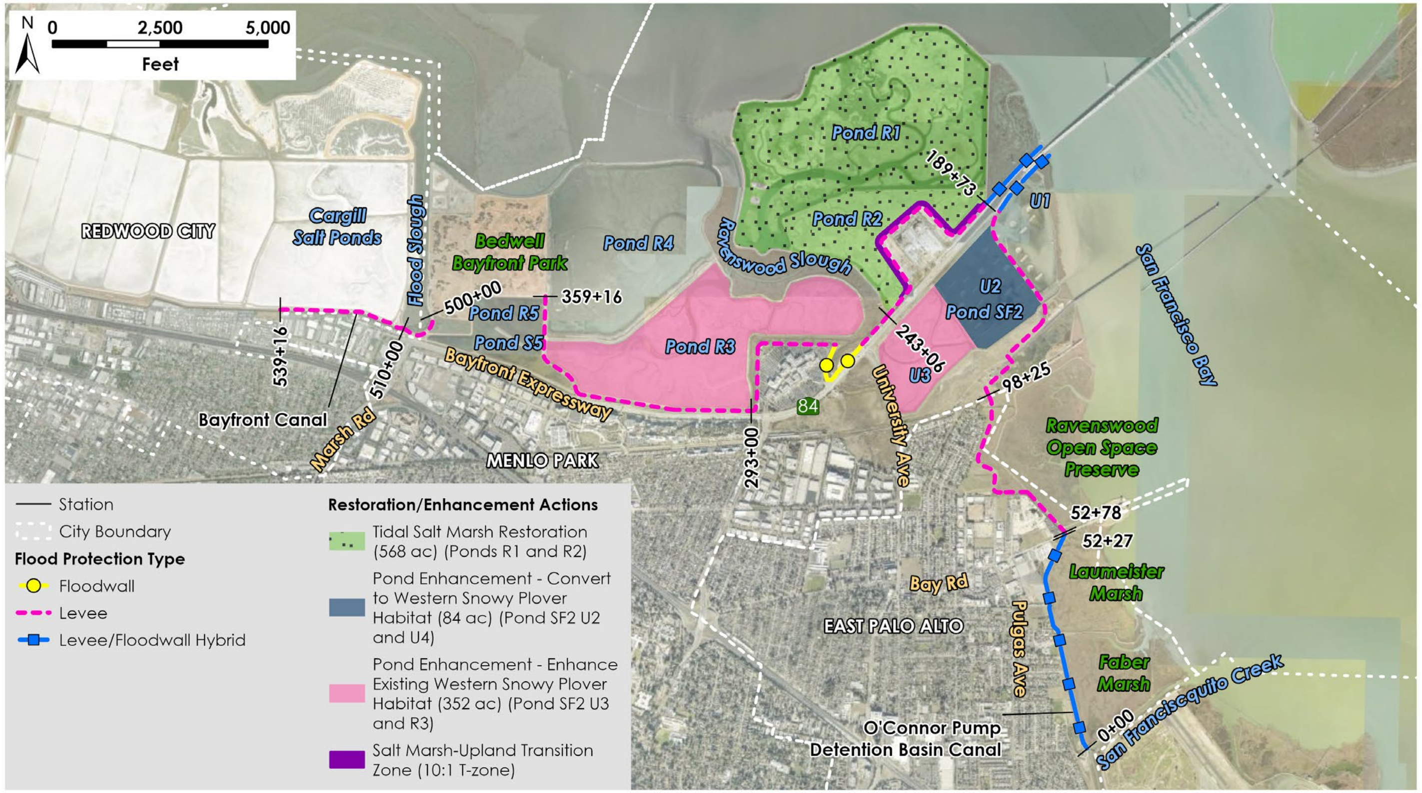
SAFER BAY
BCDC ECRB MEETING

22 July 2026

Project Overview

- Shoreline Protection, Recreation and Habitat Improvements
- 568 acres of restoration and 436 acres of enhancement within Ponds R1, R2, R3, and SF2 of the Don Edwards National Wildlife Refuge
- 7 miles along the Bay Shoreline adjacent to sensitive tidal marsh habitats
  - East Palo Alto (1.3 miles in design)
  - Menlo Park (3.4 miles in design)
  - Marsh Road reach located in Redwood City provides flood protection for Belle Haven neighborhood



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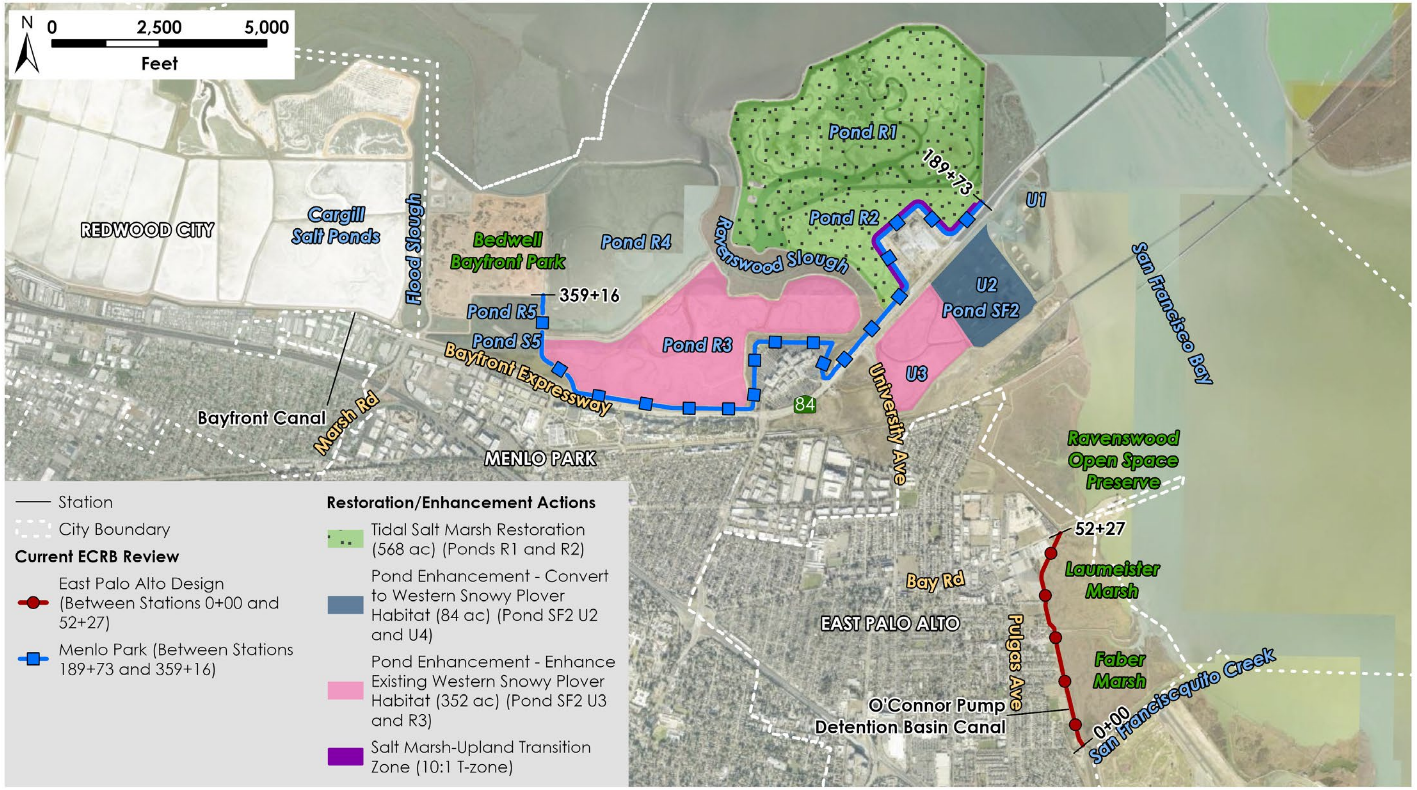
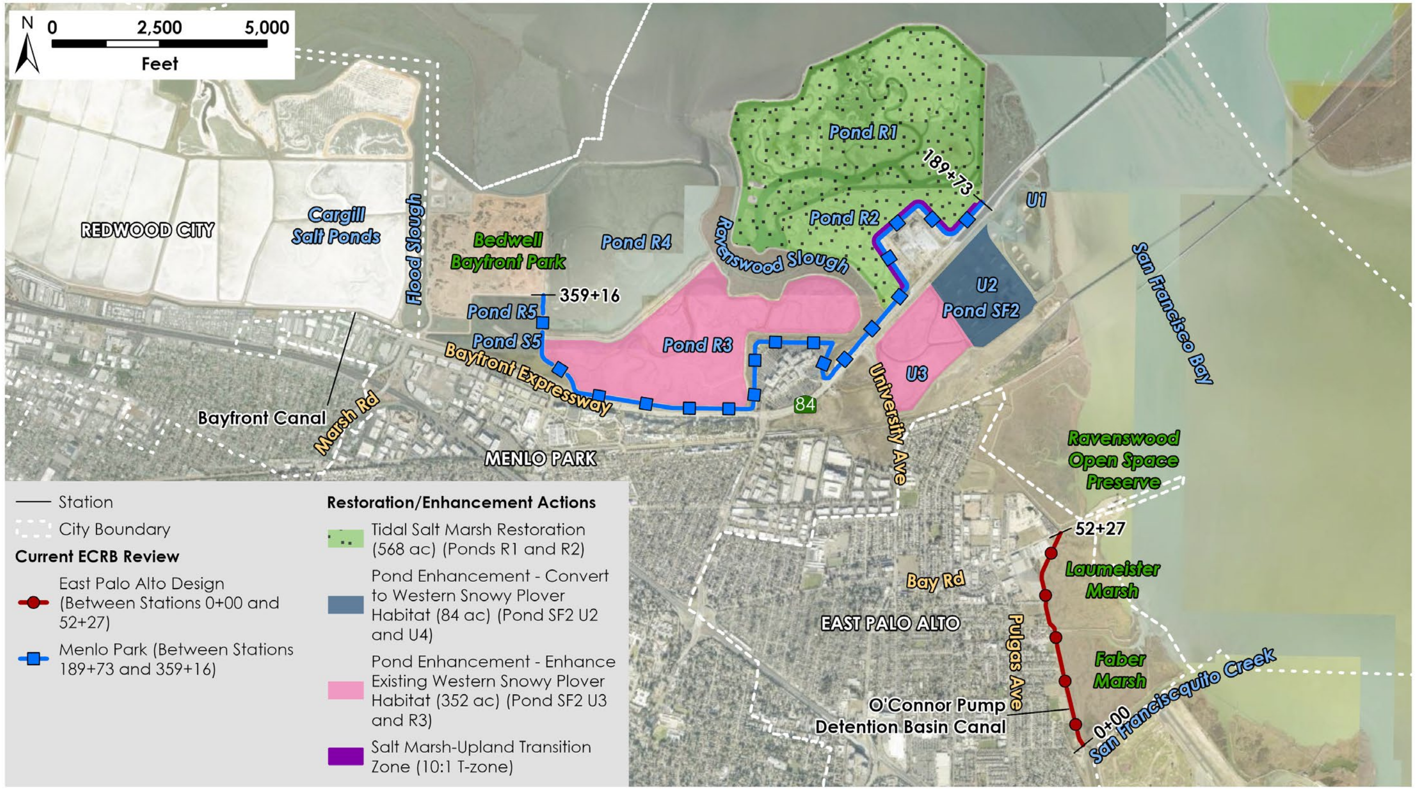
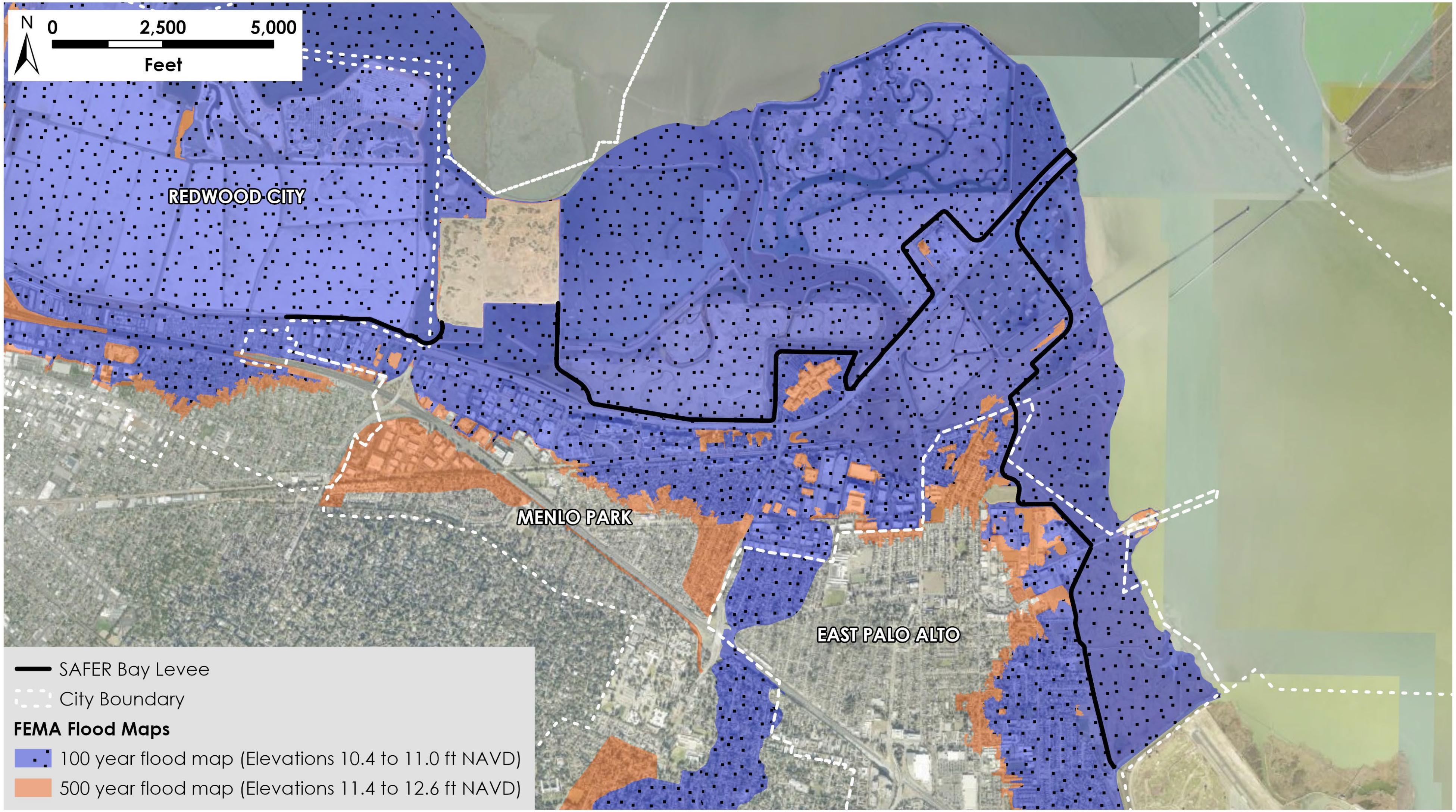


Project Purpose

- Reduce the risk of flooding in EPA and Menlo Park from SF Bay, including 3.5 feet of SLR
- Implement flood protection in ways that sustain and restore marsh habitat and support sensitive species
- Expand opportunities for recreation and community connectivity
- Minimize future maintenance requirements.
- Partner with agencies and organizations pursuing similar goals



Existing Coastal Flood Hazard in Menlo Park and East Palo Alto



Project Team

- San Francisquito Creek Joint Powers Authority (SFCJPA)
  - Members:
    - Cities of East Palo Alto, Palo Alto, and Menlo Park
    - OneShoreline
    - Santa Clara Valley Water District
  - Design team: HDR (lead), ESA, H. T. Harvey & Associates
- City of East Palo Alto
  - Design team: Sherwood (lead), Geosyntec, COWI, WRA
- City of Menlo Park
  - Design team: Schaaf & Wheeler (lead), Haley & Aldrich, CMG

Design Collaboration

Proposed Project Timeline

TABLE 2-4
SAFER BAY PROJECT IMPLEMENTATION SCHEDULE[a]

	Reach/Activity	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
		Approximate Schedule									
Project-Level Components	NEPA, supplemental CEQA as needed, design, and permitting for Project-level components										
	Dumbarton Approach Reach										
	Construct levee through Pond SF2 from railroad tracks to SR 84										
	Construct western snowy plover habitat in Pond SF2										
	Substation and Marsh Restoration Reach										
	Conduct Pond R1 and R2 restoration earthwork, except for breaching levees										
	Construct levee and 10H:1V T-zone at substation										
	Breach existing levees at Ponds R1 and R2 to restore tidal hydrology[b]										
	Tech Campus/Bayfront Expressway Reaches										
	Construct western snowy plover nesting habitat enhancements in R3										
	South of Bay Road Reach										
	Construct shoreline protection										
Program-Level Components	North of Bay Road Reach Construction										
	Dumbarton Approach Reach - Construct remaining shoreline protection										
	Tech Campus Reach Construction										
	Bayfront Expressway Reach Construction										
	Bedwell Bayfront Park Reach Construction										
	Marsh Road Reach Construction										

NOTES: CEQA = California Environmental Quality Act; NEPA = National Environmental Policy Act; SR = State Route; T-zone = Tidal salt marsh–upland transition zone

a. Project-level components shown in green; program-level components shown in blue; construction shown in dark green and dark blue.
b. Enhancement of western snowy plover habitat in Pond 3 would occur before Ponds R1 and R2 berms are breached.

SOURCE: ESA 2025; HDR 2025; H.T. Harvey & Associates 2025; SFCJPA 2024

Design Criteria

Project Objectives

- The primary objective of this project is to provide flood protection against the 100-year coastal flood along with 3.5 feet of sea level rise
- Achieve FEMA accreditation as providing flood protection against the 100-year coastal flood
- Assume a 50-year project design life

General Performance - Design Standards

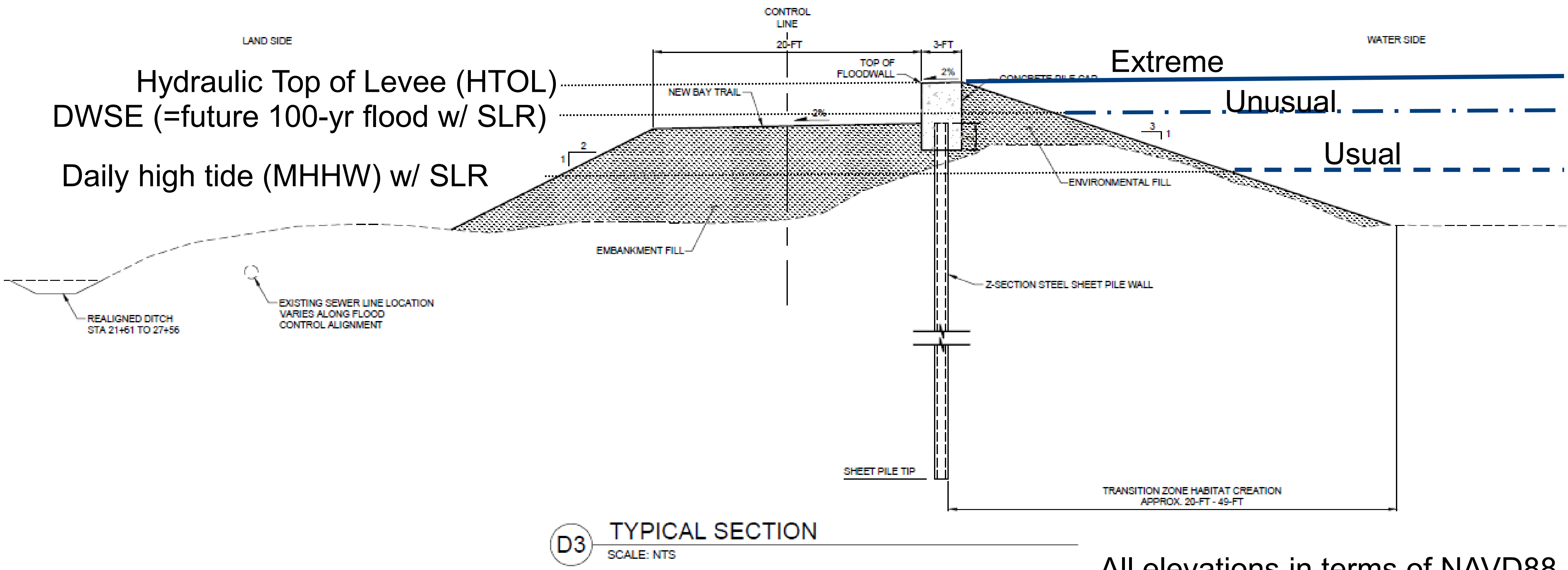
- Key geotechnical & floodwall design standards:
  - Floodwall design: EM 1110-2-2502 *Floodwalls and Other Hydraulic Retaining Structures* (USACE 2022)
  - Levee design: EM 11102-1913 *Evaluation, Design, and Construction of Levees* (USACE 2022)
  - Seismic design: ER 1110-2-1806. *Earthquake Analysis, Evaluation, and Design for Civil Works Projects* (USACE 2024)

General Performance - Design Standards

- For deep-seated failures passing beneath the floodwall, and for seepage exit gradients immediately landside of the floodwall, use EM 1110-2-2502
- For stability involving only the embankment fill, and for seepage exit gradients beyond the landside toe, use EM 1110-2-1913

General Performance – Hydraulic Loading

- EM 1110-2-2502 has performance requirements for "Usual", "Unusual", and "Extreme" load conditions:



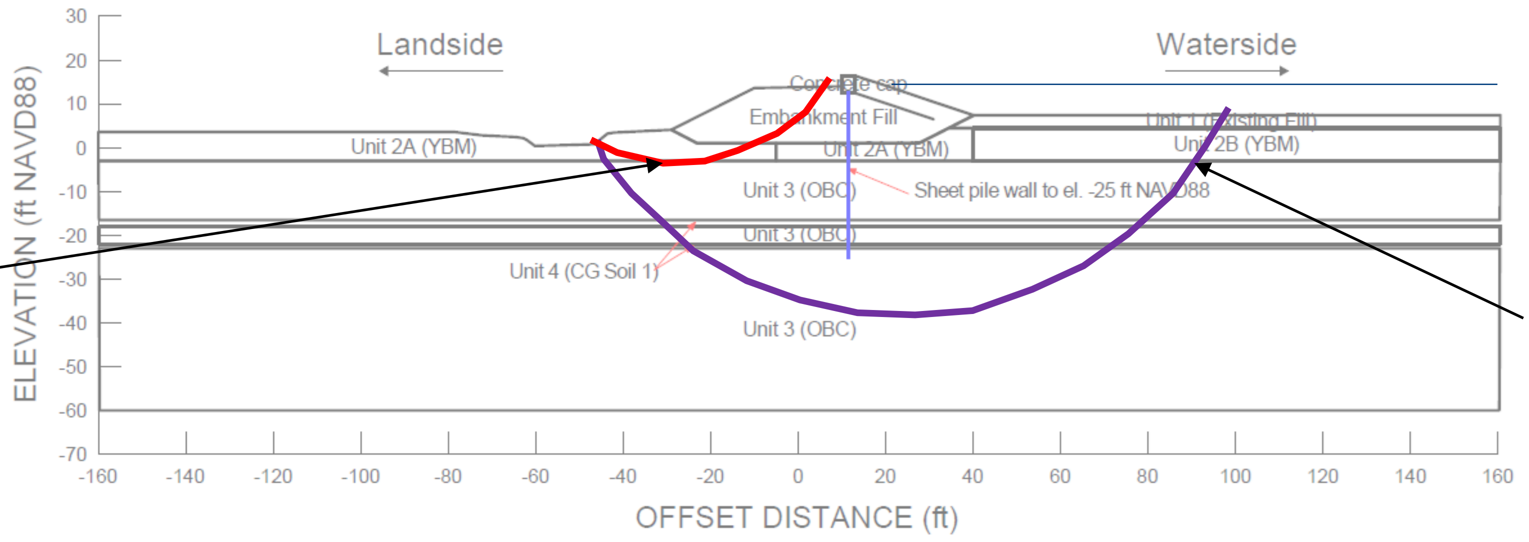
All elevations in terms of NAVD88

General Performance - Stability

Static slope stability factor of safety criteria:

Load Case	Design Standard	
	EM 1110-2-2502	EM 1110-2-1913
	Deep-seated failures beneath the floodwall	Failures only involving embankment fill
Usual	1.6	1.5
Unusual	1.5	1.4
Extreme	1.4	1.3

Example of failure of embankment only, subject to EM 1110-2-1913 criteria



Example of deep-seated failure, subject to EM 1110-2-2502 criteria

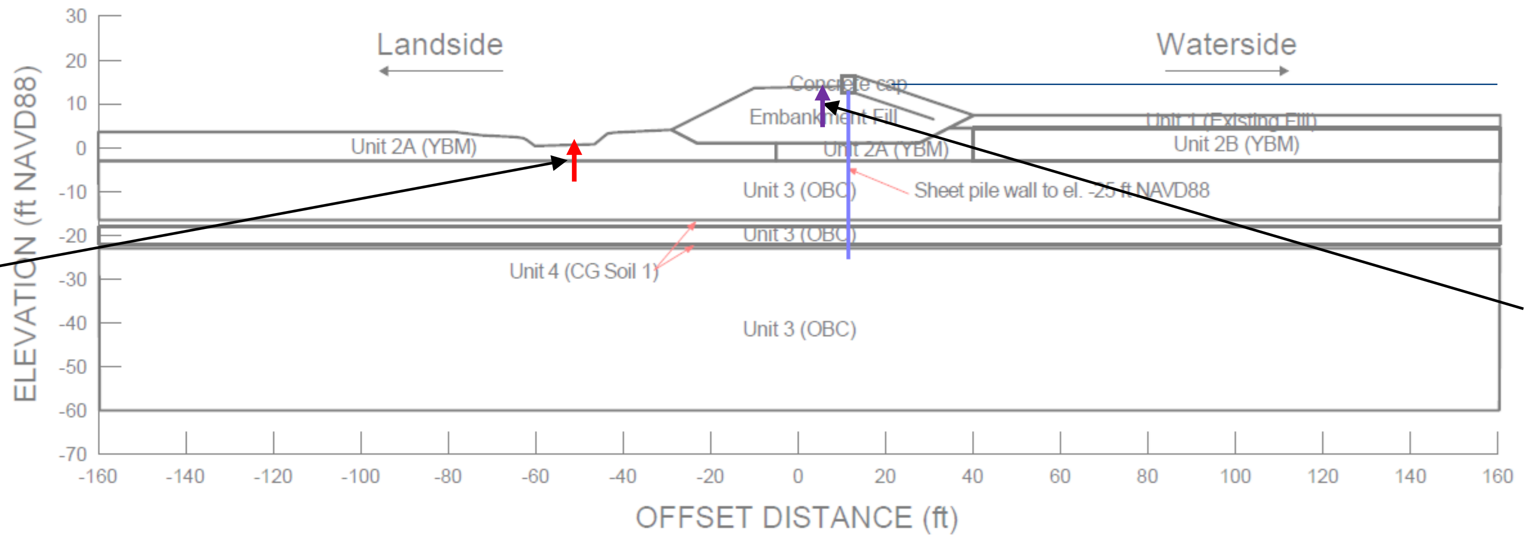
General Performance - Seepage

Vertical exit gradient minimum factor of safety criteria:

Load Case	Design Standard	
	EM 1110-2-2502	EM 1110-2-1913
	Deep-seated failures beneath the floodwall	**Failures only involving embankment fill**
Usual	2.8	-
Unusual	2.0	Varies (1.1 to 1.6)*
Extreme	1.6	1.0

* EM 1110-2-1913 (USACE 2022) defines the minimum exit gradient factor of safety as 1.6 at the landside toe, and 1.1 at a distance of D_f from the upstream toe, where D_f is equal to the effective levee height (H) divided by 0.05 (i.e., D_f = H/0.05). Minimum vertical exit gradient criteria will be linearly interpolated between the landside toe and D_f .

Example seepage exit gradient subject to EM 1110-2-1913 criteria



Example seepage exit gradient subject to EM 1110-2-2502 criteria

Seismic Design Criteria

Applicable requirements from ER 1110-2-1806 (USACE 2024)

Table 1
Consequence-based project feature classification

Project Feature Type[1]	Direct Loss of Life[2]	Disruption or Loss of Project Feature Service or Functionality; Loss of Service or Access for Lifeline Facilities[3]	Property Losses[4]	Adverse Environmental Impacts[5]
Non-Critical	None expected	None or damages are cosmetic or rapidly repairable	Minimal	Minimal damage
Critical	None expected to probable or likely (one or more)	Probable or likely	Major to extensive	Major to extensive damage[6]

Table 2
Criteria for seismic design ground motions

Project Feature Type	Minimum Earthquake Return Period for OBE-GM[1]	Earthquake Return Period for MDE-GM
Non-Critical	145-year return period[2]	975-year return period
Critical	475-year return period[3]	Greater[4] of the following: 1) 2,475-year return period[5,6] 2) MCE-GM (84th percentile values from ground motion models for source slip rate, SR ≥ 0.9 mm/year, median or 50th percentile values for SR ≤ 0.3 mm/year, and interpolation for SR values between 0.3 mm/year and 0.9 mm/year (see paragraph 9c(4))

Seismic Performance Criteria

- Operating Basis Earthquake Ground Motion (OBE-GM):
  - No more than 1 foot of vertical displacement
  - System continues to provide protection against 100-year coastal flood with SLR
  - Prevents freeboard from becoming negative
  - May require repairs to reinstate design freeboard
- Maximum Design Earthquake Ground Motion (MDE-GM):
  - Elevations after vertical displacement are no lower than 10-year water elevation with SLR (including wave run-up)
  - The MDE-GM is not likely to occur at the same time as coastal flooding
  - Criteria aims to prevents overtopping of the levee/floodwall and catastrophic flooding of the community
  - Repairs will likely be required to restore the design 100-year flood protection

Geotechnical

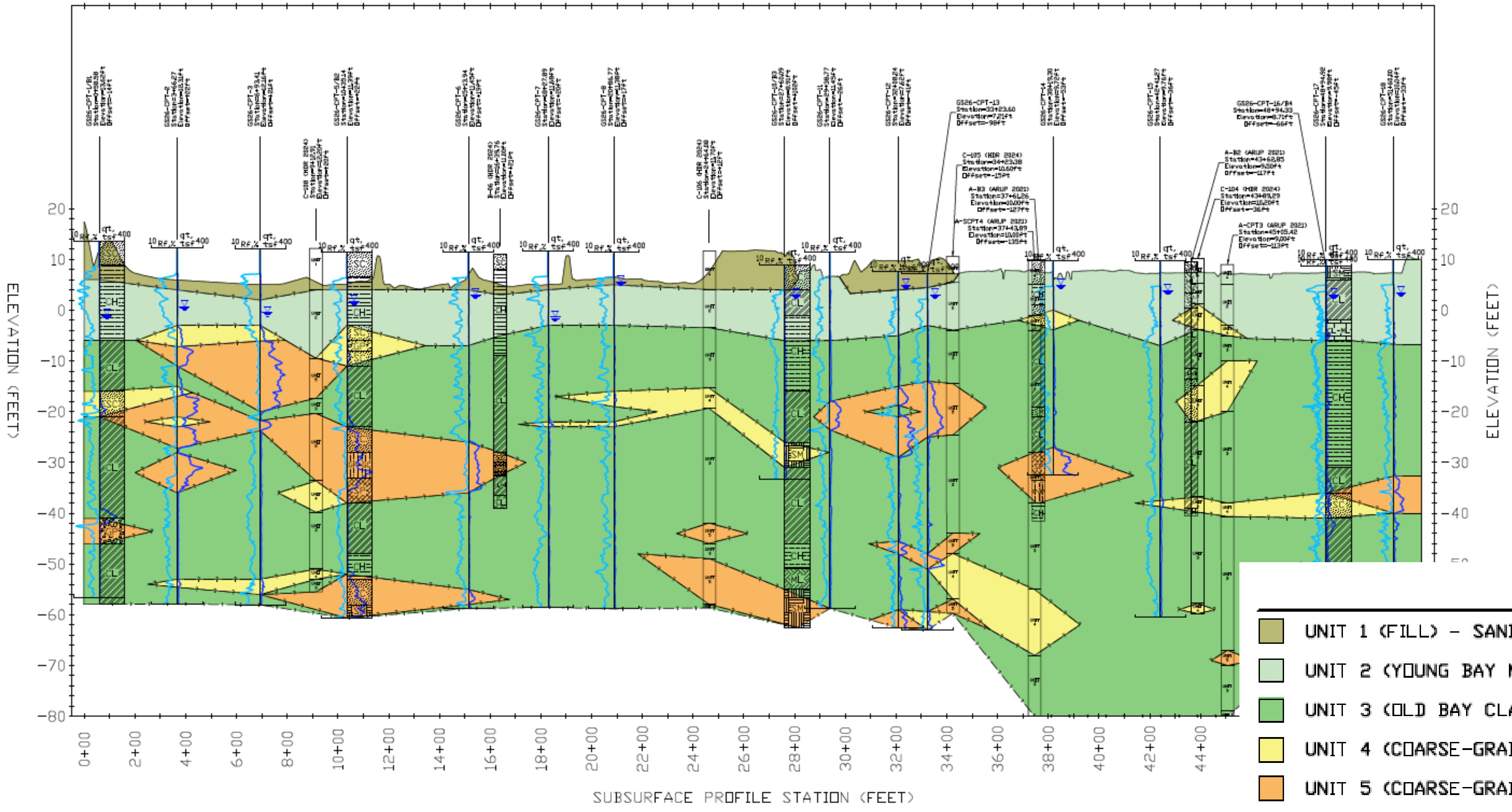
East Palo Alto Geotechnical –

- Investigation
  - Additional investigation performed in January 2026 between STA 00+00 and 69+00
  - Advanced 6 new test borings and 27 CPTs to fill data gaps
  - Supplementing historical exploration data presented in HDR June 12 2024 Geotechnical Report

- Subsurface Conditions
  - Fill – 0 to 10 feet
  - Young Bay Mud – 5 to 15 feet thick, very soft to stiff
  - Old Bay Clay – 30 to 60 feet thick, stiff to very stiff, with interbedded sand and gravel layers
  - Sand and gravel – 1 to 15 feet thick, loose to dense, generally discontinuous

East Palo Alto Geotechnical –

East Palo Alto Geological Section: STA 00+00 to 52+72 (Bay Road)



LEGEND

- UNIT 1 (FILL) - SANDY CLAY (CL/CH) TO SILTY SAND (SC/SM), SOFT TO MEDIUM STIFF
- UNIT 2 (YOUNG BAY MUD [YBM]) - VERY SOFT TO MEDIUM STIFF
- UNIT 3 (OLD BAY CLAY [OBC]) - MEDIUM STIFF TO VERY STIFF
- UNIT 4 (COARSE-GRAINED SOIL 1) - LOOSE TO MEDIUM DENSE
- UNIT 5 (COARSE-GRAINED SOIL 2) - MEDIUM DENSE TO VERY DENSE
- GROUNDWATER LEVEL ENCOUNTERED DURING INVESTIGATION (NOTE 5)

East Palo Alto Geotechnical –

- Cross-Sections
  - Five cross sections selected for modeling of embankment with embedded structural sheet pile. Sections selected to cover the range of foundation soil stress history, new fill height, presence of potentially liquefiable soil, and Young Bay Mud thickness
    - Sta 10+35
    - Sta 19+50
    - Sta 27+50
    - Sta 38+00
    - Sta 44+00

East Palo Alto Geotechnical -

- Ongoing Analysis/Current Results
  - Settlement – Rocscience Settle3
  - Liquefaction - CLiq
  - Seepage – GeoStudio SEEP/W
  - Slope Stability – GeoStudio SLOPE/W
    - Static
    - Pseudo-static

- Consolidation settlement from end of construction to 50-years
  - Sta. 7+00 – 5 in.
  - Sta. 15+00 – 10 in.
  - Sta. 28+50 – 16 in.
  - Sta. 42+50 – 17 in.
  - Sta. 49+00 – 16 in.

STA	Design Overbuild
0+00 to 12+00	6 in.
12+00 to 12+50	Transition from 6 to 12 in.
12+50 to 27+50	12 in.
27+50 to 28+00	Transition from 12 in to 18 in.
28+00 to Bay Rd	18 in.

East Palo Alto Geotechnical -

- Liquefaction (Boulanger & Idriss 2014) –
  - Settlement ranges between <1” and 6”
  - Lateral spread ranges between <1" and 10"

- Seepage Analyses
  - Steady-state – Acceptable gradients at levee toe and drainage channels
  - Clayey fill and significant Bay Mud thicknesss

East Palo Alto Geotechnical –

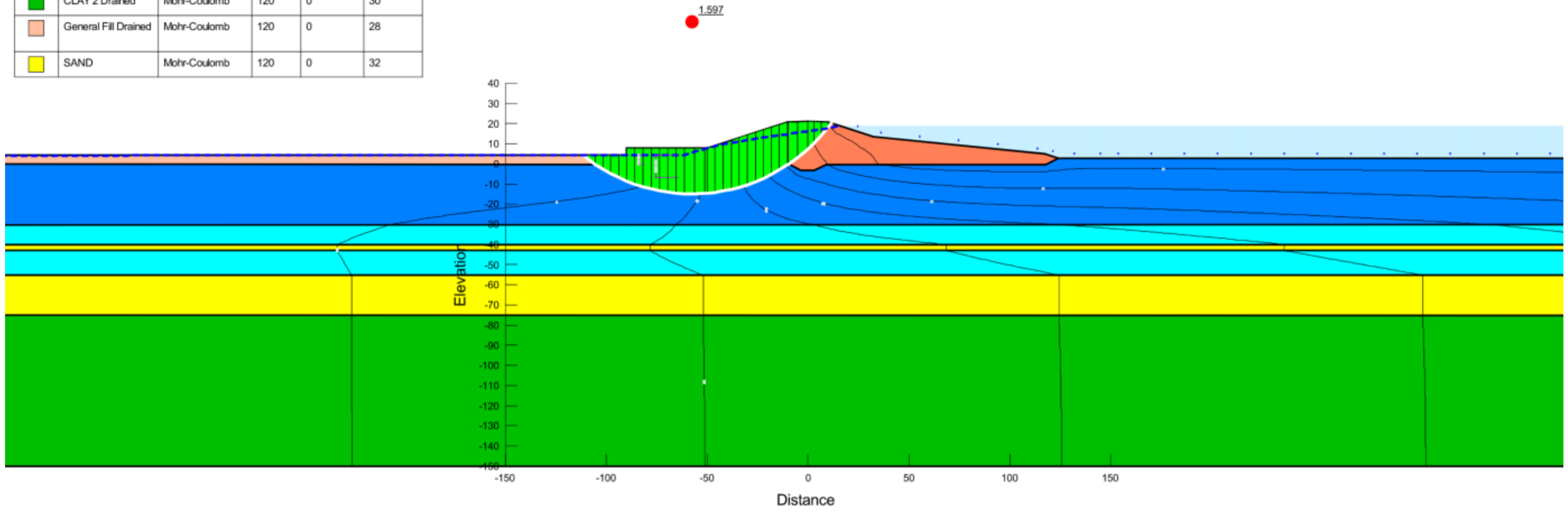
- Slope Stability Analyses
  - End of construction – Meeting criteria
  - Steady state seepage & stability – Meeting criteria
  - North of STA 27+50, fill is proposed between new & existing levees for maintenance/access. This fill is also needed to meet landside stability criteria

- Seismic Evaluation
  - Preliminary deformation estimates – Meets criteria except for Sta. 10+35
  - More detailed evaluations in progress:
    - PSHA
    - Time-history selection and scaling
    - Nonlinear deformation analysis via FLAC

Menlo Park Geotechnical –

- Cross-Sections
  - Three selected to cover the range of new fill and Young Bay Mud thickness
    - Sta 190+00 to Sta 240+00 (shown below)
    - Sta 240+00 to Sta 260+00
    - Sta 295+00 to Sta 361+00

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1- Levee Fill: Clayey Sand Drained	Mohr-Coulomb	120	100	32
	Bay Mud Drained	Mohr-Coulomb	100	0	20
	CLAY 1 Drained	Mohr-Coulomb	120	0	25
	CLAY 2 Drained	Mohr-Coulomb	120	0	30
	General Fill Drained	Mohr-Coulomb	120	0	28
	SAND	Mohr-Coulomb	120	0	32



Menlo Park Geotechnical –

- Cross-Sections
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    - Sta 190+00 to Sta 240+00
    - Sta 240+00 to Sta 260+00
    - Sta 295+00 to Sta 361+00

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- Ongoing Analysis/Current Results
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  - Liquefaction - CLiq
  - Seepage – GeoStudio SEEP/W
  - Slope Stability – GeoStudio SLOPE/W
    - Static
    - Pseudo-static

  - Settlement
    - Sta. 190+00 – Sta. 240+00 – 63 inches
    - Sta. 240+00 to Sta 260+00 – 18.5 inches
    - Sta. 295+00 to Sta 361+00 – 9 inches

Menlo Park Geotechnical -

- Liquefaction (Boulanger & Idriss 2014) –
  - Settlement ranges between 0.5” and 2.4”
  - Lateral spread generally less than 6.5"
  - C-06 from HDR 2016 shows 14 inches

- Seepage Analyses
  - Steady-state – Acceptable gradients at levee toe
  - Clayey fill and significant Bay Mud thicknesss

Menlo Park Geotechnical –

- Slope Stability Analyses
  - End of construction – Meeting criteria
  - Steady state seepage – Generally meeting criteria
  - Thicker mud area – Sta. 190 – 240 may need additional enhancement, e.g. stability berm based due to low static FS

- Seismic Evaluation
  - Post-liquefaction – Meets criteria except for Sta. 190 – 240
  - Pseudo-static - Meets criteria except for Sta. 190 – 240

Constructability

- Constructability and other design considerations:
  - Fill material suitability
  - Construction on saturated low-strength soils
  - Groundwater and dewatering
  - Deep soil mixing
  - Interaction of flood protection and habitat restoration features
  - Corrosion in a saline Bay environment

Fill Material Suitability

- Geotechnical requirements for embankment fill are largely based on Table 10-1 of EM 1110-2-1913 (USACE 2022)
  - Plasticity Index (PI) of greater than or equal to 8 and less than or equal to 40
  - Portion passing 3-inch sieve is 100%
  - Fines content (Passing No. 200 sieve) is greater than or equal to 30%
  - Organic content is less than 5%
  - Non-dispersive
  - No unsuitable material such as roots, grass, weeds, trash, and debris
- Environmental requirements:
  - Metals, organics, and other constituents shall not exceed applicable screening values in the SFBRWQCB “Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines,” or more stringent project-specific criteria.

Constructability

- Construction on saturated low-strength soils
  - May require dewatering or cofferdams
  - Low ground pressure equipment

- Deep Soil Mixing (DSM)
  - For Menlo Park – May be required to mitigate long-term total and differential consolidation settlement
  - Will decrease overall construction time
  - May reduce import soil requirements
  - Will also enhance performance during a seismic event.

Constructability

- Interaction of flood protection and habitat restoration features
  - Need to balance functions
  - Ecotone levees could help stability

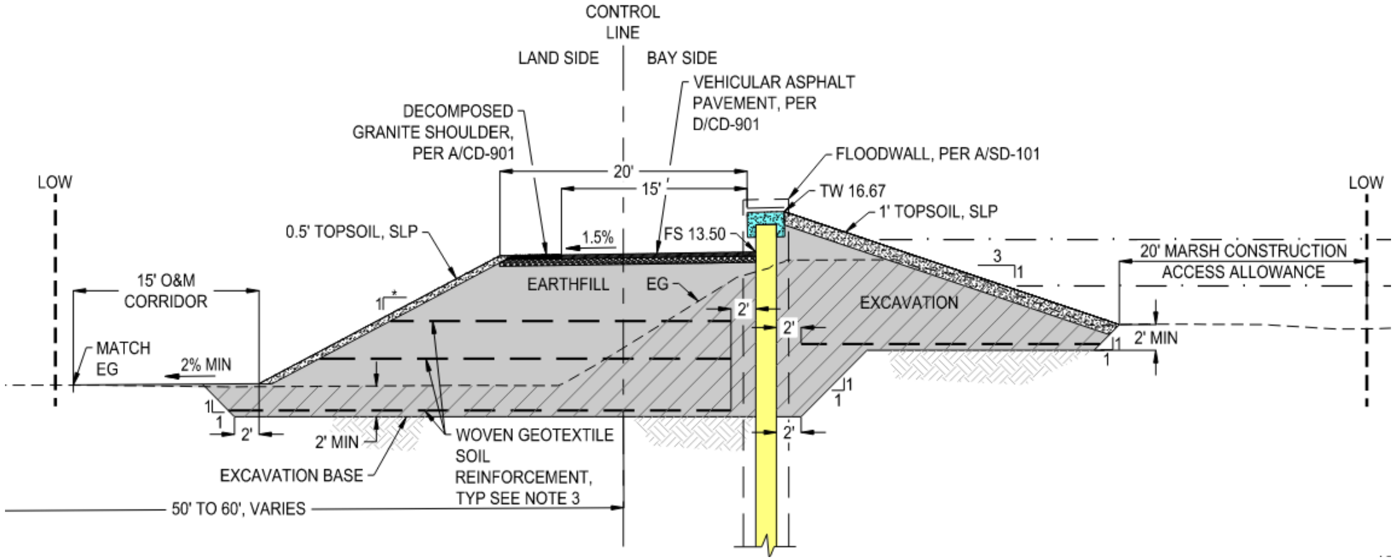
- Corrosion
  - Follow Caltrans guidance for sacrificial thickness on embedded metal components

Structural

EPA Structural - Elements

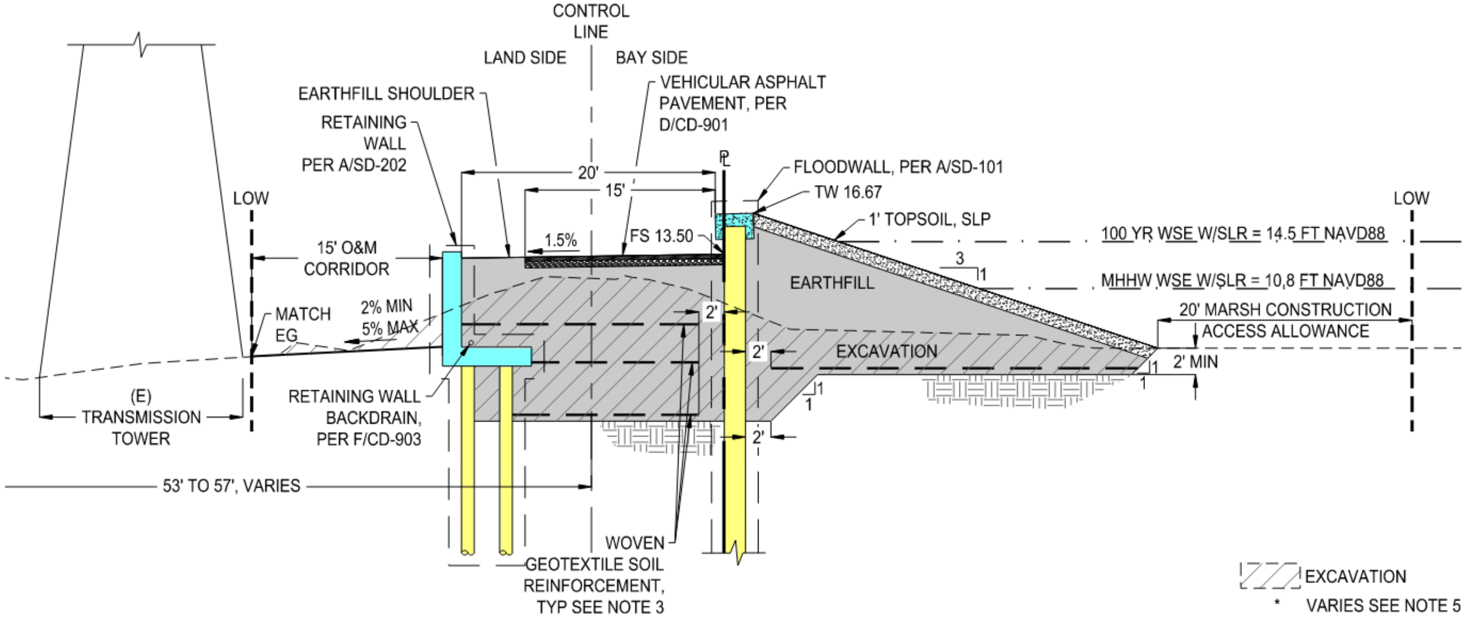
Sheet Pile Flood Wall

- Steel sheet pile
- Concrete cap at top of wall
- STA 0+07.5 to 52+27.8



Concrete Retaining wall

- Various concrete retaining wall structures on backside of levee to accommodate existing constraints/features
  - Near PG&E Transmission Tower
  - At Stormwater Channel
  - At pedestrian access points to levee



EPA Structural – Design Loads/Load Cases

Dead Load (D)

Live Load (L)

- HS-20 Truck Loading

Earth Pressure (EH / EV)

Hydrostatic Loading (Hs)

- Usual = 10.8 ft NAVD88
- Unusual = 14.5 ft NAVD88
- Extreme = 16.5 ft NAVD88 (top of floodwall)

Seismic (EQ)

Unusual = Operating Basis Earthquake (OBE) – 475 years

Extreme = Maximum Design Earthquake (MDE) – 2475 years

Table 2: Sheet Pile Load Combinations

LC	Load description	Load category	Load combination
LC-1A	Infrequent surge	Unusual	D + EH + EV + Hs
LC-1B	Maximum hydrostatic	Extreme	D + EH + EV + Hs
LC-2	Normal operating	Usual	D + EH + EV + Hs
LC-3A	Earthquake – OBE	Unusual	D + EH + EV + EQ + Hs
LC-3B	Earthquake – MDE	Extreme	D + EH + EV + EQ + Hs

Notes: Groundwater level used in LC-3A and LC-3B is at 3.3 ft NAVD88 for both landside and water side.

Table 3: Retaining Wall Load Combinations

LC	Load description	Load category	Load combination
LC-1	Normal Operating	Unusual	D + EH + EV + Hs
LC-2	Normal operating +Surcharge	Usual	D + EH + EV + Hs + ES
LC-3A	Earthquake – OBE	Unusual	D + EH + EV + EQ + Hs
LC-3B	Earthquake – MDE	Extreme	D + EH + EV + EQ + Hs

EPA Structural – Materials

Steel Piling Material

- Steel sheet pile: ASTM A328; ASTM A572 grades 50 or 60; or ASTM A690
- Steel pipe pile: ASTM A252 Gr.50
- Uncoated Steel (designed with sacrificial steel using California Department of Transportation Corrosion Guidelines Version 3.2) – similar to Foster City Levee (see image to right)

Caltrans

Corrosion Guidelines
MAY 2021
Version 3.2

Soil Embedded Zone	0.001 in (0.025 mm) per year
Fill or Disturbed Natural Soils	0.0015 in (0.0381mm) per year
Atmospheric Zone (marine)	0.002 in (0.051 mm) per year
Immersed Zone (marine)	0.004 in (0.102 mm) per year
Splash Zone (marine)	0.006 in (0.152 mm) per year

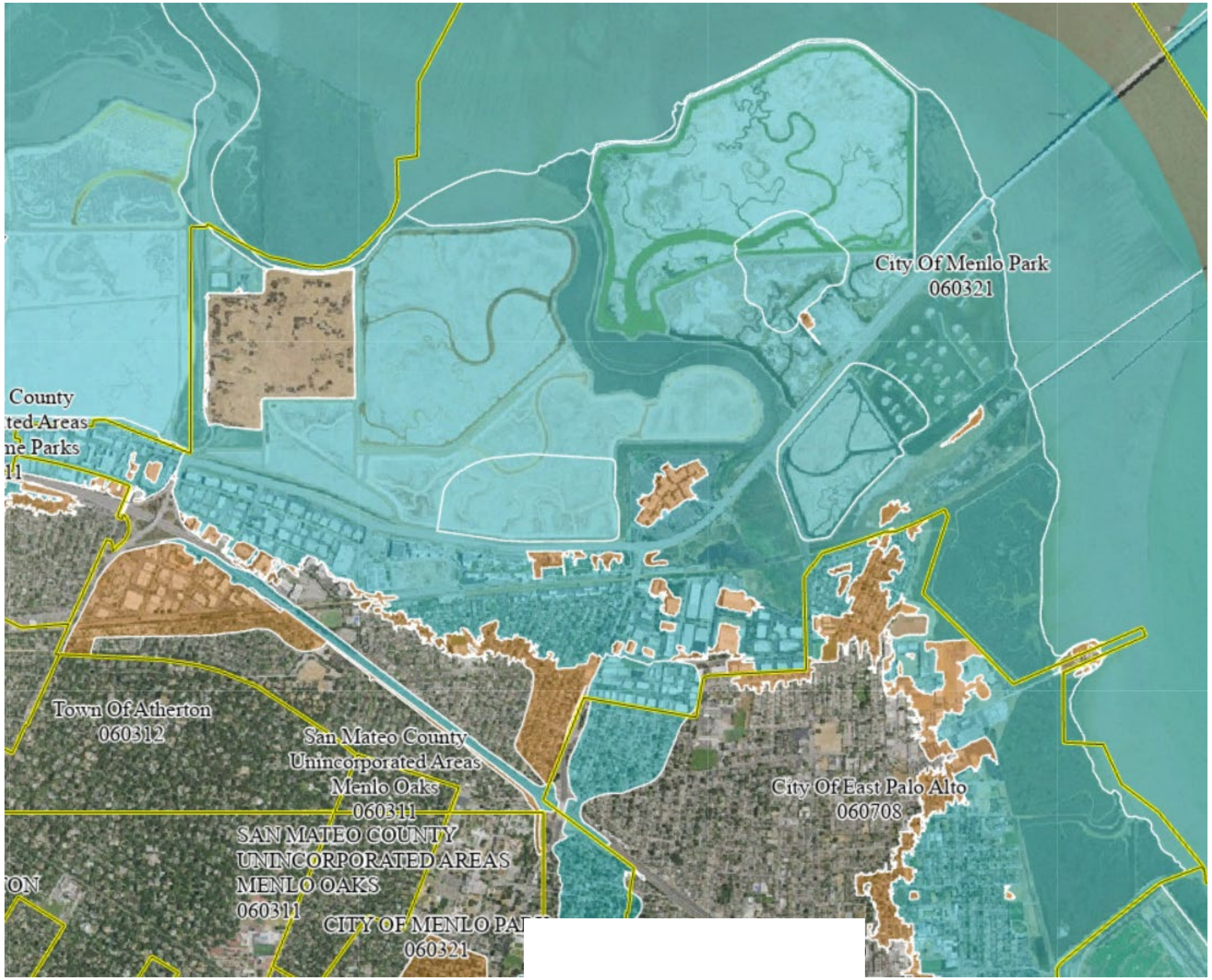
Concrete Materials

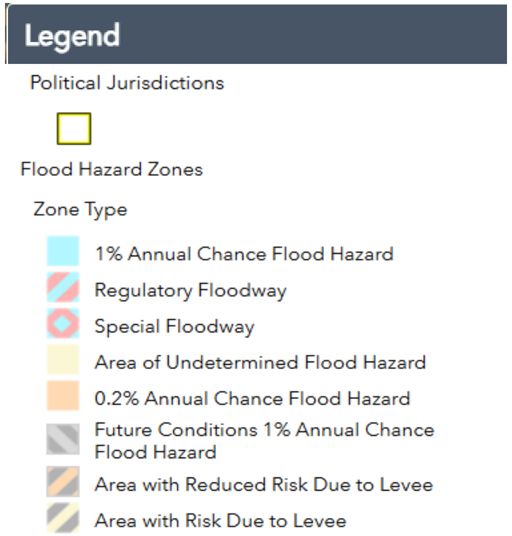
- Marine Concrete - UFGS 03 31 30
- Concrete strength: f'c = 5,000 psi
- Concrete cover: 3"
- Reinforcing steel: ASTM A615 Gr.60, black bar


Foster City Levee – sheet pile and concrete cap

Coastal

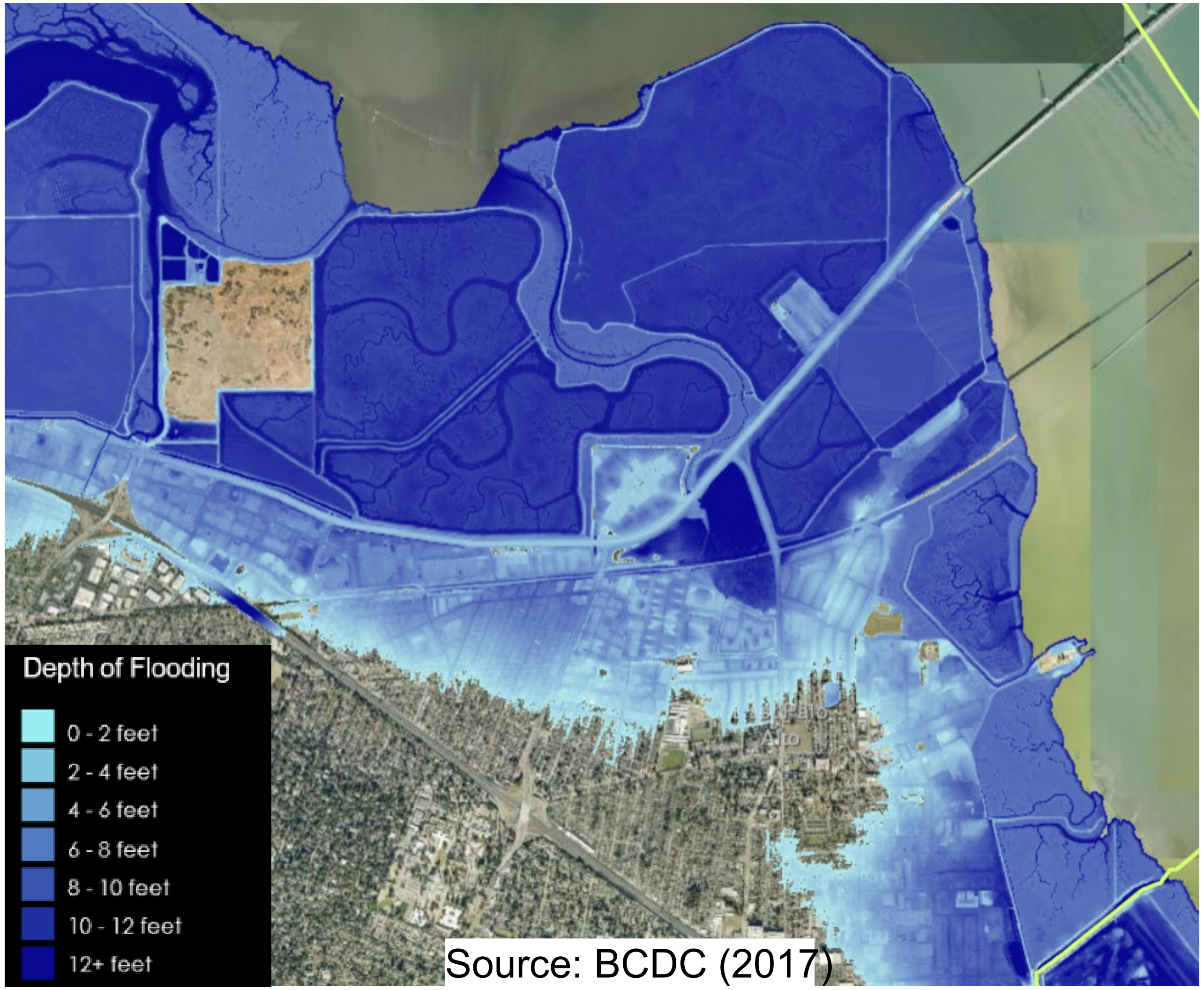
Existing Coastal Flood Hazard in Menlo Park and East Palo Alto





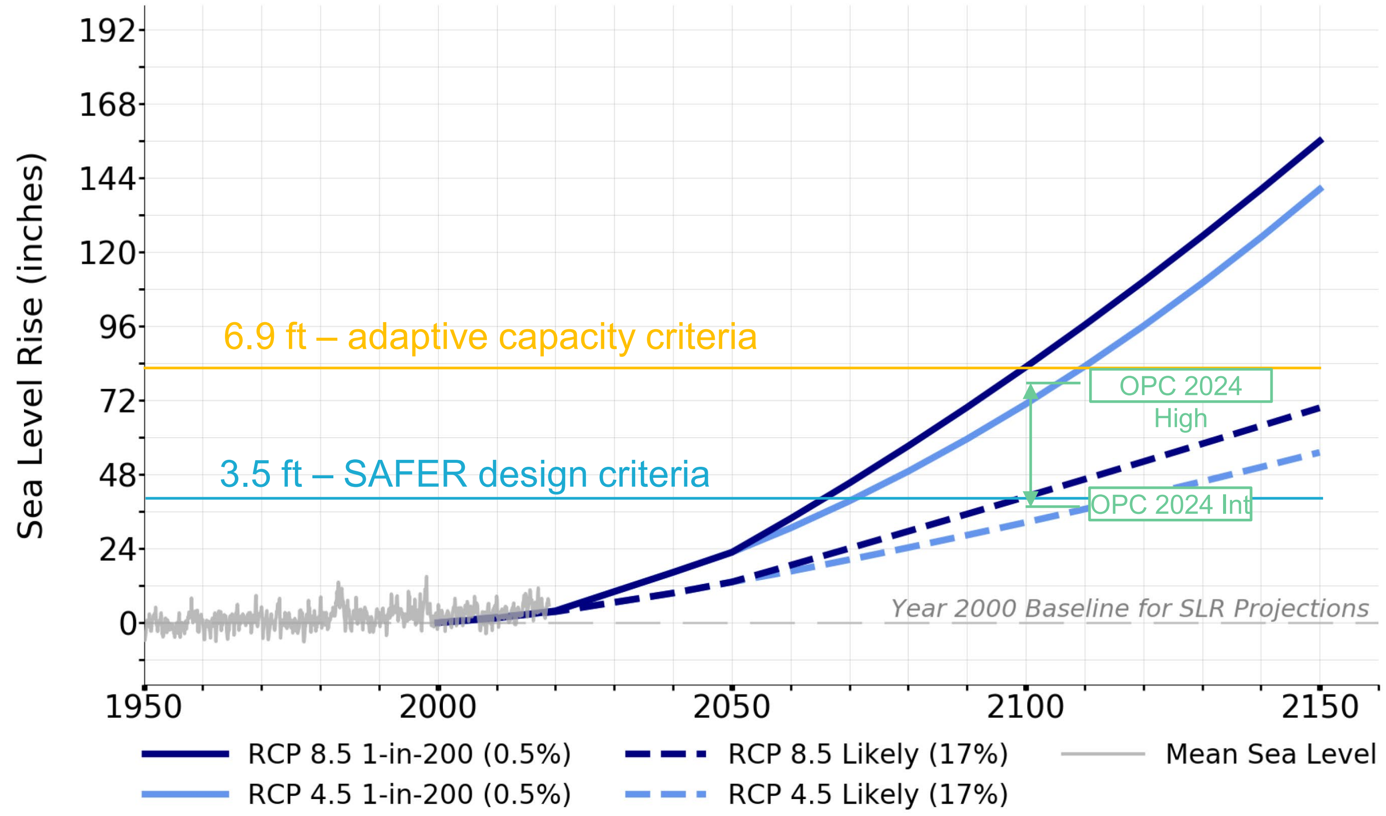
Future Coastal Flood Hazard with 3.5 Feet of Sea Level Rise

100-Year Flood Inundation with 3.5 Feet SLR



Source: BCDC (2017)

SAFER Sea Level Rise Design Criteria and Future Coastal Flood Hazard



Source: OPC (2018), OPC (2020), OPC (2024)

Objective 1.1 | Build Resiliency to Sea-Level Rise, Coastal Storms, Erosion, and Flooding

Target

1.1.1: Ensure California's coast is resilient to at least 3.5 feet of sea-level rise by 2050, as consistent with the State's Sea-Level Rise Guidance Document as appropriate for a given location or project.[9] This target will be modified periodically based on the best available science and updates to the State's Sea-Level Rise Guidance Document.

Partners

OPR	Caltrans
CCC	SWRCB
BCDC	CalOES
SCC	DWR
SLC	DSC
State Parks	

Source: OPC (2020)

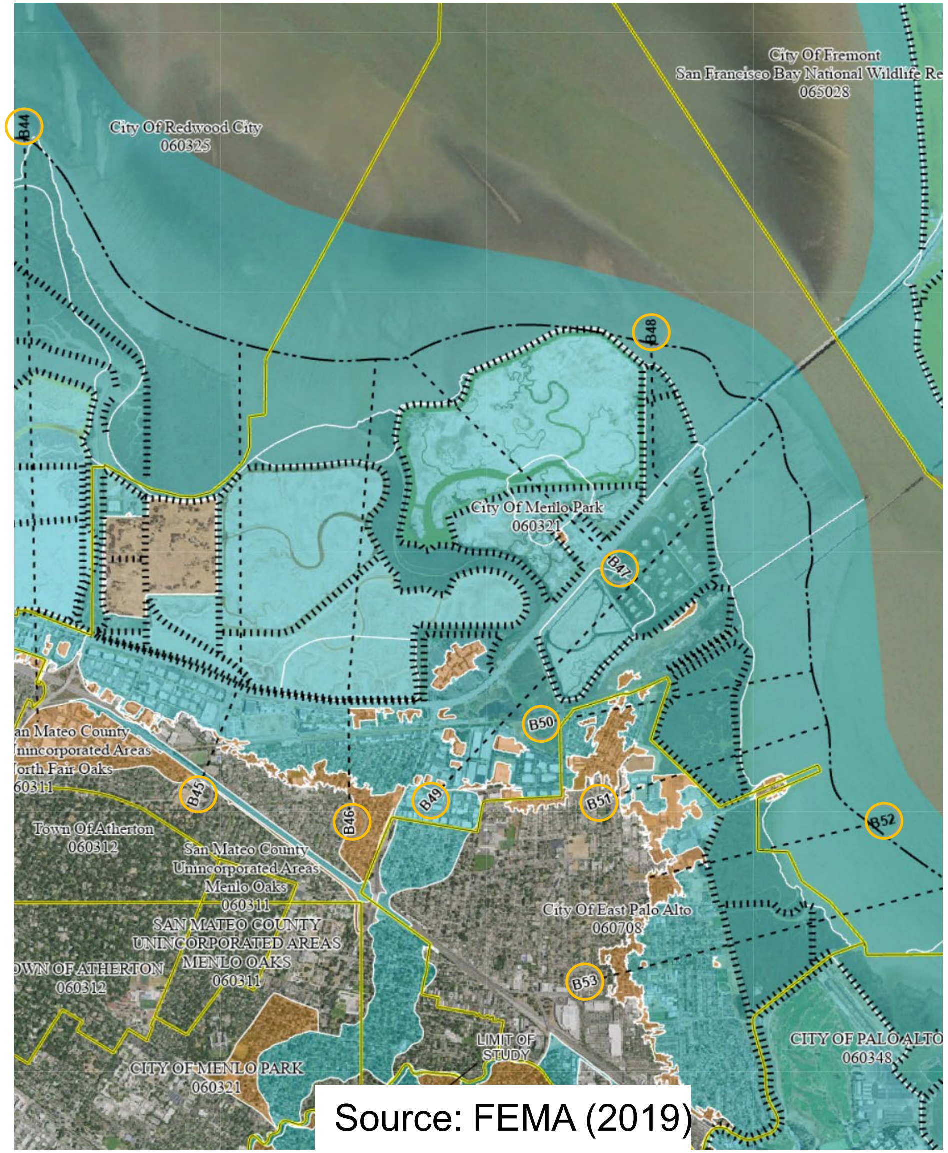
Coastal Hydraulics – Technical Approach

Approach

- Based on FEMA's Central San Francisco Bay Flood Hazard Study (BakerAECOM 2014)
- Previous approach with additional 3.5 SLR design criteria applied to shoreline with SAFER structures

Primary Data & Analyses Sources

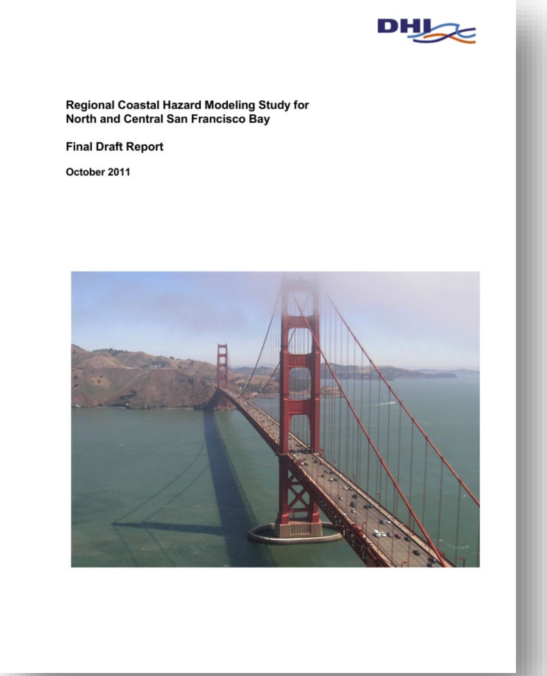
- San Francisco Bay Regional-Scale Wave and Hydrodynamic Modeling (DHI, 2011)
- 31-year hindcast model providing hourly wave and surge time series
- WHAFIS wave modeling
- TAW wave runup calculations



Source: FEMA (2019)

FEMA Coastal Overland Wave Propagation - Overview

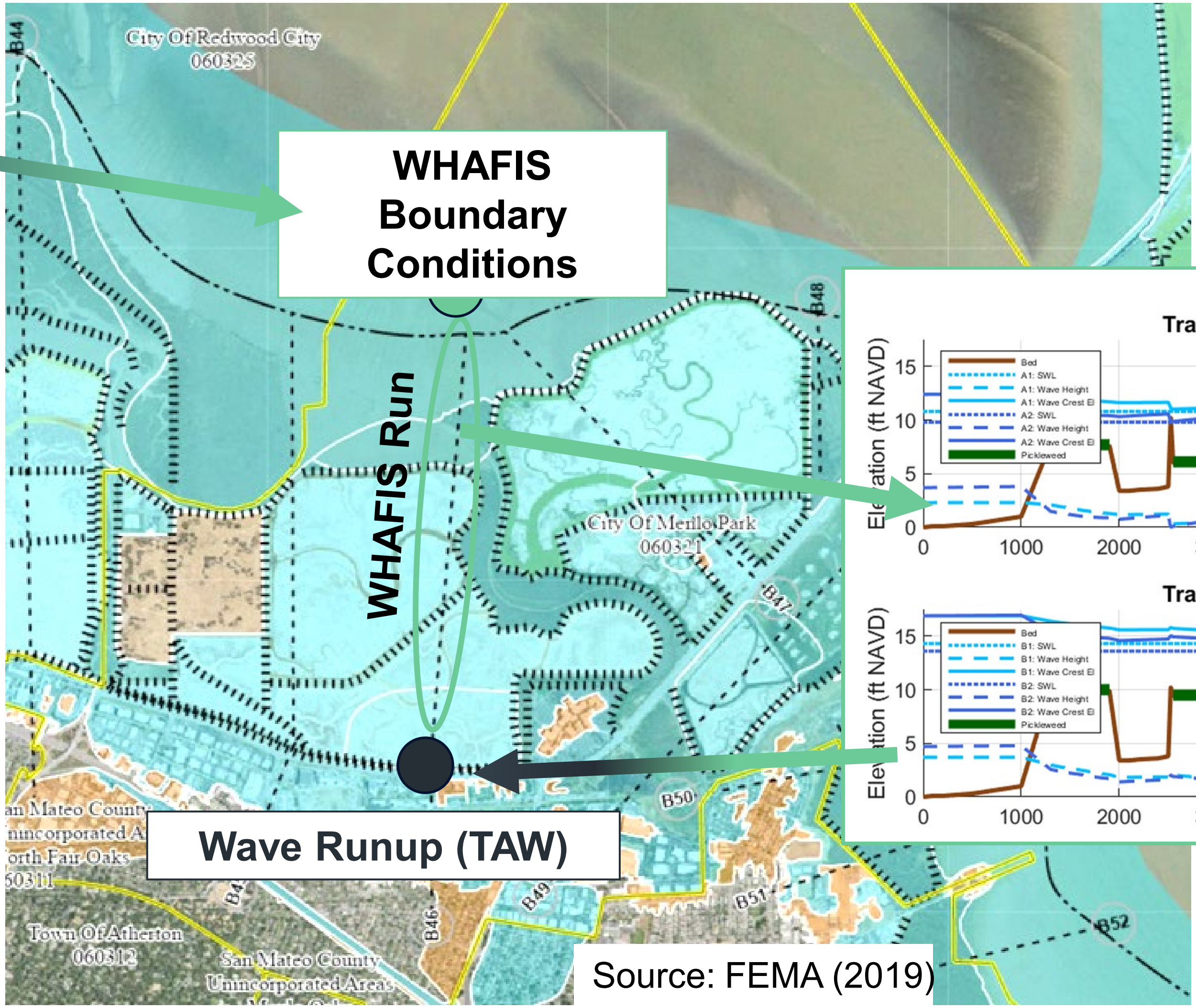
Open Bay WSE & Wave Modeling

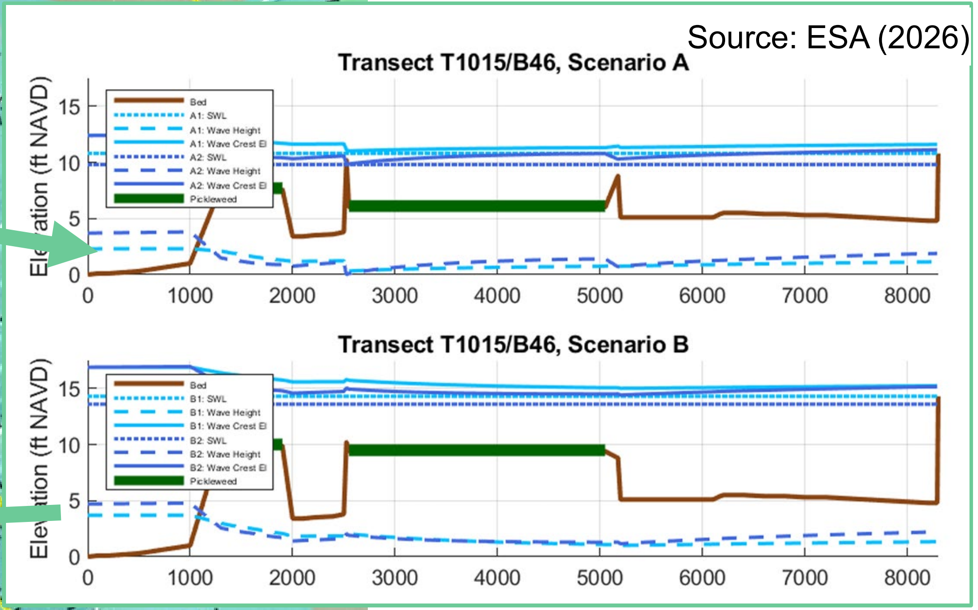

DHI

Regional Coastal Hazard Modeling Study for
North and Central San Francisco Bay

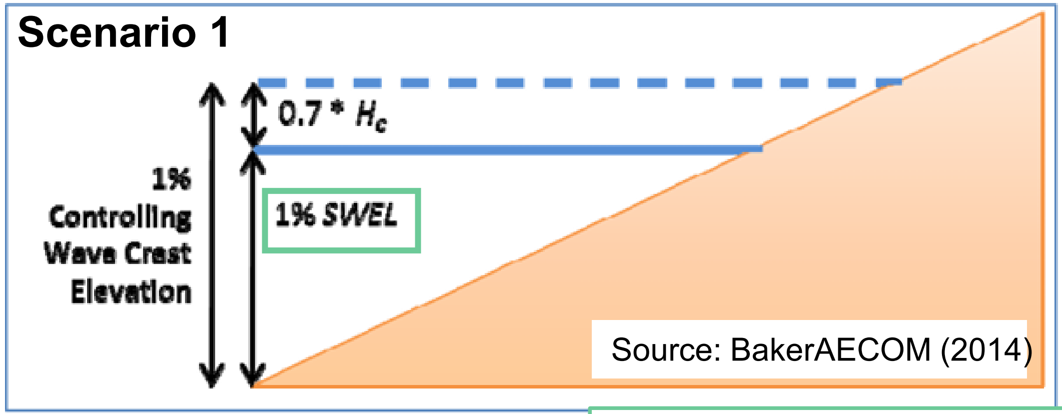
Final Draft Report

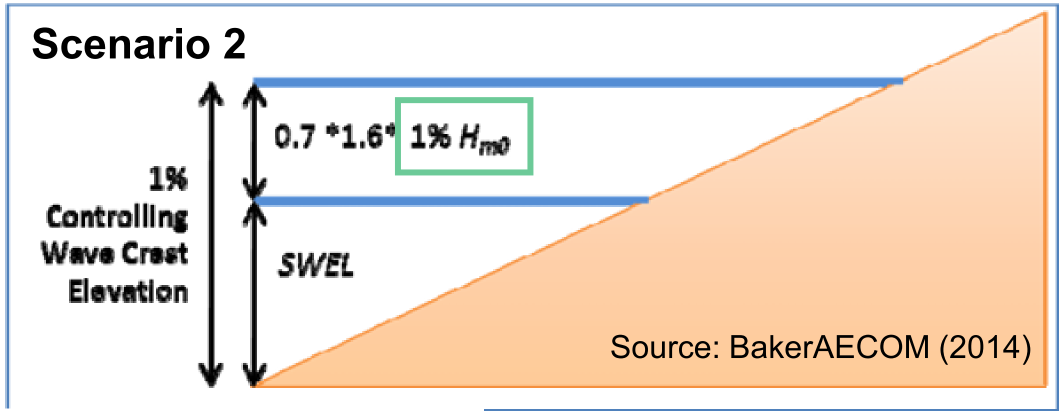
October 2011

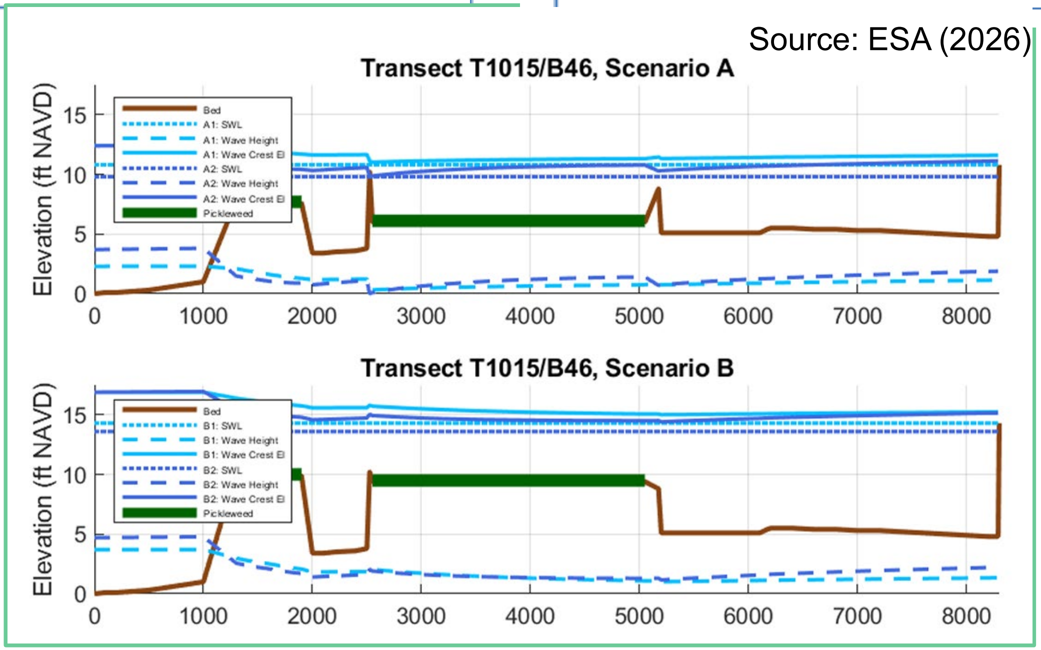




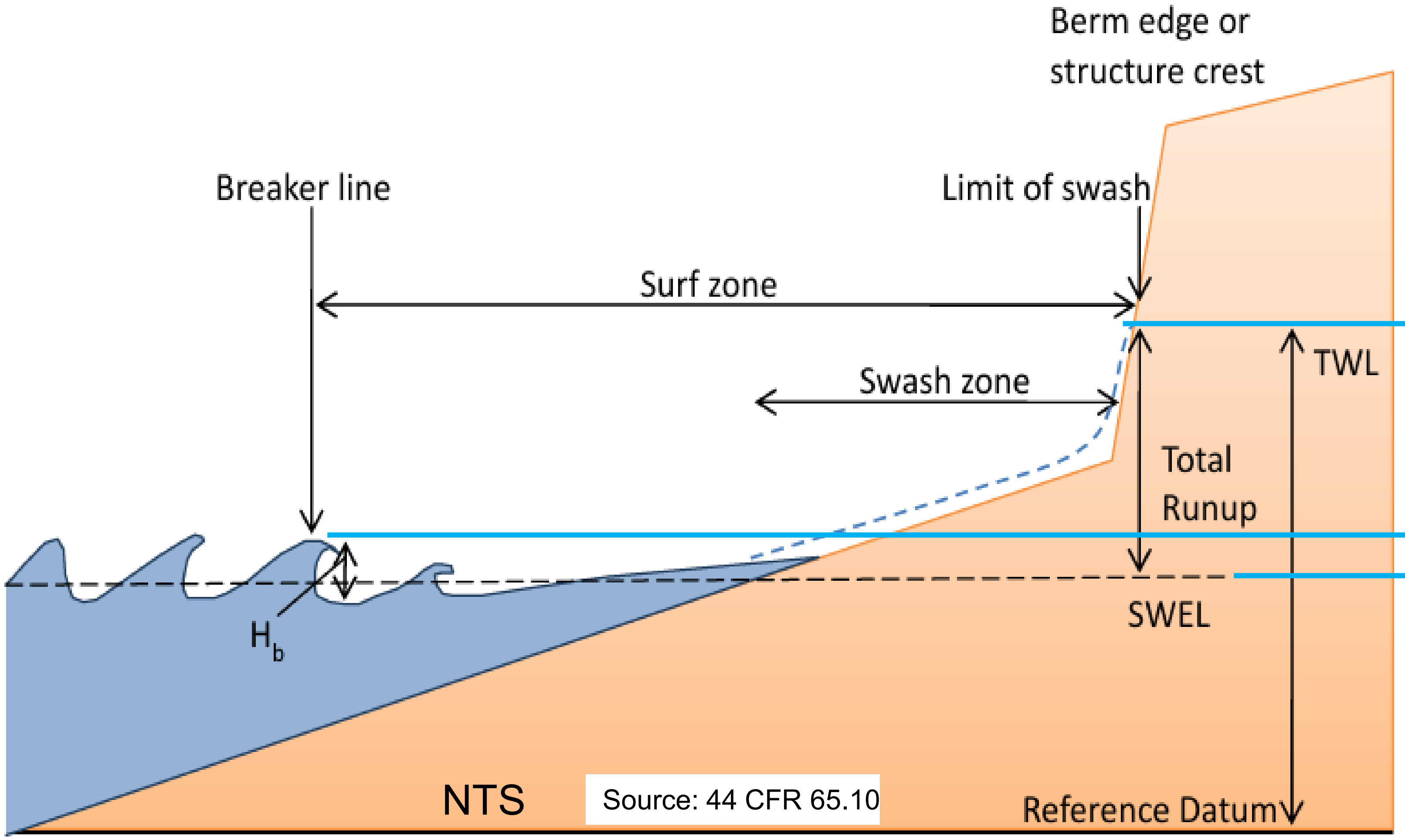
Two Event-Selection Scenarios Based on Offshore 1% Wave Crest Elevation







FEMA Coastal Freeboard Requirements For Accreditation



Source: 44 CFR 65.10

Minimum for accreditation = max of:

- TWL + 1 ft freeboard
- WCE + 1 ft freeboard
- SWL + 2 ft freeboard

Initial SAFER Design Crest Elevations Relative to Stillwater Level and Total Water Levels with +3.5-Foot SLR

Reach ID	Reach Name	SWL (ft NAVD88)	SWL Freeboard (ft)	TWL_{max} (ft NAVD88)	TWL_{max} Freeboard (ft)
Menlo Park					
B45	Bayfront Expressway	14.0	5.0	19.2	-0.2
B46	Bayfront Expressway	14.3	4.7	20.6	-1.6
B47	Substation & Marsh Restoration	14.3	4.7	16.7	2.3
East Palo Alto					
B52	South of Bay	14.5	2	16.9	-0.4
B53	South of Bay	14.5	2	16.9	-0.4

SAFER Adaptation Approach to Future Sea-Level Rise

Sea-Level Rise (ft)	Projected Decade to Occur		Proposed 2030 Design Elevations versus:		Implications
	Intermediate Scenario	High Scenario	Future 1% SWL	Future 1% TWL	
3.5	2100	2070	At least 2 feet freeboard for all reaches	At least 1 foot freeboard for all reaches	Meets FEMA accreditation, as per design criteria
4.8	2120	2080	At least ¾ foot freeboard for all reaches	Within few tenths of a foot of design elevation along multiple reaches	Does not meet freeboard requirements for FEMA accreditation Potential for minimal wave overtopping Initiate adaptation measures planning, if not already started
6.6	After 2150	2100	Negative freeboard of about 1 foot for some reaches	Negative freeboard of about 2 feet for most reaches	Structural adaptation modifications needed before this amount of sea-level rise

Interior Drainage

Methodology

Integrated Catchment Model (ICM)

- East Palo Alto and Menlo Park design teams have collaborated to create a unified Integrated Catchment Model (ICM) within East Palo Alto, Menlo Park, and Palo Alto. Watershed modeling is being performed directly for the San Francisquito Creek JPA.

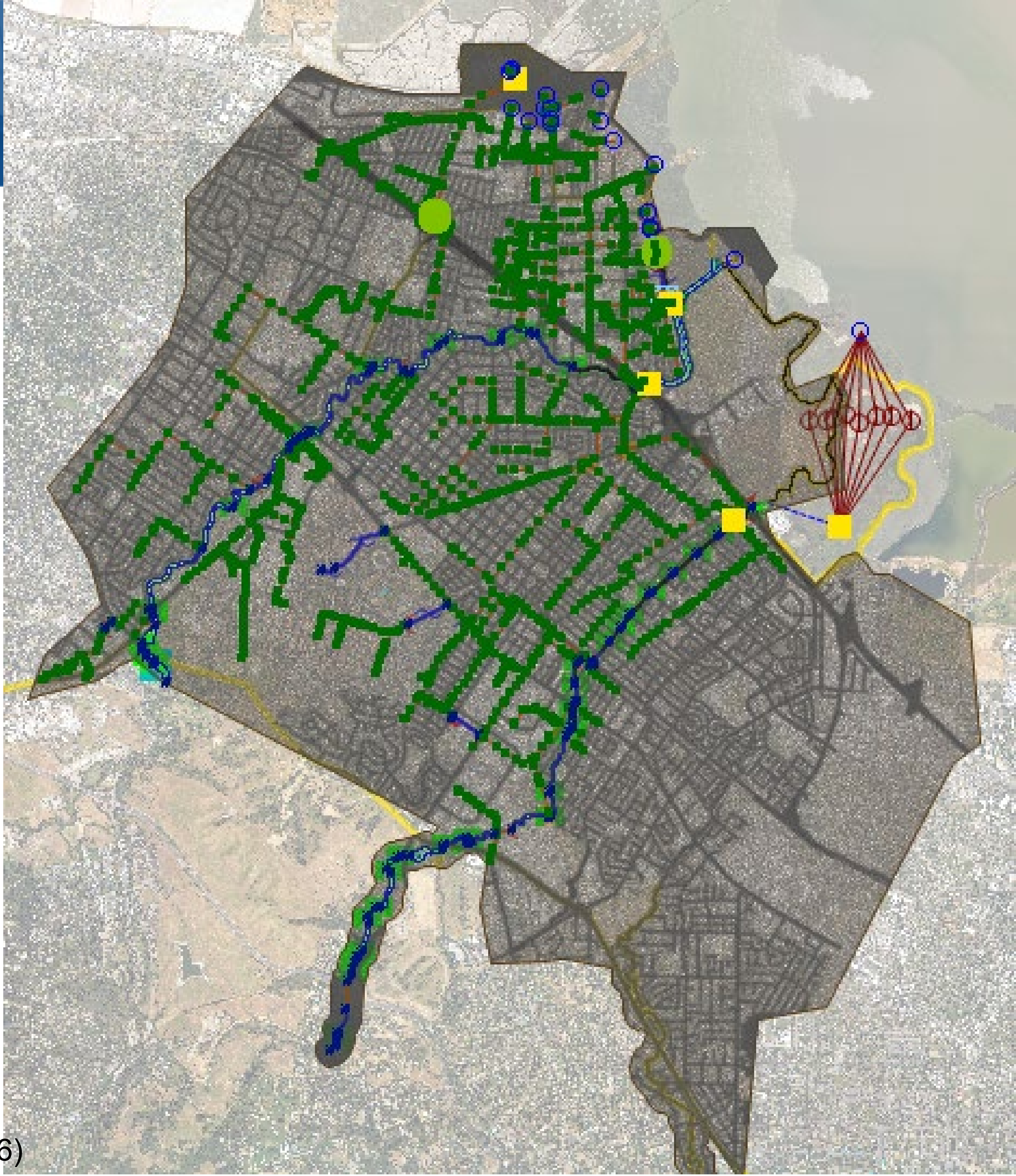
- A statistically balanced Christmas 1955 3-day rainfall pattern using local MetStat IDF data is adopted as the 100-year storm.

- Antecedent moisture conditions and baseflow are based on calibration to flood-frequency analysis performed for the USGS streamflow gage at Stanford, with 84 years of systematic record.

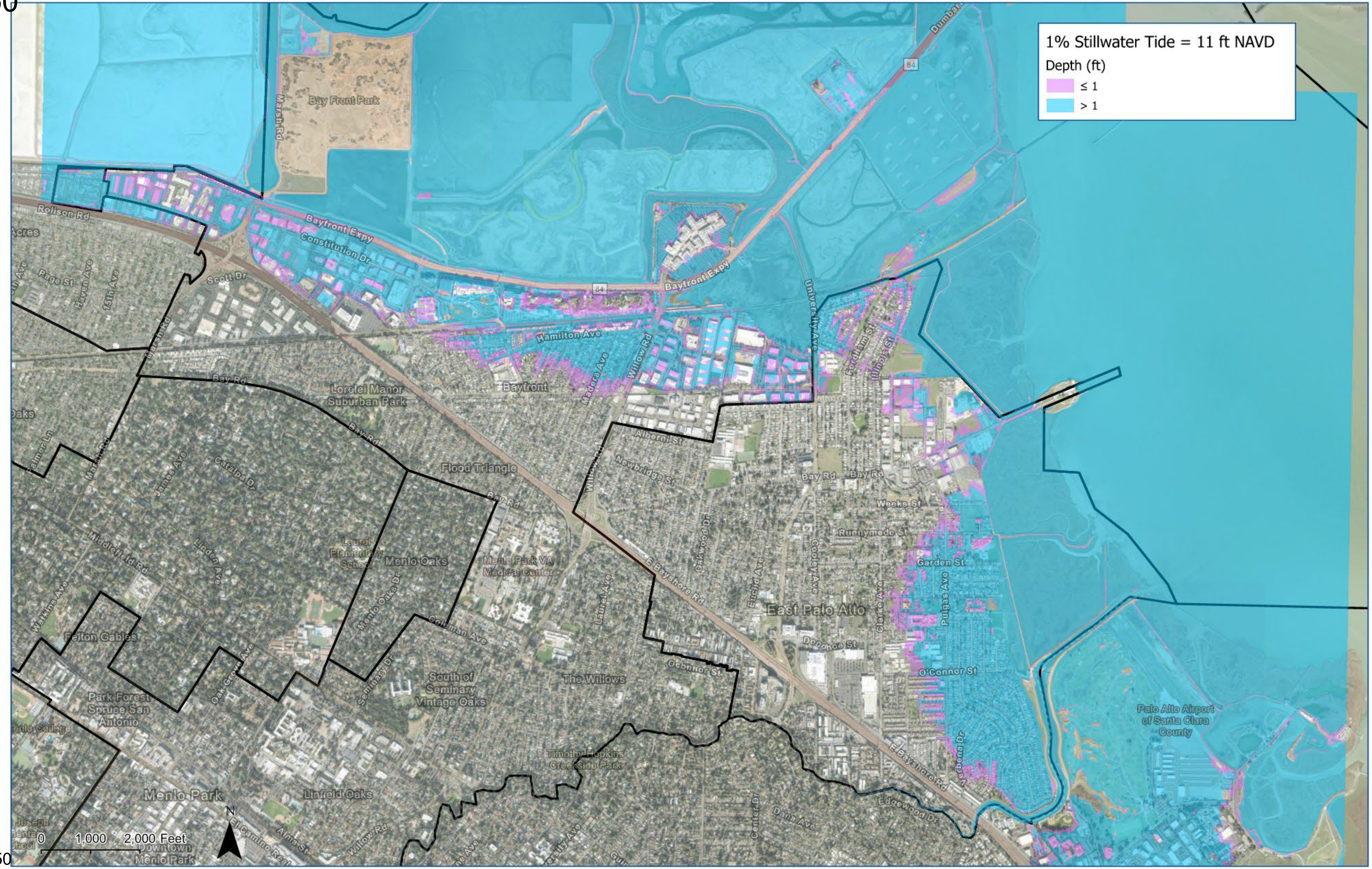
- The calibrated ICM has been verified using the recorded NYE 2022 rainfall and runoff. (AMC adjusted)

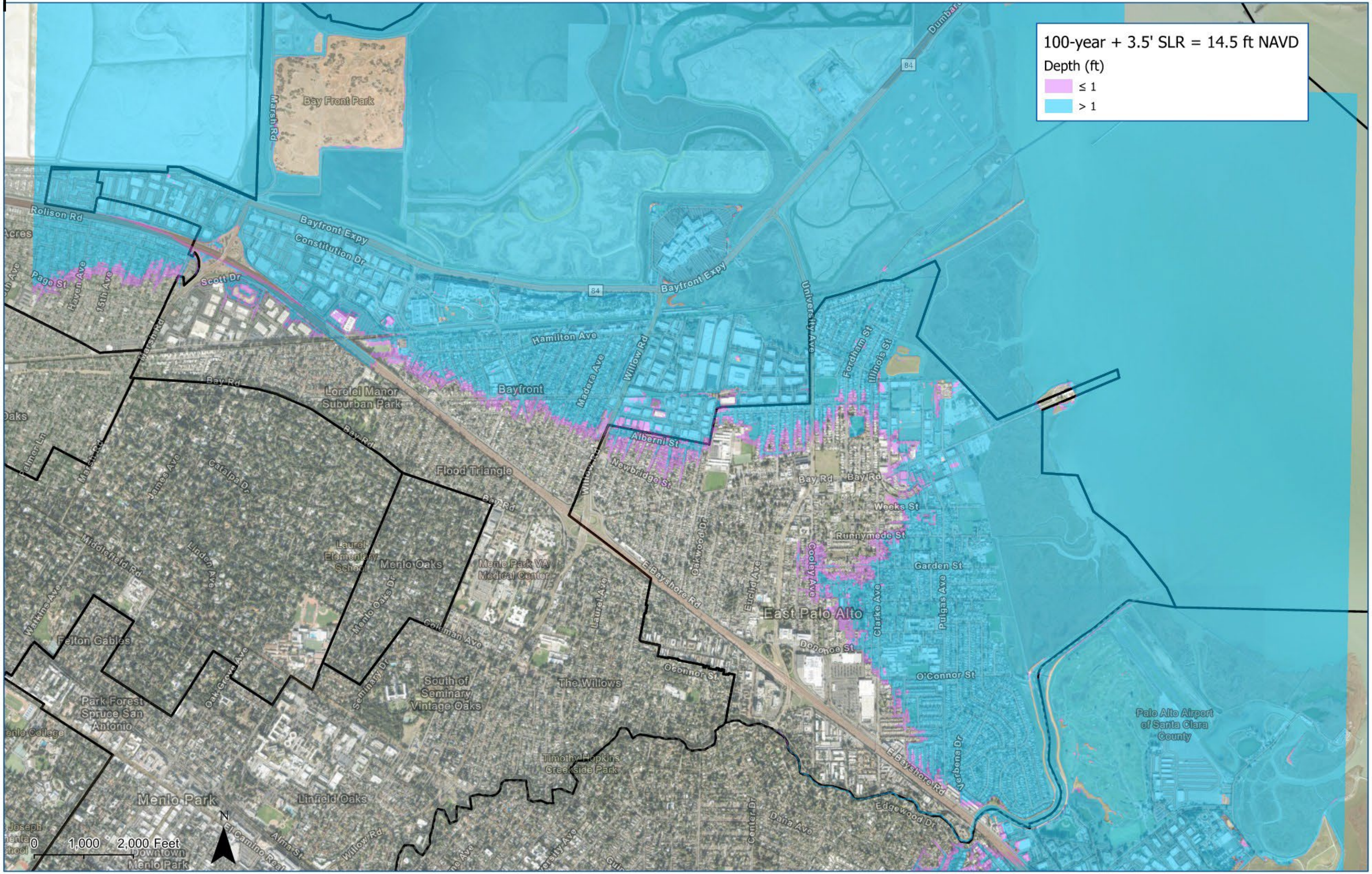
- 100-year interior runoff against 10-year tide is an appropriate joint probability for mapping.

- The East Palo Alto and Menlo Park design teams have independently verified storm drain system and pumping characteristics.



ICM Model Domain (Schaaf & Wheeler, 2026)


1% Stillwater Tide = 11 ft NAVD
Depth (ft)
≤ 1
> 1
Bay Front Park
Marsh Rd
Rollison Rd
Bayfront Expy
Constitution Dr
Scott Dr
Page St
Haven Ave
15th Ave
Hamilton Ave
Willow Rd
Madera Ave
University Ave
Fordham St
Illinois St
Dumbarton
Bayfront
Lorelei Manor Suburban Park
Bay Rd
Flood Triangle
Alberni St
Newbridge St
Weeks St
Runnymede St
Garden St
Pulgas Ave
East Palo Alto
Donohoe St
O'Connor St
Oconnor St
Verbena Dr
E Bayshore Rd
Edgewood Dr
Palo Alto Airport of Santa Clara County
Catalpa Dr
James Ave
Middlefield Rd
Linden Ave
Laurel Elementary School
Menlo Oaks
Menlo Oaks Dr
Menlo Park VA Medical Center
Coleman Ave
Felton Gables
Watkins Ave
Palmer Ln
Oak Grove Ave
Park Forest Spruce San Antonio
Seminary Dr
South of Seminary Vintage Oaks
The Willows
Oakwood Dr
Euclid Ave
Cooley Ave
Clarke Ave
Laurel Ave
Timothy Hopkins Creekside Park
Linfield Oaks
Menlo Park
Downtown Menlo Park
Menlo College
El Camino Real
Alma St
Willow Rd
Center Dr
Dana Ave
N
0 1,000 2,000 Feet


100-year + 3.5' SLR = 14.5 ft NAVD
Depth (ft)
≤ 1
> 1
Bay Front Park
Marsh Rd
Rolison Rd
Bayfront Expy
Constitution Dr
Scott Dr
Page St
Haven Ave
15th Ave
Hamilton Ave
Bayfront
Madera Ave
Willow Rd
University Ave
Fordham St
Illinois St
Bay Rd
Lorelei Manor Suburban Park
Alberni St
Newbridge St
Flood Triangle
Catalpa Dr
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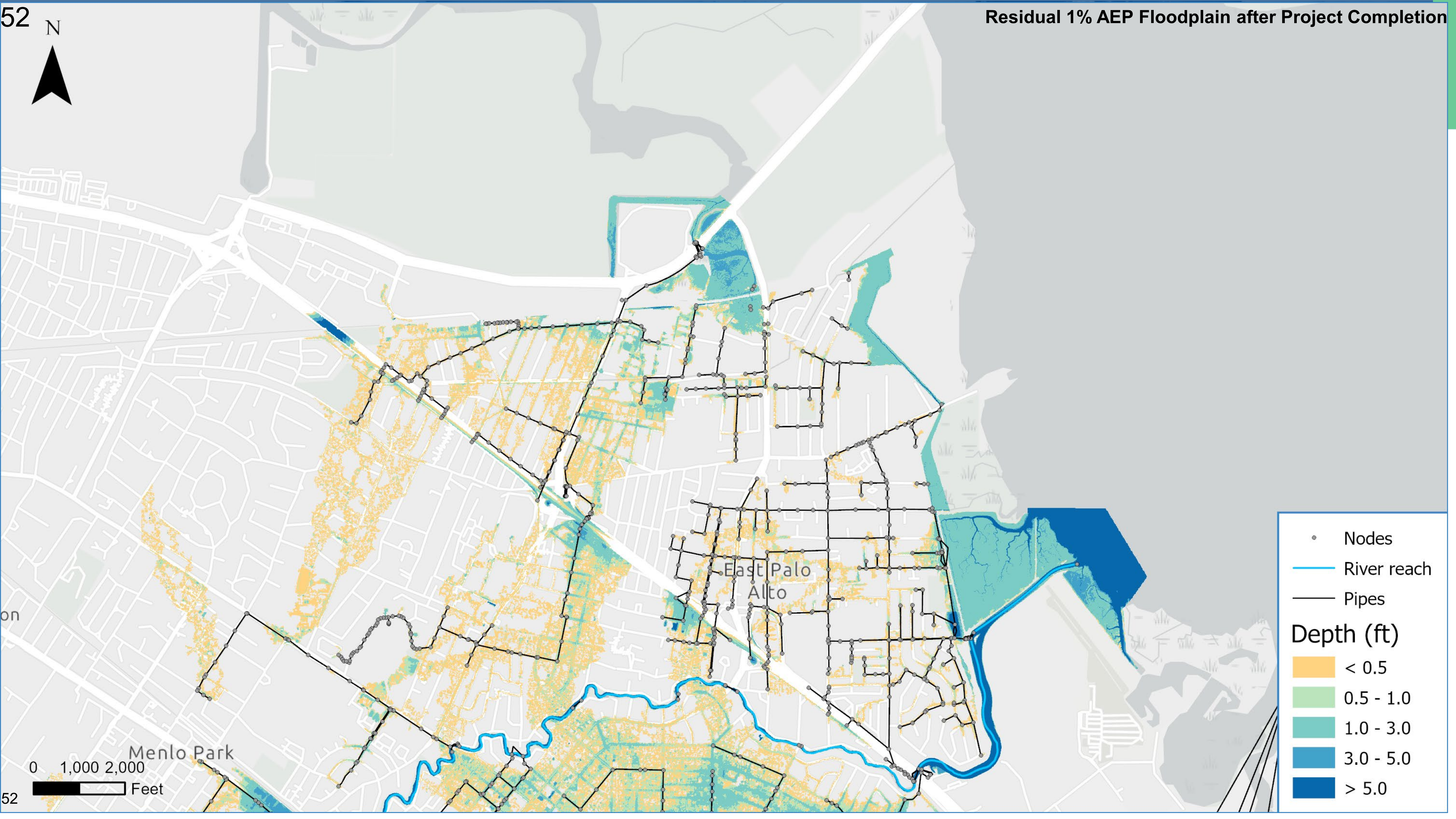
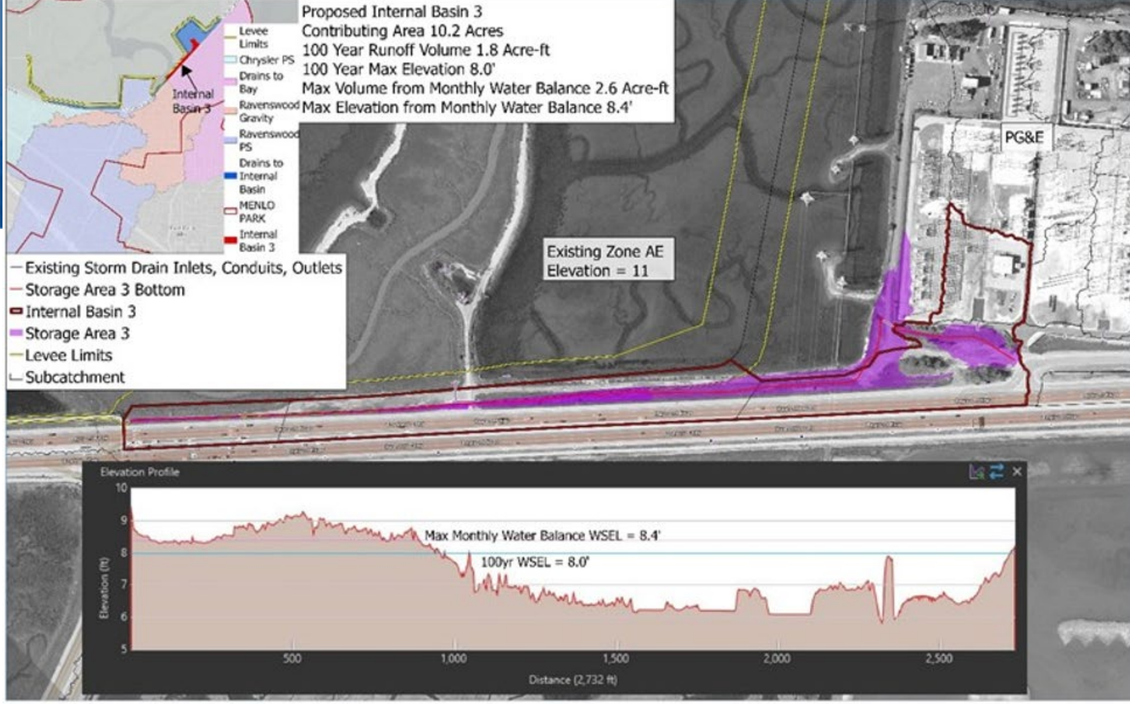
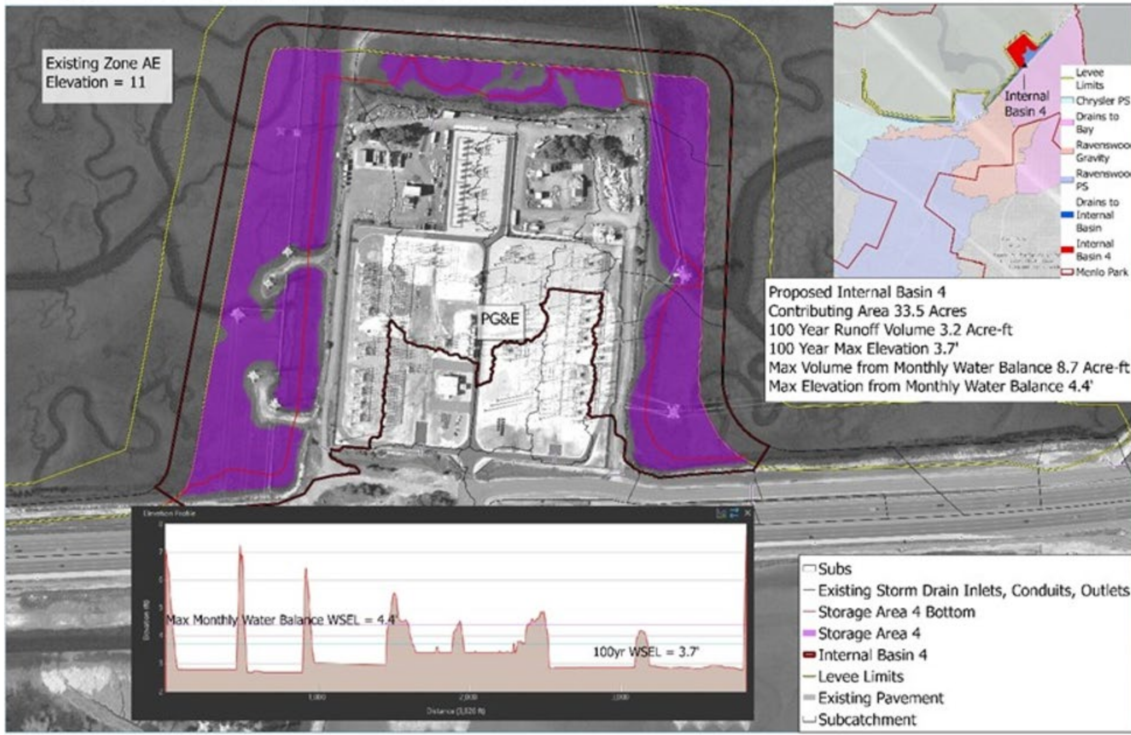
Runnymede St
Donohoe St
O'Connor St
Oconnor St
Menlo Oaks Dr
Coleman Ave
Felton Gables
Watkins Ave
Oak Grove Ave
Seminary Dr
South of Seminary Vintage Oaks
The Willows
Park Forest Spruce San Antonio
Menlo College
Timothy Hopkins Creekside Park
Menlo Park
Linfield Oaks
Palo Alto Airport of Santa Clara County
Verbena Dr
Edgewood Dr
Dana Ave
Center Dr
Alma St
El Camino Real
Willow Rd
Downtown Menlo Park
0 1,000 2,000 Feet
N
84


Residual 1% AEP Floodplain after Project Completion
N
East Palo Alto
Menlo Park
on
0 1,000 2,000
Feet
Nodes
River reach
Pipes
Depth (ft)
< 0.5
0.5 - 1.0
1.0 - 3.0
3.0 - 5.0
> 5.0

Impact of SAFER Bay on Interior Drainage

- Once completed, SAFER Bay removes the shoreline (coastal) flood hazard from the interior area.
- SAFER Bay does not adversely impact the interior drainage systems in Menlo Park or East Palo Alto.
- In East Palo Alto, minor residual flooding remains due to existing system limitations. Additional detention volume and/or pump capacity may be needed at the O'Connor system to protect the remaining buildings, but this is not due to the levee project.
- Terminal pump stations may require changes to pump trim or horsepower increases but those are not caused by the levee project.
- The coastal levee does not resolve existing interior drainage issues associated with San Francisquito Creek overflows or existing storm drain system limitations. Nor does it exacerbate those problems.
- Menlo SAFER Bay includes drainage provisions to prevent vector control problems within what will become isolated brackish ponds, for example between the new levee alignment and the PG&E substation.





Interior Remnant Ponding (Schaaf & Wheeler, 2026)