history of green sturgeon in California is summarized by Heublein *et al.* (2017) and NMFS (2015). The southern DPS (sDPS) of North American green sturgeon spawn in the deep turbulent sections of the upper reaches of the Sacramento River. As juvenile green sturgeon age, they migrate downstream and live in the lower delta and bays, spending from three to four years there before entering the ocean. Within San Francisco Bay, information provided by Kelly *et al.* (2007) suggests depths less than 10 meters (33 feet) may be preferred during foraging and migration. Adult green sturgeon return from the ocean every few years to spawn, and generally show fidelity to their upper Sacramento River spawning sites. Adult sDPS green sturgeon enter San Francisco Bay in late winter through early spring and juvenile and adult sDPS green sturgeon may be present in San Francisco Bay and in the action area year-round.

Regarding EFH, the Corps has determined that the proposed action may adversely affect EFH, based on short-term elevated turbidity levels and habitat disturbance, and long-term alteration of benthic habitat. The Project area is located within an area identified as EFH for various life stages of fish species managed under the Pacific Groundfish Fishery Management Plan (FMP), the Coastal Pelagic Species (CPS) FMP, and the Pacific Coast Salmon FMP. San Francisco Bay, including the Project area, is also designated as an estuary habitat area of particular concern (HAPC) for various federally managed fish species as defined in the Pacific Salmon and Groundfish FMPs.²

Consultation History

The Corps initiated informal consultation with NMFS by letter dated October 29, 2018. The Corps' letter also transmitted a biological assessment and Project designs.

² For more information on HAPCs designated under the Groundfish and Salmon FMPs, please see page 102 of the Groundfish FMP at http://www.pcouncil.org/wp-content/uploads/2017/03/GF_FMP_FinalThruA27-Aug2016.pdf, and page 6 of the Salmon FMP Appendix A at http://www.pcouncil.org/wp-content/uploads/Salmon_EFH_Appendix_A_FINAL_September-25.pdf.

NMFS requested additional information by letter dated December 11, 2018, to the Corps regarding multiple topics, including consultation scope, operation of intake and outfall structures, monitoring, habitat impacts, culvert and bridge alternatives, dewatering methods, and compensatory mitigation. Beginning in late December 2018, the consultation was held in abeyance for 38 days due to a lapse in appropriations and resulting partial government shutdown. Consultation resumed on January 28, 2019. The City's consultant Huffman-Broadway Group (HBG) responded to a portion of NMFS' information request by email on January 3, 2019, and January 18, 2019, regarding locations of short-term and long-term effects resulting from Project activities. NMFS requested additional information by email on January 31, 2019, regarding details of short-term and long-term effects, cofferdam installation, and habitat conditions.

On February 26, 2019, a phone call with HBG and NMFS was held to discuss the Project's construction schedule. On the call, NMFS also requested additional information and clarification on habitat effects recalculated by HBG. By email on February 28, 2019, HBG provided information to NMFS regarding water control structure operation, quantity and type of habitat impacts, and tidal restoration.

On March 11, 2019 the City led a tour of multiple sites proposed for construction in the Project. Participating agencies included the Corps, NMFS, U.S. Fish and Wildlife Service, Environmental Protection Agency, San Francisco Bay Conservation and Development Commission, San Francisco Bay Regional Water Quality Control Board, and Project consultants.

From April through June 2019, HBG provided additional information and updates to NMFS by email regarding the construction timing and amount of anticipated habitat impacts.

On July 16, 2019, NMFS received an email from HBG delivering the Project's 'Mitigation and Monitoring Plan (MMP).' NMFS requested additional details regarding anticipated sound levels from pile driving by email on July 18, 2019. HBG submitted pile driving information on July 31, 2019.

ENDANGERED SPECIES ACT

Effects of the Action

Under the ESA, "effects of the action" means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR 402.02). The applicable standard to find that a proposed action is not likely to adversely affect listed species or critical habitat is that all of the effects of the action are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or critical habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur.

During construction, the effects of the proposed action to species are reasonably likely to include the potential risk of fish entrapment in temporary cofferdams, elevated underwater sound levels, degraded water quality, and tidal wetland habitat disturbance. Post-construction, the effects of the proposed action to species are reasonably likely to include the operation of the inner lagoon intake

structure, the persistence of the levee structure in the environment, long-term tidal habitat disturbance, and tidal habitat restoration.

Effects to Listed Fish Species

The installation and removal of the temporary cofferdams are the Project's only in-water activities occurring during construction. By restricting the in-water construction activities to the period June 1 to November 30, the in-water construction schedule avoids the primary migration periods of juvenile and adult CCC steelhead in the action area. Thus, the presence of steelhead in the action area during in-water construction activities (installation and removal of temporary sheet pile cofferdams) is very unlikely. Steelhead juveniles require freshwater and relatively cool water temperatures for summer rearing, and waters of the action area are tidal. As presented below, potential impacts to fish associated with Project activities are expected to be short-term and fully dissipate when in-water construction activities cease. Therefore, any in-water construction-related effects from the proposed Project to CCC steelhead are expected to be discountable.

Threatened sDPS green sturgeon are known to occur within San Francisco Bay year-round. Therefore, juvenile, sub-adult, and adult sDPS green sturgeon may be in the Project area during construction activities, and may be subjected to the effects of potential fish entrapment in temporary cofferdams, elevated underwater sound levels, and degraded water quality. Regarding fish entrapment, the likelihood of green sturgeon to be in the shallow water work areas during a cofferdam closure is exceedingly small. Green sturgeon in the action area are relatively large fish, and are unlikely to remain in shallow water areas during the disturbances and sound vibrations of sheet pile driving to build cofferdams. Sturgeon would likely disperse to adjacent available wetted areas in tidal marsh, mudflat, or other nearby aquatic habitats prior to cofferdam completion. The cofferdams will be installed over a short duration, between one and three days, and will be closed using measures to avoid fish entrapment. This will be done by installing all but one sheet of the cofferdam, leaving an opening at the lowest point in the enclosure, and installing the remaining sheet at low tide when little or no water is present. A biologist will be onsite during all cofferdam installations. The installed cofferdam will be of a sufficient height to prevent water from entering the cofferdam during periods of high tide. Cofferdams will be removed during one period of low tide when the cofferdam will not be encroached by tidal waters. For these reasons, the potential for entrapment of sDPS green sturgeon in temporary sheet pile cofferdams is expected to be discountable.

The Project proposes to install sheet piles with vibratory hammers for floodwall construction along 3.74 miles and 4.38 miles of levee. Sheet piles will also be installed to create temporary cofferdams at the access ramp and bridge construction sites. The sheet piles installed for the temporary cofferdams will be subject to the Project's in-water work window (June 1 – November 30), and the sheet pile floodwall installation at the top of the levee will occur throughout the year. Elevated underwater sound levels resulting from driving sheet piles with a vibratory hammer may affect steelhead and green sturgeon. Based on results of hydroacoustic monitoring at various pile driving projects (Buehler *et al.* 2015), vibratory hammers have been determined to generate lower sound levels and different sound wave forms that do not cause physical injury or mortality to fish. Sheet pile floodwall will be driven on top of the levee on dry ground a minimum of 13 feet away from the Bay shore and the sound attenuation provided by passing through the ground will limit the propagation of elevated underwater sound levels in the shallow water of the adjacent shoreline. If CCC steelhead or green sturgeon are present and react behaviorally to the sound produced by construction activities, they are expected to vacate the immediate area affected by elevated sound

levels. Adjacent areas with adequate water depths and habitat area exist in South San Francisco Bay to provide sufficient area for green sturgeon and CCC steelhead to disperse and forage. Based on the above, the effects of elevated underwater sound levels during sheet pile driving and removal are expected to be insignificant to CCC steelhead and sDPS green sturgeon.

Installing and removing temporary cofferdams and placement of sediment in the O'Neill Slough remnant channel may potentially increase suspended sediment levels in Bay waters, potentially degrading water quality. If sediment loads in the water column remain high for an extended period of time, the primary productivity of an aquatic area may be reduced (Cloern 1987) and fish may suffer reduced feeding ability and be prone to fish gill injury (Benfield and Minello 1996; Nightingale and Simenstad 2001). However, in-water activities by the Project are not expected to increase suspended sediment levels due to sediment controls being implemented (silt fences, straw wattles). Excavated sediment will be placed at low tide on exposed substrate in the O'Neill Slough remnant channel when no water or listed fish are present. The following high tide after sediment placement may suspend loose sediment, but tidal water movement is expected to quickly dissipate suspended sediment to background levels after a few hours. Water that has seeped into cofferdams, settled, filtered, and discharged at the access ramps will not contact Bay waters because it will be discharged on the inland side of the levee. Water that seeps into the temporary cofferdams from O'Neill Slough at the freespan bridge installation sites will be pumped out, settled, filtered, and discharged onto the top slope in ruderal habitat adjacent to the O'Neill Slough remnant channel at the top of the levee slope, approximately five feet above MHHW. Suspended sediment levels are expected to be at or below background levels because the water source and destination are the same (O'Neill Slough), and the water will be settled and filtered before being discharged. Sediment may be mobilized in the cofferdam area during Project activities occurring within the cofferdam, and the suspended sediment will be allowed to settle before removing the cofferdams. Based on the above, elevated suspended sediment levels in tidal waters are expected to be minor, and effects to sDPS green sturgeon and CCC steelhead are expected to be insignificant.

Upon completion of the project, the City will operate the lagoon intake structure at Belmont Slough during warm season months (June to November). Very small numbers of sDPS green sturgeon may be in the vicinity of the intake during Foster City's intake operations. Adult and smolt CCC steelhead migrate during winter and spring months, and are not expected to be present during intake operations. The intake will operate very infrequently, two to three times during summer and fall months for several hours per occurrence during high tide. The intake is passive (*i.e.*, no pumps), and water flow into the inner lagoon is expected to be slow, although no velocity measurements have been recorded. The presence of a trash rack, tide gates, and dark lighting of the 500-foot long, 3.5-foot diameter culverts are expected to act as deterrents for green sturgeon. Green sturgeon in South San Francisco Bay are juveniles, sub-adults, and adults which are relatively large fish and possess a strong swimming ability. Thus, green sturgeon in the action area are unlikely to be forcibly entrained from Belmont Slough into the City's inner lagoon by a passive water control structure based on gravity flow (*i.e.*, no pumping). Based on the above, the risk of entrainment to CCC steelhead and sDPS green sturgeon at the intake tide gate structure is expected to be discountable.

Effects to critical habitat

The action area is located within designated critical habitat for CCC steelhead and sDPS green sturgeon. The physical and biological features (PBFs)³ of designated critical habitat for CCC steelhead include estuarine areas free of obstruction with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation. The PBFs of designated critical habitat for green sturgeon in estuarine areas include food resources, water flow, water quality, migratory corridor, water depth, and sediment quality.

During construction, short-term disturbance of 0.24 acres of tidal marsh habitat and 1.24 acres of tidal mudflat (see Table 1) will occur from: (1) the installation and removal of temporary sheet pile cofferdams for the two access ramps (one month), (2) installation and removal of temporary sheet pile cofferdams for the two freespan bridges (five months), and (3) levee protection activities. Excavation and placement of sediment in O'Neill Slough for tidal restoration is also included in the above total. Tidal marsh and mudflat habitat can provide foraging and refuge PBFs for steelhead and green sturgeon critical habitat. Detrital input from marsh habitat supports invertebrate productivity within the marsh and on adjacent channels and mudflats (Warwick and Price 1975). As the tide recedes, fish can retreat to subtidal areas in adjacent channels and shoreline areas (Levy and Northcote 1982; Hering et al. 2010). There may be a short-term reduction in PBFs that support foraging and refuge for steelhead and green sturgeon until cofferdams are removed, and disturbed tidal marsh vegetation and benthic invertebrates can recover. However, the total area that will be temporarily affected by Project activities is very small (approximately 1.48 acres) and distributed amongst multiple sites which will allow for rapid recovery to pre-project conditions. Upon Project completion, the City will actively revegetate and monitor disturbed tidal marsh areas to ensure successful recovery. In addition, tidal marsh vegetation and benthic invertebrates will naturally recruit and colonize from immediate areas, and are expected to provide the same foraging habitat function compared to pre-project conditions. Based on benthic community recovery rates reported by Oliver *et al.* (1977) and Watling *et al.* (2001), recovery of the invertebrate community from Project activities is expected to occur within several weeks, and tidal marsh vegetation is expected to begin recruitment within several months (the effects of restored tidal exchange are presented below).

Upon completion of the Project, 5.9 miles of levee surrounding the City will be improved, allowing it to persist until projected 2050 sea level rise elevations. The levee system was originally constructed in the 1960's, and enabled engineered landfill to replace tidal marsh, mudflat, and unconsolidated shore habitat of the eastern San Mateo Peninsula. The Foster City levee has degraded fish habitat conditions along the shoreline portion of the action area and this Project's repairs will maintain this existing degraded condition. Small fish, including juvenile anadromous salmonids, utilize natural estuary shorelines for foraging and refuge. Natural estuarine shorelines can provide terrestrial, epibenthic, and planktonic prey for fish, and natural biogenic and geomorphic structures

³ The designation(s) of critical habitat for these species used the term primary constituent element (PCE) or essential features. The new critical habitat regulations (81 FR 7414) replace these terms with physical or biological features (PBFs). This shift in terminology does not change the approach used in conducting our analysis, whether the original designation identified PCEs, PBFs, or essential features. We use the term PBF from this point forward in this letter to mean PCE or essential feature, as appropriate for the specific critical habitat.

along the shoreline limit access for larger predators (Simenstad *et al.* 1982; Beck *et al.* 2001; Sheaves *et al.* 2015; Munsch *et al.* 2016). Installing levees with steep hardened shorelines often creates deeper shoreline and waterfront areas that can be inhabited by larger predators and exclude fish that normally utilize softer shallower shoreline substrates (Munsch *et al.* 2017). Epibenthic (Morley *et al.* 2012) and terrestrial (Dugan *et al.* 2008; Sobocinski *et al.* 2010) invertebrates are negatively impacted along hardened shorelines, decreasing prey resources for estuarine fish (Dethier *et al.* 2016; Heerhartz *et al.* 2016). The original installation of the Foster City levee system has precluded the long-term existence of shallow intertidal habitat (*e.g.*, mudflat, beach, tidal marsh) along the shore margin, and has likely precluded the expansion of vegetated subtidal shallow water habitat (*e.g.*, eelgrass) that can provide prey resources for salmonids and green sturgeon. The proposed Project will continue to maintain this existing degraded condition of the shoreline by improving the levee system.

Regarding water quality from the lagoon outflow, discharges are regulated by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) through the Municipal Regional Stormwater NPDES Permit. Foster City has an approved NPDES permit (Order No. R2-2015-0049, NPDES Permit No. CAS612008) for discharge from the outlet structure to Bay waters. Pursuant to the Municipal Regional Stormwater Permit, tenants within the drainage area operate under an approved stormwater pollution prevention plan (SWPPP) that must sufficiently control, treat, or dilute runoff to meet the standards of the San Francisco Bay Basin Water Quality Control Plan (SFBRWQCB 2015). The City's compliance with Municipal Regional Stormwater Permit conditions are expected to contain and limit the discharge of contaminants to levels that are protective of all beneficial uses in San Francisco Bay, including listed fish. The potential water quality effects associated with stormwater discharge from the lagoon outflow are expected to be insignificant to CCC steelhead and sDPS green sturgeon.

Regarding tidal habitat and long-term disturbance, the Project will install concrete, steel rebar, and engineered fill material in 0.06 acres (0.03 tidal marsh, 0.03 tidal mudflat) to raise the levee elevation and install concrete bridge abutments for the two freespan bridges. Upgrading the two access ramps will alter an additional 0.05 acres below MHHW. Shoreline stabilization structures typically lack structural complexity and sever ecological connections to natural shallow tidal habitat processes, altering the vegetative and benthic community composition; ultimately reducing prey resources and refuge for fish (Munsch *et al.* 2017). However, the reconfiguration of the two access ramps will not result in any change to PBFs of critical habitat because it will remain composed of concrete path and rock riprap with a wider path and less riprap. The fill of 0.06 acres of narrow tidal marsh shore margin and tidal mudflat with concrete and riprap may affect PBFs that support foraging and refuge for steelhead and green sturgeon critical habitat. However, the concrete bridge abutments will be constructed on each side of the channel within the footprint of the earthen levee that will be excavated to install the bridges, and thus not significantly altering PBFs for steelhead and green sturgeon. The tidal marsh and mudflat habitat on and adjacent to the levee has been degraded by the original installation of the levee, as described above, and these area's pre-project conditions are not expected to be providing significant foraging or refuge benefits for steelhead and green sturgeon. Based on the above, Project activities resulting in fill are not expected to significantly reduce PBFs that support foraging or refuge availability for steelhead and green sturgeon in the action area.

Restoring full tidal exchange to the O'Neill Slough remnant channel is expected to provide benefits to 5.3 acres (3.17 acres tidal marsh, 2.13 acres tidal mudflat) of critical habitat in the action area by installing two freespan bridges. Existing degraded tidal habitat that is now bounded by a culvert and earthen levee will be restored through the installation of the two freespan bridges. To avoid ponding and associated risk of fish stranding within the remnant channel at low tide, the final depth of the two excavated tidal channels will be determined by a bathymetric survey so that the channel drains to O'Neill Slough (western end) and Belmont Slough (eastern end). Within several months after tidal connectivity is restored, marsh vegetation and benthic invertebrates are expected to begin recruiting to the area. During high tides, juvenile salmonids, green sturgeon, and other estuarine fish will have access to the restored slough and benefit from increased opportunities for foraging and refuge. As the tide recedes, fish will be able to retreat to subtidal areas in adjacent channels and shoreline areas (Levy and Northcote 1982; Hering *et al.* 2010). Detrital input from marsh habitat supports invertebrate productivity within the marsh and on adjacent channels and mudflats (Warwick and Price 1975). The productivity of crustaceans, polychaete worms, gastropod and bivalve mollusks, and other salmonid and green sturgeon invertebrate prey (Harvey *et al.* 1977) is expected to increase as a result of slough restoration. Based on the above, the restoration of 5.3 acres of tidal marsh and mudflat habitat is expected to provide benefits to steelhead and green sturgeon designated critical habitat.

Conclusion

Based on this analysis, NMFS concurs with the Corps that the proposed action is not likely to adversely affect the subject listed species and designated critical habitats.

Reinitiation of Consultation

Reinitiation of consultation is required and shall be requested by the Corps or by NMFS, where discretionary Federal involvement or control over the action has been retained or is authorized by law and (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this concurrence letter; or if (3) a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16). This concludes the ESA portion of this consultation.

MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT

Under the MSA, this consultation is intended to promote the protection, conservation and enhancement of EFH as necessary to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. For the purposes of the MSA, EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity", and includes the associated physical, chemical, and biological properties that are used by fish (50 CFR 600.10), and "adverse effect" means any impact which reduces either the quality or quantity of EFH (50 CFR 600.910(a)). Adverse effects may include direct, indirect, site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

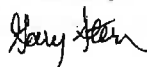
Based on information provided by the Corps and the City, proposed construction activities could include temporary elevated underwater sound levels, degraded water quality, and tidal wetland habitat disturbance. NMFS has determined that the proposed Project would adversely affect EFH

designated under the Pacific Groundfish and Coastal Pelagic Species FMPs. However, as presented above, effects resulting from short-term disturbance to tidal habitat during construction activities are minimal and localized. Therefore, NMFS has no EFH Conservation Recommendations to provide. Regarding long-term post-construction effects, the City will purchase credits in the San Francisco Bay Wetland Mitigation Bank to compensate for long-term effects to 0.06 acres of shoreline habitat (0.03 acres tidal marsh, 0.03 acres tidal mudflat). The mitigation bank is located in San Francisco Bay just offshore from Redwood City, California, and credits will be purchased on a 1:1 basis. In addition, the Project proposes to restore habitat in 5.3 acres of O'Neill Slough by restoring full tidal exchange, as described above. Thus, Project activities are expected to result in a net increase in quality and quantity of tidal wetland habitat.

The Corps must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR 600. 920(l)). This concludes the MSA portion of this consultation.

Please direct questions regarding this letter to Brian Meux, North-Central Coast Office in Santa Rosa, California at (707) 575-1253, or via email at brian.meux@noaa.gov.

Sincerely,



Gary Stern
San Francisco Bay Branch Chief
North-Central Coast Office

cc: Naomi Schowalter, Army Corps of Engineers, San Francisco District
Robert Perrera, Huffman-Broadway Group, San Rafael, California
Copy to ARN File # 151422WCR2016SR00012

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**Aquatic Resources Mitigation Plan
for the City of Foster City
Levee Protection Planning & Improvement Project
(CIP 301-657)**

Prepared For:

City of Foster City

Prepared By:

**Huffman-Broadway Group, Inc.
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1.0 INTRODUCTION

This Aquatic Resources Mitigation and Monitoring Plan (MMP) has been prepared for the City of Foster City Levee Protection Planning & Improvement Project (CIP 301-657) (Project) by the Huffman-Broadway Group, Inc. (HBG). Appendix A, Figure 1 shows the Project location. This MMP has been designed to mitigate for the permanent and temporary loss of Federal and State wetlands and other waters (aquatic resources) resulting from the Project. Plan objectives are described below in Section 1.1. The plan elements are described in Sections 2 thru 11. They include:

Section 2.0 Mitigation Approach	Section 7.0 Performance Monitoring Plan
Section 3.0 Baseline Information for Impact and Compensation Sites	Section 8.0 Adaptive Management Plan
Section 4.0 Baseline Information	Section 9.0 Long-Term Management Plan
Section 5.0 Maintenance Inspection and Action Plan	Section 10.0 Mitigation Site Protection
Section 6.0 Mitigation Performance Criteria	Section 11.0 Financial Assurances

1.1 Objectives

The objectives of this MMP are to provide mitigation to compensate for Project impacts that cannot be avoided or minimized resulting from:

1. Permanent impacts to aquatic resources resulting from the Foster City Levee & San Francisco Bay Trail (levee and trail)¹ construction activities.
2. Temporary impacts to aquatic resources resulting from levee and trail construction activities.
3. Temporary impacts to aquatic resources resulting from O'Neill Slough bridge construction activities.

Table 1 summarizes the types of aquatic resources either permanent or temporary impacted by the Project. Section 2.0 provides details regarding how mitigation will be provided for both permanent and temporary impacts. Appendix A, Figure 9 shows the general locations of these impact areas.

Table 1. Summary of Aquatic Resources Impacted by the City of Foster City Levee Protection Planning & Improvement Project (CIP 301-657)		
Permanent Levee & Trail Construction Impacts	Aquatic Resource Type	Impact (AC)
	Estuarine Intertidal Emergent Wetland	0.03
	Estuarine Intertidal Unconsolidated Shore	0.03
	Estuarine Intertidal Rocky Shore Rubble Artificial	0.02
	Palustrine Emergent Wetlands	0.009
Total Acres		0.09
Temporary Levee & Trail Construction Impacts	Estuarine Intertidal Emergent Wetland	0.14
	Estuarine Intertidal Unconsolidated Shore	0.03
	Estuarine Intertidal Rocky Shore Rubble Artificial	0.01
	Palustrine Emergent Wetland (in-board, non-tidal side of levee)	0.29

¹ <http://baytrail.org/>; [Senate Bill 100](#), authored by then-state Senator Bill Lockyer and passed into law in 1987, directed the Association of Bay Area Governments (ABAG) to develop a plan for this regional trail system including a specific alignment for the Bay Trail. [The Bay Trail Plan](#), adopted by ABAG in July 1989, includes a proposed alignment; a set of policies to guide the future selection, design and construction of routes; and strategies for implementation and financing.

Table 1. Summary of Aquatic Resources Impacted by the City of Foster City Levee Protection Planning & Improvement Project (CIP 301-657)		
Total Acres		0.47
Temporary O'Neill Slough Bridge Construction Impacts	Estuarine Intertidal Emergent Wetland	*0.10
	Estuarine Intertidal Unconsolidated Shore	0.02
Total Acres		0.12

1.2 Responsible Parties

Responsible parties overseeing mitigation activities:

**City of Foster City/
Estero Municipal Improvement District (Permittee):**
Jeff Moneda, PE
City/District Manager
610 Foster City Boulevard
Foster City, CA 94404
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2.0 MITIGATION APPROACH

Table 1 shows that a total of 0.09 acre of permanent impacts to aquatic resources will occur. This includes an 0.039-acre impact to wetlands and an 0.05-acre impact to other waters of the U.S. and State for the levee and trail (Appendices D and E). Temporary impacts associated with levee and trail improvements include 0.43-acre of wetlands and 0.04-acre of other waters. Temporary impacts associated with the O'Neill Slough bridge construction include 0.10-acres of wetlands and 0.02-acres of other waters (Appendices D and E). The following describes how both permanent and temporary Project impacts will be compensated for.

2.1 Permanent Impacts

2.1.1 Site Selection

In accordance with the Corps of Engineers (Corps) and U.S. Environmental Protection Agency (USEPA) mitigation guidelines, the Corps is requiring that all permanent adverse impacts to aquatic resources that cannot be avoided or minimized be mitigated for through a mitigation bank. Aquatic resources permanently impacted by levee and trail improvements will be mitigated for through a mitigation bank purchase of credits from the San Francisco Bay Wetland Mitigation Bank (See Appendix A, Figures 3 & 9).

2.1.2 Credit Determination

The mitigation ratio proposed is 1:1 (Impacted / Re-established). The rationale for the 1:1 mitigation ratio is summarized as follows:

1. The bank is in the same watershed situated along Belmont Slough adjacent to Foster City (Appendix A, Figures 3, 5 & 6);
2. The mitigation bank through restoration / re-establishment² has established both tidal wetland and tidal other waters;
3. Replacement of permanently impacted aquatic resources will occur through the purchase of credits prior of Project construction impacts;
4. All but 0.009 acres of the 0.09-acre of permanently impacted aquatic resources is "in-kind" habitat mitigation; and
5. The 0.009 acre of seasonal emergent wetlands is being rehabilitated to its former tidal marsh condition prior to the construction of the Foster City levee system which will result in a gain in aquatic resource function for San Francisco Bay.

2.2 Temporary Impacts

2.2.1 Site Selection

All aquatic resource areas degraded by temporary construction activities will be restored / rehabilitated to regain natural/historic functions temporarily lost during construction. These areas are shown by Appendix C.

² At the time the Bank was created the term "Creation" was used. This term is synonymous with the new terminology "restoration and re-establishment".

2.2.2 Credit Determination

Temporary Project impacts to aquatic resources can be separated into two Project specific construction areas: (1) levee and trail improvement (Appendix C) and (2) O'Neill Slough bridge construction areas (Appendix D). Table 2 summarizes by aquatic resource type how permanent and temporary Project impacts are compensated for in terms of mitigation method, mitigation credit ratio, and mitigation approach. How mitigation ratios were determined is as follows:

Levee and Trail Improvements. All temporarily impacted aquatic resource areas associated with levee and trail improvements will be restored / rehabilitated at a 1:1 ratio. No further compensation is being provided for temporary impacts to these areas. The rationale for the 1:1 mitigation ratio is summarized as follows:

1. The practicability of accomplishing ecologically self-sustaining aquatic resource restoration / rehabilitation is high given that hydric soils remain present and pre-impact hydrology conditions can be restored which allow for hydrophytic vegetation to become re-established naturally and / or with planting.
2. The temporary impacts would last less than 12 months.

O'Neill Slough Bridge Construction. All temporarily impacted aquatic resource areas associated construction of two bridges will be restored / rehabilitated at a 1:1 ratio. No further compensation is being provided for temporary impacts to these areas. The rationale for the 1:1 mitigation ratio is summarized as follows:

1. The practicability of accomplishing ecologically self-sustaining aquatic resource restoration is high given that hydric soils remain present and pre-impact hydrology conditions can be restored which allow for hydrophytic vegetation to become re-established naturally and / or with planting.
2. The temporary impacts would last less than 12 months.

The bridge construction will also result in a net gain of aquatic resource area, 0.05-acre estuarine intertidal unconsolidated shore (former earthen levee), and function through restoration / re-establishment. This restoration will result from the installation of two bridges along the pedestrian trail (one on the south side and one on the western end of O'Neill Slough) which will allow for the ability to restore full tidal exchange of waters to the existing degraded aquatic resources within O'Neill Slough. In addition, restoring full tidal exchange will increase the reach of the tidal height an additional 1-foot resulting in the restoration / re-establishment (conversion of uplands to former wetlands) of 0.11-acre of uplands to estuarine intertidal emergent wetlands along the upper reach of the shoreline of O'Neill Slough. Tidal flow to O'Neill Slough from Belmont Slough was degraded by channelization of the O'Neill Slough and fill placement during the 1970's. Restoration of unimpeded tidal flow to O'Neill Slough from Belmont Slough and from O'Neill Slough to Belmont Slough will result from the excavation of channels through the trail under the constructed bridge overcrossings (Appendix D).

2.2.3 Mitigation Definitions

The definitions of the mitigation terms *restoration*, *re-establishment*, and *rehabilitation*³ used above are as follows:

Restoration. The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in tidal aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

1. *Re-establishment* is the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former wetland. Re-establishment results in rebuilding a former wetland and results in a gain in wetland acres.
2. *Rehabilitation* is the manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function but does not result in a gain in aquatic resource area.

Project Impact by Aquatic Resource Type	Impact (AC)	Method of Compensation	Mitigation Ratio	Credits (C) / Acres (AC)	Mitigation Approach
Permanent Levee & Trail Improvement Impacts:					
Estuarine Intertidal Emergent Wetland	0.03	Mitigation Bank ⁴ (Restoration / Re-Establishment)	1:1	0.03 (C)	Purchase mitigation bank credits.
Estuarine Intertidal Unconsolidated Shore	0.03	Mitigation Bank (Restoration / Re-Establishment)	1:1	0.03 (C)	Purchase mitigation bank credits.
Estuarine Intertidal Rocky Shore Rubble Artificial	0.02	Mitigation Bank (Restoration / Re-Establishment)	1:1	0.02 (C)	Purchase mitigation bank credits.
Palustrine Emergent Wetlands	0.009	Mitigation Bank (Restoration / Re-Establishment)	1:1	0.009 (C)	Purchase mitigation bank credits.
Total	0.09			0.09 (C)	
Temporary Levee & Trail Improvement Impacts:					
Estuarine Intertidal Emergent Wetland	0.14	Restoration and Rehabilitation ⁵	1:1	0.14 (AC)	Restoration and Rehabilitation: Silt fence and hay waddles removed. Area reseeded with native seed mix and monitored for 3 years to ensure area revegetates.

³ <https://www.epa.gov/wetlands/wetlands-restoration-definitions-and-distinctions>

⁴ San Francisco Bay Wetland Mitigation Bank

⁵ <https://www.epa.gov/wetlands/wetlands-restoration-definitions-and-distinctions>

2.0 MITIGATION APPROACH

Table 2. Types of Aquatic Resource Impacted and Mitigation for Impacts					
Project Impact by Aquatic Resource Type	Impact (AC)	Method of Compensation	Mitigation Ratio	Credits (C) / Acres (AC)	Mitigation Approach
Estuarine Intertidal Unconsolidated Shore	0.03	Restoration and Rehabilitation	1:1	0.03 (AC)	Restoration and Rehabilitation: Silt fence and hay waddles removed. This water type is unvegetated, mostly shells along unvegetated beach, therefore reseeding is not recommended.
Estuarine Intertidal Rocky Shore Rubble Artificial	0.01	Restoration and Rehabilitation	1:1	0.01 (AC)	Restoration and Rehabilitation: Rip-Rap removed to accommodate access path construction will be replaced in-kind.
Palustrine Emergent Wetland (in-board, non-tidal side of levee)	0.29	Restoration and Rehabilitation	1:1	0.29 (AC)	Restoration and Rehabilitation: Silt fence and hay waddles removed and temporary staging area at Sea Cloud Park removed. Area reseeded with native seed mix and monitored for 3 years to ensure area revegetates.
Total Acres	0.47			0.47 (AC)	
Temporary O'Neill Slough Bridge Construction Impacts:					
Estuarine Intertidal Emergent Wetland	*0.10 (AC)	Restoration and Rehabilitation	NA	0.10 (AC)	Restoration & Rehabilitation: Removal of the earthen walking path and one existing culvert, to accommodate two free spanning bridges and reshaping of slough underneath to a bottom depth of 0.5 ft NAVD, will result in restoring full tidal action to this aquatic resource.
		Restoration and Re-Establishment	NA	0.11 (AC)	Restoration & Re-Establishment: Restoring full tidal exchange will increase the reach of the tidal height an additional 1-foot resulting in the restoration / re-establishment (conversion of uplands to former wetlands) of 0.11-acre of uplands to estuarine intertidal emergent wetlands along the upper reach of the shoreline of O'Neill Slough.
Estuarine Intertidal Unconsolidated Shore	0.02 (AC)	Restoration and Rehabilitation	NA	0.02 (AC)	Restoration & Rehabilitation: Removal of the earthen walking path and one existing culvert, to accommodate two free spanning bridges and reshaping of slough underneath to a bottom depth of 4 ft NAVD, will result in restoring full tidal action to this aquatic resource.
		Restoration and Re-Establishment	NA	0.05 (AC)	Restoration & Re-Establishment: Removal of the earthen walking path, to accommodate two free spanning bridge and reshaping of slough underneath to a bottom depth of 4 ft NAVD, will result in restoring full tidal action to 0.05-acre of aquatic resource which is currently an upland site but was historically an aquatic resource.
Total Acres	0.12 (AC)			5.30 (AC)	Rehabilitation = 5.14 acres Re-Establishment = 0.16
* Excavating a channel from the Emergency Egress Route Bridge (Station 331+00) will convert 0.02 acres of the 0.10 acre of estuarine intertidal emergent wetland to Estuarine Intertidal Unconsolidated Shore. This 0.02-acre conversion will be offset by the re-establishment of 0.11 acre of uplands to estuarine intertidal emergent wetlands.					

3.0 BASELINE INFORMATION FOR IMPACT AND COMPENSATION SITES

The following provides a general ecological description of the Project with regards to location, land use, topography, precipitation and growing season, soils, and detailed information regarding the Project impact sites in terms of their existing soil, hydrology, and vegetation characteristics.

3.1.1 General Project Site Description

The City of Foster City, San Mateo County, California is situated along the existing Foster City Levee and Bay Trail from approximately Rock Harbor Lane on the southern end to Mariners Point Golf Center (Appendix A, Figure 1). The latitude and longitude at the beginning of the levee and trail (Station 0+00) are 37.570300 N and 122.292121 W and at the end (Station 340+00), 37.534447 N and 122.276861 W, respectively

3.1.2 Land Use

The Foster City is situated on former filled tidal marsh, and historic baylands. Land use includes a levee that provides flood protection, Bay Trail, residential homes, public streets, schools, and public parks. An 8-mile levee spans from the City of San Mateo boundary on the north to the O'Neill Slough Tide Gate at the San Mateo/Belmont boundary to the south (Appendix A, Figures 1, 2, 3, 8 and 9). The main function of the levee system is to provide flood protection, however the San Francisco Bay Trail situated on top of or immediately adjacent to the levee also serves recreational purposes. The levee system was originally constructed in the early 1900s and improvements are believed to have been made during the initial development of Foster City in the 1960s and additional levee improvements were completed in 1995.

3.1.3 Topography

Topographic relief on the inboard side of the levee slopes gently downward toward landscaped areas, public roads and private properties. The topographic relief on the outboard side of the levee is typically at a 2:1 – 3:1 slope downward into the San Francisco Bay. Elevations range from 11-13 feet NAVD88 at top of the levee to approximately MHW bayward and 6.5 feet NAVD88 inland of the levee (Appendix A, Figure 2). Appendix B 1 provides tidal datums for the Project area.

3.1.4 Soils

A review of the Natural Resources Conservation Service (NRCS) (formerly Soil Conservation Service, SCS) Soil Survey maps for San Mateo County (USDA 1993) shows three soil types occurring in the project area. A soils map of the project site is shown in Appendix A, Figure 4. Soils along the existing levee are Urban land-Orthents, reclaimed complex, 0 to 2% slopes and Novato clay, 0 to 1% slopes. Soils offshore in San Francisco Bay are classified as Water. The levee itself is comprised of fill material. Field investigations on the project site confirmed that the NRCS soils mapping is reasonably accurate throughout the project area. Pertinent soil characteristics are summarized below:

3.0 BASELINE INFORMATION FOR IMPACT AND COMPENSATION SITES

Table 3. Pertinent Characteristics of Soils Mapped within the Project Area by NRCS							
Soil Name	Landform	Typical Profile (inches)	Minor Components	Slope	Drainage Class	Depth to Water Table (inches)	Frequency of Flooding/Ponding
Urban land-Orthents; reclaimed complex,	Tidal Flats	H1 - 0 to 40 in: variable H2 - 40 to 60 in: silty clay	Novato: 2% of map unit; salt marsh Reyes: 1% of map unit; salt marsh.	0-2 percent	Well drained	About 0 inches	None
Novato clay;	Salt marsh	H1 - 0 to 16 in: clay H2 - 16 to 60 in: clay H3 - 18 to 22 in: un-weathered bedrock	Unnamed, drained; salt marsh	0-1 percent	Very poorly drained	About 0 inches	Frequent
Water	NA	NA	NA	NA	NA	NA	NA

3.1.5 Precipitation and Growing Season

HBG acquired USDA Natural Resources Conservation Service historical weather data for Foster City using the nearest WETS station which was in Redwood City, California (NRCS 2016, Redwood City); the WETS Analysis in Appendix B 2 provides 30-year average (1971 – 2000) temperature and precipitation data for the county, along with estimated growing season dates and a 108-year record of precipitation for WETS Station CA. The historical WETS data indicate that the average annual rainfall is 20.16 inches, with average monthly rainfall of 1.68 inches from January to December of each year.⁶ The data also indicate that the growing season occurs between January and December each year for 323 to 344 days.

3.1.6 Hydrology

According to the USGS National Hydrography Dataset the Project is in Hydrologic Unit Code [HUC] 18050004 San Francisco Bay subbasin and 180500041001 San Francisco Bay Estuaries subwatershed. Appendix A, Figure 5 shows the HUC 8 subbasin boundaries and Figure 6 shows HUC 12 subwatershed boundaries near the Project. Stormwater on the outboard side of the levee flows directly into the San Francisco Bay. Stormwater on the inboard side of the levee generally flows into the municipal stormwater drains that discharge into Foster City Lagoon. Water levels in Foster City Lagoon are controlled by an intake structure on Belmont Slough near Sea Cloud Park and water is discharged during low tide back into San Francisco Bay at an outflow structure near East 3rd Avenue and Lincoln Center Drive. Appendix A, Figure 7 shows the Project is currently within the FEMA “Area with Reduced Risk Due to Levee” zone.

3.1.7 Vegetation

According to criteria of Sawyer and Keeler-Wolf (2009), there are four vegetated communities along the levee alignment: Pacific Coast Salt Marsh, Coastal Freshwater Marsh, Non-native

⁶ http://www.wcc.nrcs.usda.gov/climate/navigate_wets.htm (accessed May 11, 2016; site is a link that provides instructions for obtaining county-specific WETS data; link shown on WETS table in Appendix B 2 is a site-specific discrete single-user link).

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Grassland, and Fennel Patch. Pacific Coast Salt Marsh and Coastal Freshwater Marsh are wetland habitats.

Pacific Coast Salt Marsh consists of all the areas mapped in the wetland delineation described as Estuarine Intertidal Emergent Wetland. Vegetation within this habitat type was primarily Virginia pickleweed (*Salicornia virginica*) and along Belmont Slough and O'Neill Slough included areas of cordgrass (*Spartina foliosa*). Other species found in the Pacific Coast Salt Marsh habitats included saltgrass (*Distichlis spicata*), jaumea (*Jaumea carnosa*), alkali heath (*Frankenia grandifolia*), fat-hen (*Atriplex patula*), and marsh gum plant (*Grindellia stricta* var. *angustifolia*). Pacific Coast Salt Marsh is found outboard of the levee in Sub-reach 1, inboard of the levee in Sub-reach 2, inboard of the levee in Sub-reach 4 just south of Werder Park and outboard of the levee in portions of the Foster City Shell Bar, and outboard of the levee along Belmont Slough in Sub-reaches 5, 6, 7, 8, and 9 and along O'Neill Slough in Sub-reach 10 (Appendix A, Figure 8).

Coastal Freshwater Marsh consists of the areas mapped in the wetland delineation as Palustrine Emergent Wetland. This habitat type is located primarily in wetlands that were created as part of agency-required mitigation for the City of Foster City's Mariners Island Boulevard Extension Project and are located interior to the existing levee north of the Mariners Point Golf Center between Sub-reaches 1 and 2 (Appendix A, Figure 8). The dominant vegetation in these wetlands is cattail (*Typha latifolia*) but also includes other wetland plants such as alkali bulrush (*Bolboschoenus robustus*), annual rabbitsfoot grass (*Polypogon monspeliensis*), hyssop loosestrife (*Lythrum hyssopifolium*) and bird's foot trefoil (*Lotus corniculatus*).

Vegetated upland habitats include a Fennel Patch, which is in an area outboard of the existing levee in Sub-reach 5 (Appendix A, Figure 8), and in which the dominant vegetation is the non-native sweet fennel (*Foeniculum vulgare*). Non-native Grassland is often found around the periphery of marsh habitats and includes non-native grass and herbaceous species such as rip-gut brome (*Bromus diandrus*), wild oat (*Avena fatua*), bristly ox-tongue (*Helminthotheca echinoides*), bull mallow (*Malva nicaeensis*), hare barley (*Hordeum murinum leporinum*), black mustard (*Brassica nigra*), wild radish (*Raphanus sativa*) and bull thistle (*Cirsium vulgare*).

Much of the project area consists of urban areas or non-vegetated habitats not included in the Sawyer and Keeler-Wolf criteria. Wildlife habitats in the project area can also be categorized using the California Wildlife Habitat Relationships System (CWHR). Vegetated habitats in the CWHR System would be classified as Saline Emergent Marsh, Fresh Emergent Marsh and Annual Grassland. The CWHR System includes Urban Habitats, which in the project area include considerable areas of lawn, landscaping species or extensive areas along the levee that are vegetated with ice plant (*Caprobrotus edulis*). Additional habitats present include rocky areas of the shoreline (in the project area including rip-rap levee slopes and the Foster City Shell Bar), and mudflats located just offshore in the Bay. Under the CWHR System these areas of rocky shore and mudflat would be considered Barren (or free of vegetation).

Dominant vegetation found within areas permanently and temporarily impacted by the project

3.0 BASELINE INFORMATION FOR IMPACT AND COMPENSATION SITES

(See Appendix A, Figure 9 and Appendices D & E) is discussed as follows:

1. Permanent Impacts.

Bay Side of Levee. Most common / dominant estuarine emergent vegetation impacted includes Virginia pickleweed and saltgrass.

Land Side of Levee. Most common / dominant estuarine emergent vegetation impacted is saltgrass and alkali heath.

2. Temporary Impacts.

Bay Side of Levee. Most common / dominant estuarine emergent vegetation impacted includes Virginia pickleweed and saltgrass.

Land Side of Levee. Most common / dominant estuarine emergent vegetation impacted is saltgrass, alkali heath, seaside barley (*Hordeum marinum*) and annual rabbitsfoot grass.

4.0 MITIGATION IMPLEMENTATION PLAN

This section describes how the MMP will be implemented in terms of site grading and planting. All on-site mitigation work would be conducted at locations where temporary Project impacts to wetlands and waters of the U.S. and State have occurred. Mitigation for permanent Project impacts to aquatic resources is achieved through the purchase of mitigation bank credits from a nearby by agency approved mitigation bank as described in Section 2.0. Below, Section 4.1 identifies state and federal regulatory authorizations that are required prior to beginning site grading and planting activities; Section 4.2 describes construction activities; Section 4.3 provides a schedule; Section 4.4 describes who has funding responsibility; and Section 4.5 describes who the responsible parties are for overseeing the implementation of site grading and planting activities.

Given that Project activities will occur within or adjacent to aquatic resources and federal and state listed species habitat, construction and planting activities will be overseen by the Project Wetland Scientist and qualified biologists and biological monitors working under the authority of the Project Wetland Scientist. All of these individuals will have stop-work authority from the City. For this project both wetland and species qualified biologists are required. A qualified biologist is an individual who will have a minimum of five years of academic training in biological sciences and related resource management activities with a minimum of two seasonal years conducting surveys for each special-status species that may be present within the Project area. During or following academic training, the qualified biologist will have achieved a high level of professional experience and knowledge in biological sciences and special-status species identification, ecology and habitat requirements. A biological monitor is an individual who will have academic and professional experience in biological sciences and related resource management activities as it pertains to this Project, experience with construction-level biological monitoring, be able to recognize species that may be present within the Project area and be familiar with the habits and behavior of those species.

4.1 Regulatory Authorizations

Implementation of this Plan will begin upon receiving required state and federal authorizations. These include:

- a.** US Army Corps of Engineers, San Francisco District (Individual Permit)
- b.** San Francisco Bay Regional Water Control Board (401 Water Quality Certification and Issuance of Waste Discharge Requirements)
- c.** San Francisco Bay Conservation and Development Commission (Coastal Zone Management Act compliance certification and development permit)

4.2 Mitigation Construction and Planting

The following describes in detail the pre-construction, construction, planting, and post-construction plan implementation activities.

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4.2.1 Pre-Construction

1. Baseline Monitoring. Prior to implementation of site construction activities which will cause temporary impacts to aquatic resources, baseline monitoring will be conducted. The baseline monitoring will document existing site conditions using the methods described in Section 7.0 of this MMP.
2. Reference Site Monitoring. Prior to implementation of ground disturbing activities, an unimpacted reference site will be established for each type of aquatic resource to be temporarily impacted to establish pre-construction site conditions using the methods described in Section 7.0 of this MMP.
3. Environmental Sensitivity Training. The City will ensure that qualified biologists conduct an education program for all persons employed on the Project prior to performing work activities. Training will consist of a presentation by the qualified biologists that includes a discussion of aquatic resource types and their functions, the biology and general behavior of any sensitive species which may be in the work area, how they may be encountered within the work area, and procedures to follow when they are encountered. The status of Endangered Species Act- and California Endangered Species Act- listed and California fully protected species including legal protection, penalties for violations, and Project-specific protective management measures required by various authorizations will be discussed. Interpretation will be provided for non-English speaking workers, and the same instruction will be provided for any new workers hired after the initial training. The qualified biologist(s) will prepare and distribute wallet-sized cards or a factsheet handout containing this information for workers to carry on-site. Upon completion of the training, employees will sign an affidavit stating they attended the training and understand all protection measures. These affidavits will be filed at the City with an up to date copy maintained at the Project supervisor's on-site office. Copies of the various agency authorizations for the Project will also be maintained at the worksite with the Project supervisor.
4. Topographic Survey. If necessary, a licensed surveyor will provide elevation data to supplement elevation survey data prepared for the authorizing agencies. All survey data will be georeferenced to a State plane coordinate system. The vertical datum used will be NAVD 88. Typical cross sections of areas to be excavated and filled will be developed from the combined survey data.
5. Prepare Detailed Construction Plan Drawings. Detailed construction will be prepared by a licensed civil engineer prior to implementation of the construction activities based on the plan elements described below and plans presented by Appendices D & E.
6. Prepare Detailed Planting Plan Drawings. Detailed planting plan drawings will be prepared by the Project Wetland Scientist on top of a copy of the detailed

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construction plan drawings described above prior to implementation of the planting activities described below.

7. Pre-Construction Fish and Wildlife Surveys. Within 48 hours prior to each phase of construction work within the Project area, the qualified biologist(s) will conduct pre-construction surveys for presence of special-status fish and wildlife species within all construction areas, staging areas, and access routes, herein referred to as the Project Work Area. The City will survey for Endangered Species Act (ESA)- and California Endangered Species Act (CESA)- listed and California fully protected species that may potentially be impacted by the Project. Surveys will be conducted at the appropriate time of day and in habitat suitable for each of the species. If state or federally listed species are found, work will cease, and the qualified biologist will contact the appropriate California Department of Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS) and / or National Marine Fisheries Service (NMFS) staff for further guidance and approval to continue work.
8. Nesting Bird Surveys. If Project-related work is scheduled during the nesting season, a qualified biologist will conduct nesting bird surveys. Nesting seasons are typically defined as followed: (1) February 15 to August 30 for small bird species such as passerines; (2) February 1 to August 31 for burrowing owl and California Ridgway's rail; (3) January 15 to September 15 for other owls; and (4) February 15 to September 15 for other raptors. Two surveys for active nests within 14 days prior to the beginning of Project construction will be conducted, with the final survey conducted within 48 hours prior to construction. The minimum survey radii surrounding the work area will be the following: (1) 250 feet for passerines; (2) 500 feet for burrowing owl and other small raptors such as accipiters; and (3) 1,000 feet for larger raptors such as buteos. Surveys will be conducted at the appropriate times of day, and during appropriate nesting times and will concentrate on areas of suitable habitat. If a lapse in Project-related activities of 15 days or longer occurs, another survey will be required before construction can be reinitiated. If an active nest is found, the qualified biologist will consult with CDFW and the USFWS regarding appropriate action to comply with the Fish and Game Code of California, CESA (if applicable), and the federal Migratory Bird Treaty Act (MBTA) of 1918.

If active nests are found, the qualified biologist will establish an appropriate buffer between the nest and active construction. The City will clearly mark the established buffer. The City will maintain the buffer until the young have fledged and are foraging independently. Prior to construction, the qualified biologist will conduct baseline monitoring of the nest to characterize "normal" bird behavior and will establish a buffer distance which allows the birds to exhibit normal behavior. The qualified biologist will monitor the nesting birds daily during construction activities and will increase the buffer if the birds show signs of unusual or distressed behavior (e.g. defensive flights and vocalizations, standing up from a brooding position, and/or flying away from the nest). If buffer establishment is not possible, the qualified biologist or construction foreman

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should have the authority to cease all construction work in the area until the young have fledged, and the nest is no longer active.

9. Excavated Material Testing at Bridge Locations. Soils excavated at the two bridge locations may be redeposited along the edge of O'Neill Slough, if economically practicable, beginning near the excavated channels and approximately midway down the O'Neill Slough. If it is determined re-use of the excavated material is practicable, the material must be screened using guidelines and thresholds established by the RWQCB's recently updated 1992 sediment screening guidelines⁷ to determine if the material is suitable for re-use in tidal wetlands. If after testing it is determined the material is not suitable for re-use, or not economically practicable to re-use the material, the excavated material would be disposed of in an upland location.

4.2.2 Construction

1. Regulatory Compliance Monitoring. The Project Wetland Scientist will work in close coordination with the City and supervising engineer to meet the conditions of the various agency's authorizations received from the Corps, RWQCB, and BCDC together with conservation / protective measures received from the USFWS and NMFS. The Project Wetland Scientist will monitor pre- construction, construction, planting and post-construction activities to ensure the Plan is followed and activities comply with authorizing agencies conditions of authorization. If non-compliance issues are identified, corrective actions will be taken upon authorization from the Project Wetland Scientist. When appropriate, depending on the nature of the compliance issue, the Project Wetland Scientist in coordination with the City will immediately notify the project authorizing agencies to determine what corrective action needs to be taken.
2. Biological Monitoring During Work. Biological monitoring includes both aquatic resource and special status species monitoring. The qualified biologist or biological monitor will monitor for avoidance and minimization of impact to waters of the U.S. and State as specified in the Corps, RWQCB, and BCDC Project authorizations and impacts to special-status species during vegetation removal and other Project activities. If special-status species are encountered during work, City or biological monitor will notify the USFWS, NMFS, and/or CDFW immediately for further guidance. For any ESA and CESA listed species, only a biologist with the necessary permits issued by USFWS, NMFS, and/or CDFW may handle and relocate listed species. The biologist will contact the USFWS, NMFS, and/or CDFW, as appropriate, prior to any proposed relocation activities for further guidance and approval. Through consultation with USFWS, NMFS, and/or CDFW, additional measures may be developed to protect special-status species and those additional measures will be

⁷ Draft Staff Report Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines May 2000 (with minor corrections as of 3/14/19)

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considered part of the various agency's conditions of authorization.

If special-status species are encountered during work, City or Project Wetland Scientist will notify the USFWS, NMFS, and /or CDFW immediately. If there is imminent danger of injury to special-status species from Project activities, and the special-status species individual(s) do not move out of the work area on their own, a USFWS, NMFS, and /or CDFW -approved qualified biologist will relocate the individual(s) to suitable habitat located at a safe distance away (a minimum of 250 feet) from the construction area. For any ESA and/or CESA listed species, only a biologist with the necessary permits issued by USFWS, NMFS, and/or CDFW, can handle and relocate listed species. The biologist will contact USFWS, NMFS, and/or CDFW within 24 hours of relocation activities. Through consultation with the USFWS, NMFS, and/or CDFW, additional measures may be developed to protect special-status species.

3. **Best Management Practices (BMPs).** Contractors will be instructed by the City to:
 - a. **Work Area Delineation.** Place orange construction fencing around the construction corridor within aquatic resources and special status species areas. Orange construction will be removed and appropriately disposed of within 5 calendar days of the completion of construction work. Access paths and staging areas to be adequately and temporarily fenced or flagged to prevent damage to adjacent aquatic resource and sensitive habitats.
 - b. **Equipment Operation.** Avoid where practicable operation of heavy vehicle and equipment operation in wetlands and other waters using long-reach excavation equipment operated from upland areas. If impacts to soils by heavy vehicles or machinery are unavoidable, compaction of soils will be minimized by driving on, and working from, wooden or metal mats.
 - c. **Staging Equipment.** Locate staging and storage areas for equipment, materials, fuels, lubricants and solvents to be outside of waters of the U.S. and State and sensitive species areas including wetland and open water areas, and stream, riparian, and floodplain areas. Best Management Practices such as high-visibility temporary construction fencing, and erosion control and daily equipment inspections, will be used to protect nearby waters of the U.S. and State and sensitive species areas. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to waters of the U.S. and State and sensitive species areas, will be positioned over drip-pans. Any equipment or vehicles driven and/or operated within or adjacent to waters of the U.S. and State and sensitive species areas must be checked and maintained daily to prevent leaks of materials that if introduced to water could be deleterious to aquatic life and sensitive species. Vehicles will be moved away at a minimum distance of 300 feet from waters of the U.S. and State and sensitive species areas prior to refueling and lubrication. Secondary containment methods, including drip pans and/or placement of absorbent material, will be used around equipment to

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protect waters of the U.S. and State and sensitive species areas from any spills that may occur.

- d. Spoils.** Not place spoil (dredged material) where it may enter waters of the U.S. and State, and sensitive species areas, or other vegetation except as authorized. Spoil will be hauled offsite or stockpiled in an upland location where it will be covered with plastic sheeting whenever it is evident that rainy conditions threaten to erode loose soils into sensitive habitats.
- e. Imported Materials.** Not import, move, or remove any rock, gravel, and/or other materials within waters of the U.S. and State and sensitive species areas unless authorized by the Corps, RWQCB, and BCDC.
- f. Debris.** Ensure that debris originating from Project activities does not enter waters of the U.S. and State and sensitive species areas. Any debris that inadvertently enters these areas will be removed and disposed of according to State and local laws and ordinances.
- g. Contaminants.** Prevent debris, soil, silt, bark, rubbish, creosote-treated wood, raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil, gasoline or diesel fuel, or other petroleum products, or any other substances which could be hazardous to aquatic life and / or sensitive species resulting from Project activities from contaminating the soil and/or entering waters of the U.S. and State and sensitive species areas. Contractors will immediately remove any of these materials that are placed within or where they may enter waters of the U.S. and State and sensitive species areas as a result of Project activities.
- h. Spill Containment.** Have absorbent materials designated for spill containment and cleanup activities on-site for use in an accidental spill when Project activities are performed in or within 50 feet of a waters of the U.S. and State and / or sensitive species area. When spills occur, the City will immediately notify the California Emergency Management Agency at 1-800-852-7550, immediately initiate the cleanup activities, and then inform authorizing agencies of status within the same day.
- i. Hazardous Spill Plan.** Prepare hazardous spill plans prior to construction of each Project phase. The plan will describe what actions will be taken in the event of a spill. The plan will also incorporate preventative measures to be implemented, such as vehicle and equipment staging, cleaning, maintenance, refueling, and contaminant (including fuel) management and storage. In the event of a contaminant spill, work at the site will immediately cease until the contractor has contained and mitigated the spill. The contractor will immediately prevent further contamination and notify the City who will then notify appropriate authorities and mitigate damage as appropriate.
- j. Erosion and Sediment Control.** Install and maintain erosion control materials as follows:

- 1) Erosion Control Materials. Install erosion control materials as follows:

On Land. Place erosion protection in areas where vegetation cannot reasonably be expected to become re-established. Contractors will also be instructed not to use erosion control materials containing plastic monofilament netting (erosion control matting) or similar material containing netting within the Project area or mitigation areas due to documented evidence of amphibians and reptiles becoming entangled or trapped in such material. Acceptable substitutes include coconut coir matting, straw/coconut fiber erosion blanket, straw wattles, or tackified hydroseeding compounds. These materials will be placed in a manner so that erosion protection is provided, but that the materials blend with the natural contours of the ground surface. Loosely scattered sterile straw will be applied to all bare soil areas if other erosion control measures, such as coconut coir matting, straw/coconut fiber erosion blanket, straw wattles, or tackified hydroseeding compounds, cannot be implemented within the next 48-hour period.

In Water. Install floating silt curtains temporarily around all in-water work areas when working on the outboard side of the levee or O'Neill Slough areas as a BMP to minimize sediment transport during site excavation and planting. Floating silt curtains will be inspected daily while construction and planting activities are ongoing. Floating silt curtains will be redeployed if found to be broken loose from anchor points and repaired if not found to be in working order on an as needed basis.

- 2) Work Area Perimeter Control. Install twelve-inch sterile straw rolls around all on land work areas and staging areas to prevent sediment transport to adjacent waters of the U.S. and State and sensitive species areas.
- 3) Monitoring and Maintenance. Monitor and maintain erosion control measures during and after each storm event. Modifications, repairs and improvements to erosion control measures will be made whenever they are needed.
- 4) Erosion Control Installation Time Period. Install all erosion control plantings, seeding, and materials soon as possible after Project activities in those areas cease. Seeding placed after October 15 will be covered with broadcast straw, jute netting, coconut fiber blanket or similar erosion control blanket.

4. Construction.

- a. ***Restore Temporarily Impacted Aquatic Resources.*** Implementation of mitigation restoration and rehabilitation actions within temporarily impacted wetlands will consist of: (1) Removing silt fence and hay wattles and (2) restoration of ground surface to original grade. Implementation of mitigation restoration and rehabilitation actions within temporarily impacted other waters will consist of: (1) In-kind replacement of Rip-

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Rap removed to accommodate access path construction and (2) removal of floating silt curtains. Appendix C figures shows the locations of the temporarily impacted aquatic resource areas to be restored. Table 4 provides a summary of aquatic resources temporarily impacted and mitigation restoration approach. Table 5 below provides a summary of excavation dimensions, volumes of earthen material generated, and equipment to be used. To obtain original grade elevations of each temporarily impacted aquatic resource grade stakes and grade checking during restoration activities will be based on elevation control(s) set by a licensed surveyor.

- b. **Excavate O'Neill Slough Tidal Channels.** Implementation of mitigation restoration and rehabilitation actions within temporarily impacted wetlands will consist of: (1) hand removal of vegetation within construction areas under the supervision of a qualified biologist; (2) installation of a sheet pile coffer dams; (3) removal of an earthen walking path and one existing culvert at the approximate eastern end of O'Neill Slough to create an open channel connection with Belmont Slough that will be overcrossed by a free spanning bridge (Appendix D, Figures 1 – 6); (4) removal of an earthen walking path at the western end of O'Neill Slough to create an open channel connection with Belmont Slough that will be overcrossed by a free spanning bridge (Appendix D, Figures 1 – 6); (5) Removing silt fence and hay waddles and restoration of ground surface to original grade for temporarily impacted wetland areas; and (6) planting the wetland areas adjacent to each constructed channel location (see Subsection 4.2.3, below). Table 4 provides a summary of aquatic resources temporarily impacted and mitigation restoration approach. Table 5 below provides a summary of excavation dimensions, volumes of earthen material generated, and equipment to be used. Note to avoid ponding and associated fish stranding within O'Neill Slough at low tide the final depth of the two excavated tidal channels will be determined by a bathymetric survey so that the slough drains to Belmont Slough. To obtain original grade elevations of each temporarily impacted aquatic resource grade stakes and grade checking during restoration activities will be based on elevation control(s) set by a licensed surveyor.

Mitigation re-establishment will also result from the construction of two tidal channels underneath two clearspan bridges re-establishing full tidal action to an 0.05-acre upland site that was historically an aquatic resource prior to the construction of Foster City.

Soils from the excavated tidal channels may be redeposited along the edge of O'Neill Slough, if economically practicable, beginning near the excavated channels and approximately midway down the O'Neill Slough (Appendix D, Figure 6). If it is determined re-use of the excavated material is practicable, the material would be screened using guidelines and thresholds established by the RWQCB's recently updated 1992 sediment screening guidelines⁸ to determine if the material is suitable for re-use in tidal wetlands. If the material is not suitable for re-use or not economically practicable, the excavated material would be disposed of in an upland location.

⁸ Draft Staff Report Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines May 2000 (with minor corrections as of 3/14/19)

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A description of dewatering and bridge construction actions follows:

Dewatering the Work Zones at the Two Bridge Construction Locations (Stations 306+00 & 331+00). After vegetation is hand removed within the work area, a sheet pile cofferdam would be installed starting from the upslope end on each side working down to the channel bottom. This would allow any fish that may still be within the work area to move offsite before the cofferdam is sealed. All work would be conducted at low tide and a biologist will be on site to ensure there are no fish within the work zone prior to the cofferdam being sealed. If the water is too deep or murky to clearly see fish, or there are fish within the work zone, the biological monitor/s will use a piece of plywood and slowly sweep the plywood starting from the inland end (near culvert) and working outward toward the opening of the sheet pile cofferdam. Once this is complete, the final sheet piles will be installed to seal off the work area.

Water removed from the work zone would be pumped into a baker tank. If the site required constant dewatering and a baker tank was not feasible, a sedimentation basin may be constructed. An example of a sedimentation basin may include two or more sediment basins constructed by making a haybale perimeter with a row of bales down the middle. A Hypalon sheet would line the entire double basin. Water would be pumped into one with a series of PVC discharge lines laying on the Hypalon covered haybales until it is full which allows the water to enter the sediment basins gently so as to not agitate the remaining sediment on the bottom of the basin. A small pump would pull water from the surface of the last sedimentation basin and into a filtration bag. The filtration bag would be placed along the slope of the channel to allow for the water to slowly seep out and sheet flow along the vegetated slope back into O'Neill Slough. The filter bag would be changed as it becomes clogged as needed. The contractor will provide the final details and if different from what is described about the dewatering plan would be provided to NOAA for approval.

Baffin Street Bridge (Station 306+00). This culvert and a portion of the earthen fill pedestrian pathway will be replaced with a bridge that will span the newly created tidal channel to restore unobstructed tidal flows to the tidal wetlands and improve the trail to provide safe emergency vehicle access from Belmont and Redwood City to Foster City. The bridge will sit on two abutments constructed on the earthen levee and span the newly constructed channel. Although the abutments will be constructed on what is currently uplands, once the earthen levee is removed and the tidal channel restored the abutments may be exposed to tidal water below the HTL and MHW. Implementation will require the placement of a sheet pile cofferdam on each side of the bridge location extending out approximately 5 feet from the toe of the slope. Once the cofferdams are in place and the work site has been dewatered, in accordance with dewatering procedure described below, the earthen fill pedestrian pathway will be excavated. Excavated material, deemed suitable based on screening results using the RWQCB's

4.0 MITIGATION IMPLEMENTATION PLAN

recently updated 1992 sediment screening guidelines⁹ for the beneficial reuse of dredge material, will be placed along the edge of the O'Neill Slough beginning near the excavated channels and approximately midway down the O'Neill Slough to augment the natural sedimentation accretion process and rehabilitation of the existing estuarine emergent wetlands by raising their bottom elevations to accommodate full tidal flooding (Appendix D, Figure 6). If the material is not suitable, or it is not economically practicable to conduct the testing, it will be disposed of in an offsite upland location.

Concrete bridge abutments will be constructed on existing upland areas on each side of the channel. Top of abutments will start at approximately 9.6 feet NAVD88 and end at approximately 4 feet NAVD88. The top elevation of the bridge will be at approximately 9.6 feet NAVD88. Refer to Figure 39 for the plan view and Figure 40 for a typical cross section of the bridge.

Emergency Egress Route Bridge (Station 331+00). A portion of the earthen fill pedestrian pathway will be replaced with a bridge that will span the newly created tidal channel to restore unobstructed tidal flows to the tidal wetlands and improve the trail to provide safe emergency vehicle access from Belmont to Foster City. The bridge will sit on two abutments constructed on the earthen levee and span the newly constructed channel. Although the abutments will be constructed on what is currently uplands, once the earthen levee is removed and the tidal channel restored the abutments may be exposed to tidal water below the HTL and MHW. Implementation will require the placement of a sheet pile cofferdam on each side of the bridge location extending out approximately 5 feet from the toe of the slope. Once the cofferdams are in place and the work site has been dewatered, in accordance with dewatering procedure described below, the earthen fill pedestrian pathway will be excavated. Excavated material, deemed suitable based on a Phase 1 Study, will be placed along the edge of the O'Neill Slough beginning near the excavated channels and approximately midway down the O'Neill Slough to augment the natural sedimentation accretion process and rehabilitation of the existing estuarine emergent wetlands by raising their bottom elevations to accommodate full tidal flooding (Appendix D, Figure 6). If the material is not suitable it will be disposed of in an offsite upland location. Refer to Figure 41 for the plan view and Figure 42 for a typical cross section of the bridge.

Table 4. Aquatic Resources Temporarily Impacted and Mitigation Restoration Approach			
Project Temporary Impact by Aquatic Resource Type and Approximation Station Line Location (SL)	Impact (Ac)	Acres Restored (Ac)	Mitigation Restoration Construction and Planting Approach
Temporary Levee & Trail Improvement Impacts:			
Estuarine Intertidal Emergent Wetland (Appendix C, Figures 8,	0.14	0.14	Restoration and Rehabilitation: Silt fence and hay waddles removed. Area reseeded with native seed mix and monitored for 3 years to

⁹ Draft Staff Report Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines May 2000 (with minor corrections as of 3/14/19).

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Table 4. Aquatic Resources Temporarily Impacted and Mitigation Restoration Approach			
Project Temporary Impact by Aquatic Resource Type and Approximation Station Line Location (SL)	Impact (Ac)	Acres Restored (Ac)	Mitigation Restoration Construction and Planting Approach
10, 19, 25, & 29)			ensure area revegetates.
Estuarine Intertidal Unconsolidated Shore (Appendix C, Figure 7)	0.03	0.03	Restoration and Rehabilitation: Silt fence and hay waddles removed. This water type is unvegetated, mostly shells along unvegetated beach, therefore reseeding is not recommended.
Estuarine Intertidal Rocky Shore Rubble Artificial (Appendix C, Figures 5, 6, 11, & 13).	0.01	0.01	Restoration and Rehabilitation: Rip-Rap removed to accommodate access path construction will be replaced in-kind.
Palustrine Emergent Wetland (in-board, non-tidal side of levee) (Appendix C, Figures 3, 4, 8, 9, 10, 12, & 14 – 30).	0.29	0.29	Restoration and Rehabilitation: Silt fence and hay waddles removed and temporary staging area at Sea Cloud Park removed. Area reseeded with native seed mix and monitored for 3 years to ensure area revegetates.
Total Acres	0.47	0.47	
Temporary O'Neill Slough Bridge Construction Impacts:			
Estuarine Intertidal Emergent Wetland (Appendix D)	*0.10	3.06	Restoration & Rehabilitation: Removal of the earthen walking path and one existing culvert, to accommodate the two free spanning bridges and reshaping of channel underneath to a bottom depth of 4 ft NAVD, will result in restoring full tidal action to this aquatic resource.
		0.11	Restoration & <u>Re-Establishment</u> : Restoring full tidal exchange will increase the reach of the tidal height an additional 1-foot resulting in the restoration / re-establishment (conversion of uplands to former wetlands) of 0.11-acre of uplands to estuarine intertidal emergent wetlands along the upper reach of the shoreline of O'Neill Slough.
Estuarine Intertidal Unconsolidated Shore (Appendix D, Figures 4, 5 & 6 Sheet 1)	0.02	2.08	Restoration & Rehabilitation: Removal of the earthen walking path and one existing culvert, to accommodate the two free spanning bridges and reshaping of channel underneath to a bottom depth of 4 ft NAVD, will result in restoring full tidal action to this aquatic resource.
		0.05	Restoration & <u>Re-Establishment</u> : Removal of the earthen walking path, to accommodate the free spanning bridge and reshaping of channel underneath to a bottom depth of 4 ft NAVD, will result in re-establishing full tidal action to this 0.05-acre aquatic resource which is <u>currently an upland site</u> but was historically an aquatic resource.
Total Acres	0.12	5.30	Rehabilitation = 5.14 acres Re-Establishment = 0.16
* Excavating a channel from the Emergency Egress Route Bridge (Station 331+00) will convert 0.02 acres of the 0.10 acre of estuarine intertidal emergent wetland to Estuarine Intertidal Unconsolidated Shore. This 0.02 acre conversion will be offset by the re-establishment of 0.11 acre of uplands to estuarine intertidal emergent wetlands.			

Table 5. Summary of O'Neill Slough Bridge Construction Excavation and Fill Activities						
Construction Activity (see Appendix D)	Design Width and Depth Dimensions (ft)		Linear Feet	Area (ac)	Estimated Volume (Yds³) *	Source / Type of Material & Equipment to be used
	Width (ft)	Depth / Height (ft NAVD)				
EXCAVATE (Re-Establishment):						
Excavate eastern tidal channel at new bridge overcrossing location to connect O'Neill Slough to Belmont Slough (thru levee and in/out board of levee)	15 (under bridge crossing)	4 (+/-6 in)	20	0.001	41	Source & Type: Excavated soil, pavement, & metal culvert from existing levee / trail. Pavement and metal culvert removed and disposed of a
	35 (In sloughs)	4 (+/-6 in)	60	0.05	187	

Table 5. Summary of O'Neill Slough Bridge Construction Excavation and Fill Activities						
Construction Activity (see Appendix D)	Design Width and Depth Dimensions (ft)		Linear Feet	Area (ac)	Estimated Volume (Yds ³) *	Source / Type of Material & Equipment to be used
	Width (ft)	Depth / Height (ft NAVD)				
Excavate western tidal channel at new bridge overcrossing location to connect O'Neill Slough to Belmont Slough (thru levee and in/out board of levee)	15 (under bridge crossing)	4 (+/-6 in)	20	0.001	44	County approved landfill or recycling facility. <u>Equipment.</u> Long reach excavator with 1-yard bucket (3.5 ft wide); Rubber-tired dump truck with 8 to 10 Yds ³ capacity.
	35 (In sloughs)	4 (+/-6 in)	60	0.05	187	
Excavation Total				0.1	462	
FILL (Rehabilitation):						
Place excavated channel soil material on the edge of O'Neill Slough adjacent to excavated eastern tidal channel and mid- O'Neill Slough to expand estuarine emergent wetlands (Appendix D, Figure 6, Sheets 3 & 4)	25	1 (+/-6 in)	246	0.5	228	Source & Type: (1) Excavated soil from new earthen lined channel & pool construction. (2) Soil from earthen levee deconstruction. <u>Equipment.</u> Same as above
Place excavated channel material on the edge of O'Neill Slough adjacent to excavated western tidal channel and mid-O'Neill Slough to expand estuarine emergent wetlands (Appendix D, Figure 6, Sheets 1 & 2)	25	1 (+/-6 in)	250	0.5	231	
Restoration Rehabilitation Fill Total					1,596	

4.2.3 Planting

Revegetation of temporarily impacted wetland sites will occur during the same construction season as the Project impacts to aquatic resources occur. If feasible, plantings and/or seed will be applied immediately prior to the first rain event. Planting shall be done by December 31 but may be postponed until January 30 of the year immediately following impacts if there is insufficient rainfall prior to December 31 to ensure survival of plantings. If revegetation survival and/or cover requirements do not meet performance standards (Section 6.0), City is responsible for replacement planting, additional watering, weeding, invasive species eradication, or any other actions, to achieve these requirements. Replacement plants will be monitored with the same performance criteria as original plantings/revegetation. Planting details for temporarily impacted wetlands along (1) levee and trail areas and (2) the waterside margin of O'Neill Slough are as follows:

Levee and Trail Areas. In order to promote seed growth within temporary impact areas soils will be finely disked using a small rubber-tired tractor or hand-guided roto-tiller to loosen compacted soils 4 to 6 inches below the surface. Impacted aquatic resource areas will then be hydroseeded with the three grasses referenced in Table 6 below. Natural revegetation by both

4.0 MITIGATION IMPLEMENTATION PLAN

native and naturalized non-native wetland species is also expected to occur.

O'Neill Slough Margin. To promote seed growth within temporary impact areas soils will be finely disked using a small rubber-tired tractor or hand-guided roto-tiller to loosen compacted soils 4 to 6 inches below the surface. Impacted aquatic resource areas will then be hydroseeded with three grasses referenced in Table 6 below. Natural revegetation by both native and naturalized non-native wetland species is also expected to occur. To add structure to the plant community and provide a source of refugia for the federal and state protected salt marsh harvest mouse (*Reithrodontomys raviventris*) and Ridgway's Rail (*Rallus obsoletus obsoletus*), taller salt tolerant shrub species to include marsh gum plant (*Grindellia stricta* var. *angustifolia*) and big salt bush (*Atriplex lentiformis*) will be planted adjacent to bridge locations and mid-way along the O'Neill Slough margin. Appendix D, Figures 6, Sheets 1 - 4 provides a planting plan overlay. Table 6 below provides a summary of the planting approach.

Table 6. Planting Specifications						
Plant Name	Scientific Name	California Native?	Type	Planting Approach	Rate	Source Location
Levee and Trail Areas						
Saltgrass	<i>Distichlis spicata</i>	Yes	Seed	Hydroseed with mulch and tackifier	7 lbs/ac	Local within watershed
Creeping wildrye	<i>Elymus triticoides</i>	Yes	Seed	Hydroseed with mulch and tackifier	20 lbs/ac	Local within watershed
Red Fescue	<i>Festuca rubra</i>	Yes	Seed	Hydroseed with mulch and tackifier	20 lbs/ac	Local within watershed
O'Neill Slough Margin						
Saltgrass	<i>Distichlis spicata</i>	Yes	Seed	Hydroseed with mulch and tackifier	7 lbs/ac	Local within watershed
Marsh gum plant	<i>Grindellia stricta</i> var. <i>angustifolia</i>	Yes	Transplant	5-gallon bucket plantings	5 / grouping 2 ft apart	Local within watershed
Big salt bush	<i>Atriplex lentiformis</i>	Yes	Transplant	5-gallon bucket plantings	3 / grouping 3 ft apart	Local within watershed

4.2.4 Post-Construction

1. **Post-Construction Removal of Access Routes(s).** Any necessary temporary earthen access ramp(s) or other temporary earthen fill placed in waters of the U.S. and State and sensitive species area along the landward edge of the Project levee (and trails) will be removed and disposed of at a suitable upland location within the City.

2. **Removal of BMPs.** All structural BMPs will be removed except where straw rolls and/or fiber matting are being used to prevent slope erosion. Remove all floating silt curtains temporarily installed around all in-water work areas.

3. **Post-Construction Topographic Survey.** A licensed surveyor will provide a topographic survey of the mitigation sites restored following site construction and planting. The survey will provide both spot and topographic contour elevations. The same cross sections will be surveyed as were surveyed as part of the pre-construction survey described above. All survey data will be georeferenced to a State plane coordinate system.

4.0 MITIGATION IMPLEMENTATION PLAN

4. **Post- Construction Reporting.** Within 60 days following completion of construction and planting activities, the Project Wetland Scientist will prepare an “As-Restored / As-Built Report” report documenting construction and planting activities and results and submit it to the authorizing agencies. The report will include: (1) a copy of as-built plans; (2) a written description of site grading and planting activities and BMPs utilized; (3) comparison of pre- and post-construction project plans with any changes shown in red, elevations, and topography; and (4) photo- documentation which illustrates site grading and planting activities and the use of BMPs. The locations of the permanent photo-documentation points established or to be established prior to construction and planting activities using a GPS unit with sub-meter accuracy, will also be identified on the as-built plan or map.

4.3 Schedule

The following table provides an approximate schedule for proposed phased Project plan implementation activities.

Table 7. Schedule for Temporary Impact Mitigation Implementation	
Activity	Duration (Months)
PRE-CONSTRUCTION (Required prior to each phase of construction:	
1. Baseline Monitoring	1
2. Reference Site Monitoring	1
3. Environmental Sensitivity Training (Required training also provided when workers are added throughout Project construction and planting phase)	1 +
4. Topographic Survey	1
5. Prepare Detailed Construction Plan Drawings	1
6. Prepare Detailed Planting Plan Drawings	1
7. Pre-Construction Fish and Wildlife Surveys	30
8. Nesting Bird Surveys	0.25
CONSTRUCTION (on-going to end of each construction Phase):	
1. Regulatory Construction Compliance	30
2. Biological Monitoring During Work	30
3. Best Management Practices (BMPs)	30
4. Restore Temporarily Impacted Aquatic Resources	24
5. Excavate O'Neill Slough Channels	0.25
PLANTING (on-going at end of each construction Phase):	
1. Levee and Trail Areas	0.25
2. O'Neill Slough Margin	0.25
POST-CONSTRUCTION (on-going at end of each construction Phase):	
1. Post-Construction Removal of Access Route(s)	0.5

4.0 MITIGATION IMPLEMENTATION PLAN

2. Removal of BMPs	0.25
3. Post-Construction Topographic Survey	1
4. Post-Construction Reporting	1.5

4.4 Funding

City of Foster City will fund all the costs associated with MMP implementation.

4.5 Responsible Parties

Responsible parties overseeing the implementation of site grading and planting activities:

**City of Foster City/
Estero Municipal Improvement District (Permittee):**
Jeff Moneda, PE
City/District Manager
610 Foster City Boulevard
Foster City, CA 94404
(650) 286-3288
jmoneda@fostercity.org

Project Wetland Scientist:
Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Avenue
San Rafael, CA 94901
415.385.1045 (cell) ~ 415.925.2006 (fax)
thuffman@h-bgroup.com

5.0 MAINTENANCE INSPECTION AND ACTION PLAN

This section describes land management site inspection and follow-up maintenance actions for maintaining the mitigation sites where wetland restoration has occurred following successful implementation of site grading and planting activities. The objective of inspections and follow-up maintenance actions, if needed, is to ensure that agency required performance standards are successfully achieved at each mitigation site where temporary Project impacts have occurred. Site inspection and maintenance actions are discussed below.

5.1 Implementation

The Project Wetland Scientist or designated qualified representative will conduct site inspections following the schedule described by the table below and inform the City that maintenance actions are needed to ensure mitigation performance success.

During site inspections, the Project Wetland Scientist's and / or designated representative will look for potential problems that may result in the objectives of the MMP not being achieved and to ensure that appropriate corrective actions are taken, if found necessary. A record of management inspections and any maintenance actions undertaken will be submitted as part of the annual mitigation monitoring report. A Maintenance Monitoring Field Data Collection Form is provided in Appendix E, Form 1. Any maintenance issues discovered will be photo-documented during monitoring inspections and the location mapped, all of which will be provided with the annual monitoring report. Follow-up photo-documentation will occur once the needed maintenance action(s) is completed.

Representative photographs of each mitigation site will be taken. Mitigation site overview photographs will also be taken from permanent approximate north, south, east, and west photo points established during baseline monitoring using a hand-held GPS unit with sub-meter accuracy. All photos used in report documents will provide the location in terms of latitude and longitude in six place decimal degrees, direction of view, and, if appropriate, a description of any maintenance issue identified which requires future action.

5.2 Site Inspection and Maintenance Actions

This section describes the site inspection and maintenance actions that are to be performed. These include:

1. Vandalism Inspections and Maintenance Actions
2. Trash and Debris Inspection and Maintenance Actions
3. Invasive Plant Inspection and Maintenance Actions

Site inspection and potential maintenance actions are described below.

5.2.1 Vandalism Inspection and Maintenance Actions

Maintenance visits will include inspection for and documentation of any evidence of vandalism that may interfere with successful achievement of wetland mitigation performance criteria. The

5.0 MAINTENANCE INSPECTION AND ACTION PLAN

mitigation site will be monitored for signs of excessive human disturbance such as heavy foot traffic, removal of plantings, off-road vehicle use, gardening, or evidence of waste dumping.

Maintenance actions taken may include temporary fencing, filling trail ruts or vehicle ruts to original grade elevation, replanting, installation of access signage while restoration is on-going.

5.2.2 Manmade Trash and Litter Inspection and Maintenance Actions

Although accumulation of manmade trash and litter is not anticipated to be a significant problem, inspections for and documentation of observed trash and litter will be made.

Accumulated trash and litter that may interfere with successful achievement of wetland mitigation performance criteria will be removed and disposed of at an appropriate County authorized landfill location.

5.2.3 Invasive Plant Inspection and Maintenance Actions

If maintenance site inspections or performance monitoring determine that invasive plant species rated “high”¹⁰ or included as a “red alert” species by the California Invasive Plant Council and species rated as “high priority” by the Bay Area Early Detection Network¹¹ are present and comprise greater than 5 percent of the total plant cover for any mitigation site(s), invasive plant maintenance actions need to be taken. The objective of invasive plant maintenance actions is to provide a competitive advantage for native and naturalized plant species over invasive species through various vegetation management methods. Allowable methods to control invasive weed species at the wetland mitigation sites are described below. In conducting invasive plant control use of non-chemical removal is fully to be pursued to the maximum extent feasible.

- a. **Hand/Mechanical Removal of Invasive Weed Species.** Hand removal or use of handheld equipment (such as a weed uprooted¹² or a chainsaw) should always be the preferred method of removing invasive weed species from the mitigation site planting area(s). If hand removal methods are tried and found to be ineffective, or the problem is too widespread for hand removal to be practicable, then hand-held mechanical methods of removal, focused grazing, or chemical controls as described below can be implemented. The goal is to rely on application of herbicides as a last resort.
- b. **Hand Cutting or Mowing.** Hand clipping or mowing with a hand-held mechanical mower or weed whip to control invasive weed species before they set seed is allowable during the late winter, spring and early summer months.
- c. **Focused Grazing.** Focused grazing with sheep or goats to control invasive plants is

¹⁰ Plants are considered invasive if they have been introduced into an environment where they did not evolve. As a result, they may have no natural enemies or other constraints to limit their reproduction and spread (Westbrooks, 1998, cited by BLM). Some invasive plants can produce significant changes to vegetation, composition, structure, or ecosystem function (Cronk and Fuller, 1995, cited by BLM). An inventory with ranking of invasives (High, Moderate, and Limited) can be found at <http://www.cal-ipc.org/paf/>.

¹¹ https://www.sfbayiv.org/bay_area_early_detection_network.php.

¹² <https://www.theuprooter.com/>

5.0 MAINTENANCE INSPECTION AND ACTION PLAN

allowable preferably during the late winter, spring and early summer months before seed sets.

- d. **Controlled Herbicide Use.** Only herbicides registered with the California Department of Pesticide Regulation (DPR) will be applied. Localized spot treatments should be used, when feasible. All herbicides will be applied in accordance with regulations set by DPR, used according to labeled instructions, and approved for use in an aquatic environment (e.g. Rodeo®). Labeled instructions for the herbicide used will be made available to authorizing agencies and DPR upon request. Herbicide application will be conducted on calm days only with wind less than five (5) miles per hour to prevent airborne transfer of herbicide. Pesticide mixing sites will be located at existing road sites outside of aquatic resource areas. No herbicides will be used where CESA and/or federally listed ESA species have been documented to occur.
- e. **Replanting.** Based on the performance criteria described in Section 8.0 below, if planted vegetation and / or natural re-vegetation within any portions of the mitigation site appears unsuccessful due to invasive plants within any of the monitoring years, the invasive plant species will be removed from the unsuccessful area and the area will be replanted with native vegetation. Consideration should be given to the use of a pre-emergent herbicide if repopulation with a dominance of invasive species is a concern. Consideration should also be given to whether the species to be planted needs to be changed from the original planting plan followed. If plant species are proposed other than described in the planting plan provided in this MMP (Section 4.0), the authorizing agencies need to be consulted.

5.2.4 Record Keeping and Reporting

Documentation of all inspection and maintenance activities will be required. A record of maintenance activities by date will be submitted yearly to the authorizing agencies as part of the annual Mitigation Monitoring Report. All annual reports will include the following information: (1) frequency and dates of observations, (2) photographs of areas where maintenance issue(s) are found with direction of view, latitude and longitude, and location mapping, locations of permanent photo points and direction of view, what was observed, maintenance activities, a summary of repairs and any recommended follow-up maintenance actions that may be required.

5.3 Schedule

To assure that the performance criteria presented in Section 6.0 are successfully met, the land management activities described above will commence after completion of construction and planting activities. Maintenance actions will continue for 3 years according to the schedule provided by the Table below unless the restored aquatic resources have not met the agency required performance criteria in which case maintenance actions will continue until performance criteria are successfully met.

5.0 MAINTENANCE INSPECTION AND ACTION PLAN

Table 8. Schedule for Land Management Inspections and Actions		
Inspection and Maintenance Actions	Activity	Schedule (Years 1-3)
1. Vandalism	I & M ¹	January, April, July, and October
2. Manmade Trash and Litter	I & M	January, April, July, and October
3. Vegetation Management	I & M	January, April, July, and October
4. Record Keeping	Documentation	Contemporaneously during Inspection & Maintenance Activities
5. Reporting	Report Preparation	January 31 following each monitoring year
¹ Inspection and, if necessary, perform necessary maintenance.		

5.4 Funding

The City of Foster City will fund all the costs associated with site inspection and maintenance activities as described in this Maintenance Plan.

5.5 Responsible Parties

Successful implementation of this Management Plan is the responsibility of:

**City of Foster City/
Estero Municipal Improvement District (Permittee):**
Jeff Moneda, PE
City/District Manager
610 Foster City Boulevard
Foster City, CA 94404
(650) 286-3288
jmoneda@fostercity.org

Project Wetland Scientist:
Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Avenue
San Rafael, CA 94901
415.385.1045 (cell) ~ 415.925.2006 (fax)
thuffman@h-bgroup.com

Table 9 identifies specific responsibilities associated with management inspections and maintenance activities.

Table 9. Responsibilities for Management Inspections and Maintenance Actions	
Inspection and Maintenance Actions	Responsibility (Years 1 - 3)
1. Vandalism Inspection and Maintenance	City of Foster City
2. Manmade Trash and Litter Inspection and Maintenance	City of Foster City
3. Invasive Plant Inspection and Maintenance	City of Foster City
4. Record Keeping and Reporting	City of Foster City

6.0 MITIGATION PERFORMANCE CRITERIA

Mitigation sites for temporary project impacts to wetlands and waters occur on both the inboard and bay side of the Foster City levee. These aquatic resource areas differ in that the bay side areas are a result of hydric soil conditions influenced by tides and wave runup while areas separate from the bay by the levee are primarily influenced by seasonal rainfall conditions. Because of this difference in hydrology conditions separate performance criteria have been developed for mitigation sites on the inland side of the area and bay side of the levee. The criteria can be found in the subsections below.

6.1 Performance Criteria for Inland Side of Levee

Mitigation for temporary impacts will be determined successful when the physical, hydrology, and vegetation interim and final performance criteria described in Table 10, below are satisfied for each aquatic resource site temporarily impacted during construction of the Project.

Table 10. Performance Criteria for Inland Side of Levee				
Number/Categories:	Performance Standards:	Target (R= Restriction):		
		Yr. 1	Yr. 2	Yr. 3
Physical-1	The City will ensure that the total surface area of temporarily impacted aquatic resource area is restored.	R (determine impacted area replaced)	R (determine impacted area replaced)	R (determine impacted area replaced)
Hydrologic -1	Based on Corps delineation methodology at least one primary or two secondary wetland hydrology indicators will be present within each quadrat sampled at each mitigation site for each Monitoring Year	1 primary or 2 secondary indicators	1 primary or 2 secondary indicators	1 primary or 2 secondary indicators
Fauna-1	N/A – no specific fauna focus.			
Flora-1	Total percent plant cover of wetland indicator species resulting from planted native vegetation and native / naturalized plant recruitment will be greater than 80%.	20%	50%	80%
Flora -2	Invasive plant species ¹³ rated “high” or included as a “red alert” species by the California Invasive Plant Council and species rated as “high priority” by the Bay Area Early Detection Network ¹⁴ shall not comprise greater than 5 percent of the total plant cover.	≤5%	≤5%	≤5%
WQ-1	N/A – no specific water quality focus.			

6.2 Mitigation Performance Criteria for Bay Side of Levee

Mitigation for temporary impacts will be determined successful when the following physical, hydrology, vegetation, and water quality interim and final performance criteria described in Table 11, below are satisfied for each aquatic resource site temporarily impacted during

¹³ Plants are considered invasive if they have been introduced into an environment where they did not evolve. As a result, they may have no natural enemies or other constraints to limit their reproduction and spread (Westbrooks, 1998, cited by BLM). Some invasive plants can produce significant changes to vegetation, composition, structure, or ecosystem function (Cronk and Fuller, 1995, cited by BLM). An inventory with ranking of invasives (High, Moderate, and Limited) can be found at <http://www.cal-ipc.org/paf/>.

¹⁴ https://www.sfbayiv.org/bay_area_early_detection_network.php.

6.0 MITIGATION PERFORMANCE CRITERIA

construction of the Project.

Table 11. Performance Criteria for Bay Side of Levee				
Number/Categories:	Performance Criteria:	Targets (R= Restriction)		
		Yr. 1	Yr. 2	Yr. 3
Physical-1	Topography will be restored to pre-construction elevations. (This performance Standard excludes areas that may be affected by tidal channel or inlet migration and similar natural/non-anthropogenic hydrogeomorphic changes.)	Based on a post-construction survey, topography will be restored to pre-construction elevations.	NA	NA
Hydrologic -1	The City will ensure the site is open to free exchange of tidal waters, with no obvious hydrologic restrictions present.	R	R	R
Hydrologic -2	Based on Corps delineation methodology at least one primary or two secondary wetland hydrology indicators will be present within each quadrat sampled at each mitigation site for each Monitoring Year	1 primary or 2 secondary indicators	1 primary or 2 secondary indicators	1 primary or 2 secondary indicators
Fauna-1	N/A – no specific fauna focus.	N/A	N/A	N/A
Flora-1	Total percent plant cover of wetland indicator species resulting from planted native vegetation and native / naturalized plant recruitment will be equal to or greater than 80%.	20%	50%	80%
Flora -2	Invasive plant species ¹⁵ rated “high” or included as a “red alert” species by the California Invasive Plant Council shall not comprise greater than 5 percent of the total plant cover.	≤5%	≤5%	≤5%
WQ-1	The indicators of water quality temperature, turbidity, pH, dissolved oxygen, chlorophyll a and algae within O’Neill Slough are similar (within ± 15%) as compared to the same indicators in Belmont Slough.	≤15%	≤15%	≤15%

¹⁵ Plants are considered invasive if they have been introduced into an environment where they did not evolve. As a result, they may have no natural enemies or other constraints to limit their reproduction and spread (Westbrooks, 1998, cited by BLM). Some invasive plants can produce significant changes to vegetation, composition, structure, or ecosystem function (Cronk and Fuller, 1995, cited by BLM). An inventory with ranking of invasives (High, Moderate, and Limited) can be found at <http://www.cal-ipc.org/paf/>.

7.0 PERFORMANCE MONITORING

Monitoring is required by the authorizing agencies to determine whether the mitigation is successful or is trending toward success as determined by meeting the performance criteria described in Section 6.0. The Project Wetland Scientist will implement the Monitoring program described by this Plan.

7.1 Monitoring Objective

The objective of monitoring is to determine whether the performance criteria defined below are being successfully met and to identify actual and potential problems that may impact the success of the mitigation effort. This will be accomplished by collecting data to determine the level of success and the need for any improvements or remedial actions to be taken in the mitigation effort.

7.2 Baseline and Reference Site Monitoring

Baseline conditions at the mitigation site(s) and Reference Site(s) will be established prior to construction at mitigation sites. The primary purpose of baseline monitoring is to establish a basis of comparison between existing and constructed / planted habitat mitigation site conditions and thus be used to determine whether interim and final performance criteria have been successfully met or are proceeding on a trajectory toward success. Baseline monitoring will document existing land surface conditions and document status of performance criteria indicators defined below. Baseline conditions will be referenced against annual monitoring results in each annual monitoring report. Baseline topography will also be provided and compared to as-built topography.

Representative photographs of each mitigation site will be taken. Mitigation site overview photographs will also be taken from permanent approximate north, south, east, and west photo points established during baseline monitoring using a hand-held GPS unit with sub-meter accuracy. All photos used in report documents will provide the location in terms of latitude and longitude in six place decimal degrees, and direction of view.

7.3 Sampling Methodology

This section describes the methodology that will be used to collect data to determine whether the performance criteria are being met.

7.3.1 Hydrology Sampling

Hydrology conditions will be monitored by walking each mitigation site and documenting the presence of hydrology indicators following the Corps wetland delineation criteria and methodology as described in the *Corps' 1987 Wetlands Delineation Manual (Corps Delineation Manual)*, and the *Corps' 2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (Arid West Supplement)*. Subsurface hydrology indicators will be determined by digging a soil pit up to 22-inches deep. On-site observations will be recorded on Corps' Wetland Determination Data Forms – Arid West Region (“Arid West Data Forms”) (Appendix E, Form 2). The location of any area

within the mitigation site that does not satisfy the hydrology criteria will be memorialized as a polygon feature using a Global Positioning System (GPS) unit and the feature added to the annual report mapping of site conditions. Representative photographs of hydrology indicators observed within each mitigation site will be taken. All photos used in report documents will provide the location in terms of latitude and longitude in six place decimal degrees, direction of view, and identification of hydrology indicator present.

7.3.2 Vegetation Sampling

Plant Cover. Percent plant cover¹⁶ will be used to determine revegetation success or to determine if management actions are needed which will lead to successful plant community development. Plant cover data will be collected prior to construction at the mitigation site(s) and reference site(s) and post-construction monitoring of the mitigation and reference site(s). Both the mitigation site(s) and reference site(s) will be monitored for 3 years to determine if the planted vegetation combined with natural recruitment of native and naturalized vegetation is trending toward a dominance of wetland vegetation similar to that found during baseline monitoring.

A random sampling design will be used to sample vegetation to determine percent cover within each mitigation site(s) and reference site(s). Methodology to determine plant species plant cover will follow Elzinga, *et al.* (undated). Vegetation will be sampled between March and June each monitoring year (depending on general plant growth related to precipitation received) using 3-foot by 3-foot or 2-foot by 2-foot sampling quadrats depending on mitigation site width and geographical shape. The number of sample plots used for sampling will be determined using a cumulative species/ sample (or cumulative species/area) curve with a minimum of 3 quadrats¹⁷ sampled within the planted areas at each mitigation site. Locations for each quadrat will be determined using a random number generator during each sampling period. During each annual sampling period, the location of each quadrat randomly determined will be loaded into a GPS unit with real-time beacon correction (accuracy <50cm), and georeferenced in the field during quadrat sampling. Data will be recorded using the data sheet provided in Appendix E (Form 3).

Appendix E provides an example performance monitoring data sheet (Form 3) for assessing plant species cover. Representative photographs of each sample quadrat will be taken. Mitigation site overview photographs will also be taken from permanent approximate north, south, east, and west photo points established during baseline monitoring. All photos used in report documents will provide the location in terms of latitude and longitude in six place decimal degrees, direction of view, and, if appropriate, identification of dominant species present. A complete floristic survey will also be conducted, and a list of species found within

¹⁶ The percentage of the ground covered by the vertical projection of the plant crowns of a species or defined set of plants (also known as the vertical projection of foliage of plants) as viewed from above. Small openings in the canopy and overlap are excluded (SRM 1989). The absolute cover of herbaceous plants includes any standing (attached to a living plant, and not lying on the ground) plant parts, whether alive or dead; this definition excludes litter and other separated plant material. <http://www.cnps.org/cnps/vegetation/>

¹⁷ A quadrat as referred to here is a plot used in ecological field sampling to isolate a standard unit of area for study of the distribution of vegetation data over a larger area.

the mitigation site and reference site(s) will be prepared and submitted with each annual monitoring report.

7.3.3 Water Quality Sampling

Water quality sampling will only be collected at the O'Neill Slough tidal restoration site. The objective of the sampling is to compare water quality within O'Neill Slough and the adjacent Belmont Slough before and after the construction of two earth lined tidal channels which will allow for unimpeded tidal flow between the two slough channels. Baseline sampling will occur in January, April, July, & October. Depending on the start of construction baseline conditions may not be recorded for all four months. Only months with baseline data will be included in the post-construction sampling, and a minimum of two baseline sampling months will be conducted.

Water quality monitoring will be conducted at three locations during an incoming tide on a quarterly basis in the months of January, April, July, & October. Sample Point 1 (SP-1) will be on the Belmont Slough side of the beginning of the new bridge channel before it enters the eastern end of O'Neill Slough; Sample Point 2 (SP-2) will be located west of SP-1 approximately mid-way down O'Neill Slough (SP-2); and the third location will be at the beginning of the new bridge channel entrance at the western end of O'Neill Slough (SP-3) (see Appendix D, Figure 6, Sheets 1 – 4).

Water quality properties to be sampled for are physical, chemical or biological related. Physical indicators of water quality include temperature and turbidity; chemical indicators include pH and dissolved oxygen; and biological indicators include chlorophyll and algae. Data collected will also include time of day, ambient air temperature, and height of the incoming tide. The following table summarizes by type of water quality data collected, detection limit, and method of data collection and schedule.

Table 12. Summary of Water Quality Data to be Collected within O'Neill Slough				
Type of Sample	Detection Limit	Method		Schedule
		Field Testing	Lab Analysis	
Temperature	< 0 C	Hydrolab Quanta Meter ^{18 19}	NA	Pre-Construction Baseline Monitoring: Sampling to occur during an incoming tide 30 days prior to mitigation construction. Post-Construction Monitoring: Sampling to occur during an incoming tide in January, April, July, & October for Years 1 – 3.
pH	6.5 – 8.5	Hydrolab Quanta Meter	NA	
Dissolved Oxygen	> 5 mg/L	Hydrolab Quanta Meter	NA	
Turbidity	< 50 NIU	Hydrolab Quanta Meter	NA	
Chlorophyll a	< 5 mg/L	Grab sample take for laboratory testing	Alpha Analytical Laboratories in Dublin, CA	
Algae	Visual Observation	Observable algal bloom present	NA	

¹⁸ <https://www.environmental-expert.com/products/ott-hydrolab-model-quanta-multi-probe-water-quality-meter-538544>

¹⁹ Sampling equipment calibrated just prior to each sampling period.

7.4 Data Analysis

The monitoring data obtained during the annual monitoring periods will be compared with the data from: (1) baseline monitoring prior to the initiation of ground disturbing activities and (2) reference site data taken prior to ground disturbing activities and contemporaneously during performance monitoring of the temporarily impacted aquatic resources. Data analysis will be accomplished using Microsoft Excel and ArcGIS.

Microsoft Excel will be used to create various graphical comparisons to include:

1. Percent cover mapping
2. Percent cover of native and naturalized plant species vs. invasive plant species

Habitat feature mapping using the GIS program ArcGIS will be conducted for visual comparative purposes to include:

1. Vegetation cover mapping
2. Bare ground cover mapping
3. Point location and cover mapping of invasive weed species
4. Location of any stormwater BMPs
5. Location of signs of erosion
6. Location of signs of sedimentation
7. Protective fencing Location (if used)

7.5 Reporting

Monitoring reports will be submitted on an annual basis during the month of January after each monitoring year (1 - 3) and a final summary report in the third (3rd) year of monitoring. The first annual Monitoring Report will be submitted following the first year of performance and maintenance monitoring with the first monitoring report due to the authorizing January 31 of the year following the monitoring period. These reports will provide technical findings as to the progress toward achievement of final performance success and recommendations if adaptive management action is required to successfully meet agency required performance criteria. The reports will include the following:

- 1.0 Executive Summary**
- 2.0 Introduction**
 - 2.1 Background
 - 2.2 Objective
 - 2.3 Maintenance Requirements
 - 2.4 Performance Criteria
- 3.0 Methods**
 - 3.1 Sampling
 - 3.2 Analysis
- 4.0 Results**
 - 4.1 Implementation of Maintenance Actions
 - 4.2 Status of Successfully Meeting Performance Criteria
 - 4.2.1 Vegetation and Site Integrity
 - 4.2.2 Hydrology
- 5.0 Recommendations**
 - 5.1 Maintenance Requirements
 - 5.2 Remedial Actions (if necessary)
- 6.0 Literature Cited**

7.0 Appendices

- A. Location Maps (site, plant associations, sample locations)
- B. Maintenance Records (observations and actions taken)
- C. Monitoring Data Sheets (vegetation, hydrology, wetlands)
- D. Photo Documentation (aerial and onsite)
- E. GIS Comparison Mapping/Analysis
- F. Data Summaries
- G. Floristic Survey
- H. Agency Contacts
- I. Agency Permits
- J. Names, title and company names of all persons who prepared the report and conducted field work

7.6 Monitoring Procedures

The protocol and results of the monitoring program will be reviewed annually by the Project Wetland Scientist. Adjustments to monitoring procedures may be required as the site changes over time, or if logistical problems render a procedure unduly difficult to conduct. Such adjustments would be reported to the authorizing agencies. After reviewing annual reports, authorizing agencies staff may have suggestions for adjusting the monitoring program. Agency suggestions will be reviewed and if appropriate will be incorporated into the monitoring program, following agreement between the land owner, wetland scientist, and agency staff. The key is to anticipate that the monitoring program may need occasional adjustments to remain viable for determining attainment of performance criteria and the identification of factors that may be limiting successful achievement of performance criteria.

7.7 Schedule

Monitoring to determine the successful attainment of performance criteria will be tied to the actual implementation date of the mitigation effort rather than to predetermined years. A minimum of 3 years of site monitoring is required to determine if the performance criteria as outlined by this Plan have been successfully achieved within areas temporarily impacted by the Project. The proposed monitoring schedule is outlined in the Table below:

Table 13. Performance Monitoring and Reporting Activities	
Type of Activity	Schedule
Data Collection: Document baseline conditions at both mitigation and reference sites. Baseline conditions will be referenced against annual monitoring results in each annual monitoring report.	Sampling and data documentation to occur between March-June if construction scheduling permits this or within 30 days prior to beginning of construction activities
Data Collection and Preparation of As-Built Report: Conduct post-restoration site inspection and prepare an as-built (restored) report with before and after descriptions of site conditions. Report submitted to authorizing agencies.	Within 60 days following the completion of restoration activities
Data Collection: Conduct restoration performance monitoring at mitigation and reference sites to include completion of data forms and taking site photographs.	<u>Physical, Hydrology, & Vegetation Parameters:</u> Between March-June for monitoring Years 1-3. <u>Water Quality Physical, Chemical & Biological Parameters:</u> Sampling to occur

7.0 PERFORMANCE MONITORING

Table 13. Performance Monitoring and Reporting Activities	
Type of Activity	Schedule
	during an incoming tide in January, April, July, & October for monitoring Years 1-3
Preparation of Annual Performance Monitoring Report. Prepare and submit annual compliance monitoring report to include data sheets, photo documentation and a report summarizing monitoring results. Report submitted to authorizing agencies. Final report to include notice of completion, if appropriate.	January 31 following monitoring Years 1-3

7.8 Completion

7.8.1 Notification of Completion

When the final performance monitoring period is complete, and if the property owner believes the agency required performance criteria have been successfully met, the City of Foster City or designated representative will notify the authorizing agencies when submitting the final annual report. Project authorizing agencies include the Corps, RWQCB, and BCDC.

7.8.2 Agency Confirmation

Following receipt of the report the authorizing agencies may require a site visit to confirm performance success prior to providing a written confirmation either in Email or official letter form that mitigation is successful. Authorizing agencies include the Corps, RWQCB, and BCDC.

7.9 Funding

The City of Foster City will fund all the costs associated with the monitoring activities outlined in this Plan, which includes performance monitoring and agency-required reporting.

7.10 Responsible Parties

Successful implementation of the above-described performance monitoring and reporting is the responsibility of:

**City of Foster City/
Estero Municipal Improvement District (Permittee):**
Jeff Moneda, PE
City/District Manager
610 Foster City Boulevard
Foster City, CA 94404
(650) 286-3288
jmoneda@fostercity.org

Project Wetland Scientist:
Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Avenue
San Rafael, CA 94901
415.385.1045 (cell) ~ 415.925.2006 (fax)
thuffman@h-bgroup.com

8.0 ADAPTIVE MANAGEMENT PLAN

An integral part of a successful mitigation project is early detection of problems during implementation, determining the cause(s) of those problems, and attempting to correct those problems so that the mitigation project achieves its objectives and performance standards. Correcting problems requires the development of a strategy for how to correct the problem and then implementation of the strategy with follow-up monitoring to determine if the problem has been corrected. The following discusses problem identification and initiation of adaptive management, management of problems, agency notification, funding, and responsible parties.

8.1 Problem Identification

Interim performance standards are crucial to ensuring mitigation performance follows a trajectory to attain final mitigation success. Failure to meet one or more of the annual performance standards described in Section 6.0 is the primary means to determine if an adaptive management strategy needs to be developed and then implemented. However, initiation of an adaptive management process can also be anticipatory where it is judged during site inspection that if corrective action is not taken one or more performance standards may not be met. Examples include unanticipated anthropogenic problems such as large-scale trespassing and vandalism, goose predation of plantings, waterfowl congregation, and growth of invasive plant species.

8.2 Adaptive Management

Once problems are identified a strategy for correcting the problem is developed and corrective action or actions are taken to implement corrective actions. Such measures may include, but are not limited to, part or all of the mitigation site. If problems are of a small-scale nature immediate notification of the problem to the approving agencies is not necessary and can be reported in the annual monitoring report. However large-scale problems should be reported to the authorizing agencies as soon as possible requesting assistance in development of a management strategy. The following Subsections provides a representative summary of types of small- and large-scale problems that have been encountered by past aquatic resource mitigation projects, possible management strategies, and corrective actions. This is not meant to be an inclusive summary, but although believed unlikely, is prepared in anticipation of more common issues should they arise.

8.2.1 Small Scale Problems

Potential small-scale problems and possible management strategies and actions that may be taken are summarized in the table below:

Table 14. Example Small Scale Problem Adaptive Management Strategies and Actions		
Small Scale Problem	Management Strategy	Potential Corrective Action(s)
Trash	Litter and debris should be removed as a matter of routine maintenance. If litter and debris continue to be left at the migration site fencing and signage should be installed to discourage access. If person or persons committing the vandalism are known, law enforcement should also be involved.	<ul style="list-style-type: none">• Remove litter and debris• Place fencing around the mitigation site until performance

Table 14. Example Small Scale Problem Adaptive Management Strategies and Actions		
Small Scale Problem	Management Strategy	Potential Corrective Action(s)
Vandalism	Measures should be taken to discourage access such installing temporary fencing and signage. If person or persons committing the vandalism are known, law enforcement should also be involved. Law enforcement should be involved if problem persists.	<ul style="list-style-type: none"> criteria successfully met Install sign(s) indicating to please keep out of fenced area which is an ecological restoration site Involve law enforcement
Heavy foot traffic	Measures should be taken to discourage access such installing temporary fencing and signage.	<ul style="list-style-type: none"> Restore damaged areas Place temporary fencing around the mitigation site until performance criteria successfully met Install sign(s) indicating to please keep out of fenced area which is an ecological restoration site
Isolated instances of plant mortality	Re-planting during the rainy season should occur.	<ul style="list-style-type: none"> Re-prepare seed bed Re-plant seed during rainy season Continue annual monitoring.
Small-scale weed infestations	Invasive plants should be removed without the use of herbicides followed by re-planting, if necessary, during the rainy season should occur.	<ul style="list-style-type: none"> Remove invasive species Re-prepare seed bed Re-plant seed during rainy season Continue annual monitoring.
Goose predation of plantings	Measures should be taken to re-plant the site and then preclude access through the use of fencing and overhead netting to discourage access.	<ul style="list-style-type: none"> Place temporary fencing and overhead netting around the mitigation site until performance criteria successfully met Re-prepare seed bed Re-plant seed during rainy season Continue annual monitoring

8.2.2 Large Scale Problems

Potential large-scale problems and possible management strategies and actions that may be taken are summarized in the table below:

Table 15. Example Large Scale Problem Adaptive Management Strategies and Actions		
Large Scale Problem	Management Strategy	Potential Corrective Action(s)
Mitigation cannot be constructed in accordance with the approved mitigation plan	Either revise mitigation construction design or provide mitigation by an alternate means.	<ul style="list-style-type: none"> Revise construction plan Select an alternative mitigation site for approved plan implementation Purchase mitigation bank credits
Failure to meet hydrology criteria	Measures should be taken to understand existing soil permeability and topographic conditions as relates to surface drainage. Then, if necessary re-grade and plant the site.	<ul style="list-style-type: none"> Conduct soil permeability study Prepare topographic survey Re-grading to modify surface drainage Excavation and regrading after adding soil with low permeability Re-plant site during rainy season Implement mitigation at an alternate site using initially approved performance criteria Purchase mitigation bank credits
Failure to meet Vegetation Criteria (Dominance of Wetland Species)	Measures should be taken to understand existing soil permeability and topographic conditions as relates to surface drainage and hydric soil development that supports hydrophytic vegetation. Then, if necessary re-grade to created wetter soil conditions and plant the site.	<ul style="list-style-type: none"> Re-seeding and watering weeding to eliminate competing non-native invasive species Replanting with a different species; Allowing for continued re-

Table 15. Example Large Scale Problem Adaptive Management Strategies and Actions		
Large Scale Problem	Management Strategy	Potential Corrective Action(s)
		vegetation with naturalized non-invasive vegetation. <ul style="list-style-type: none"> • Implement mitigation at an alternate site using initially approved performance criteria • Purchase mitigation bank credits
Failure to meet Vegetation Criteria (Control of invasive plant species)	Measures should be taken to aggressively remove invasive species and then either re-plant site and / or allow for natural revegetation. Intensify maintenance monitoring and actions, if needed, remove any invasive species as they begin to appear to minimize competition.	<ul style="list-style-type: none"> • Mowing • Focused grazing • Pre-emergent herbicide treatment • Seed bed preparation and re-planting (with same or different) • Implement mitigation at an alternate site using initially approved performance criteria • Use of mitigation bank plant species • Allow for natural revegetation • Intensify inspection and maintenance actions
Fire	Measures should be taken to re-plant the site.	<ul style="list-style-type: none"> • Re-planting as before
Failure to meet performance criteria after corrective action taken	Evaluate performance standard for appropriateness and potentially change. If appropriate, revise performance criteria to account for measures taken to address deficiencies in the compensatory mitigation project or to reflect changes in management strategies and objectives if the new criteria provide for ecological benefits that are comparable or superior to those approved.	<ul style="list-style-type: none"> • Revise performance criteria • Implement mitigation at an alternate site using initially approved performance criteria • Purchase mitigation bank credits

8.3 Agency Initiating Procedures

Notification to authorizing agencies is required for the following adaptive management actions:

1. A significant modification of the approved mitigation plan in terms of plan implementation, maintenance, performance criteria, performance monitoring, long-term management, site protection, or financial assurances.
2. If monitoring or other information indicates that the mitigation project is not progressing towards meeting its performance standards as anticipated, the responsible party must notify the permitting authority as soon as possible.

Notification will consist of providing the authorizing agencies an analysis of the problem and proposed corrective strategy / action plan for approval. Scaled plan and section view drawings should be provided for site construction modifications.

If all the performance criteria have not been met by Year 3, the maintenance and performance monitoring obligations will continue until the authorizing agencies determine the mitigation project is complete.

8.4 Funding

The City of Foster City will fund the costs associated with adaptive management actions taken to successfully achieve the objectives of the following MMP activities:

1. Mitigation Implementation (Section 4.0)
2. Maintenance Inspection and Action (Section 5.0)

3. Performance Monitoring (Section 7.0)
4. Long-Term Management (Section 9.0)

8.5 Responsible Parties

The following parties are responsible for identifying problems and, if needed, contacting authorizing agency representatives to develop appropriate measures in the event performance standards are not met:

**City of Foster City/
Estero Municipal Improvement District (Permittee):**
Jeff Moneda, PE
City/District Manager
610 Foster City Boulevard
Foster City, CA 94404
(650) 286-3288
jmoneda@fostercity.org

Project Wetland Scientist²⁰:
Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Avenue
San Rafael, CA 94901
415.385.1045 (cell) ~ 415.925.2006 (fax)
thuffman@h-bgroup.com

²⁰ The Project wetland scientist will work in coordination with the City Manager and City staff responsible for levee and trail inspection and maintenance.

9.0 LONG-TERM MANAGEMENT PLAN

Long-term management of mitigation sites will commence once the performance criteria described in Section 6.0 have been determined successful by the authorizing agencies. The objective of the MMP is to restore wetlands and other waters temporarily impacted by the Project back to their self-sustaining state as an aquatic resource. The mitigation sites are protected and managed by the City of Foster City as open space lands associated with the City's levee and trail system. The maintenance actions described in Section 5.0 will continue as part of the City's management of its levee and trail open space lands. These activities are summarized in the following table.

Table 16. Long-Term Management Inspections and Actions		
Management Inspections and Actions	Activity	Schedule
1. Vandalism	I & M*	Monthly
2. Manmade Trash and Litter	I & M	Monthly
3. Vegetation Management	I & M	Monthly
4. Record Keeping	I & M	Documented contemporaneously during Inspection & Maintenance Activities
* Inspection and, if necessary, perform necessary maintenance.		

9.1 Funding

The City of Foster City will fund all costs associated with long-term management of restored wetlands and other waters that were temporarily impacted by the Project.

9.2 Responsible Party

Implementation of the long-term management plan is the responsibility of:

**City of Foster City/
Estero Municipal Improvement District (Permittee):**
Jeff Moneda, PE
City/District Manager
610 Foster City Boulevard
Foster City, CA 94404
(650) 286-3288
jmoneda@fostercity.org

Project Wetland Scientist²¹:
Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Avenue
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thuffman@h-bgroup.com

²¹ The Project wetland scientist will work in coordination with the City Manager and City staff responsible for levee and trail inspection and maintenance.

10.0 MITIGATION SITE PROTECTION

Lands used to mitigate for permanent and temporary Project impacts are described below.

Permanent Impacts. Lands within the San Francisco Bay Wetland Mitigation Bank used to mitigate for permanent project impacts to wetlands and other waters are protected by an agency approved conservation easement.

Temporary Impacts. Lands where temporary impacts to wetlands and other waters occur are on public open space lands owned by the City or leased by the City from the State Lands Commission. If changes in City needs results in an incompatible future use, such as adaptation to sea level rise, the City is responsible for providing alternative compensatory mitigation that is acceptable to the Project permitting agencies for any loss in aquatic resource area and function resulting from the incompatible use.

11.0 FINANCIAL ASSURANCES

Funding to ensure that the Project mitigation as described by this MMP will be successfully completed in accordance with agency required conditions of authorization will be provided through the City's Capital Improvements Project budget (CIP 301-657) which is funded by a 90 million local bond approved last fall by the voters of the City of Foster City. This includes:

1. ***Permanent Impacts.*** Purchase of mitigation bank credit for permanent impacts to wetlands and other waters of the U.S. and State resulting from the Project levee and trail construction activities; and
2. ***Temporary Impacts.*** Mitigation in the form of on-site restoration for temporary impacts to wetlands and other waters of the U.S. and State resulting from:
 - a. Project levee and trail construction activities
 - b. O'Neill Slough bridge construction activities

The wetlands and other waters of the U.S. and State temporarily impacted by the Project occur within open space lands that are part of the City's levee and public trail system. Funding to manage these areas as public open space lands has been provided by the City on a continuing annual basis since the construction of the City. Funding for the Long-term Management Plan activities will be provided as part of the City's annual levee and trail operations and management program.

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APPENDIX A. FIGURES

- Figure 1** **Project Area Location Map**
- Figure 2** **USGS Topographic Map of the Project Area**
- Figure 3** **Aerial Photograph of the Project Area**
- Figure 4** **USGS NHD HUC 10 Map of the Project Area with Watershed Boundaries**
- Figure 5** **USGS NHD HUC 12 Map of the Project Area with Subwatershed Boundaries**
- Figure 6** **Soils Map of the Project Area**
- Figure 7** **FEMA Map of the Project Area**
- Figure 8** **Aerial Imagery Showing Project Segments**
- Figure 9** **Levee Improvement Type and Location of Permanent and Temporary Impacts to Aquatic Resources**



Figure 1. Project Area Location Map

Levee Protection Planning and Improvement Project (CIP 301-657)
Foster City, San Mateo County, CA

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

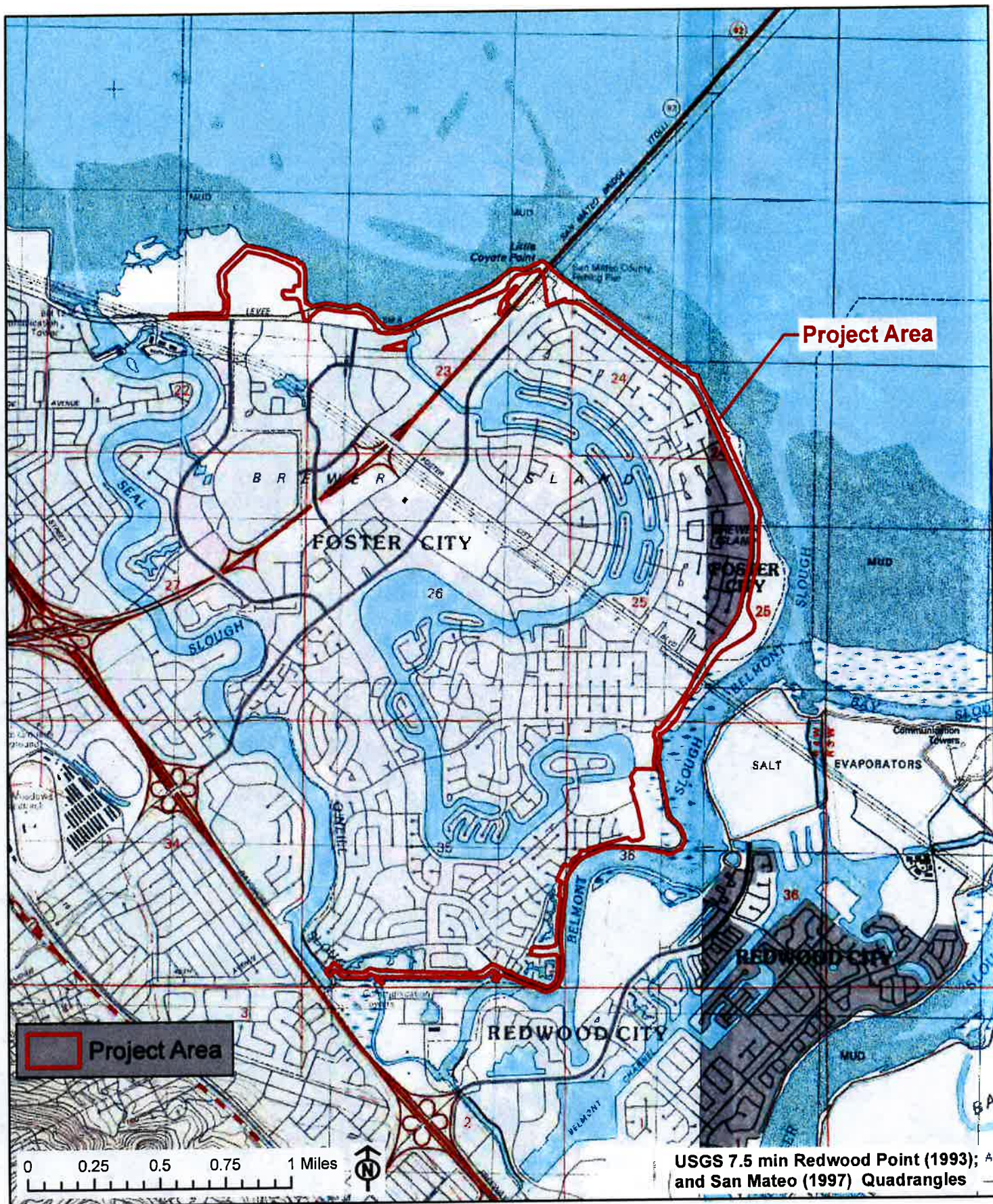


Figure 2. USGS Topographic Map of the Project Area

Levee Protection Planning and Improvement Project (CIP 301-657)
Foster City, San Mateo County, CA

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS



Figure 3. Aerial Photograph of the Project Area

Levee Protection Planning and Improvement Project (CIP 301-657)
Foster City, San Mateo County, CA

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

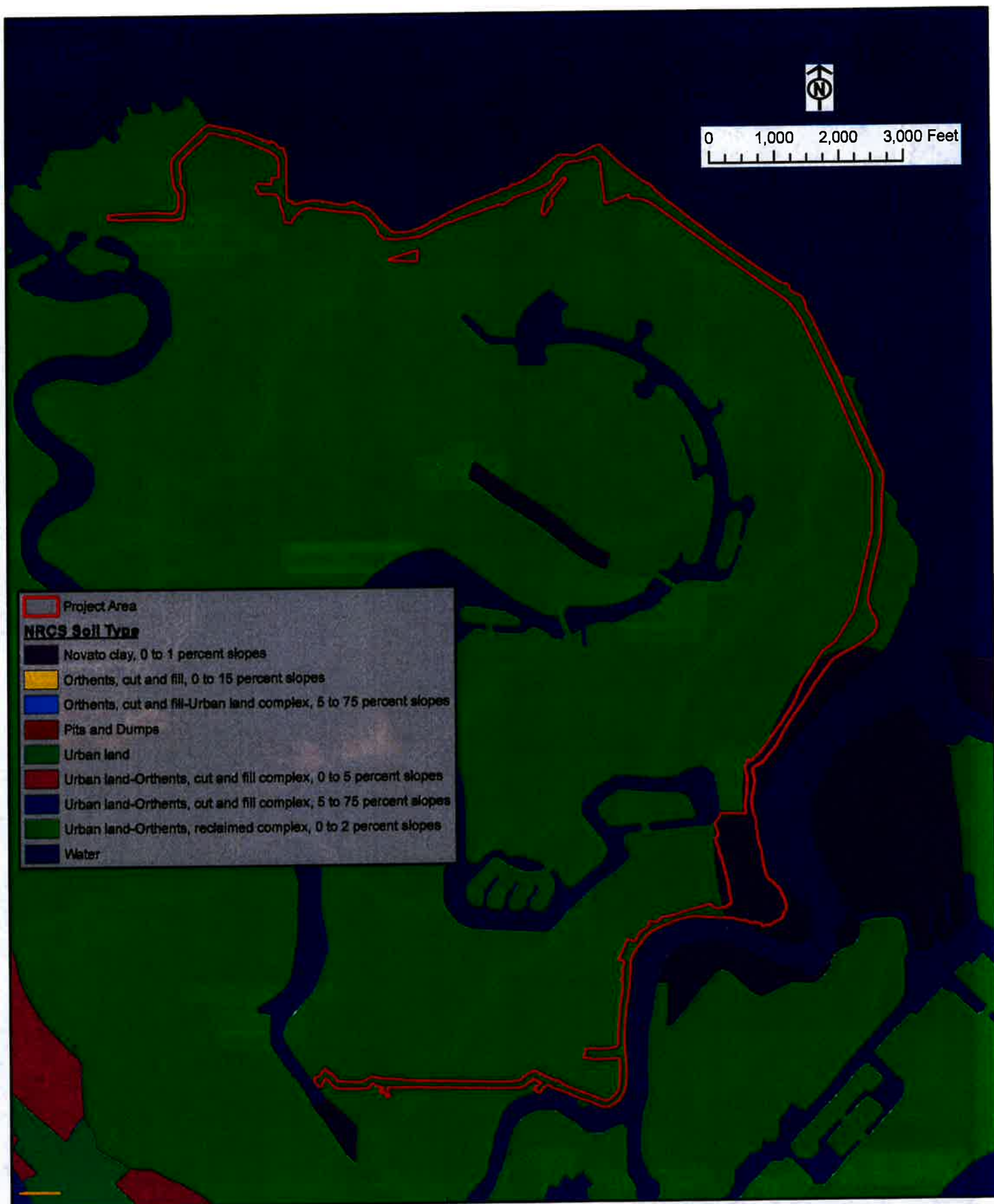


Figure 4. Soils Map of the Project Area
 Levee Protection Planning and Improvement Project (CIP 301-657)
 Foster City, San Mateo County, CA

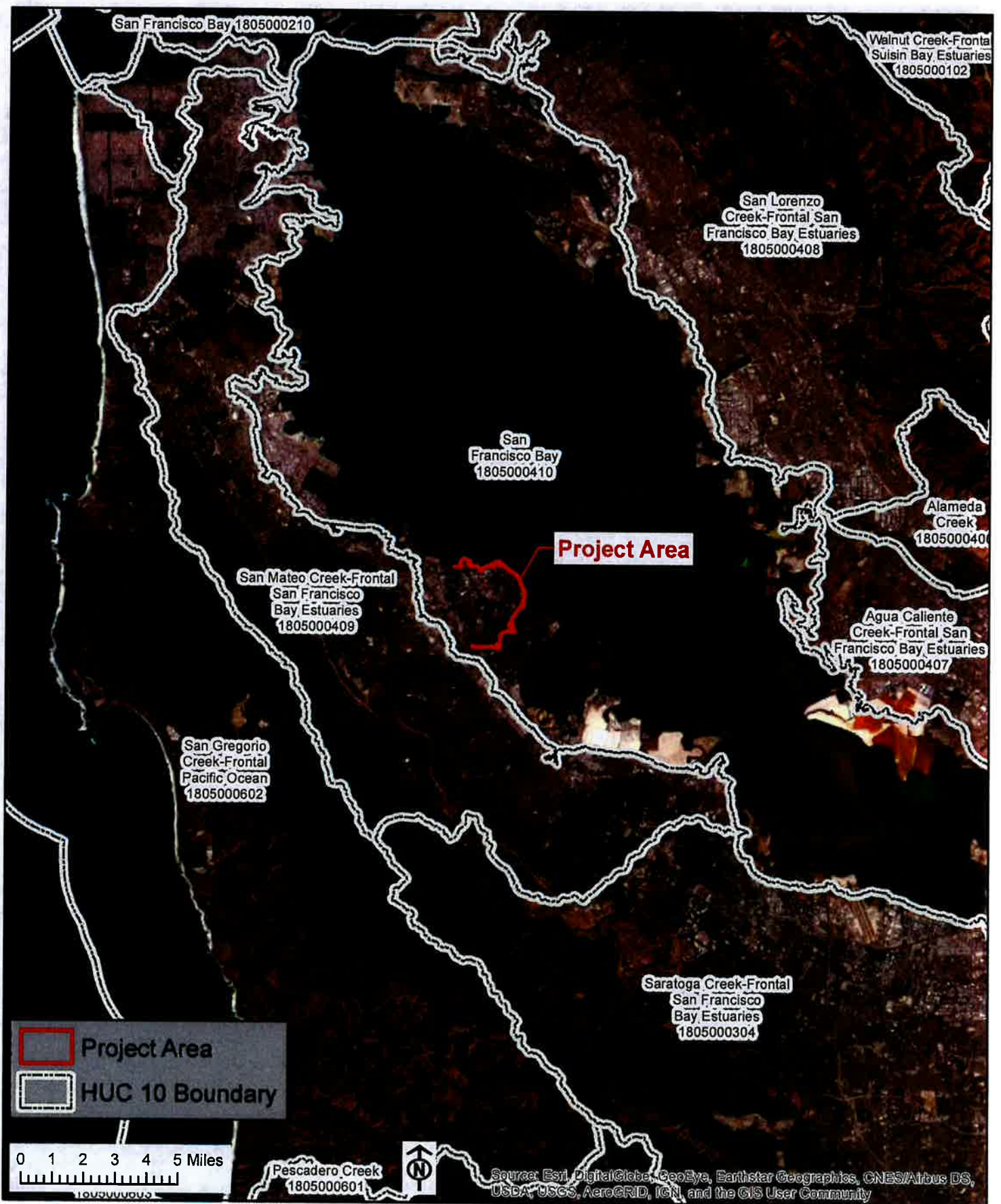


Figure 5. USGS NHD HUC 10 Map of the Project Area with Watershed Boundaries

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Levee Protection Planning and Improvement Project (CIP 301-657)
Foster City, San Mateo County, CA



Figure 6. USGS NHD HUC 12 Map of the Project Area with Subwatershed Boundaries

Levee Protection Planning and Improvement Project (CIP 301-657)
Foster City, San Mateo County, CA

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

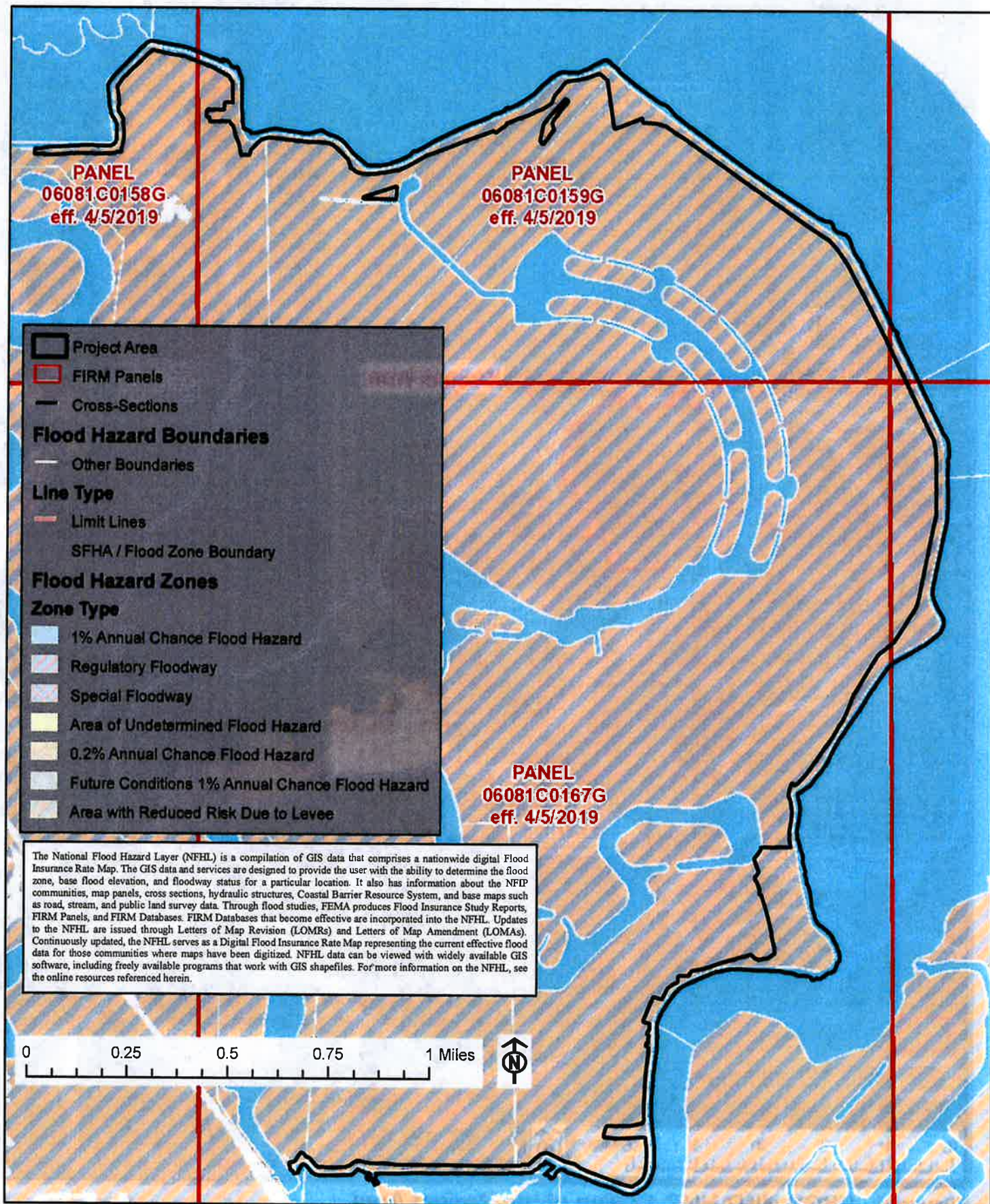


Figure 7. FEMA Map of the Project Area
Levee Protection Planning and Improvement Project (CIP 301-657)
Foster City, San Mateo County, CA



Figure 8. Aerial Imagery Showing Project Segments

Levee Protection Planning and Improvement Project (CIP 301-657)
Foster City, San Mateo County, CA

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

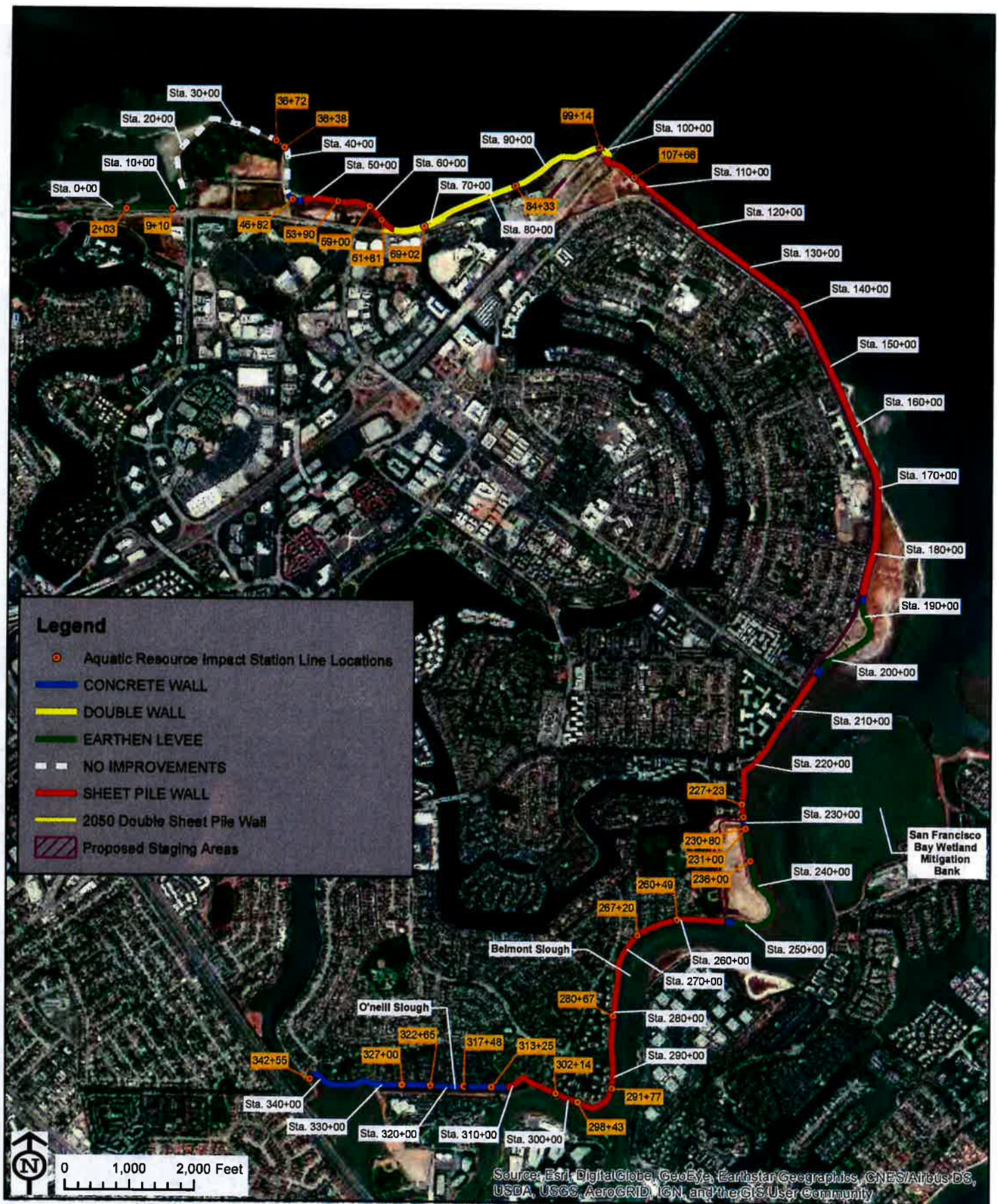


Figure 9. Levee Improvement Type and Location of Permanent and Temporary Impacts to Aquatic Resources

APPENDIX B. WETS DATA & TIDAL DATUMS

APPENDIX B 1. NOAA TIDAL DATUMS

APPENDIX B 2. NRCS WETS

Appendix B 1. Tidal Datums at W. End, San Mateo Bridge, Station 9414458

	MLLW DATUM			NAVD			NGVD	
	Meters	Feet		Meters	Feet		Meters	Feet
Highest Obs. WL	3.264	10.71		3.001	9.84		2.18	7.16
MHHW	2.354	7.72		2.091	6.86		1.27	4.17
MHW	2.16	7.08		1.897	6.22		1.08	3.54
MTL	1.261	4.14		0.998	3.27		0.18	0.59
MSL	1.253	4.11		0.99	3.25		0.17	0.56
MLW	0.362	1.19		0.099	0.32		-0.72	-2.36
MLLW	0	0.00		-0.263	-0.86		-1.08	-3.55
Lowest Obs. WL	-0.881	-2.89		-1.144	-3.75		-1.96	-6.44
NAVD=MLLW minus:	0.263	0.86			NGVD=NAVD minus		0.818	2.684
Reference:	http://co-ops.nos.noaa.gov/data_menu.shtml?stn=9414458%20San%20Mateo%20Bridge,%20CA&							
Tidal Bench Mark:	Guano Island No. 6 1851 1967							
Tidal Epoch:	1983-2001							

APPENDIX B 2. WETS DATA

WETS Station: REDWOOD CITY, CA

Requested years: 1971 - 2000

Month	Temperature (°F)				Precipitation (inches)			
	Avg daily max	Avg daily min	Avg daily mean	Avg	30% chance will have		Avg number of days with 0.10 inch or more	Average total snowfall
					less than	more than		
Jan	58.5	39.7	49.1	4.19	1.88	5.11	7	0.0
Feb	62.3	42.4	52.3	3.88	1.59	4.72	7	0.0
Mar	65.2	44.3	54.8	3.30	1.36	4.01	7	0.0
Apr	70.4	45.7	58.1	1.07	0.41	1.30	3	0.0
May	74.9	49.0	62.0	0.43	0.11	0.37	1	0.0
Jun	80.3	52.7	66.5	0.10	0.00	0.10	0	0.0
Jul	82.7	55.0	68.9	0.03	0.00	0.03	0	0.0
Aug	82.5	55.0	68.7	0.10	0.00	0.06	0	0.0
Sep	80.4	53.5	67.0	0.22	0.00	0.23	1	0.0
Oct	75.0	49.4	62.2	1.06	0.43	1.20	2	0.0
Nov	64.8	43.6	54.2	2.62	0.77	2.99	5	0.0
Dec	58.6	39.3	48.9	2.79	1.39	3.36	5	0.0
Annual:					15.47	23.79		
Average	71.3	47.5	59.4	-	-	-	-	-
Total	-	-	-	19.78			39	0.0

GROWING SEASON DATES

Requested years of data: 1971 - 2000
 Years with missing data: 24 deg = 2 28 deg = 2 32 deg = 2
 Years with no occurrence: 24 deg = 28 28 deg = 23 32 deg = 2
 Data years used: 24 deg = 28 28 deg = 28 32 deg = 28

Probability	Temperature		
	24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	No occurrence	No occurrence	1/28 to 12/18 324 days
70 percent *	No occurrence	No occurrence	1/18 to 12/29 345 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

STATS TABLE

Total precipitation (inches)

Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1906				0.98	1.52	0.83						M2.19	5.52
1907	M2.95	2.72	M7.86	MT	0.28	0.60			0.09	M0.92		4.32	19.74
1908	3.15	3.93	0.93	0.20	0.47				M0.01	M0.24	0.70	2.10	11.73
1909	11.63	5.97	2.75						M0.96	M1.05	M1.41	M4.81	28.58
1910	M3.47	M0.65	M2.43							M0.30	M0.35	M0.45	7.65
1911		M0.61		M0.83						0.10		M1.81	3.35
1912	M1.40	0.29			0.68	1.01			0.50	M0.05	0.49	0.71	5.13
1913	3.17	0.60	M1.07	0.29	0.57	0.00	0.24	0.00		0.00	M4.69	M4.42	15.05
1914	M10.76	4.56	0.63	0.64	M0.06	0.27			0.00	0.54	0.64	5.01	23.11
1915	4.51	M7.64	1.72	0.60	M2.10	0.00	0.00	0.00	0.00	0.00	0.38	M7.08	24.03
1916	13.66	1.59	0.87	0.00	0.03		0.00	M0.10	0.71	M1.18	0.57	M4.63	23.34
1917	M0.86	M4.86	M0.73										6.45
1918		M1.98	M3.63	M0.40									6.01
1919													
1920													
1921													
1922													
1923													
1924													
1925													
1926													
1927													
1928													
1929													
1930										0.57	1.42	0.25	2.24
1931	4.96	0.87	1.16	0.45	0.79	0.75	0.01		T	0.45	1.66	9.14	20.24
1932	2.76	3.23	0.17	0.45	0.20	T	0.00	0.00	0.00	0.00	0.27	2.77	9.85
1933	5.86	0.60	2.96	0.13	1.21	0.05	0.00	0.00	0.02	1.09	0.00	5.55	17.47
1934	1.07	3.83	T	0.30	0.28	0.67	0.00	T	0.16	0.69	2.91	2.67	12.58
1935	5.21	1.01	4.15	3.71	0.00	0.00	0.00	0.31	T	1.55	0.41	2.03	18.38

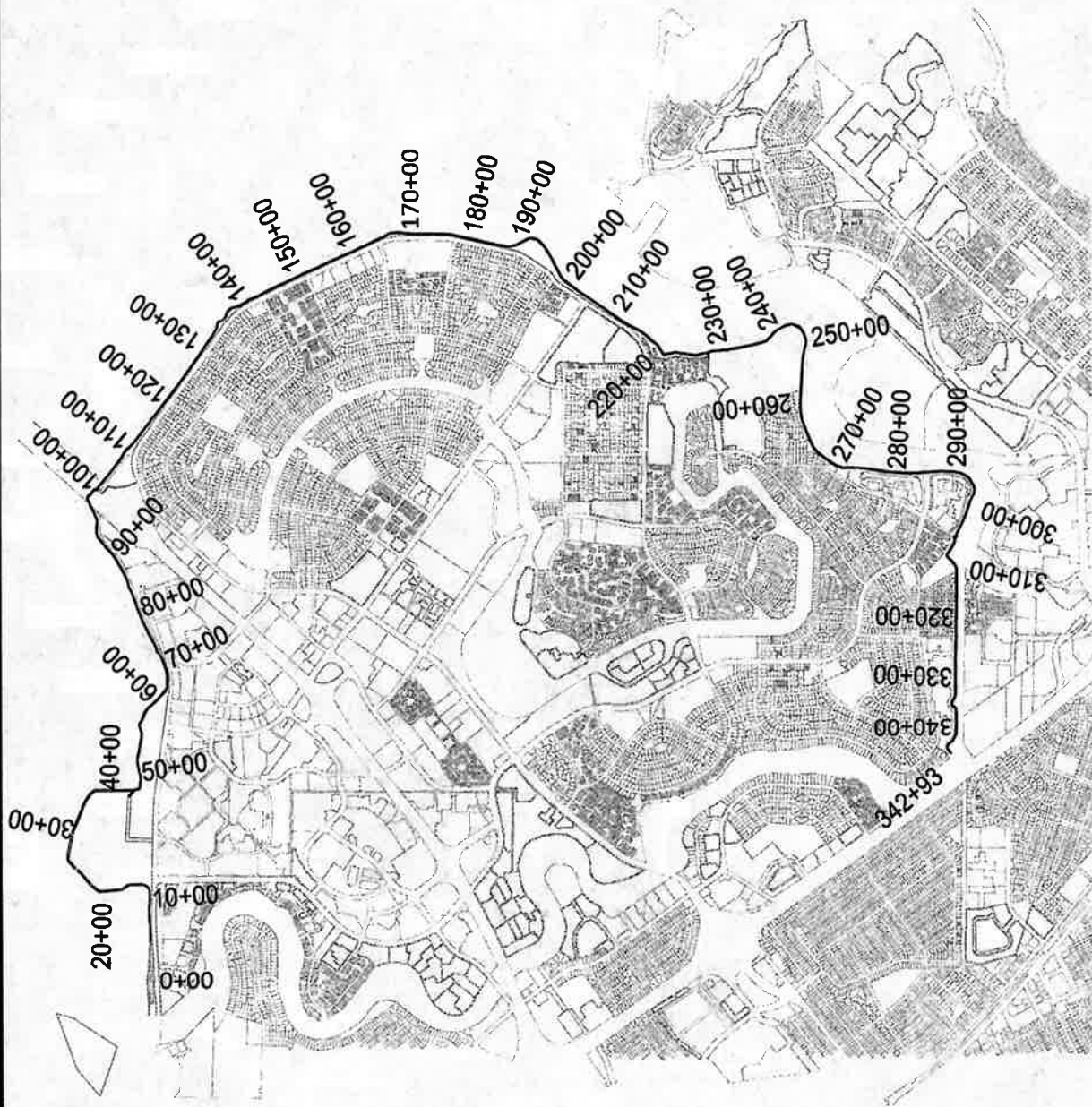
Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1936	3.82	8.19	0.98	1.48	0.12	0.15	0.01	0.00	0.00	0.42	0.02	4.91	20.10
1937	4.64	5.67	6.54	0.87	0.02	0.31	0.00	0.00		0.82	2.97	4.01	25.85
1938	3.25	7.73	6.26	1.55	0.00	0.00	0.00	0.00	0.06	1.11	1.30	1.29	22.55
1939	2.94	1.66	1.58	0.66	1.05	0.00	0.00	0.00	0.44	1.08	0.33	0.72	10.46
1940	12.28	8.99	M4.88	M0.36	0.32	0.00	0.00	0.00	M0.27	0.68	M0.41	M7.59	35.78
1941	M6.72	6.99	M3.39	4.04	M0.41	0.05	0.01	T	0.00	0.98	1.13	M7.10	30.82
1942	5.62	3.03	2.45	2.91	1.64	0.00	0.00	0.00	0.15	1.14	3.06	2.43	22.43
1943	7.65	1.78	3.15	1.32	T	0.02	0.00	0.00	T	0.55	0.65	1.86	16.98
1944	3.19	6.30	1.03	0.99	0.50	T	0.00	0.00	0.00	1.67	4.09	3.13	20.90
1945	0.65	4.80	3.46	0.30	0.39	T	T	T	T	2.21	2.33	6.04	20.18
1946	1.05	1.64	2.19	0.04	0.27	0.00	0.20	0.00	0.04	0.19	4.56	2.93	13.11
1947	0.99	1.59	2.91	0.19	0.15	0.43	0.00	T	T	2.84	0.76	1.33	11.19
1948	0.26	M1.61	3.14	3.35	0.41	0.00	0.02	0.00	0.00	0.25	M0.12	4.10	13.26
1949	1.20	3.39	4.91	T	0.72	0.01	0.09	0.21	0.03	0.07	1.54	2.09	14.26
1950	7.44	2.52	1.47	1.05	0.53	0.03	0.00	0.00	T	1.66	6.54	5.69	26.93
1951	2.92	2.21	1.18	0.89	0.64	0.02	0.00	T	T	1.03	2.58	9.34	20.81
1952	8.57	1.90	4.43	0.80	0.25	0.09	0.03	0.00	0.01	0.14	2.51	10.19	28.92
1953	3.12	0.04	1.76	2.11	0.48	0.16	0.00	0.03	T	0.24	2.44	0.36	10.74
1954	4.33	2.67	3.07	0.98	0.04	0.24	0.00	0.00	0.00	0.02	2.30	4.00	17.65
1955	4.58	1.71	0.11	1.55	0.60	0.00	T	0.00	0.00	T	1.45	14.16	24.16
1956	7.85	2.36	0.19	0.94	0.93	0.01	M0.00	0.00	0.22	1.10	0.00	0.35	13.95
1957	2.97	4.06	1.42	1.32	2.76	T	T	0.00	0.72	1.95	0.66	4.12	19.98
1958	4.61	8.82	6.52	6.37	0.30	0.20	0.00	0.00	0.10	0.01	0.12	1.06	28.11
1959	5.05	4.55	0.14	0.21	T	0.00	0.00	0.02	3.07	0.00	T	1.65	14.69
1960	4.51	4.57	0.89	0.65	0.63	0.00	T	0.00	T	0.05	3.15	0.99	15.44
1961	1.95	0.83	2.70	0.94	0.76	0.03	0.00	0.02	0.36	0.19	3.11	1.77	12.66
1962	1.84	7.58	3.29	0.25	T	0.00	0.00	0.01	0.01	6.39	0.33	2.82	22.52
1963	4.46	3.20	3.63	2.92	0.55	T	0.00	T	0.29	0.95	3.98	0.26	20.24
1964	3.60	0.27	1.67	0.13	0.56	0.75	T	0.08	0.00	1.30	3.59	6.63	18.58
1965	3.88	1.08	1.96	3.25	0.00	T	0.00	0.07	0.01	T	4.45	5.17	19.87
1966	2.18	1.81	0.24	0.66	0.13	0.09	0.30	0.04	0.10	T	4.04	3.56	13.15
1967	10.90	0.17	5.44	4.68	0.15	0.52	0.00	0.00	0.00	0.25	1.33	2.86	26.30
1968	5.44	1.42	3.43	0.78	0.07	0.00	0.00	0.11	0.00	0.37	1.95	4.75	18.32
1969	9.39	8.90	1.42	1.79	0.01	0.04	0.00	0.00	0.01	1.24	0.73	4.11	27.64

Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1970	8.77	2.04	1.43	0.40	0.04	0.06	0.00	0.00	0.00	0.74	6.69	7.42	27.59
1971	1.22	0.36	2.73	0.73	0.21	0.00	0.01	0.35	0.12	0.03	0.81	4.36	10.93
1972	1.15	1.21	0.09	0.86	0.00	0.08	0.00	0.00	0.47	4.19	6.29	1.80	16.14
1973	7.61	6.07	2.09	0.11	T	0.00	0.00	0.00	0.03	1.96	7.36	4.83	30.06
1974	3.46	1.05	4.64	2.11	T	0.13	0.22	0.00	0.00	1.20	0.69	2.59	16.09
1975	1.50	4.33	5.72	1.57	T	0.11	0.13	0.46	T	1.55	0.22	0.22	15.81
1976	0.27	1.92	0.84	0.79	0.00	0.03	0.02	0.90	0.52	0.38	1.11	1.23	8.01
1977	1.46	0.86	1.97	0.01	1.07	0.00	0.10	T	0.85	0.25	2.17	3.49	12.23
1978	9.05	4.95	5.01	2.83	0.02	0.00	0.00	0.00	0.36	T	1.73	0.52	24.47
1979	5.73	4.94	3.53	1.00	0.38	0.00	0.23	0.00	0.00	2.08	1.65	M1.03	20.57
1980	4.56	8.08	1.79	1.43	0.10	0.02	0.10	0.00	T	0.05	0.07	2.54	18.74
1981	7.21	2.50	4.39	0.19	0.06	0.00	0.00	0.00	0.26	2.20	7.23	5.20	29.24
1982	7.29	3.41	8.23	3.27	0.00	0.10	0.00	0.02	1.03	2.05	5.94	5.25	36.59
1983	8.07	7.36	9.20	3.58	0.37	0.00	0.00	0.00	0.37	0.69	7.09	6.09	42.82
1984	0.46	1.66	1.58	0.54	0.00	0.03	T	0.20	0.22	1.83	5.67	2.03	14.22
1985	0.66	1.97	4.15	0.08	0.45	0.15	0.05	0.01	0.18	0.99	M2.87	2.57	14.13
1986	2.98	10.06		0.67	0.45	0.00	0.03	0.00	0.63	T	0.04	1.33	16.19
1987	2.84	5.01	1.60	0.22	0.03	T	0.00	0.00	0.00	1.05	1.60	3.93	16.28
1988	3.31	0.58	0.05	1.65	0.24	0.03	0.00	0.00	0.00	0.18	1.87	M3.09	11.00
1989	1.59	1.37	3.27	0.95	0.05	0.03	0.00	0.00	0.64	1.72	1.42	T	11.04
1990	2.48	2.68	0.76	0.18	1.61	0.00	0.01	0.00	0.11	0.20	0.09	2.04	10.16
1991	0.33	2.94	7.87	0.33	0.15	0.15	0.00	0.17	0.13	1.70	0.40	2.63	16.80
1992	1.85	6.34	3.05	0.20	0.00	0.20	0.00	0.05	T	1.58	0.09	6.26	19.62
1993	9.81	4.78	2.51	0.63	0.44	0.31	0.00	0.00	0.00	0.41	1.40	2.08	22.37
1994	1.97	4.90	0.40	0.99	1.52	0.00	0.00	0.00	0.08	0.62	5.30	2.30	18.08
1995	8.55	0.13	8.45	1.16	1.53	0.69	0.00	0.00	0.00	0.00	0.00	6.10	26.61
1996	6.51	6.26	3.11	1.01	1.06	0.00	0.00	0.00	0.00	0.60	2.29	6.46	27.30
1997	7.84	0.08	0.31	0.28	0.37	0.35	0.00	0.81	T	0.62	7.60	2.61	20.87
1998	7.48	12.42	2.43	2.05	2.23	T	0.00	0.00	0.06	0.70	3.26	0.89	31.52
1999		4.33	3.46	1.77	0.03	0.39	0.00	0.06	0.22	0.32	M1.53	0.34	12.45
2000			2.36	0.92		0.13	0.00			M2.57	0.77	0.21	6.96
2001	2.44	4.48	1.48	0.83	0.00	T	0.00		0.19	0.36	4.54	6.50	20.82
2002	M0.24	1.40		0.21	0.28	0.00	0.00	0.00	0.00		1.38	11.75	15.26
2003	1.58	1.36	M0.25	3.75	0.64	0.00	T	0.00	0.00	0.00	1.27	M6.44	15.29

Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
2004	4.60	5.12	0.47		0.00	0.00	0.00	0.00	0.03	4.41	0.64	6.07	21.34
2005		4.47	4.35	1.90	0.75	0.27		0.00	0.02	M0.00			11.76
2006	2.25				0.47	0.00	0.00	0.00	0.00		0.49	1.98	5.19
2007	0.59	3.04	0.26	0.46	M0.03	0.00	0.00	0.00	0.29	1.16	0.01	2.42	8.26
2008	M4.43	2.42		0.00	0.00	M0.00	M0.00	M0.00	M0.00	M0.00	M0.00	M3.86	10.71
2009	M1.18	M4.78	2.06	M0.02	0.43	0.06	0.01	0.00	0.24	3.88	0.13	2.25	15.04
2010	6.33	2.88	2.31	2.83	0.66	0.00	0.00	0.00	0.00	M0.14	2.50	M1.75	19.40
2011	M0.70	4.36	5.43	0.18	0.34	M1.04	0.00	0.00	0.00	M0.97	M1.21	M0.04	14.27
2012	M2.82	1.00	6.17	3.12	0.02	0.17	0.00	0.00	0.00	M1.75	3.71	M6.40	25.16
2013	M0.30	0.50	0.71	0.51	0.01	0.03	0.00	0.00	M0.00	0.00	0.53	M0.04	2.63
2014	0.00	3.59	1.60	0.84	0.00	0.00	0.00	0.00	0.60	0.35	M1.00	10.73	18.71
2015	0.00	M0.01	0.05	M0.01	0.04	0.10	0.00	0.00	0.01	0.02	2.04	3.89	6.17
2016	5.20	0.97	6.82	M0.69	0.00	0.00	0.00	0.00	0.00	3.64	1.19	3.51	22.02
2017	10.42	7.52	3.05	M2.18	0.00	0.01	0.00	M0.00	0.01	0.21	M0.92	0.08	24.40
2018	4.44	0.26	4.17	1.41	0.00	0.00	0.00	0.00	0.00	0.00	M0.07	1.77	12.12
2019	5.00	7.45	3.87	0.26	1.87	0.00	M0.00						18.45

Notes: Data missing in any month have an "M" flag. A "T" indicates a trace of precipitation.
Data missing for all days in a month or year is blank.

APPENDIX C
RESTORATION PLANS FOR TEMPORARY LEVEE
AND TRAIL CONSTRUCTION IMPACTS TO AQUATIC
RESOURCES



PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATUM: NAVD 86
ADJACENT PROPERTY OWNERS:
1. State of CA
2. Foster City
DATE: 8/19/2018

Figure 1. Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMD; 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / thuffman@h-bgroup.com

KEY SHEET
PROJECT NAME: Levee Protection Planning and Improvement Project
(CIP 301-557)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California

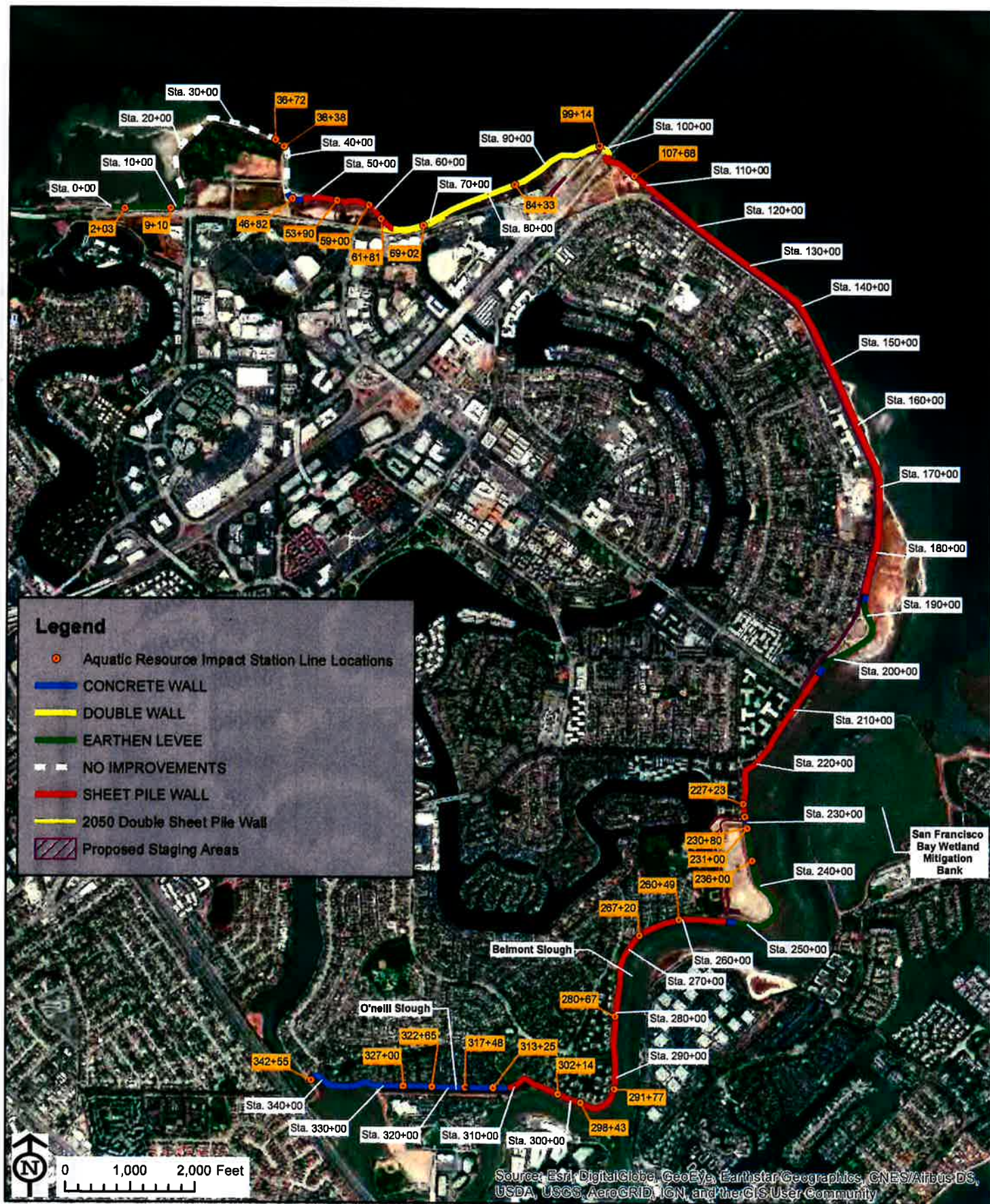


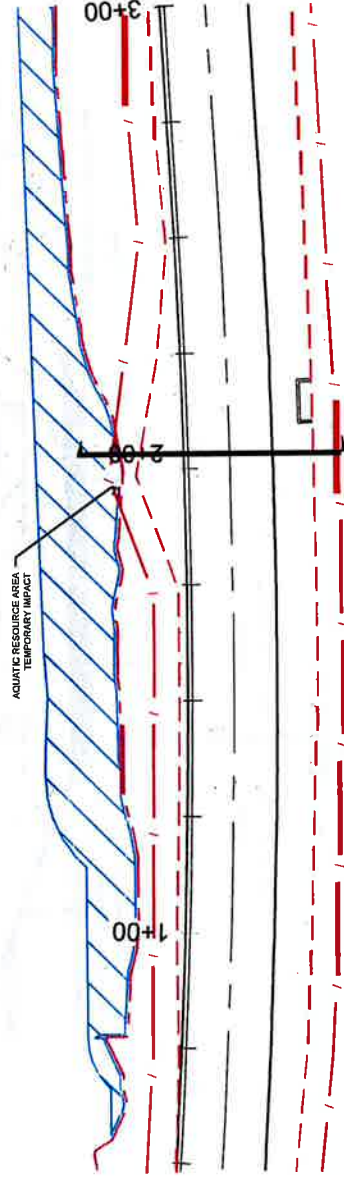
Figure 2. Foster City Levee Protection Planning and Improvement Project
Levee Improvement Type and Location of Permanent and Temporary
Impacts to Aquatic Resources

Huffman-Broadway Group, Inc.
 ENVIRONMENTAL REGULATORY CONSULTANTS



LEGEND:

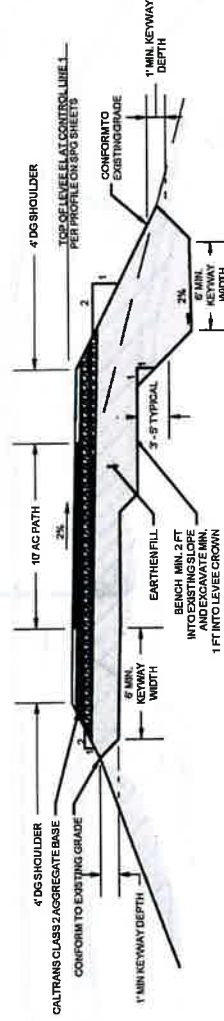
- LIMIT OF TEMPORARY WORK
- LIMIT OF GRADING WORK
- HIGH TIDE LINE
- MEAN HIGH WATER LINE (EL.=6.3 FT)
- AQUATIC RESOURCE AREA
- AQUATIC RESOURCE AREA PERMANENT IMPACT
- AQUATIC RESOURCE AREA TEMPORARY IMPACT



PLAN
SCALE: 1" = 40'

CONTROL LINE 1
SEE S4 SHEETS

BAY SIDE LAND SIDE

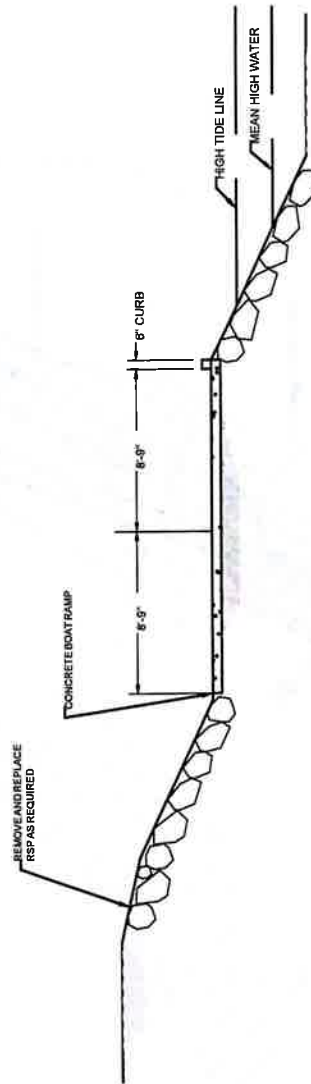
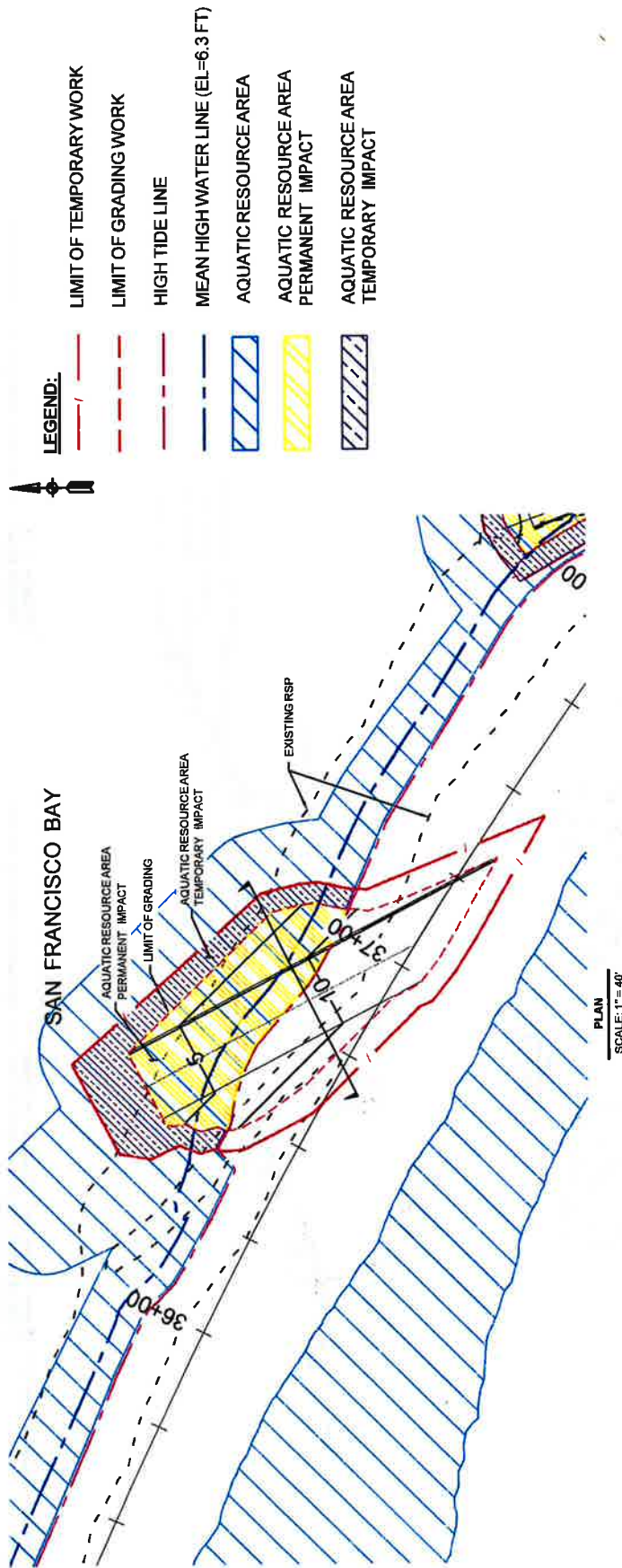


PROFILE

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
1. State of CA 2. Foster City
DATE: 8/15/2018

Figure 3- Levee Aquatic Resource Area
APPLICATION BY: City of Foster City/EMD; 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / thuffman@h-bgroup.com

STATION: 2+03
PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-857)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California

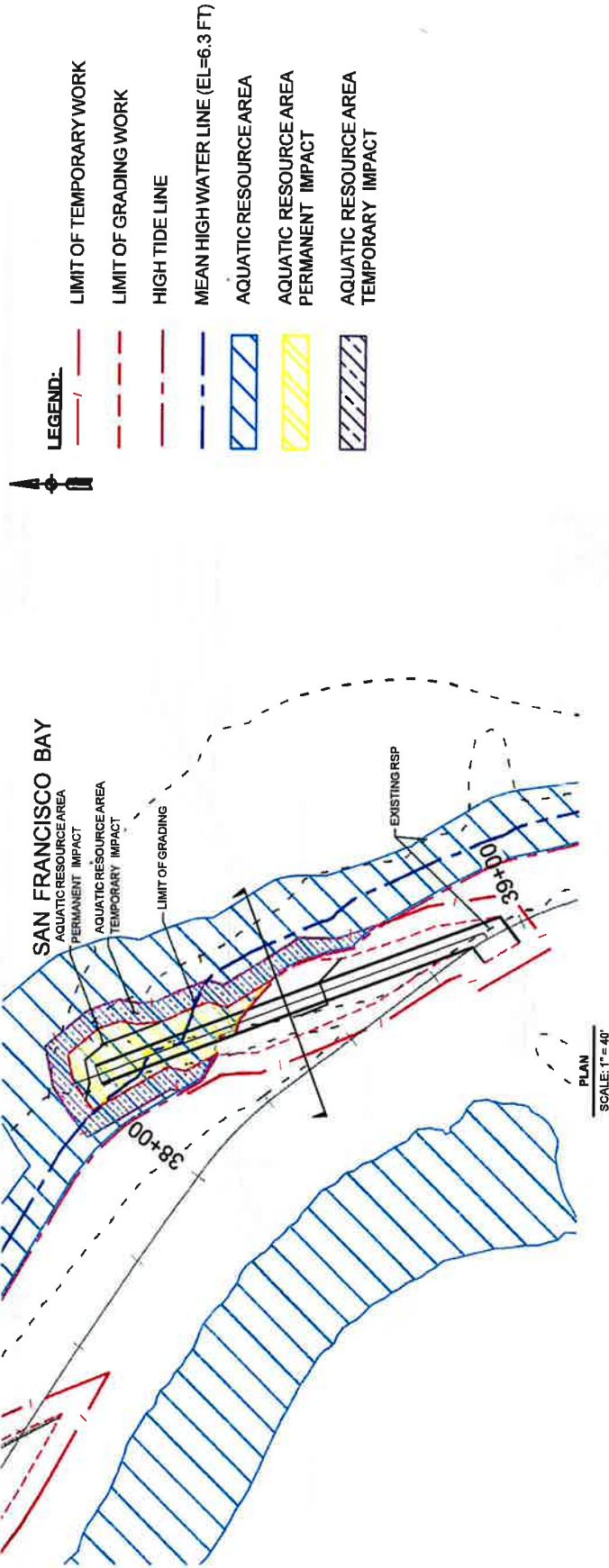


PROFILE
SCALE: NTS

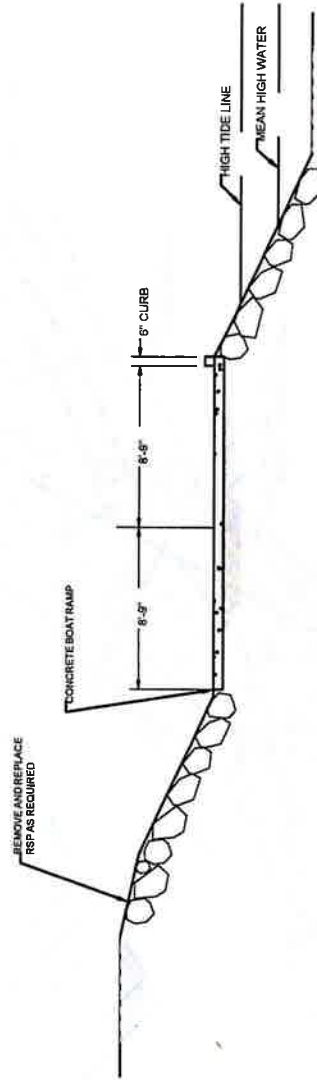
PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
 DATUM: NAVD 86
 ADJACENT PROPERTY OWNERS:
 1. State of CA
 2. Foster City
 DATE: 8/15/2016

Figure 5. Levee Aquatic Resource Area Impact
 APPLICATION BY: City of Foster City/EMID, 610 Foster City Boulevard, Foster City, CA 94404
 APPLICANT'S AGENT: Terry Huffman, PhD
 Huffman-Broadway Group, Inc.
 828 Mission Ave
 San Rafael, CA 94901
 415.385.1045 / thuffman@h-bgroup.com

STATION: 36+72
 PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-557)
 IN: waters of the United States
 AT: Adjacent to existing City Levee System
 COUNTY OF: San Mateo
 STATE: California



PLAN
SCALE: 1"=40'



PROFILE
SCALE: 1"=10'

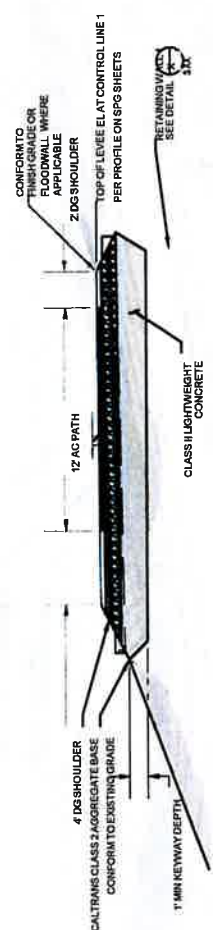
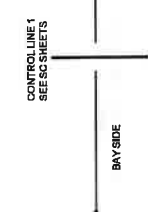
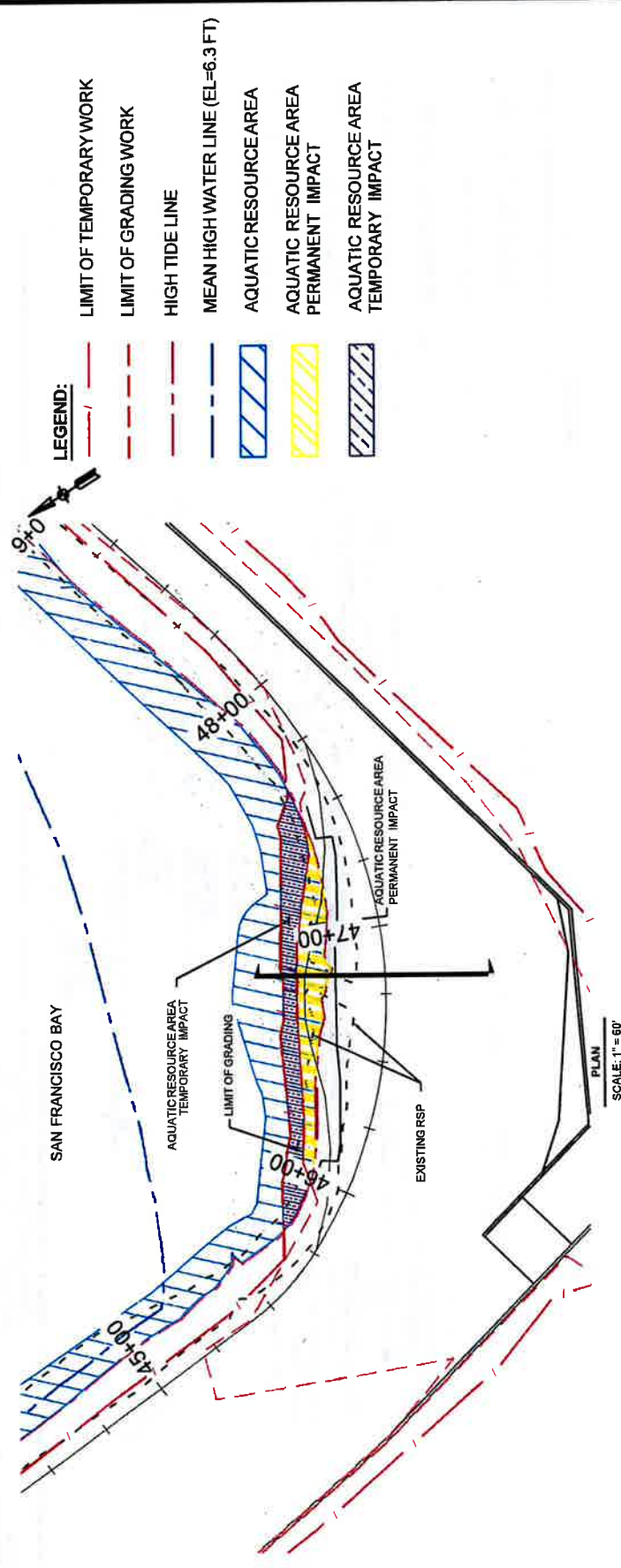
LEGEND:

- LIMIT OF TEMPORARY WORK
- LIMIT OF GRADING WORK
- HIGH TIDE LINE
- MEAN HIGH WATER LINE (EL=6.3 FT)
- AQUATIC RESOURCE AREA
- AQUATIC RESOURCE AREA PERMANENT IMPACT
- AQUATIC RESOURCE AREA TEMPORARY IMPACT

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
 1. State of CA
 2. Foster City
DATE: 8/15/2018

Figure: 6. Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMD: 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PhD
 Huffman-Broadway Group, Inc.
 828 Mission Ave
 San Rafael, CA 94901
 415.365.1045 / terryhuffman@hbg-group.com

STATION: 38+38
PROJECT NAME: Levee Protection Planning and Improvement Project (CJP 301-657)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California



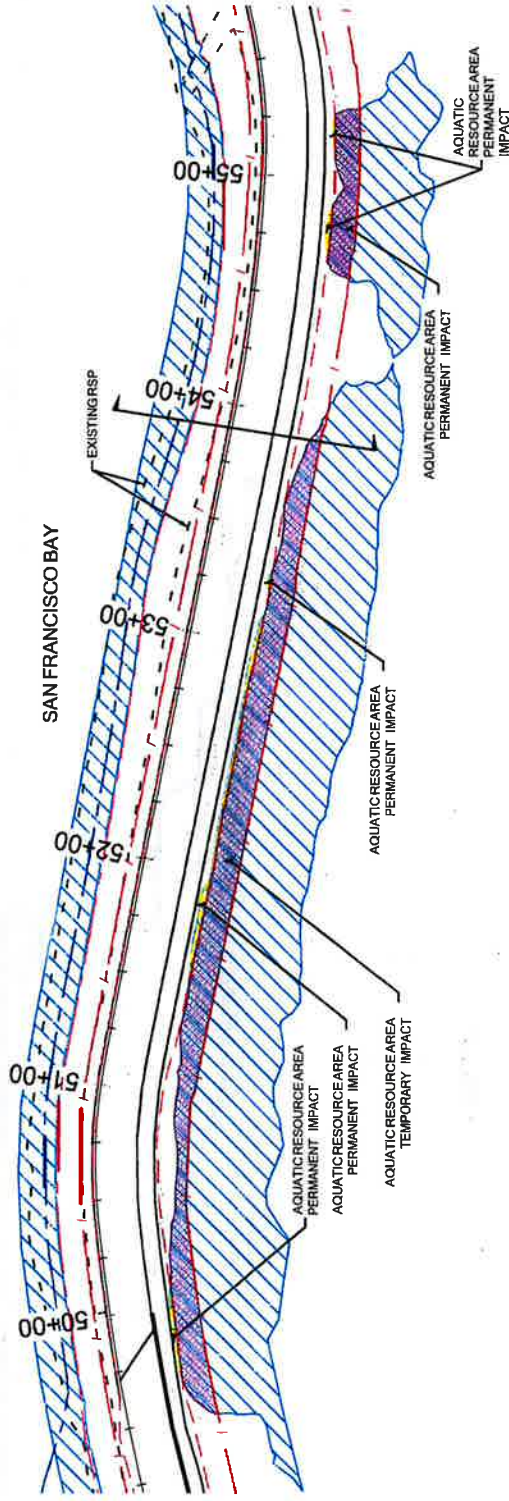
PROFILE

SCALE: 1" = 60'

Figure 7 Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMID, 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PhD
 Huffman-Broadway Group, Inc.
 828 Mission Ave
 San Rafael, CA 94901
 415.385.1045 / thuffman@h-bgroup.com

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATE: MAY 2016
ADJACENT PROPERTY OWNERS:
 1. State of CA
 2. Foster City
DATE: 8/15/2016

STATION: 48+82
PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-857)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California



PLAN
SCALE: 1" = 80'

CONTROL LINE 1
SEE SC SHEETS

LAND SIDE

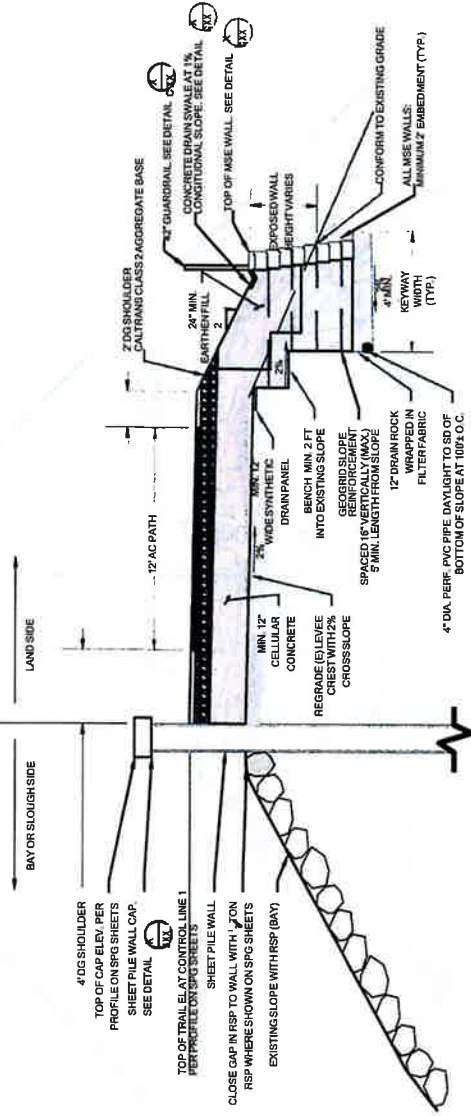
BAY OR SLOUGH SIDE

4" DG SHOULDER
TOP OF CAP ELEV. PER
PROFILE ON SPG SHEETS
SEE DETAIL

TOP OF TRAIL ELAT CONTROL LINE 1
PER PROFILE ON SPG SHEETS
SEE DETAIL

SHEET PILE WALL
CLOSE GAP IN RSP TO WALL WITH 1" ON
RSP WHERE SHOWN ON SPG SHEETS

EXISTING SLOPE WITH RSP (BAY)



PROFILE
SCALE: NTS

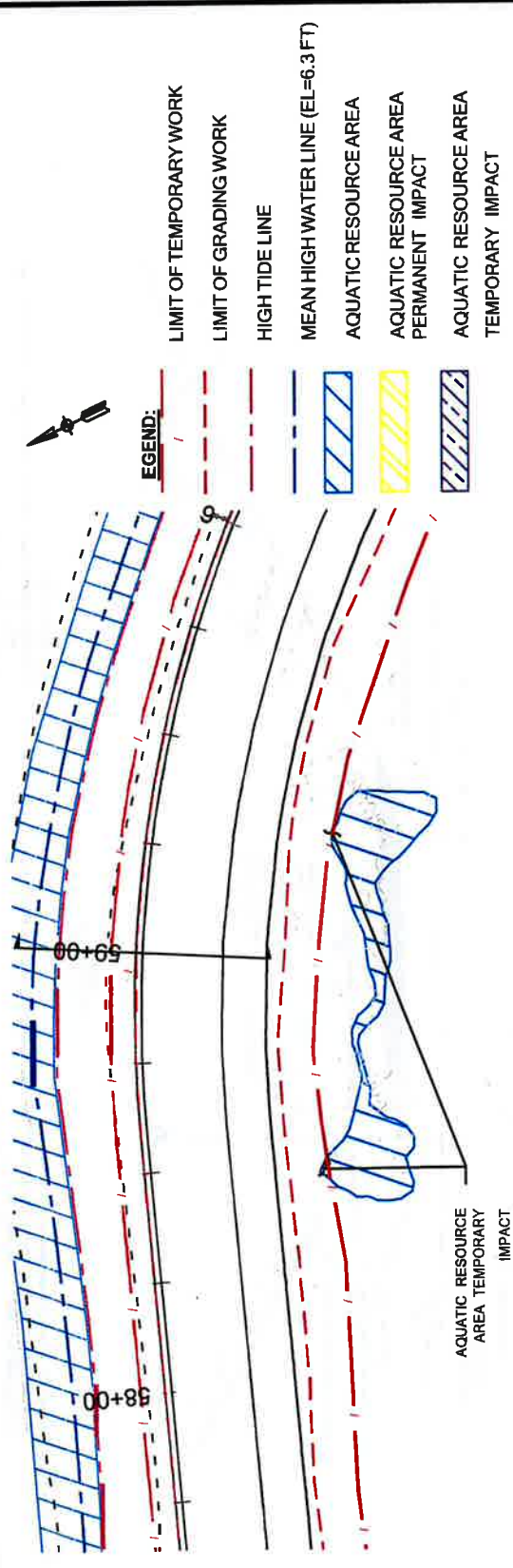
LEGEND:

- LIMIT OF TEMPORARY WORK
- LIMIT OF GRADING WORK
- HIGH TIDE LINE
- MEAN HIGH WATER LINE (EL=6.3 FT)
- AQUATIC RESOURCE AREA
- AQUATIC RESOURCE AREA PERMANENT IMPACT
- AQUATIC RESOURCE AREA TEMPORARY IMPACT

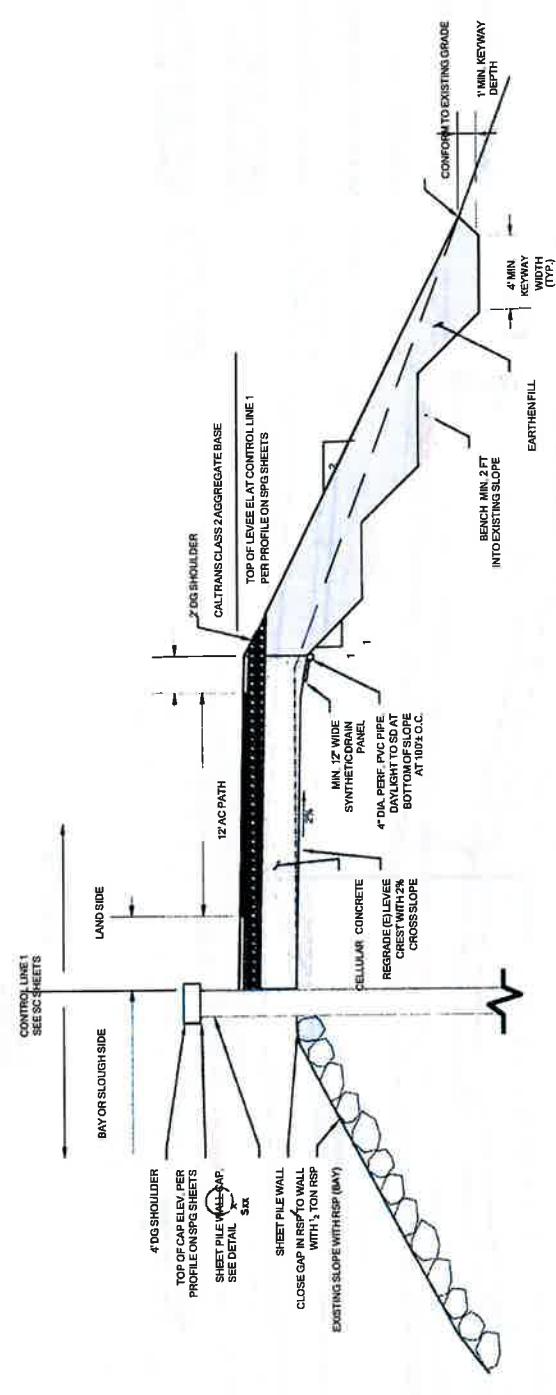
PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
1. State of CA
2. Foster City
DATE: 8/15/2018

Figure 8. Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave.
San Rafael, CA 94901
415.385.1045 / t.huffman@hbg-group.com

STATION: 53+80
PROJECT NAME: Levee Protection Planning and Improvement Project
(CIP 301-657)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California



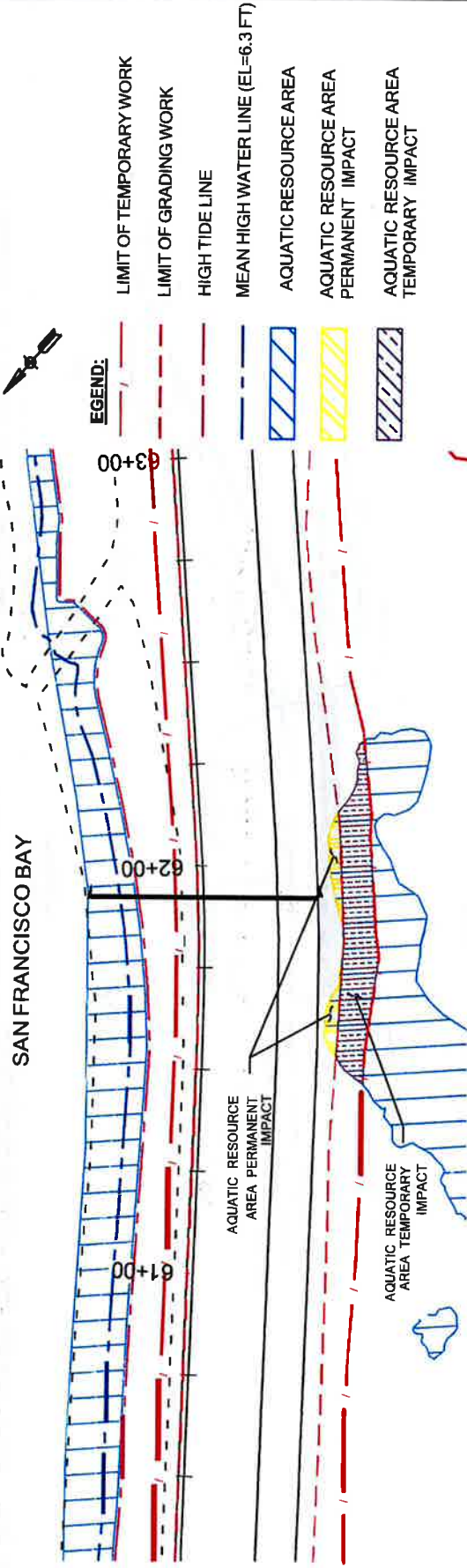
PLAN
SCALE: 1" = 40'



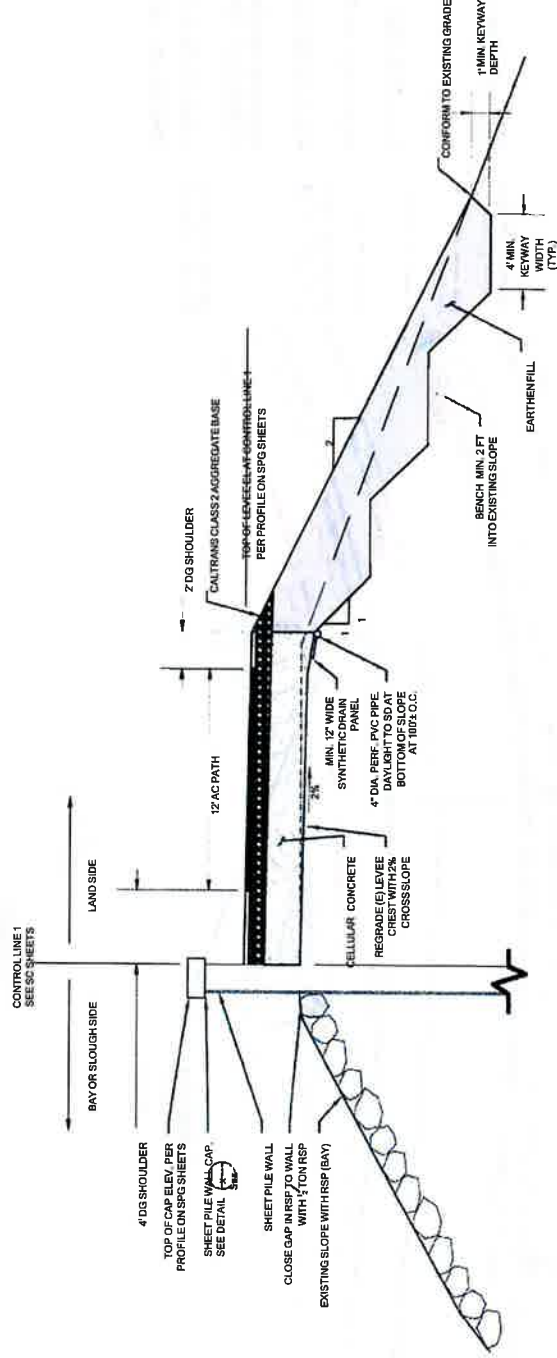
PROFILE
SCALE: NTS

<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATUM: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <ol style="list-style-type: none"> State of CA Foster City <p>DATE: 8/15/2018</p>	<p>Figure 3. Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID: 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com</p>	<p>STATION: 58+00</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-857)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>
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SAN FRANCISCO BAY



PLAN
SCALE: 1" = 40'

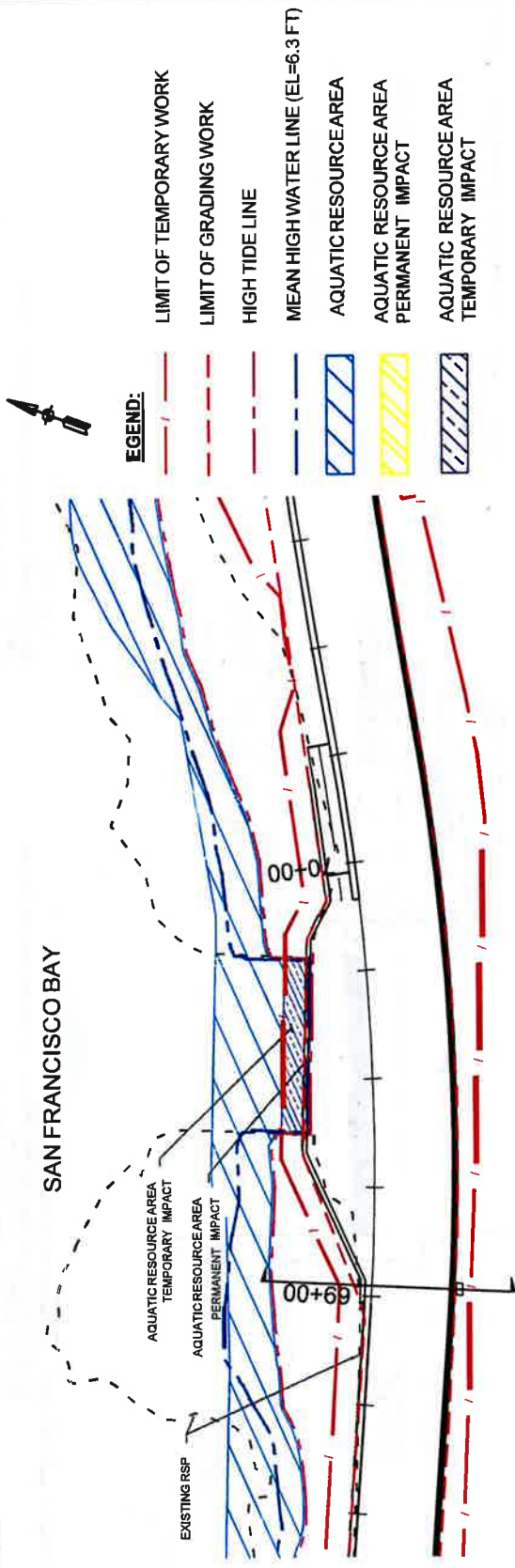


PROFILE
SCALE: NTS

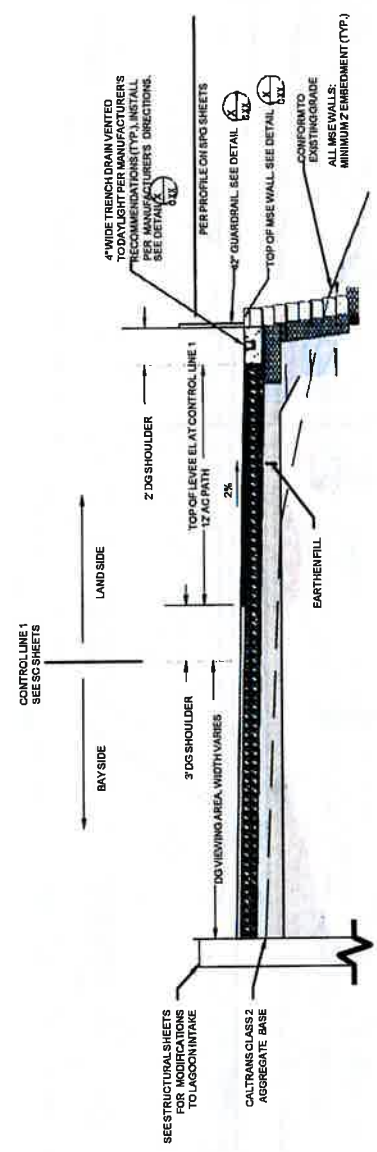
PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
1. State of CA
2. Foster City
DATE: 8/15/2018

Figure: 10. Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMID: 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / thuffman@h-bgroup.com

STATION: 61+81
PROJECT NAME: Levee Protection Planning and Improvement Project
(CJP 301-657)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California



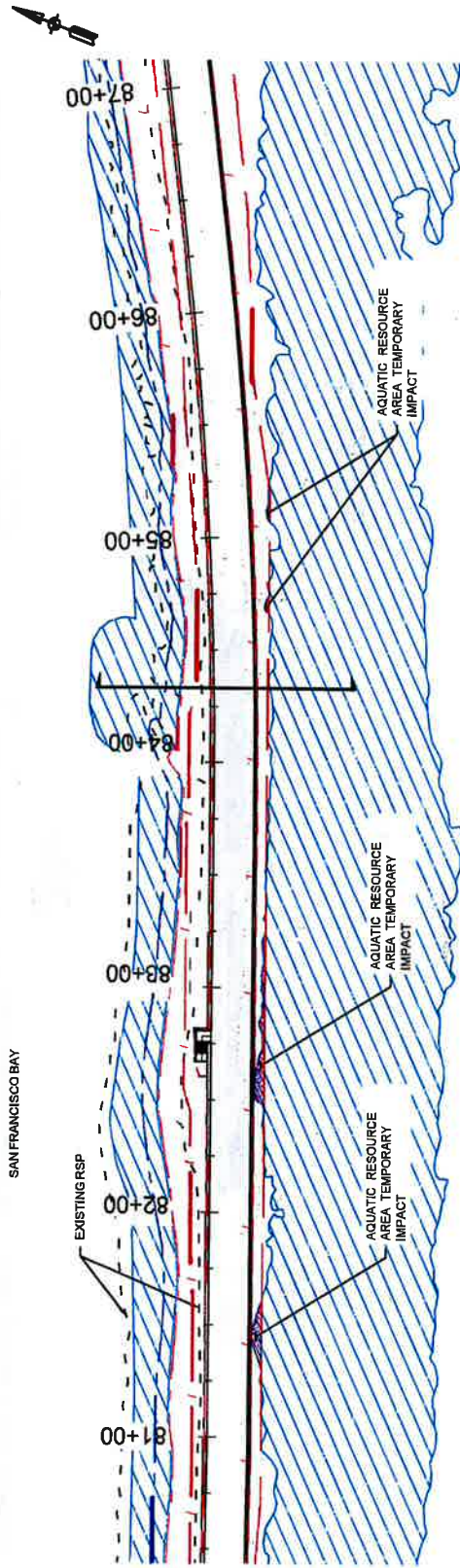
PLAN
SCALE: 1" = 40'



PROFILE
SCALE: 1" = 10'

<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATE: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <ol style="list-style-type: none"> State of CA Foster City <p>DATE: 8/15/2018</p>	<p>Figure 11: Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID, 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@hbg-group.com</p>	<p>STATION: 68+02</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-157)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>	<p>Schaaf & Wheeler</p>
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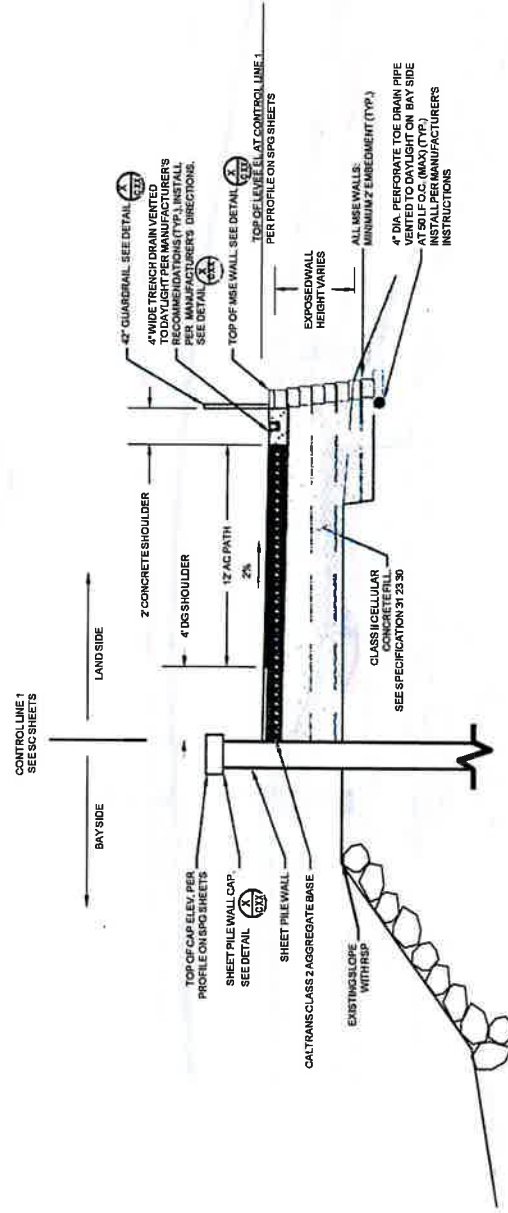
SAN FRANCISCO BAY



PLAN
SCALE: 1" = 80'

LEGEND:

- LIMIT OF TEMPORARY WORK
- - - LIMIT OF GRADING WORK
- - - HIGH TIDE LINE
- - - MEAN HIGH WATER LINE (EL. = 6.3 FT)
- AQUATIC RESOURCE AREA
- AQUATIC RESOURCE AREA PERMANENT IMPACT
- AQUATIC RESOURCE AREA TEMPORARY IMPACT

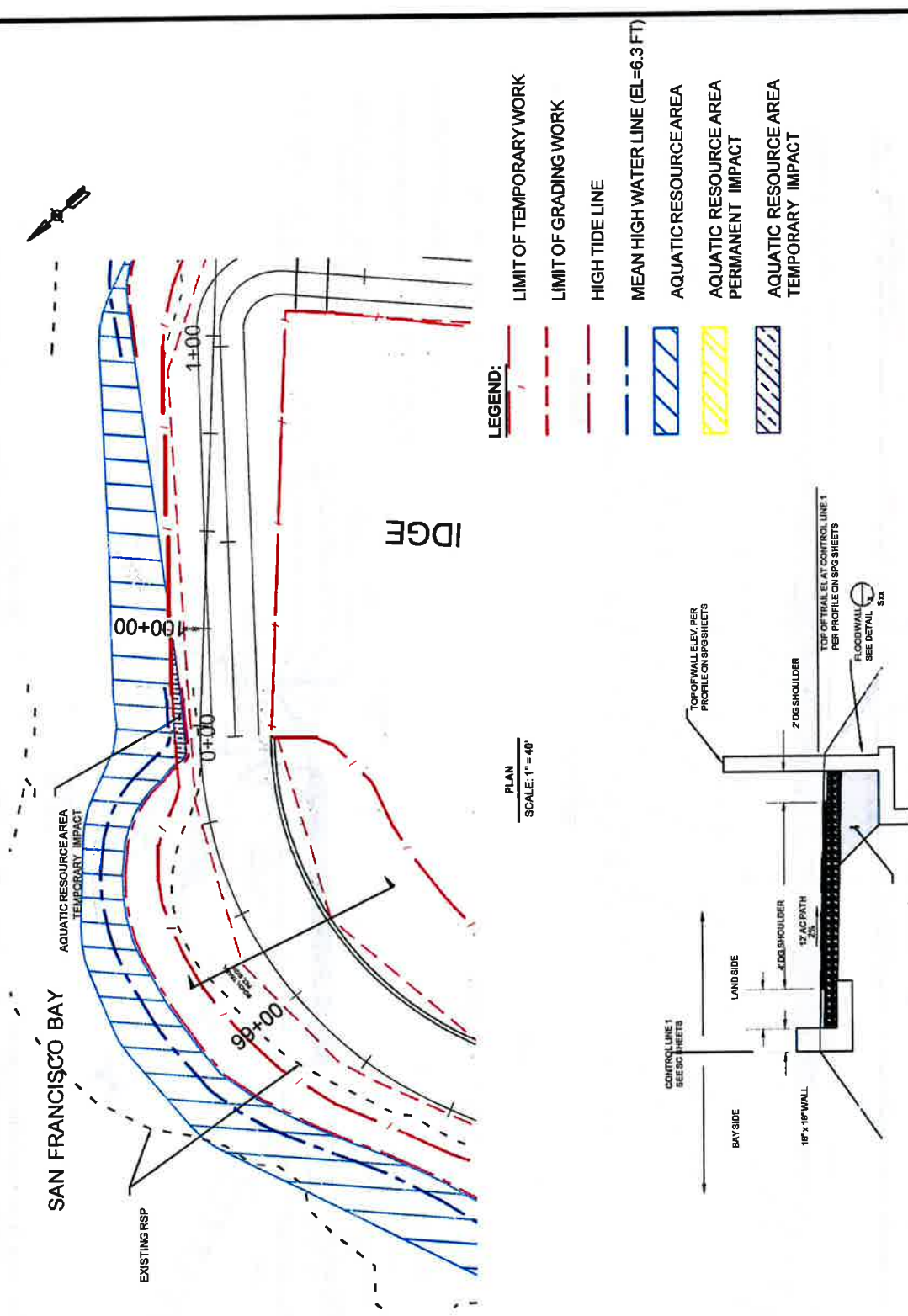


PROFILE
SCALE: NTS

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
 1. State of CA
 2. Foster City
DATE: 8/15/2018

Figure 12. Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PhD
 Huffman-Broadway Group, Inc.
 828 Mission Ave
 San Rafael, CA 94901
 415.385.1045 / huffman@h-group.com

STATION: 84+33
PROJECT NAME: Levee Protection Planning and Improvement Project (CJP 301-657)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California

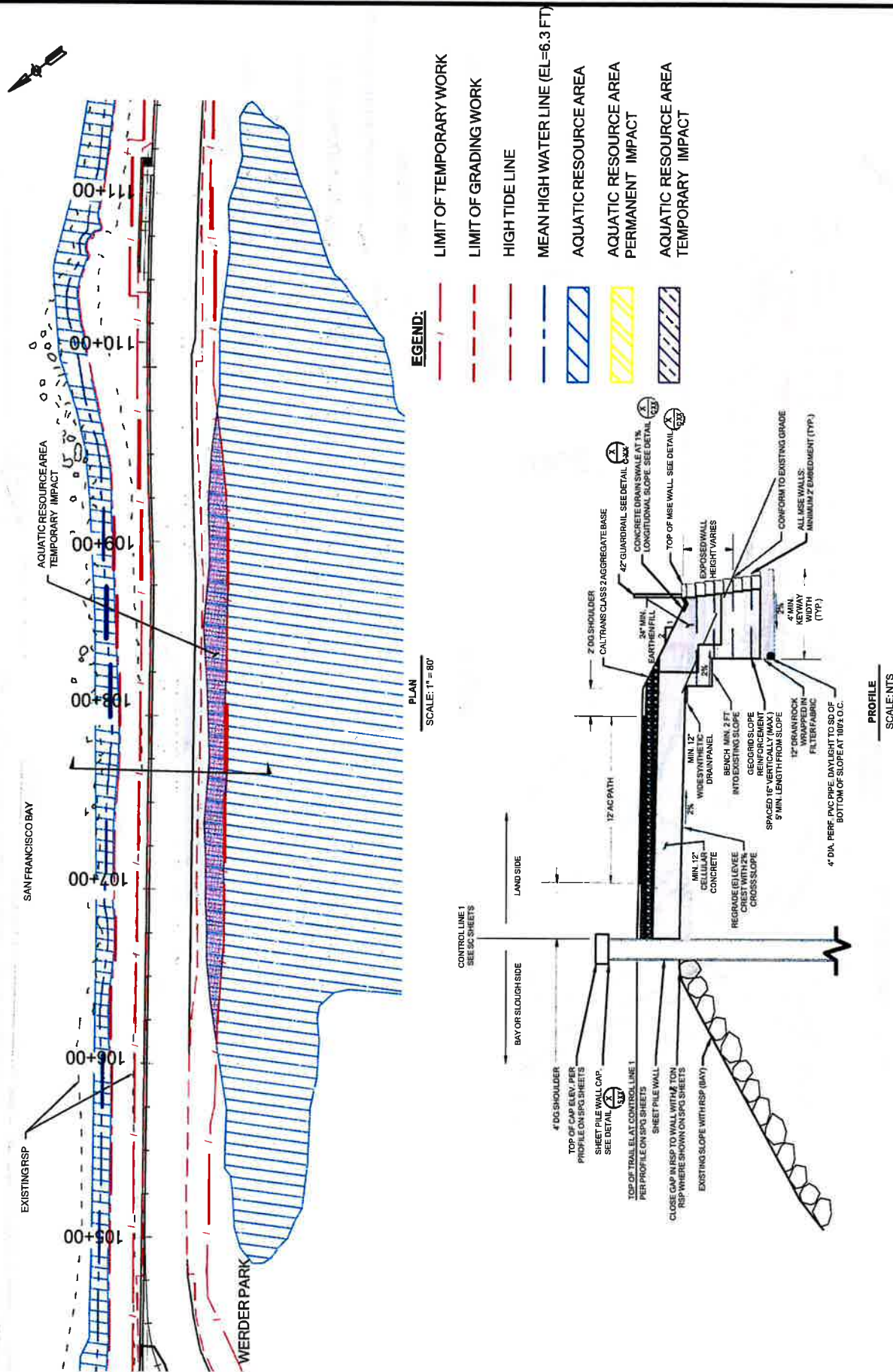


- LEGEND:**
- LIMIT OF TEMPORARY WORK
 - - - LIMIT OF GRADING WORK
 - - - HIGH TIDE LINE
 - - - MEAN HIGH WATER LINE (EL=6.3 FT)
 - ▨ AQUATIC RESOURCE AREA
 - ▨ AQUATIC RESOURCE AREA PERMANENT IMPACT
 - ▨ AQUATIC RESOURCE AREA TEMPORARY IMPACT

PLAN
SCALE: 1" = 40'

PROFILE

PURPOSE: Rehabilitate levee system to retain FEMA accreditation. DATUM: NAVD 88 ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City DATE: 8/15/2018	Figure: 13. Levee Aquatic Resource Area Impact APPLICATION BY: City of Foster City/EMD, 610 Foster City Boulevard, Foster City, CA 94404 APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1046 / thuffman@h-bgroup.com	STATION: 99+14 PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657) IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
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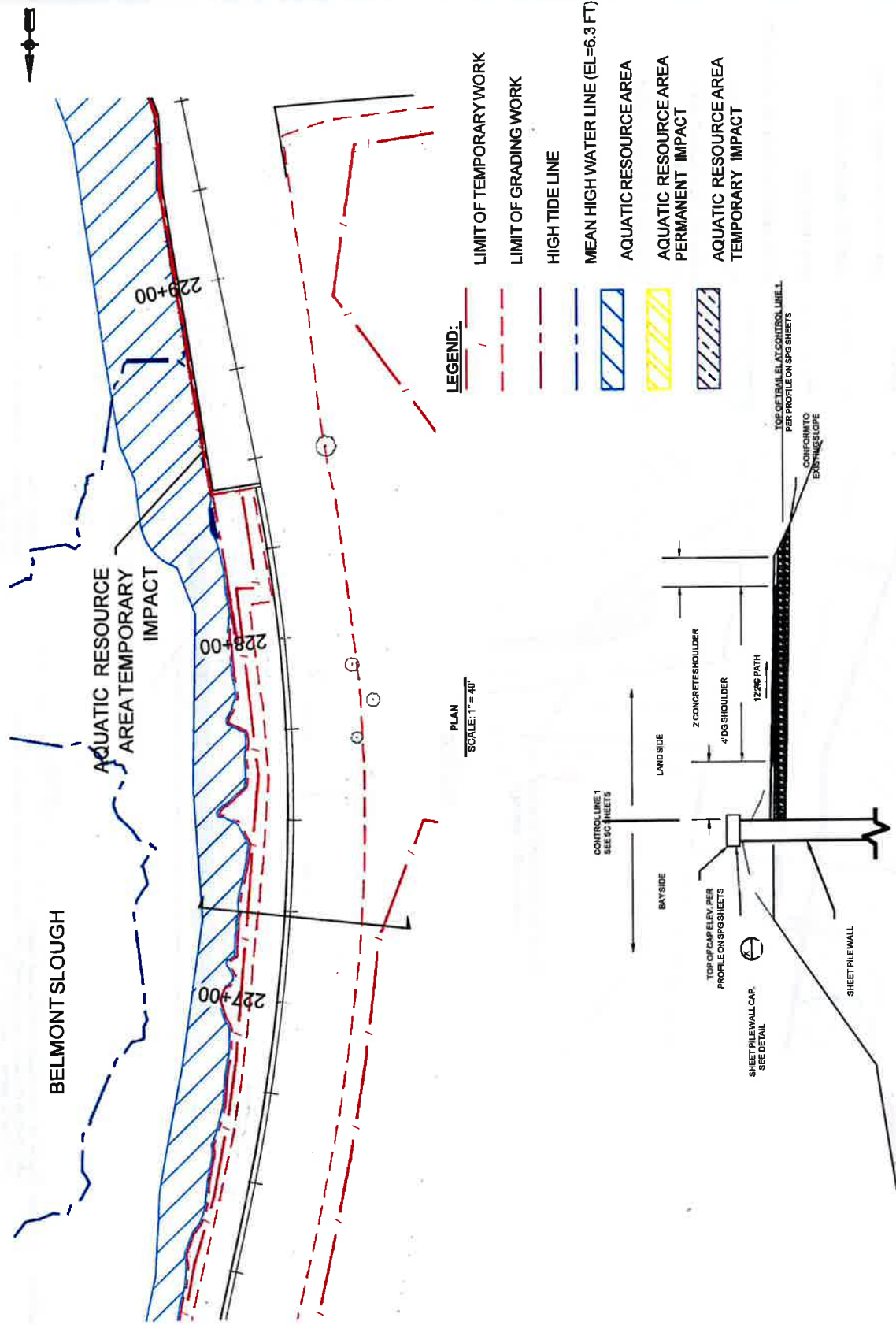


PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
 1. State of CA
 2. Foster City
DATE: 8/15/2018

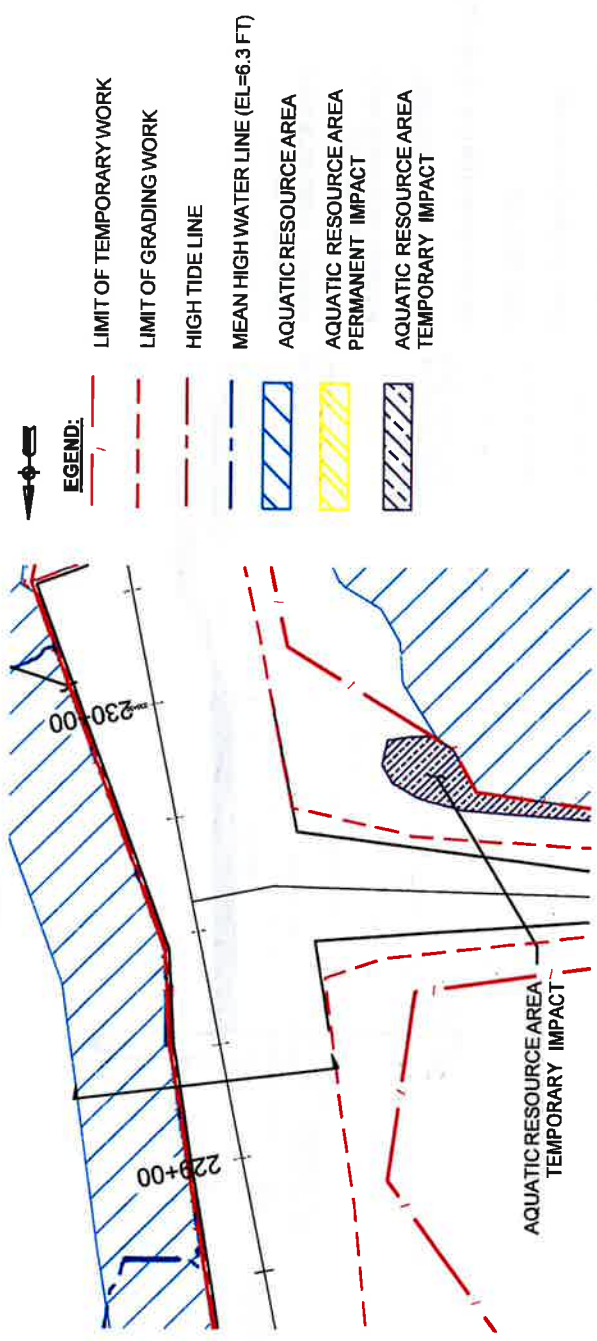
Figure: 14. Leaves Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404
APPLICANTS AGENT: Terry Huffman, PhD
 Huffman-Broadway Group, Inc.
 828 Mission Ave
 San Rafael, CA 94901
 415.385.1045 / huffman@h-bg.com

STATION: 107+68
PROJECT NAME: Levee Protection Planning and Improvement Project
 (CIP 301-457)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California

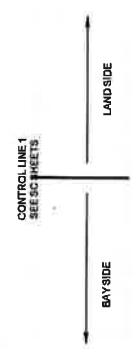
Schaaf & Wheeler



<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATUM: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <p>1. State of CA 2. Foster City</p> <p>DATE: 8/15/2018</p>	<p>Figure 15: Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@hbggroup.com</p>	<p>STATION: 227+23</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>	<p>PROFILE</p>
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PLAN
SCALE: 1" = 40'



PROFILE

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATE: NAVD 88
ADJACENT PROPERTY OWNERS:
 1. State of CA
 2. Foster City
DATE: 8/15/2018

Figure 16. Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PhD
 Huffman-Broadway Group, Inc.
 828 Mission Ave
 San Rafael, CA 94901
 415.385.1045 / huffman@hbggroup.com

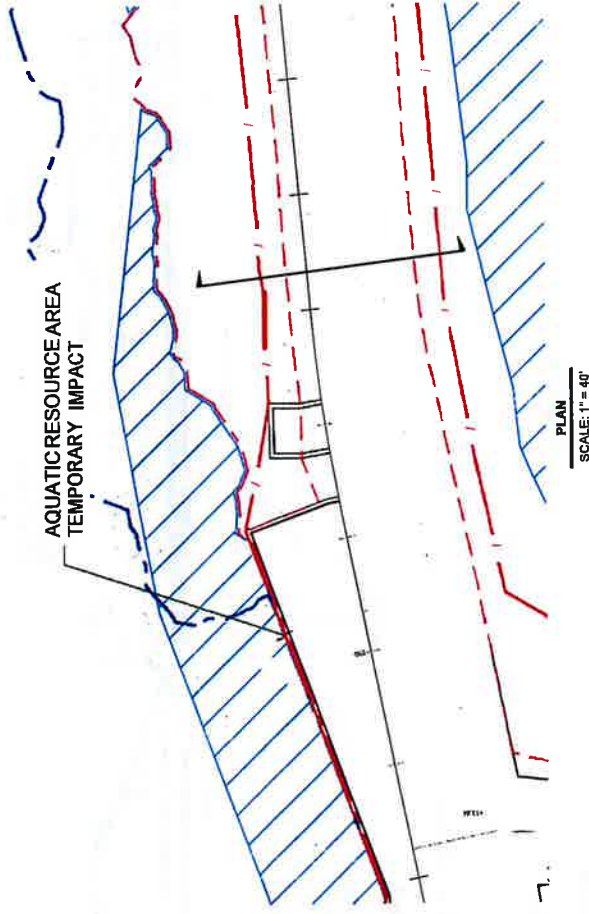
STATION: 228+17
PROJECT NAME: Levee Protection Planning and Improvement Project
 (CJP 301-657)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California

BELMONT SLOUGH



LEGEND:

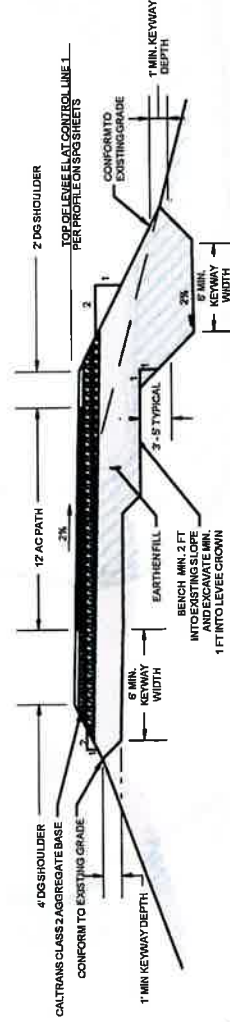
- LIMIT OF TEMPORARY WORK
- LIMIT OF GRADING WORK
- HIGH TIDE LINE
- MEAN HIGH WATER LINE (EL=6.3 FT)
- AQUATIC RESOURCE AREA
- AQUATIC RESOURCE AREA PERMANENT IMPACT
- AQUATIC RESOURCE AREA TEMPORARY IMPACT



CONTROL LINE 1
SEE SC SHEETS

LANDSIDE

BAYSIDE



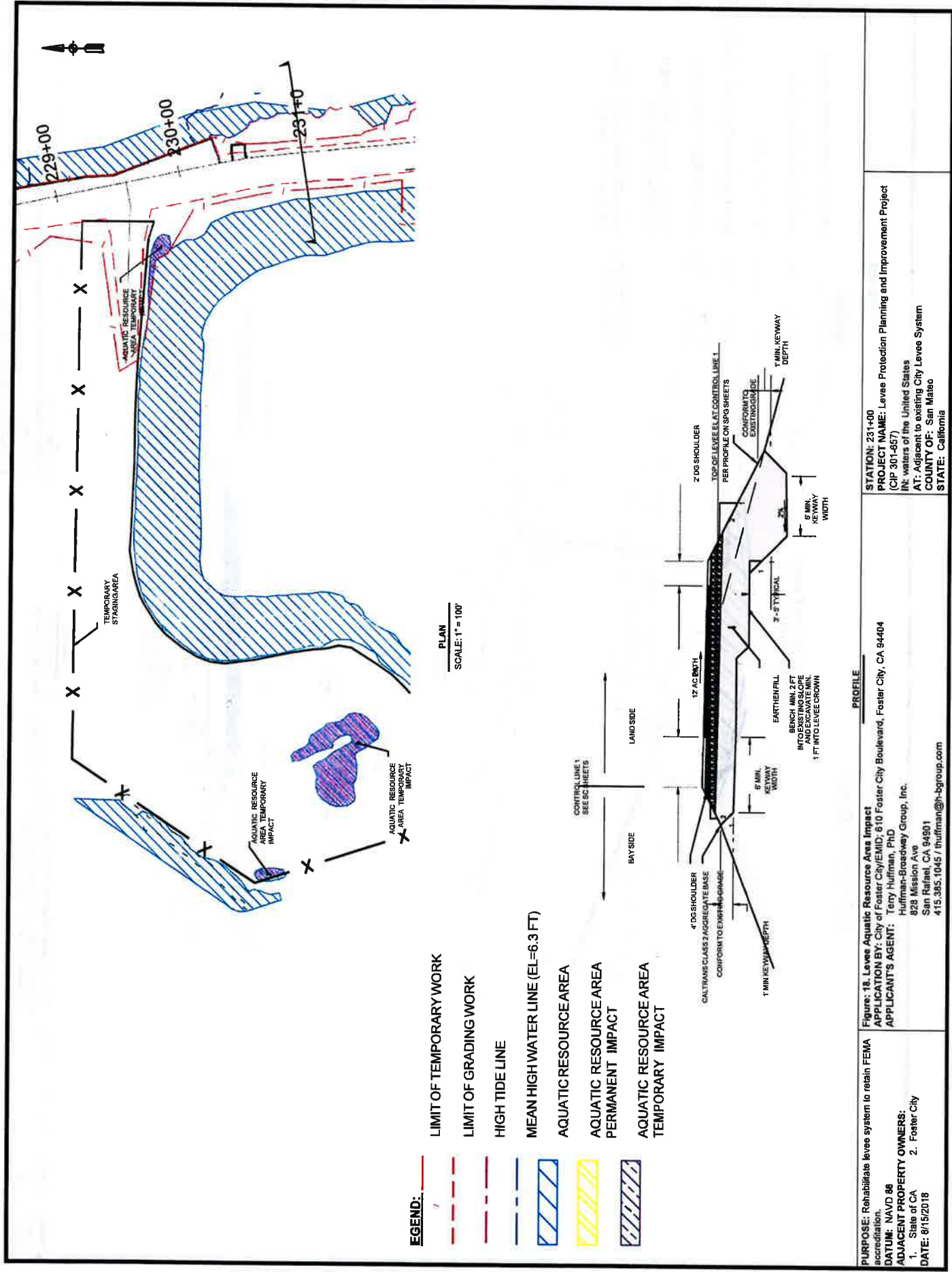
PROFILE

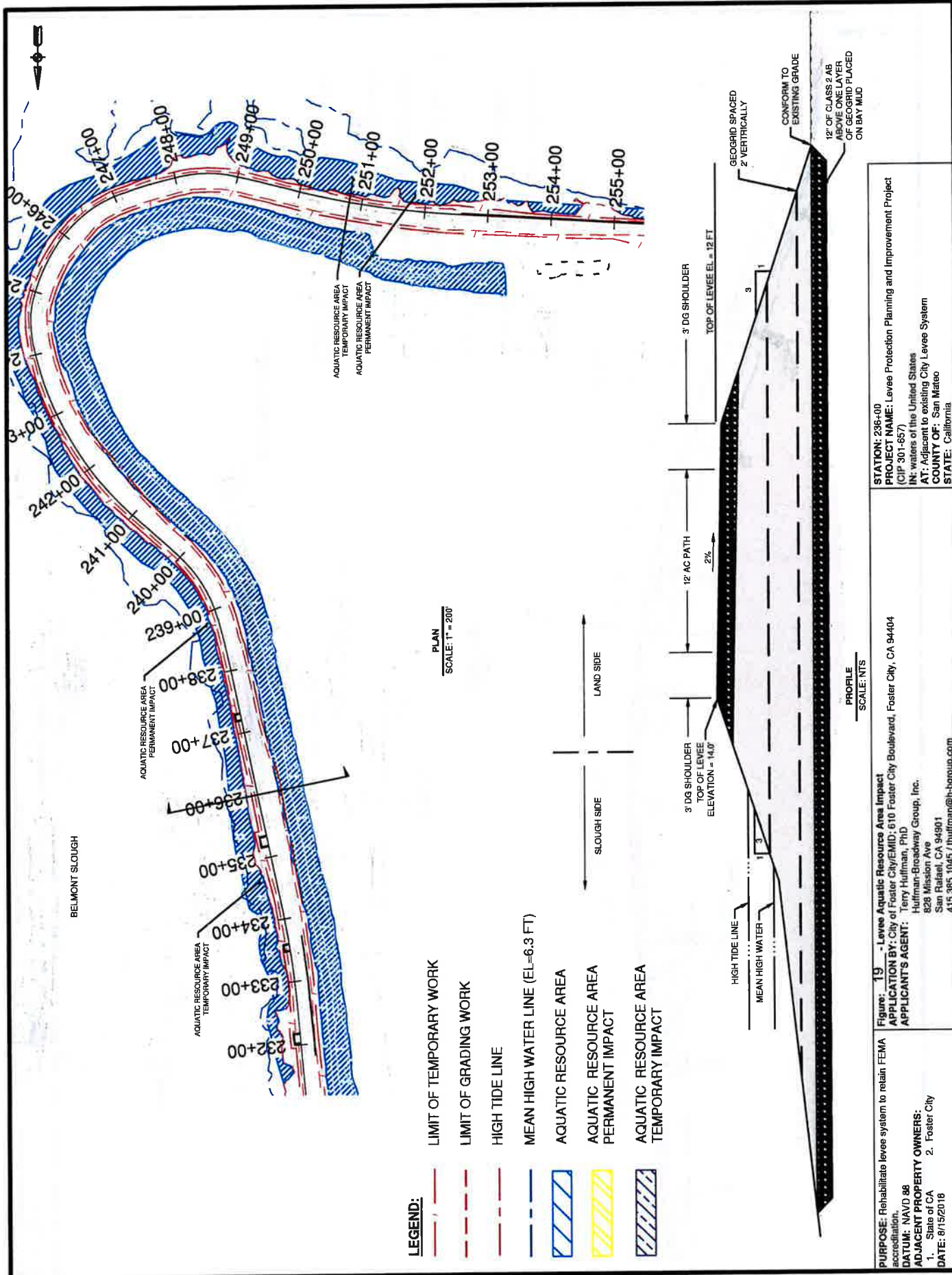
SCALE: NTS

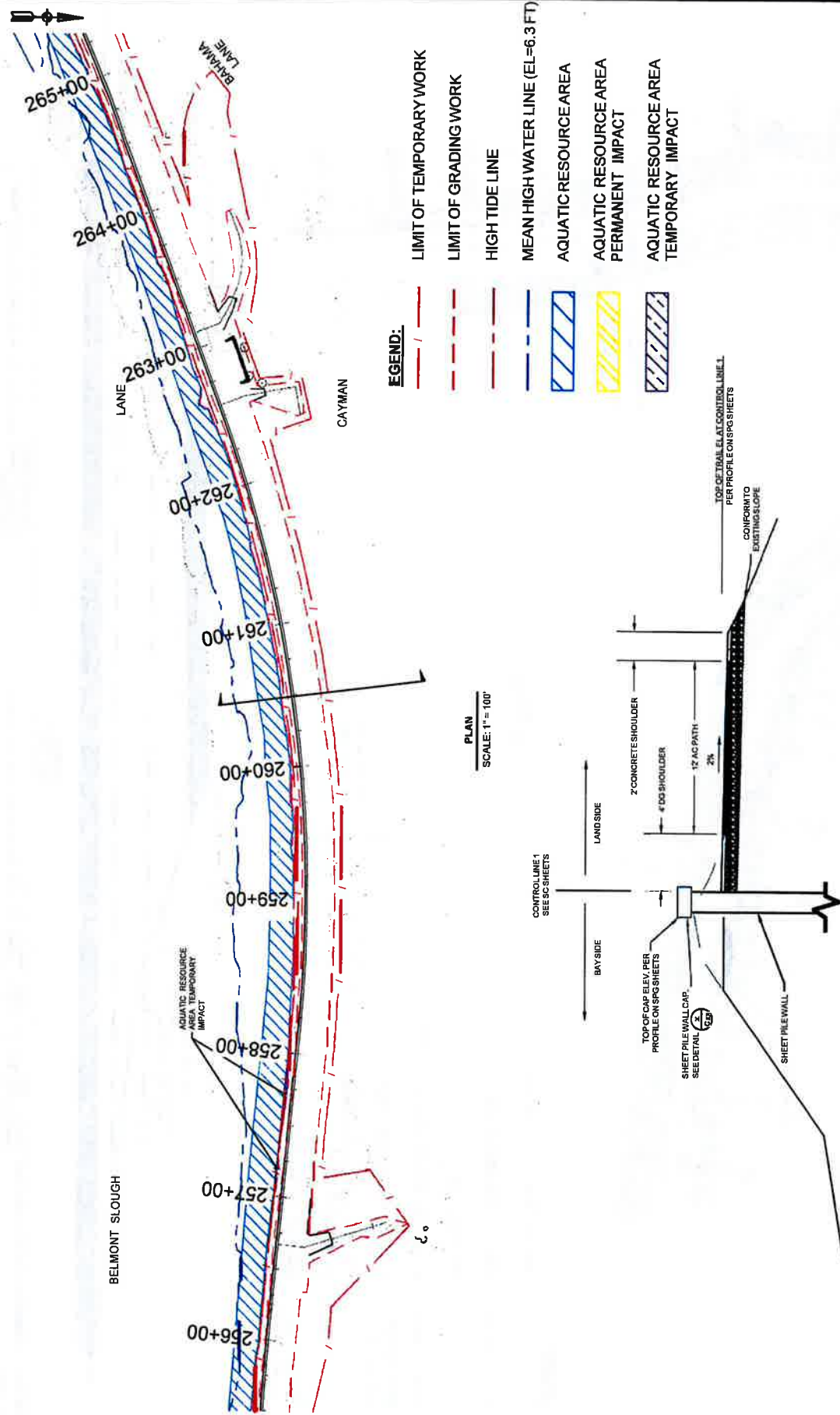
Figure: 17. Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMID: 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PRD
 Huffman-Broadway Group, Inc.
 828 Mission Ave
 San Rafael, CA 94901
 415.385.1043 / t.huffman@h-bgroup.com

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
 1. State of CA
 2. Foster City
DATE: 8/15/2018

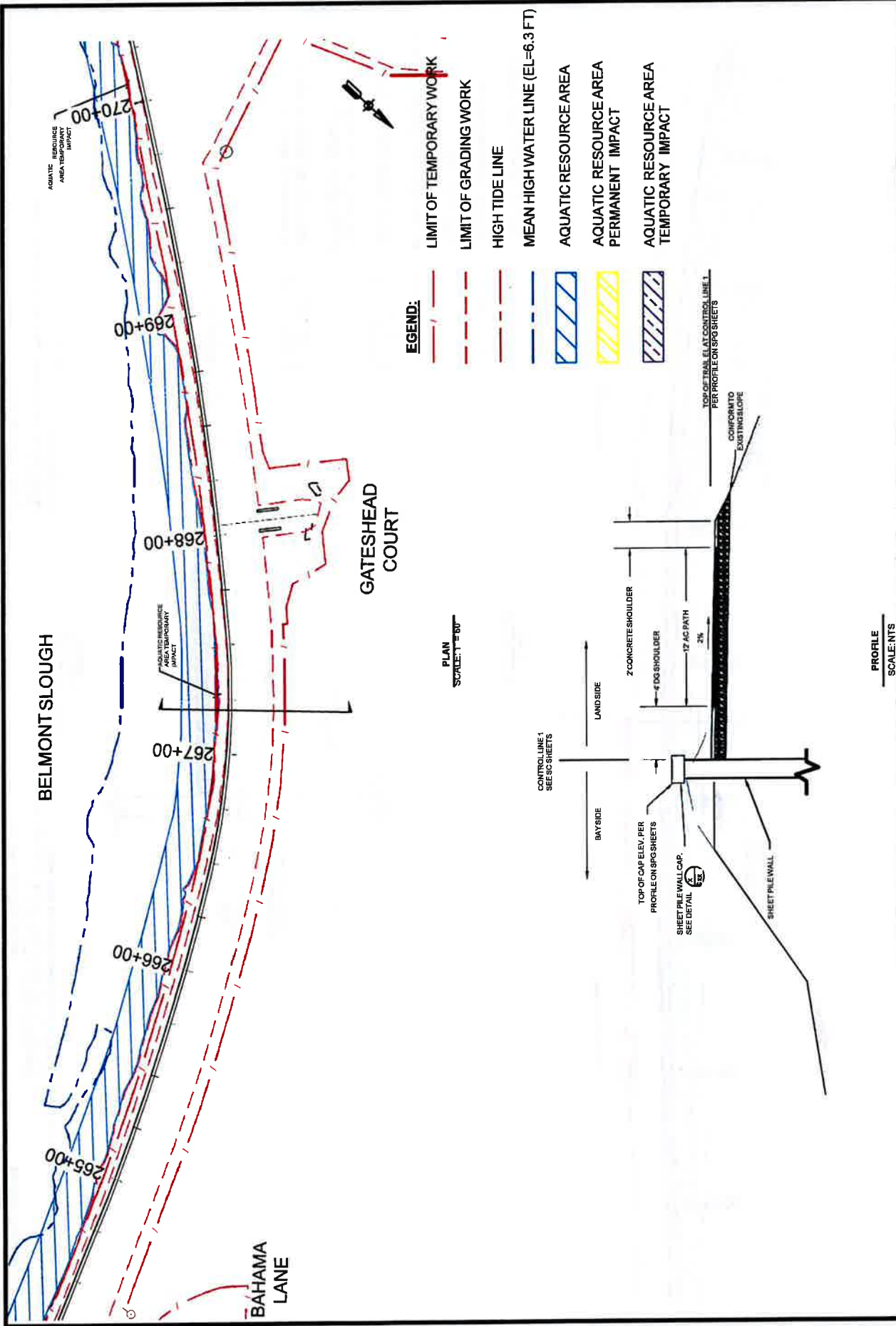
STATION: 230+80
PROJECT NAME: Levee Protection Planning and Improvement Project (CJP 301-657)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California







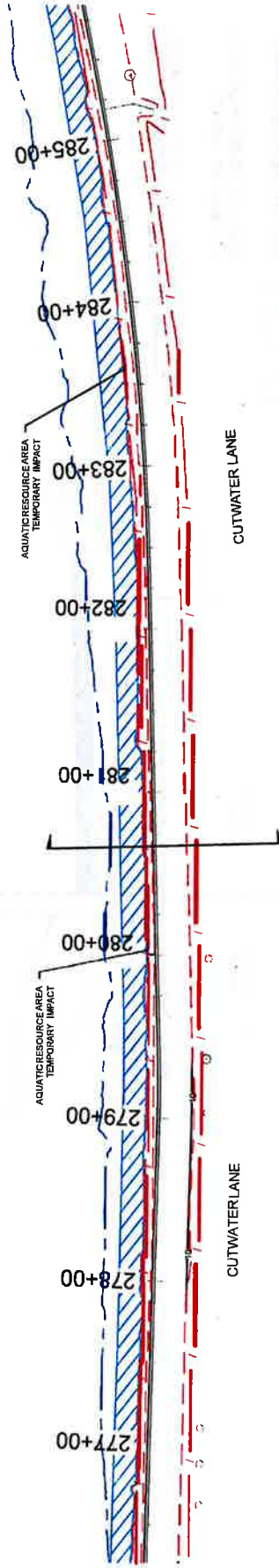
PURPOSE: Rehabilitate levee system to retain FEMA accreditation. DATUM: NAVD 88 ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City DATE: 8/15/2018	STATION: 260+48 PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657) IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
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<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATE: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <ol style="list-style-type: none"> State of CA Foster City <p>DATE: 8/15/2018</p>	<p>Figure: 21. Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / huffman@h-bgroup.com</p>	<p>STATION: 267+20</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CJP 301-657)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>
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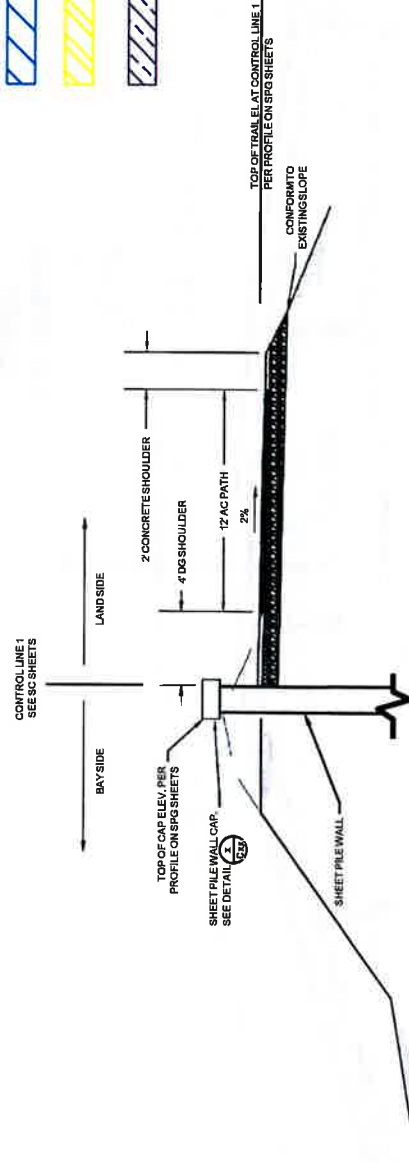
BELMONT SLOUGH



LEGEND:

- LIMIT OF TEMPORARY WORK
- LIMIT OF GRADING WORK
- HIGH TIDE LINE
- MEAN HIGH WATER LINE (EL=6.3 FT)
- [Blue Hatched] AQUATIC RESOURCE AREA
- [Yellow Hatched] AQUATIC RESOURCE AREA PERMANENT IMPACT
- [Diagonal Hatched] AQUATIC RESOURCE AREA TEMPORARY IMPACT

PLAN
SCALE: 1" = 100'



PROFILE
SCALE: 1" = 10'

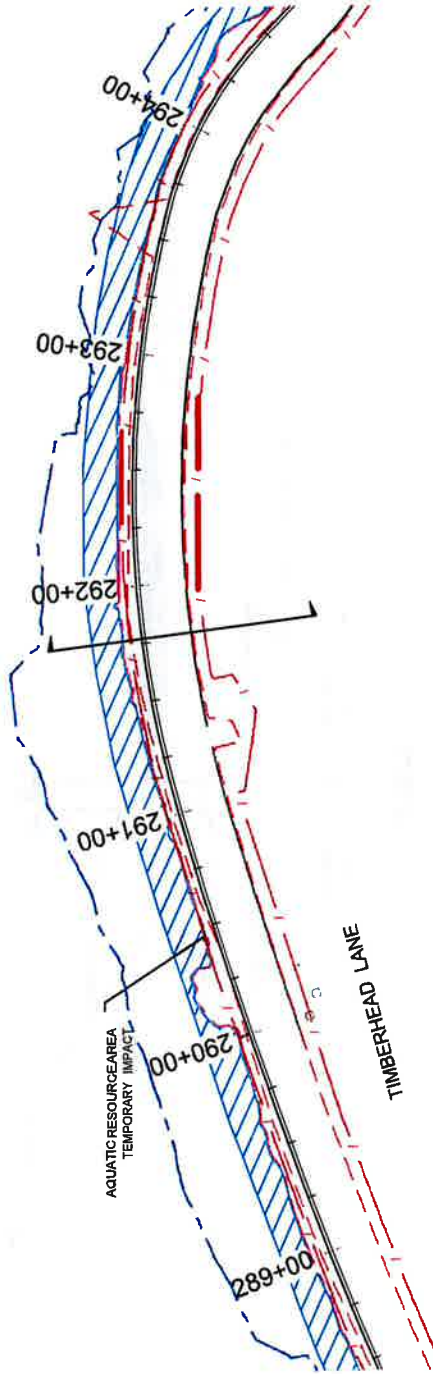
PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
1. State of CA
2. Foster City
DATE: 8/15/2018

Figure: 22. Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMID, 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT:
Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / huffman@hbggroup.com

STATION: 280+67
PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California



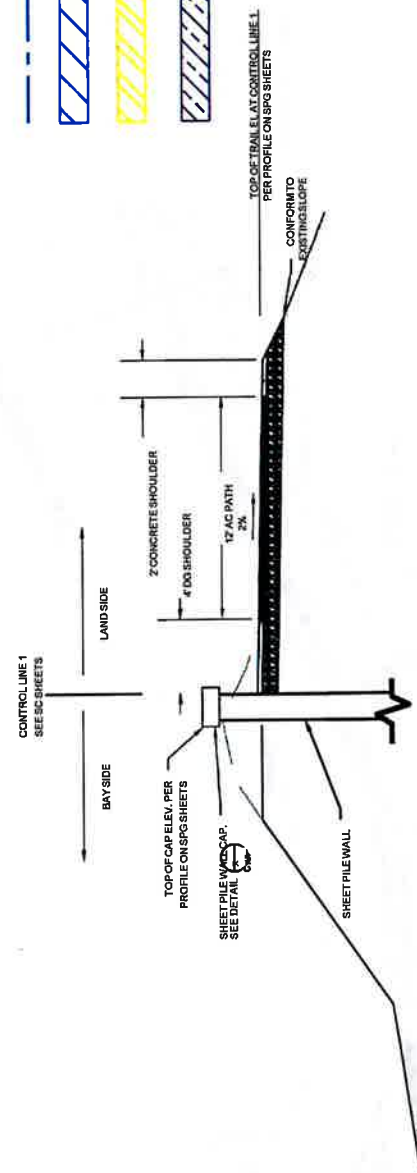
BELMONT SLOUGH



PLAN
SCALE: 1" = 80'

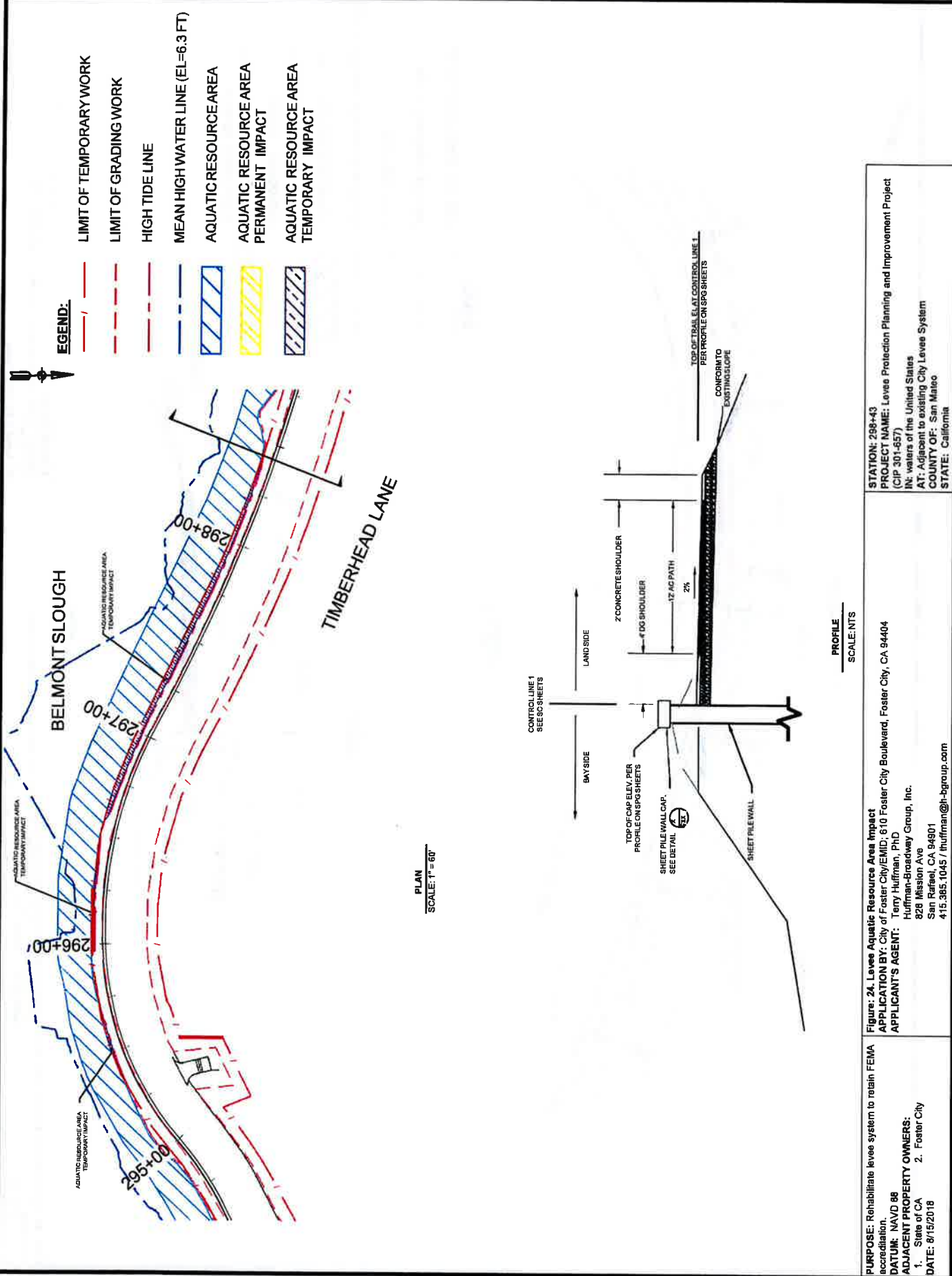
LEGEND:

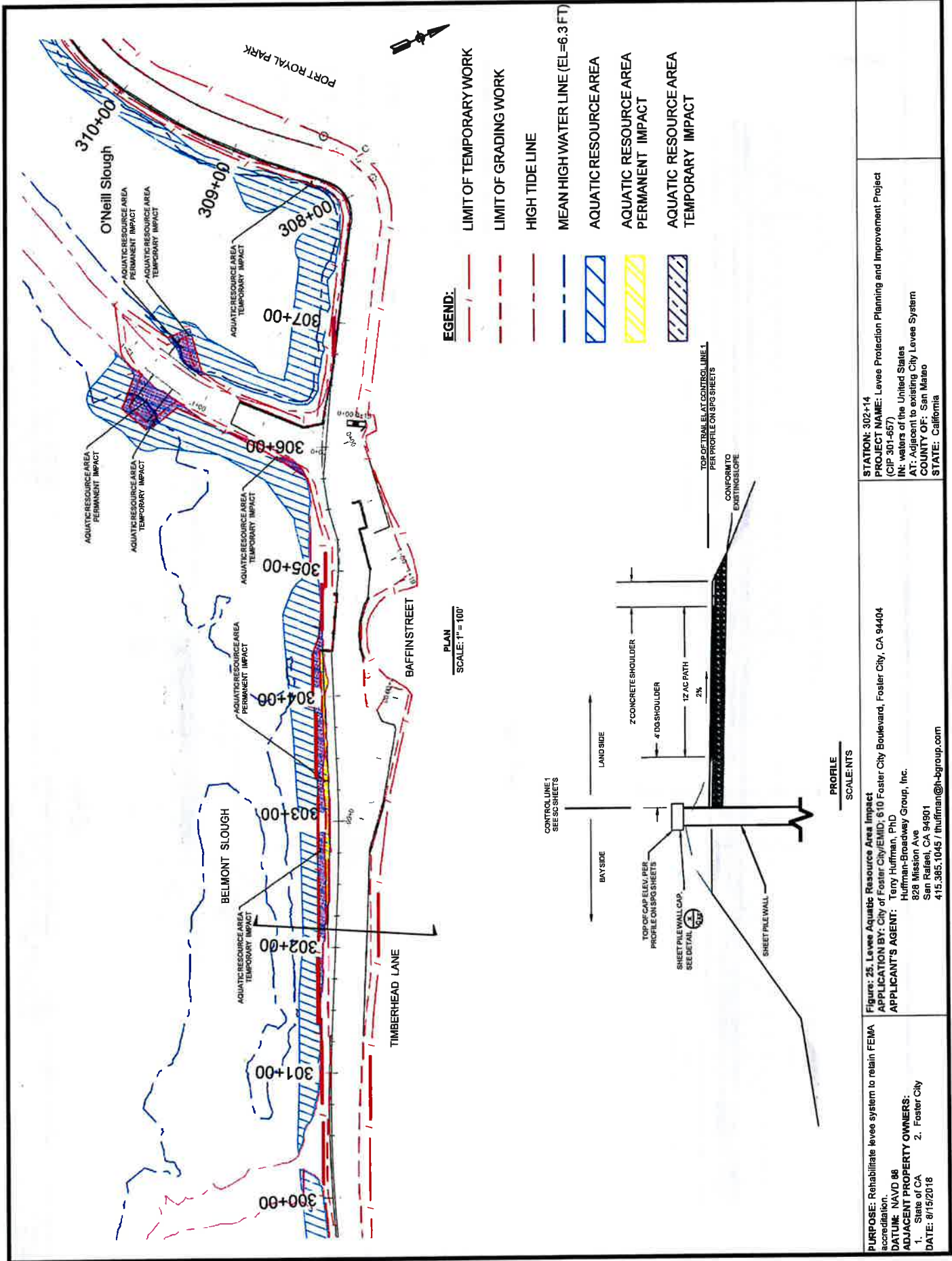
- LIMIT OF TEMPORARY WORK
- LIMIT OF GRADING WORK
- HIGH TIDE LINE
- MEAN HIGH WATER LINE (EL=6.3 FT)
- AQUATIC RESOURCE AREA
- AQUATIC RESOURCE AREA PERMANENT IMPACT
- AQUATIC RESOURCE AREA TEMPORARY IMPACT



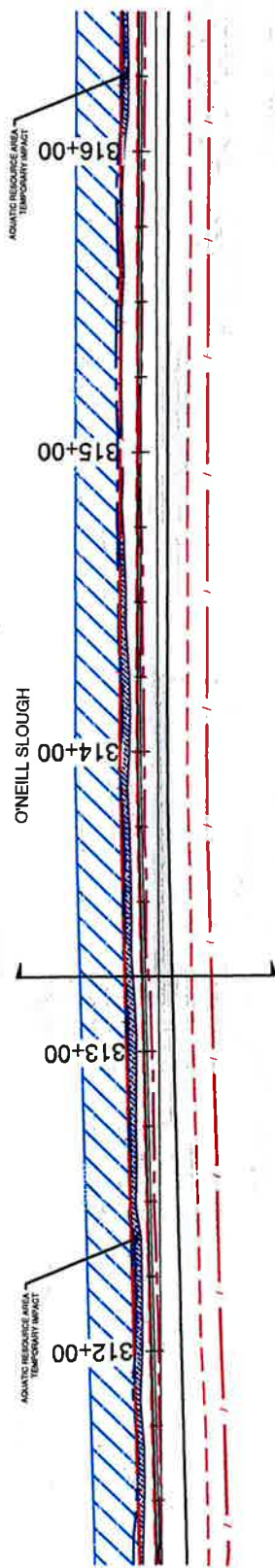
PROFILE
SCALE: 1" = 10'

<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATE: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <p>1. State of CA 2. Foster City</p> <p>DATE: 8/15/2018</p>	<p>Figure 23. Levee Aquatic Resource Area Impact</p> <p>APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com</p>	<p>STATION: 291+77</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)</p> <p>IN: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo</p> <p>STATE: California</p>
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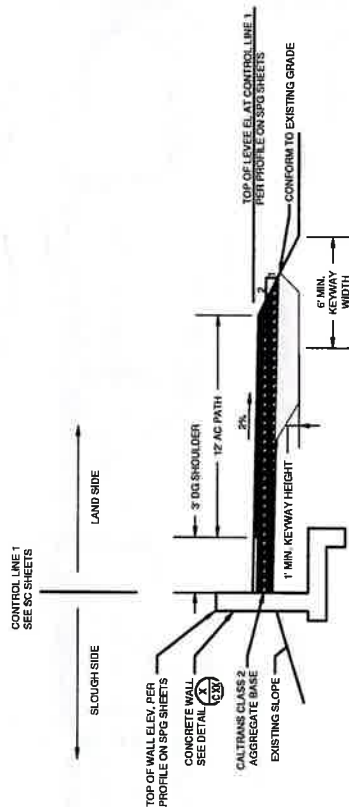
PURPOSE: Rehabilitate levee system to retain FEMA accreditation. DATE: NAVD 88 ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City DATE: 8/15/2018	Figure: 25. Levee Aquatic Resource Area Impact APPLICATION BY: City of Foster City/EMD; 610 Foster City Boulevard, Foster City, CA 94404 APPLICANT'S AGENT: Tony Huffman, PND Huffman-Broadway Group, Inc. 828 Mission Ave. San Rafael, CA 94901 415.365.1043 / tnhuffman@h-bgroup.com	STATION: 302+14 PROJECT NAME: Levee Protection Planning and Improvement Project (CJP 301-657) IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
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PLAN
SCALE: 1" = 60'

LEGEND:

- LIMIT OF TEMPORARY WORK
- - - LIMIT OF GRADING WORK
- · - · - HIGH TIDE LINE
- - - MEAN HIGH WATER LINE (EL=6.3 FT)
- AQUATIC RESOURCE AREA
- AQUATIC RESOURCE AREA PERMANENT IMPACT
- AQUATIC RESOURCE AREA TEMPORARY IMPACT

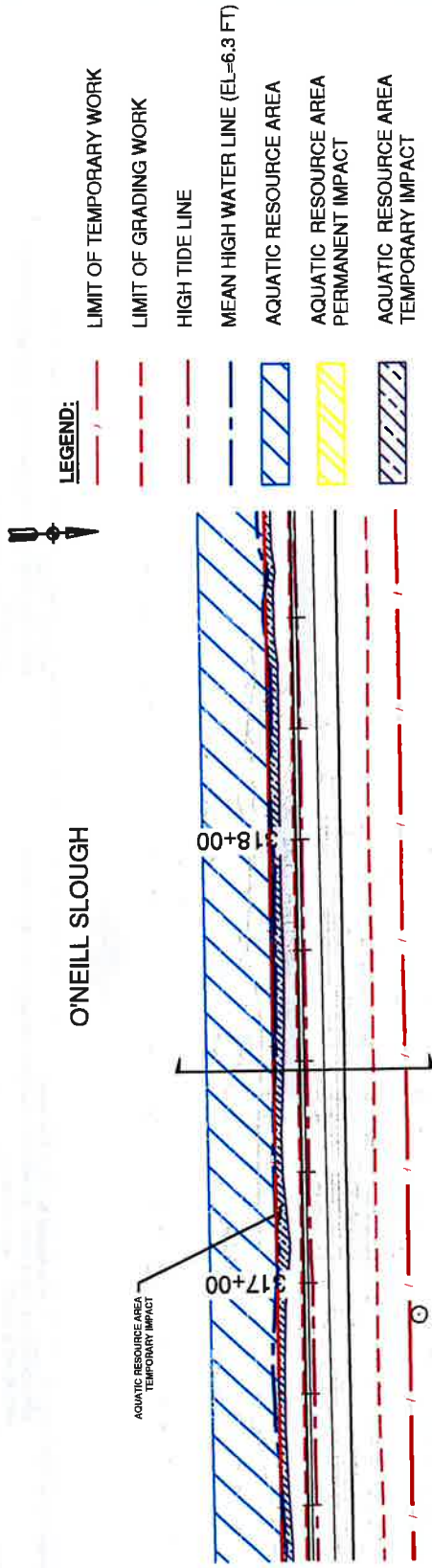


PROFILE
SCALE: NTS

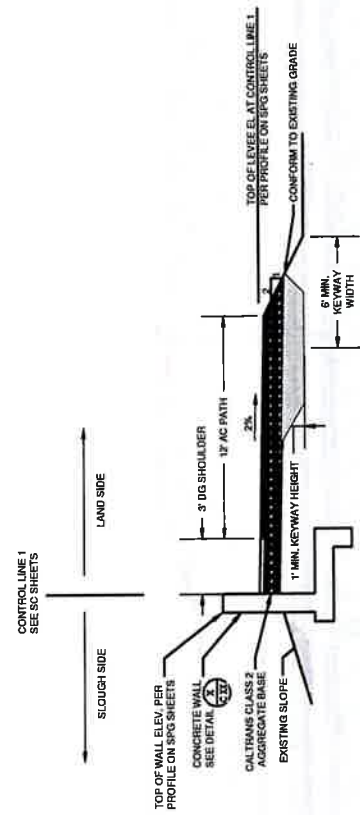
PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
1. State of CA
2. Foster City
DATE: 8/15/2018

Figure: - Levee Aquatic Resource Area Impact
APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404
APPLICANT'S AGENT: Terry Huffman, PhD
Huffman-Broadway Group, Inc.
828 Mission Ave
San Rafael, CA 94901
415.385.1045 / thuffman@h-bgroup.com

STATION: 313+25
PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-1557)
IN: waters of the United States
AT: Adjacent to existing City Levee System
COUNTY OF: San Mateo
STATE: California



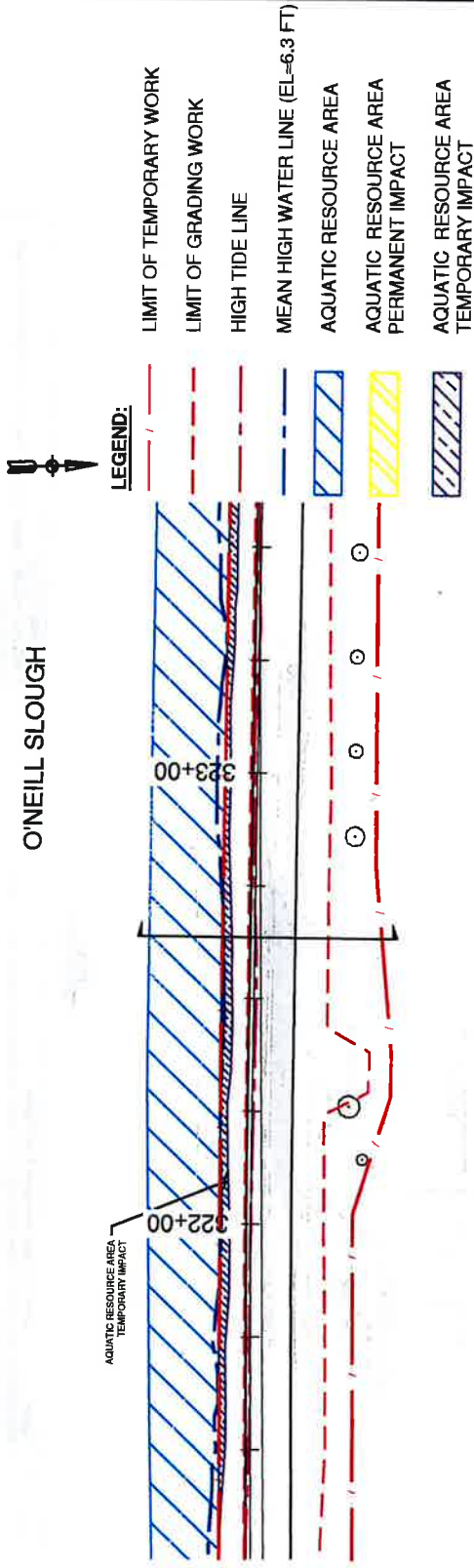
PLAN
SCALE: 1" = 40'



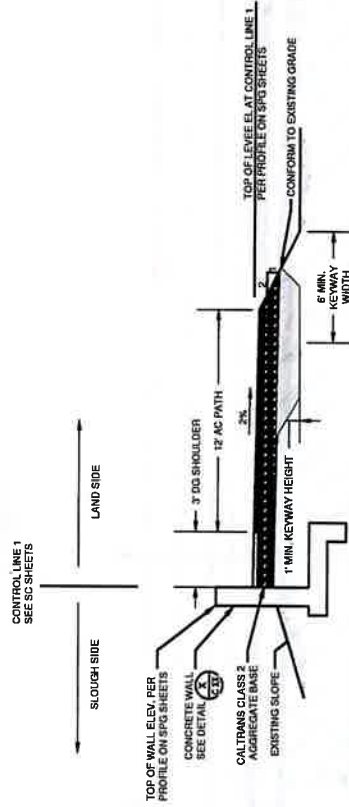
PROFILE
SCALE: NTS

PURPOSE: Rehabilitate levee system to retain FEMA accreditation. DATUM: NAVD 88 ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City DATE: 8/15/2018	Figures: - Levee Aquatic Resource Area Impact APPLICATION BY: City of Foster City/EMID: 610 Foster City Boulevard, Foster City, CA 94404 APPLICANT'S AGENT: Terry Hultman, PhD Hultman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thultman@h-bgroup.com	STATION: 317+48 PROJECT NAME: Levee Protection Planning and Improvement Project (CJP 301-657) IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
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ONEILL SLOUGH

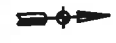
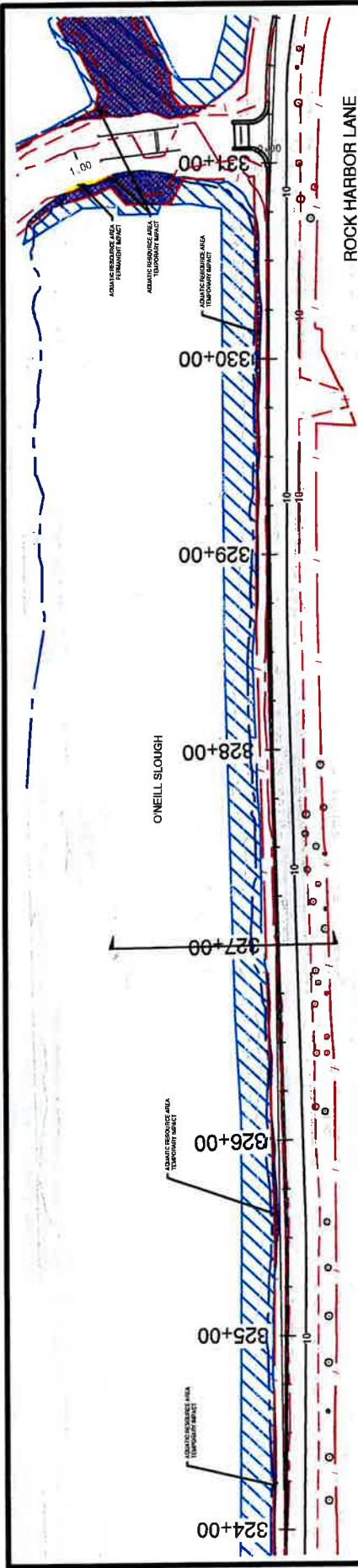


PLAN
SCALE: 1" = 40'



PROFILE
SCALE: NTS

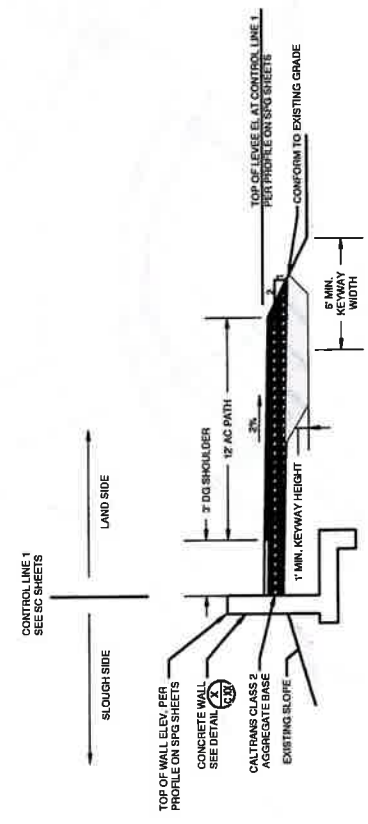
PURPOSE: Rehabilitate levee system to retain FEMA accreditation. DATUM: NAVD 88 ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City DATE: 8/15/2018	Figure: - Levee Aquatic Resource Area Impact APPLICATION BY: City of Foster City/CMD: 610 Foster City Boulevard, Foster City, CA 94404 APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / huffman@h-bgroup.com	STATION: 322+65 PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-557) IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
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PLAN
SCALE: 1" = 80'

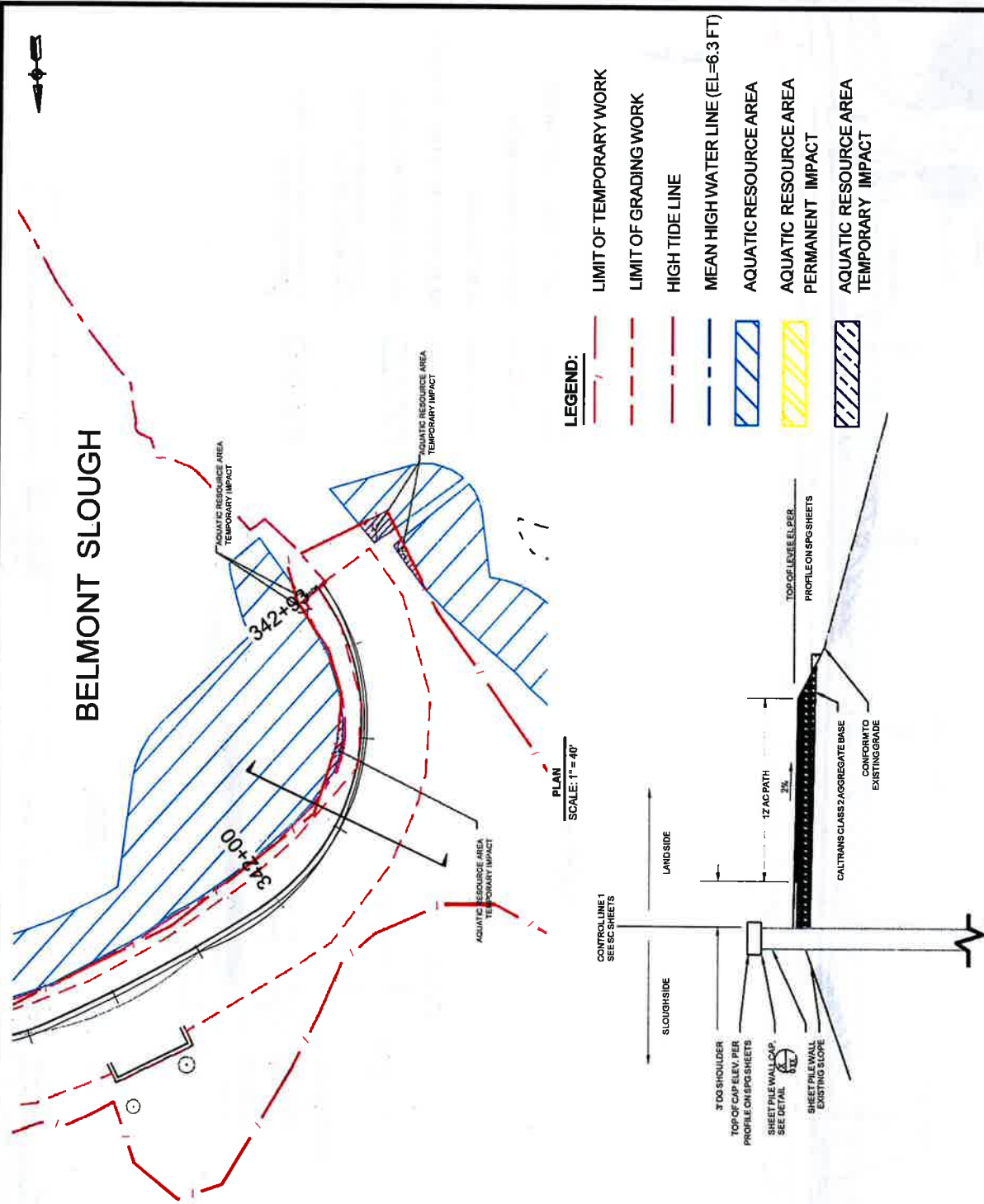
LEGEND:

- LIMIT OF TEMPORARY WORK
- LIMIT OF GRADING WORK
- HIGH TIDE LINE
- MEAN HIGH WATER LINE (EL=6.3 FT)
- AQUATIC RESOURCE AREA
- AQUATIC RESOURCE AREA PERMANENT IMPACT
- AQUATIC RESOURCE AREA TEMPORARY IMPACT



PROFILE
SCALE: NTS

PURPOSE: Rehabilitate levee system to retain FEMA accreditation DATUM: NAVD 88 ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City DATE: 8/15/2018	Figure: * Levee Aquatic Resource Area Impact APPLICATION BY: City of Foster City/EMID: 610 Foster City Boulevard, Foster City, CA 94404 APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com	STATION: 327+00 PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657) IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
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PURPOSE: Rehabilitate levee system to retain FEMA accreditation. DATUM: NAVD 88 ADJACENT PROPERTY OWNERS: 1. State of CA 2. Foster City DATE: 8/15/2018	Figure: 30. Levee Aquatic Resource Area Impact APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404 APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Braduey Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com	STATION: 342+55 PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657) IN: waters of the United States AT: Adjacent to existing City Levee System COUNTY OF: San Mateo STATE: California
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APPENDIX D
RESTORATION PLANS FOR O'NEILL SLOUGH TEMPORARY
BRIDGE CONSTRUCTION IMPACTS TO AQUATIC RESOURCES



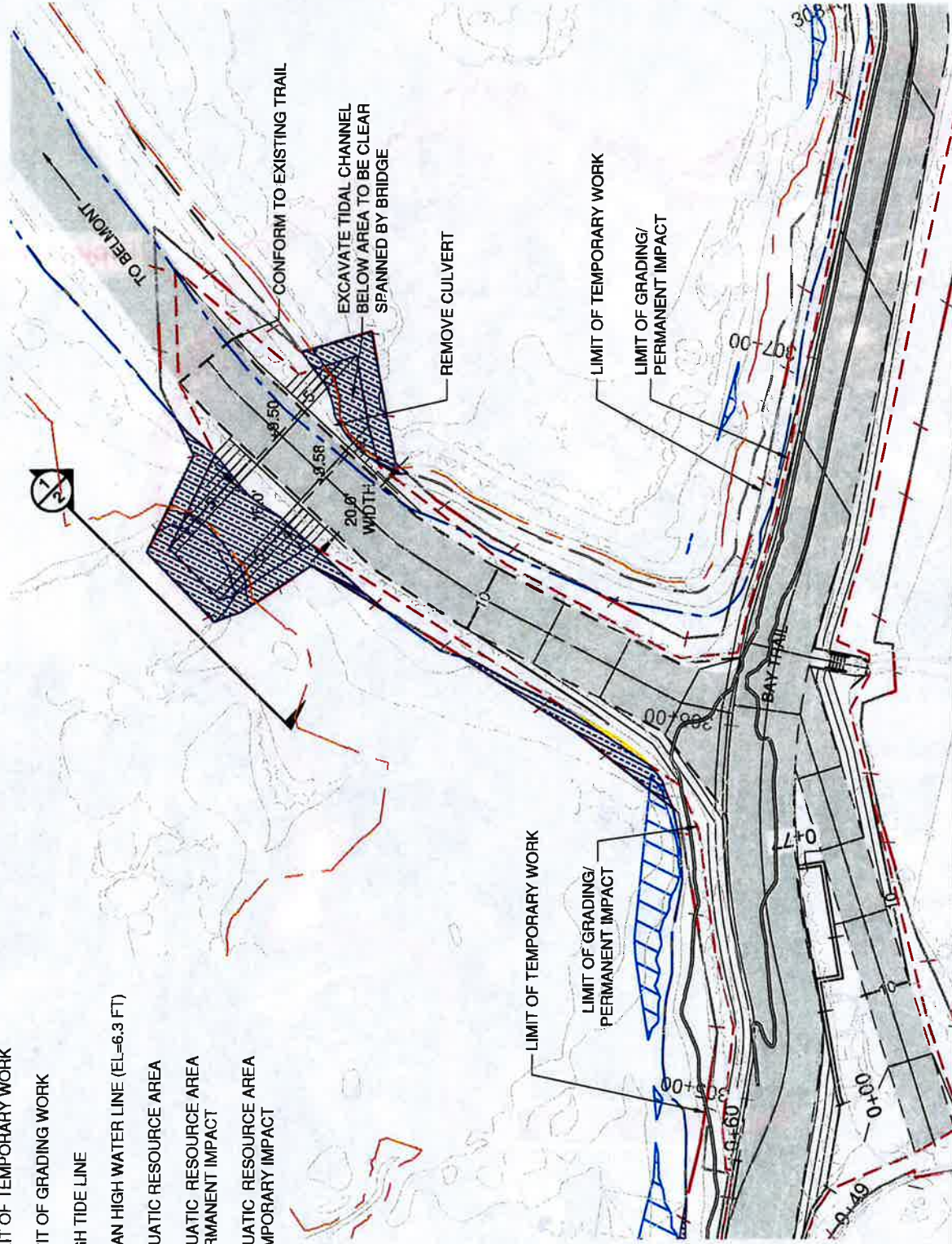
**Figure 1. O'Neill Slough Mitigation
Restoration Location Map**

Levee Protection Planning and Improvement Project CIP 301-657
City of Foster City, San Mateo County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

LEGEND:

- / — LIMIT OF TEMPORARY WORK
- - - LIMIT OF GRADING WORK
- - - HIGH TIDE LINE
- - - MEAN HIGH WATER LINE (EL=6.3 FT)
- ▨ AQUATIC RESOURCE AREA
- ▨ AQUATIC RESOURCE AREA PERMANENT IMPACT
- ▨ AQUATIC RESOURCE AREA TEMPORARY IMPACT



SCALE: 1" = 40'

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.

DATUM: NAVD 88

ADJACENT PROPERTY OWNERS:

1. State of CA
2. Foster City

DATE: 8/15/2018

Figure: 2 - Levee Aquatic Resource Area Impact

APPLICATION BY: City of Foster City/EMD: 610 Foster City Boulevard, Foster City, CA 94404

APPLICANT'S AGENT: Terry Huffman, PhD

Huffman-Broadway Group, Inc.

828 Mission Ave

San Rafael, CA 94901

415.385.1045 / thuffman@hbg-group.com

LOCATION: BAFFIN ST BRIDGE

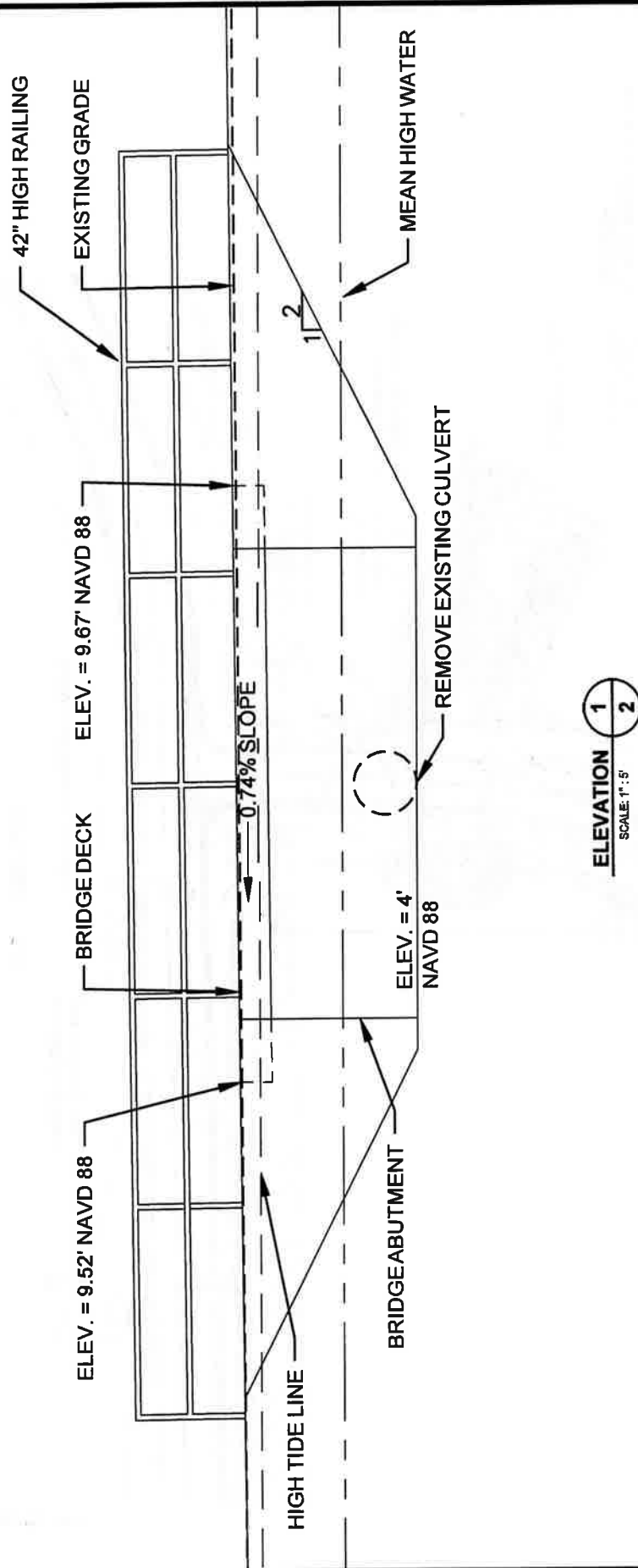
PROJECT NAME: Levee Protection Planning and Improvement Project

(CIP 301-857)

IN: waters of the United States

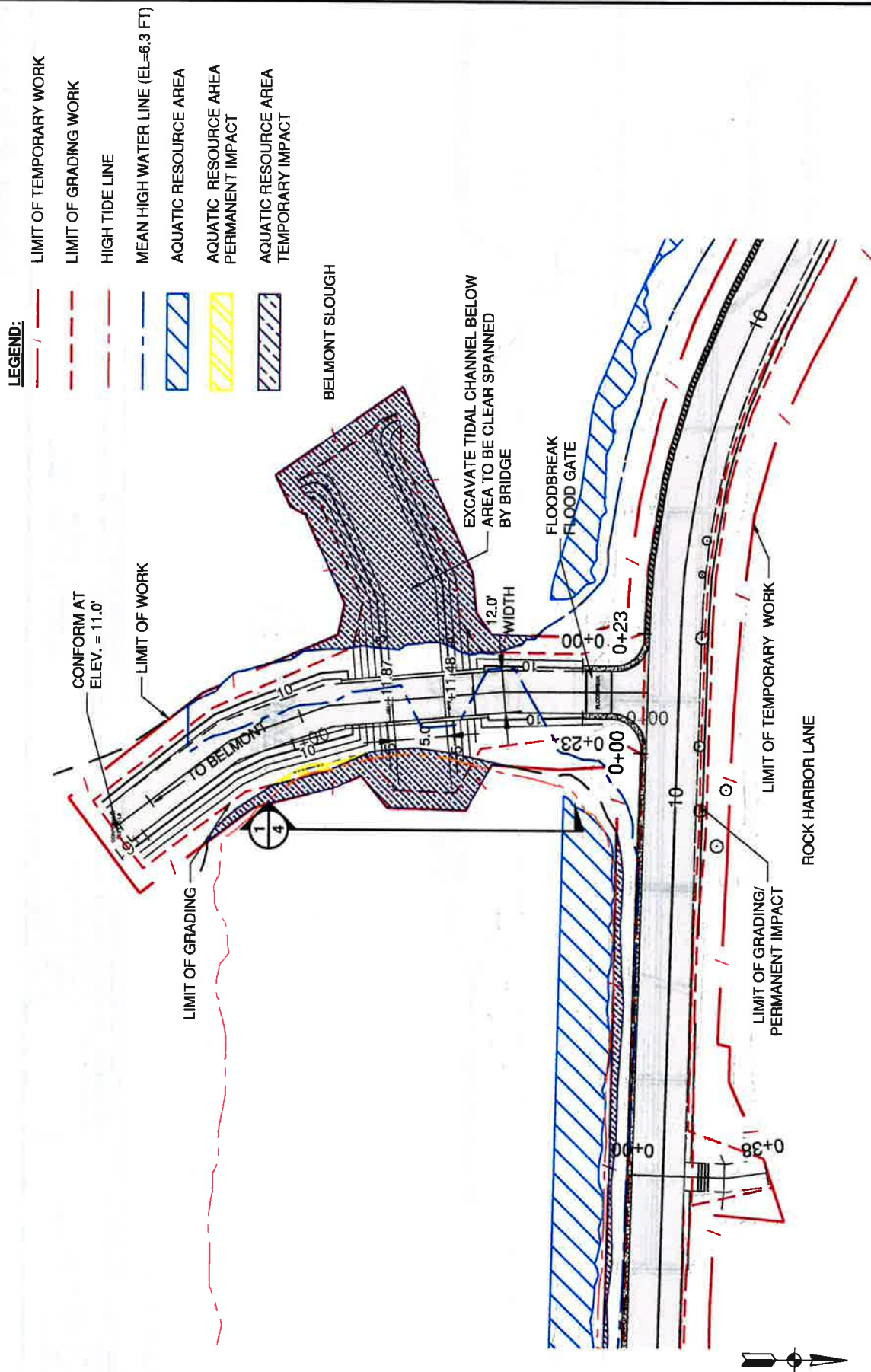
AT: Adjacent to existing City Levee System

COUNTY OF: San Mateo STATE: California



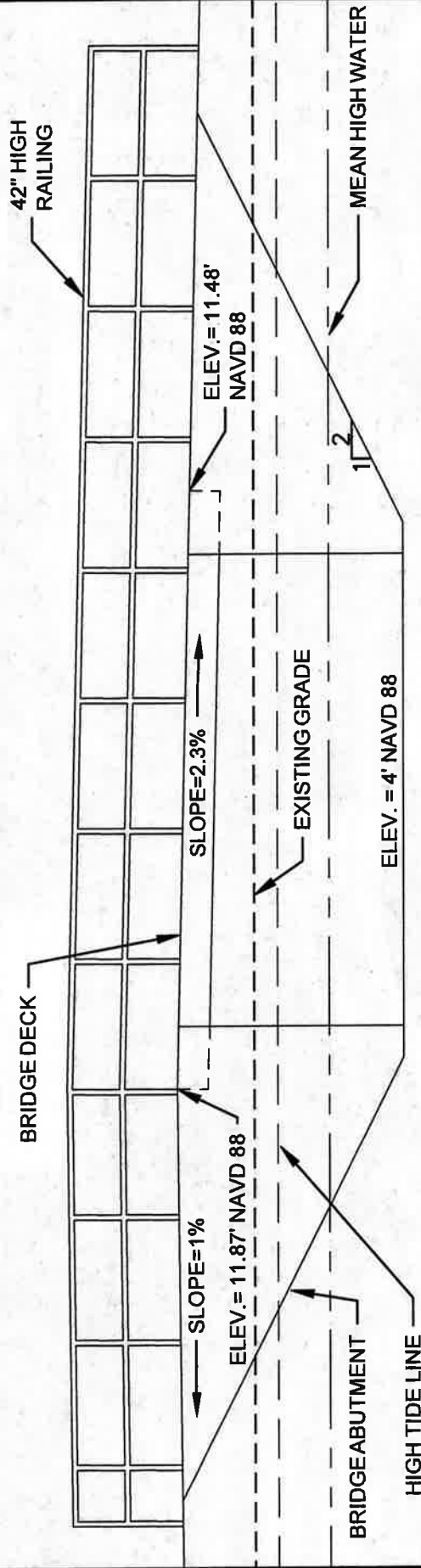
SCALE: 1" = 5'

<p>PURPOSE: Rehabilitate levee system to retain FEMA accreditation.</p> <p>DATE: NAVD 88</p> <p>ADJACENT PROPERTY OWNERS:</p> <ol style="list-style-type: none"> 1. State of CA 2. Foster City <p>DATE: 8/15/2018</p>	<p>Figure 3. Levee Aquatic Resource Area Impact APPLICATION BY: City of Foster City/EMID; 610 Foster City Boulevard, Foster City, CA 94404</p> <p>APPLICANT'S AGENT: Terry Huffman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thuffman@h-bgroup.com</p> <p>LOCATION: BAFFIN ST BRIDGE</p> <p>PROJECT NAME: Levee Protection Planning and Improvement Project (CJP 301-457)</p> <p>INT: waters of the United States</p> <p>AT: Adjacent to existing City Levee System</p> <p>COUNTY OF: San Mateo STATE: California</p>
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SCALE: 1" = 40'

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.	Figure: 4 - Levee Aquatic Resource Area Impact	LOCATION: EMERGENCY EGRESS ROUTE BRIDGE
DATUM: NAVD 88	APPLICATION BY: City of Foster City/EMID: 610 Foster City Boulevard, Foster City, CA 94404	PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)
ADJACENT PROPERTY OWNERS:	APPLICANT'S AGENT: Terry Hultman, PhD Huffman-Broadway Group, Inc. 828 Mission Ave San Rafael, CA 94901 415.385.1045 / thultman@h-bgroup.com	IN: waters of the United States AT: Adjacent to existing City Levee System
DATE: 8/15/2018		COUNTY OF: San Mateo STATE: California



ELEVATION
SCALE: 1" = 5'

SCALE: 1" = 5'

PURPOSE: Rehabilitate levee system to retain FEMA accreditation.
 DATUM: NAVD 88
 ADJACENT PROPERTY OWNERS:
 1. State of CA
 2. Foster City
 DATE: 8/15/2018

Figure 5: Levee Aquatic Resource Area Impact
 APPLICATION BY: City of Foster City/EMD; 610 Foster City Boulevard, Foster City, CA 94404
 APPLICANT'S AGENT: Terry Huffman, PhD
 Huffman-Broadway Group, Inc.
 828 Mission Ave
 San Rafael, CA 94901
 415.385.1045 / thuffman@h-bgroup.com

LOCATION: EMERGENCY EGRESS ROUTE BRIDGE
 PROJECT NAME: Levee Protection Planning and Improvement Project (CIP 301-657)
 IN: waters of the United States
 AT: Adjacent to existing City Levee System
 COUNTY OF: San Mateo STATE: California



Figure 6. Free Span Bridge Location Near Station 331+ 00, Restored to Full Tidal, Sheet 1 of 4

Levee Protection Planning and Improvement Project (CIP 301-657)
Foster City, San Mateo County, CA

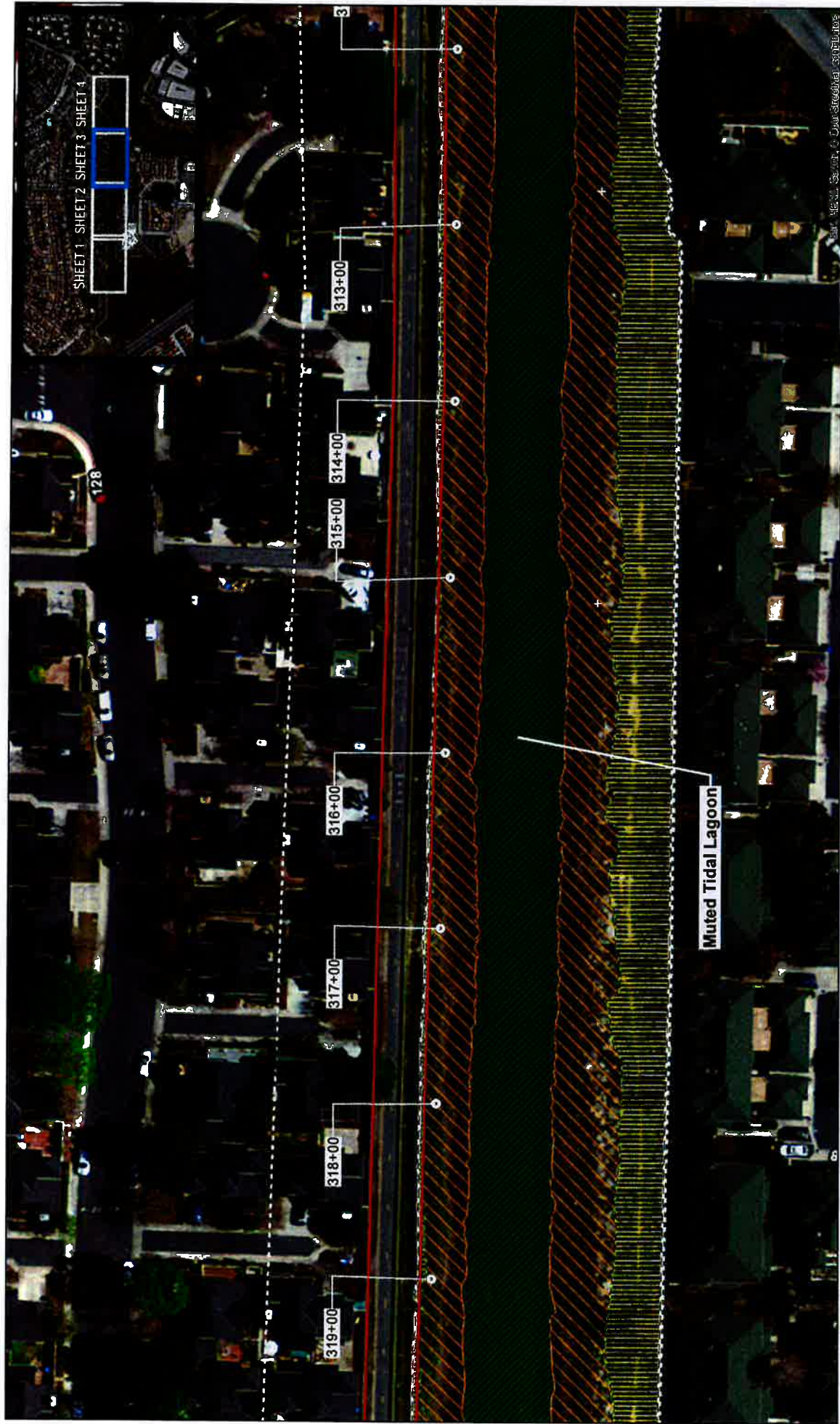


Figure 6. Restored to Full Tidal, Sheet 3 of 4
 Levee Protection Planning and Improvement Project (CIP 301-657)
 Foster City, San Mateo County, CA

Ready Areas

- ITL & P.C. Clearances
- In-located tidal regions
- 10' P.C. within tidal region
- 10' P.C. within tidal region
- 10' P.C. within tidal region

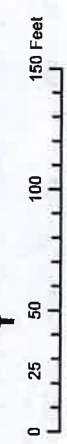
Suggested Areas

- Suggested Areas
- Suggested Areas
- Suggested Areas
- Suggested Areas

Notes:

- Interventions shown for Segment 1 are subject to final design and engineering review.
- Interventions shown for Segment 2 are subject to final design and engineering review.
- Interventions shown for Segment 3 are subject to final design and engineering review.
- Interventions shown for Segment 4 are subject to final design and engineering review.

Huffman-Broadway Group, Inc.
 ENVIRONMENTAL REGULATORY CONSULTANTS





APPENDIX E

FIELD MONITORING DATA FORMS

APPENDIX E. FIELD MONITORING DATA FORMS

1.	Maintenance Monitoring Field Data Collection Form
2.	Corps' Wetland Determination Data Form – Arid West Region
3.	Performance Monitoring Data Sheet for Assessing Plant Cover

FORM 1. MAINTENANCE MONITORING FIELD DATA COLLECTION FORM

Project Name: _____

Monitoring Year _____ Date: _____; Time: _____ (AM / PM);

Inspected By: _____; Technical Reviewer: _____; Map Reference:

INSPECTION ITEM	Maintenance Necessary ¹	LOCATION ²	DESCRIBE ACTION TO BE TAKEN OR TAKEN
1. Vegetation Management			
2. Site Access Security			
3. Fences, Gates, Locks, Signs, and Boundary Markers			
4. Fuel Management			
5. Mosquito Abatement			
6. Other			

¹ Status: No= no maintenance action required; A = Immediate maintenance action required, high priority; B = Maintenance action required, low priority, but need before year end. ² Attach location map and photo.

Form 3. WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: _____ City/County: _____ Sampling Date: _____
 Applicant/Owner: _____ State: _____ Sampling Point: _____
 Investigator(s): _____ Section, Township, _____ Range: _____
 _____ Landform (hillslope, terrace, etc.): _____
 _____ Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR): _____ Lat: _____ Long: _____ Datum: WGS84
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	Is the Sampled Area within a Wetland? Yes _____ No _____
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>None</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>0</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
4. _____				
	= Total Cover			
Sapling/Shrub Stratum (Plot size: _____)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: (A) _____ (B) _____ Prevalence Index = B/A = _____
1. <u>None</u>				
2. _____				
3. _____				
4. _____				
5. _____				
	= Total Cover			
Herb Stratum (Plot size: _____)				Hydrophytic Vegetation Indicators: ___ Dominance Test is >50% ___ Prevalence Index is ≤3.0 ¹ ___ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
	= Total Cover			
Woody Vine Stratum (Plot size: _____)				Hydrophytic Vegetation Present? Yes _____ No _____
1. _____				
2. _____				
	= Total Cover			
% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____				
Remarks:				

SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Texture	Remarks	
	Color (moist)	%	Color (moist)	%	Type ¹			

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	Sandy Redox (S5)
<input type="checkbox"/> Histic Epipedon (A2)	Stripped Matrix (S6)
<input type="checkbox"/> Black Histic (A3)	Loamy Mucky Mineral (F1)
<input type="checkbox"/> Hydrogen Sulfide (A4)	Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	Depleted Matrix (F3)
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	Redox Dark Surface (F6)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	Depleted Dark Surface (F7)
<input type="checkbox"/> Thick Dark Surface (A12)	Redox Depressions (F8)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	Vernal Pools (F9)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No _____
--	--

Remarks:

Soil is well drained

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No _____
---	--

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

NA

Remarks:

FORM 3. PERFORMANCE MONITORING DATA SHEET FOR ASSESSING PLANT SPECIES COVER

Project Name:	Data Sheet #:	Recorder:	Comments:
Monitoring Year:			
Date:	Technical Reviewer:		
Map Reference:			

[illegible]

