TIM LEWIS COMMUNITIES
PRESENTATION TO BCDC ENGINEERING CRITERIA REVIEW BOARD

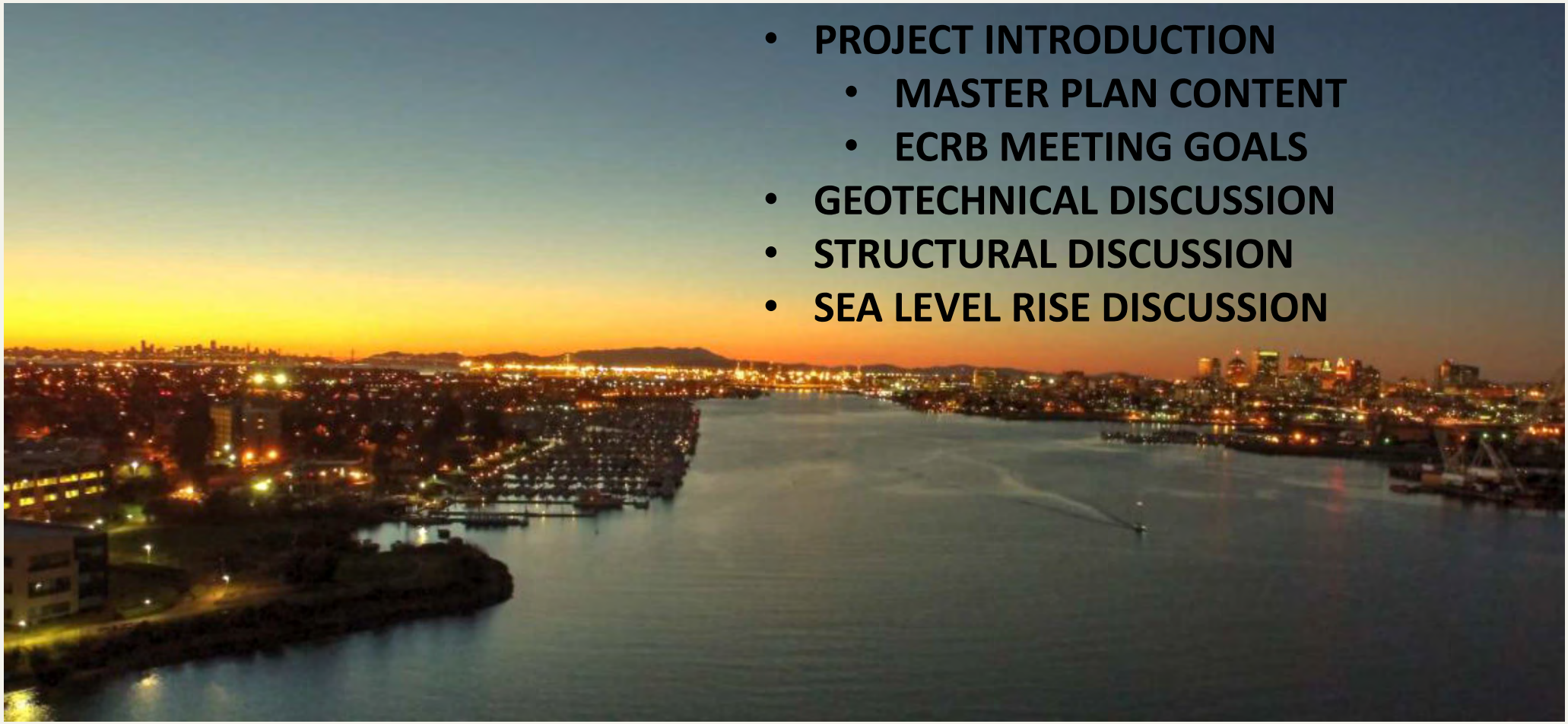
ENCINAL TERMINALS

Alameda, California

November 1, 2017

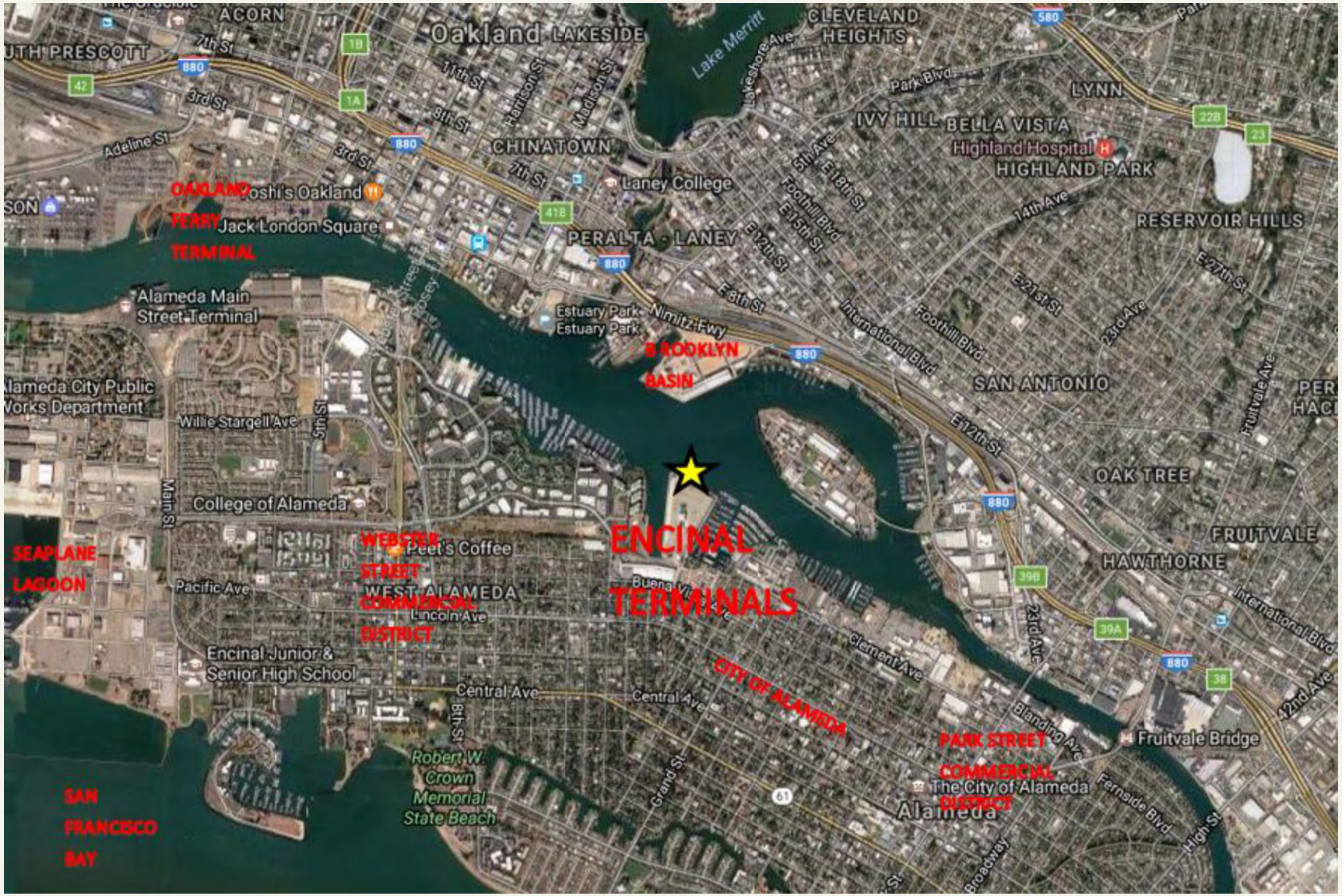
- Tim Lewis Communities
- Page/BMS Design Group
- VTBS Architects
- Carlson, Barbee & Gibson
- Moffat & Nichol
- ENGEO
- Power Engineering Construction
- Briscoe Ivester

AGENDA



- **PROJECT INTRODUCTION**
  - **MASTER PLAN CONTENT**
  - **ECRB MEETING GOALS**
- **GEOTECHNICAL DISCUSSION**
- **STRUCTURAL DISCUSSION**
- **SEA LEVEL RISE DISCUSSION**

GENERAL SITE CONTEXT



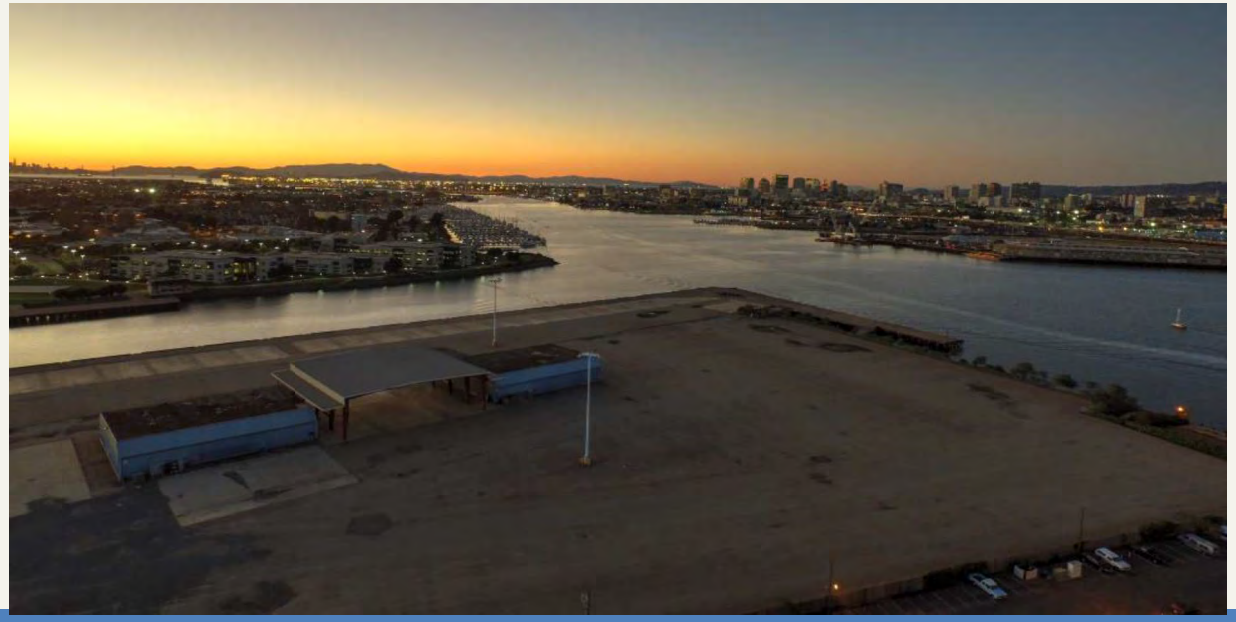
ENCINAL TERMINALS: a new mixed use waterfront community

SITE CONTEXT

- Marina Shores (35 SFD, 54 TH)
  - Approved 2012
  - Construction complete
- Del Monte Warehouse (380 units)
  - Approved 2014
  - Construction commencement in 2017
- Encinal Terminals
  - Entitlement processing

PROPERTY SUMMARY

- Site Area: 32 Acres (including submerged lands)
  - 23 upland acres (17 ac private (NWCLLC), 6 ac City Owned)
  - 9 Submerged acres
- Zoning: MX (Mixed Use) with MF (Multi-Family Overlay= 30 DU/AC)
- Northern Waterfront Plan (City): Create a vibrant waterfront space with a variety of uses (retail, commercial, residential)



PUBLIC ACCESS CONTEXT

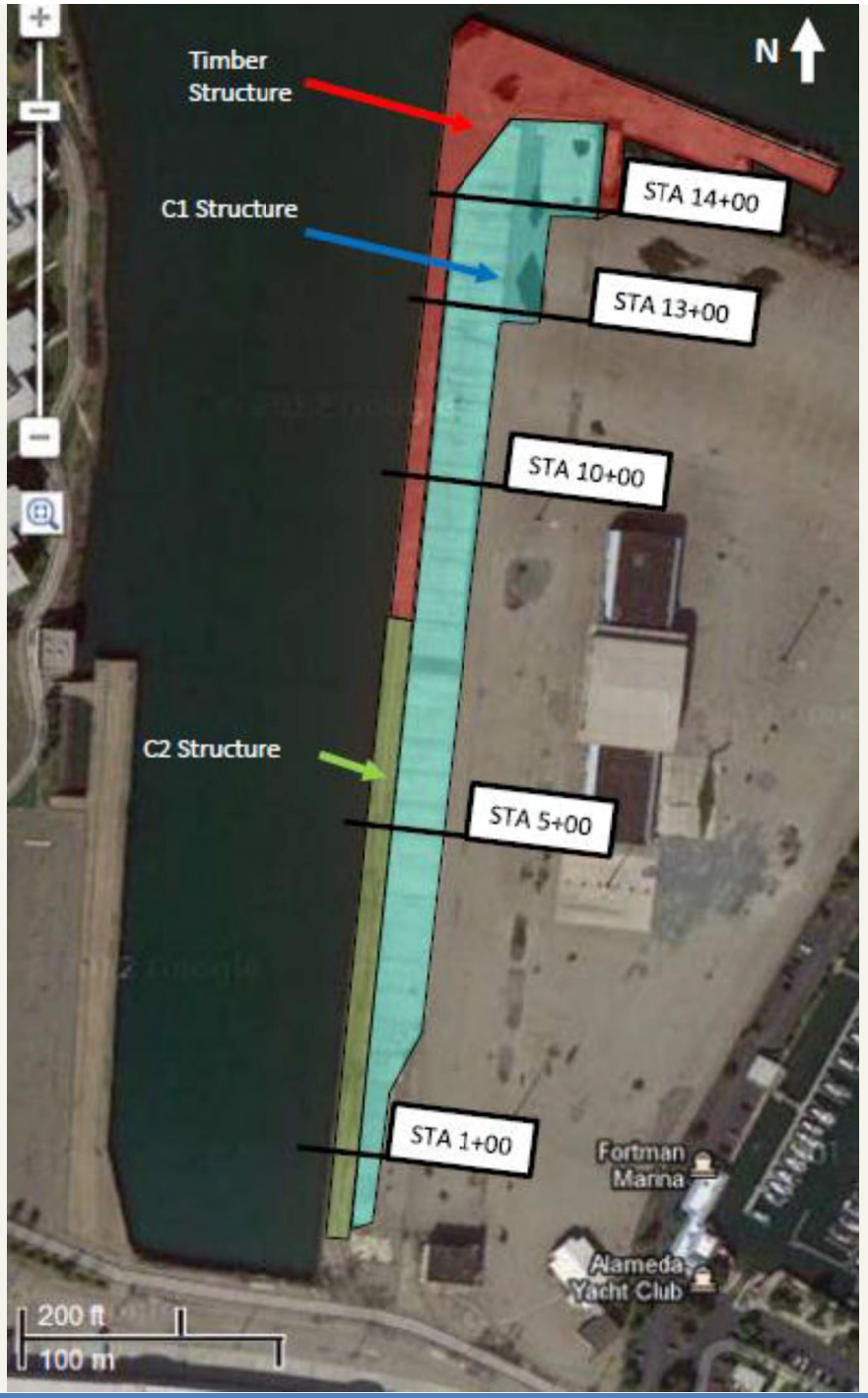
ENCINAL TERMINALS: a new mixed use waterfront community

BCDC PERMITS

- CURRENT PERMITS
- Wind River: Blue
- Encinal Terminals: Pink
- Del Monte: Yellow
- Fortman: Grey

- FUTURE PERMITS
  - Wind River Assignment: red outline
  - Encinal: Orange

- **EXISTING WHARF COMPONENTS**
  - **CONCRETE WHARF:**
    - Blue (1927)
    - Green (1962)
  - **TIMBER WHARF:**
    - Red (1927)



HIGHLIGHTS OF THE CONCEPTUAL PLAN

PLAN HIGHLIGHTS

- 14 ACRES OF PUBLIC SPACE (60%)
- CENTRAL BOULEVARD
- PROMENADE
  - Public plazas
  - Pedestrian and bicycle dominated “shared plaza”
  - Water shuttle dock
- WATERFRONT PARK
  - Active and passive uses
  - Performance venue
- CORE COMMERCIAL ZONE
- MARINA

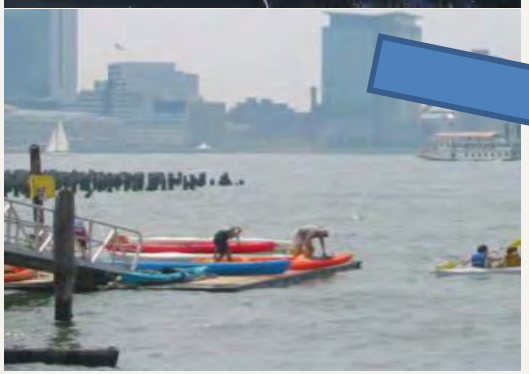
PLAN HIGHLIGHTS

- GATEWAY MIXED USE DISTRICT

HIGHLIGHTS OF THE CONCEPTUAL PLAN

PLAN HIGHLIGHTS

- **MARITIME, MARINA, SMALL CRAFT LAUNCH**

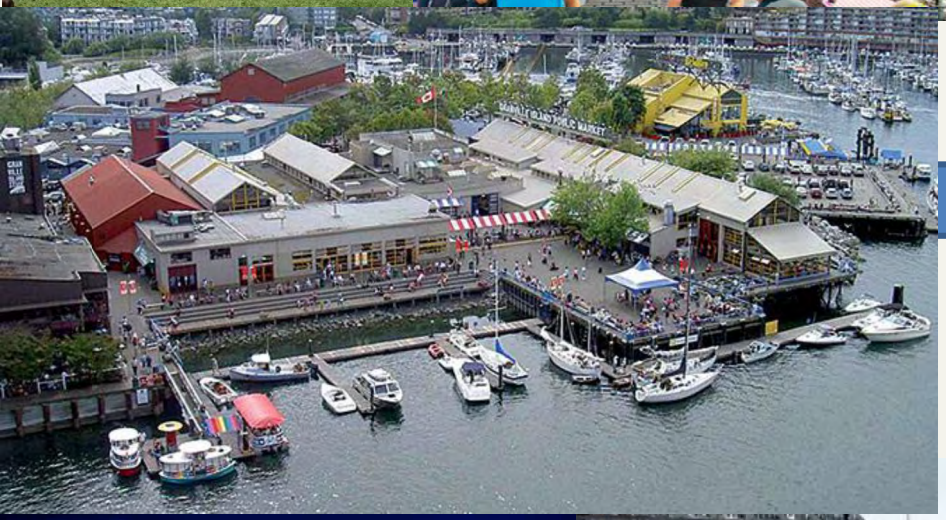


PLAN HIGHLIGHTS

- PUBLIC SPACE/WATERFRONT PROMENADE

PLAN HIGHLIGHTS

- ALASKA BASIN MARITIME MIXED USE DISTRICT



ENCINAL TERMINALS: a new mixed use waterfront community

HIGHLIGHTS OF THE CONCEPTUAL PLAN

PLAN HIGHLIGHTS

- NORTHWEST ESTUARY PLAZA DISTRICT

ENCINAL TERMINALS: a new mixed use waterfront community

PLAN HIGHLIGHTS

HIGHLIGHTS OF THE CONCEPTUAL PLAN

BCDC ECRB MEETING GOALS

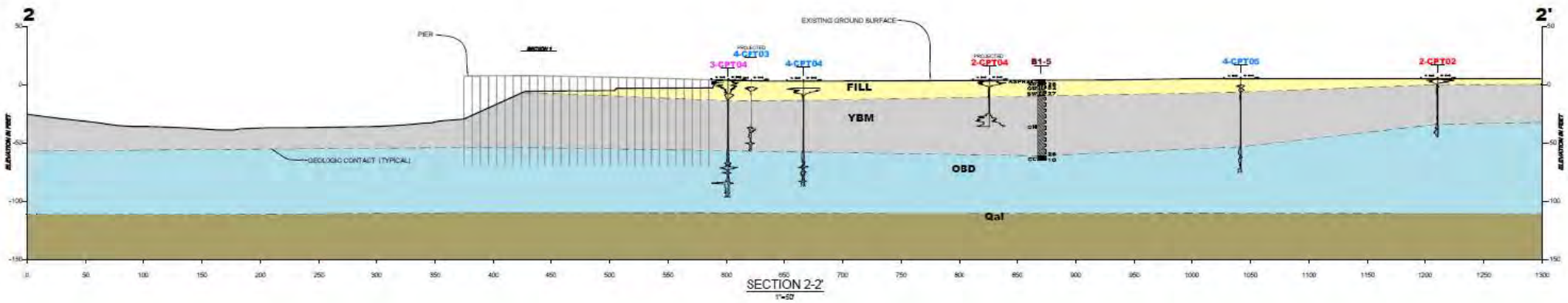
- **BCDC MASTER PLAN PERMIT**
- **REVIEW AND APPROVE CRITERIA FOR DESIGN AS PRESENTED**
- **OUR TEAM OF CONSULTANTS**
  - **ENGEO**
    - **URI ELIAHU**
    - **JEFF FIPPIN**
    - **PEDRO ESPINOSA**
  - **MOFFAT AND NICHOL**
    - **BRAD PORTER**
    - **SAM TOOLEY**
    - **MARC PIRCHER**
    - **DILIP TRIVEDI**
  - **CARLSON BARBEE GIBSON**
    - **ANGELO OBERTELLO**

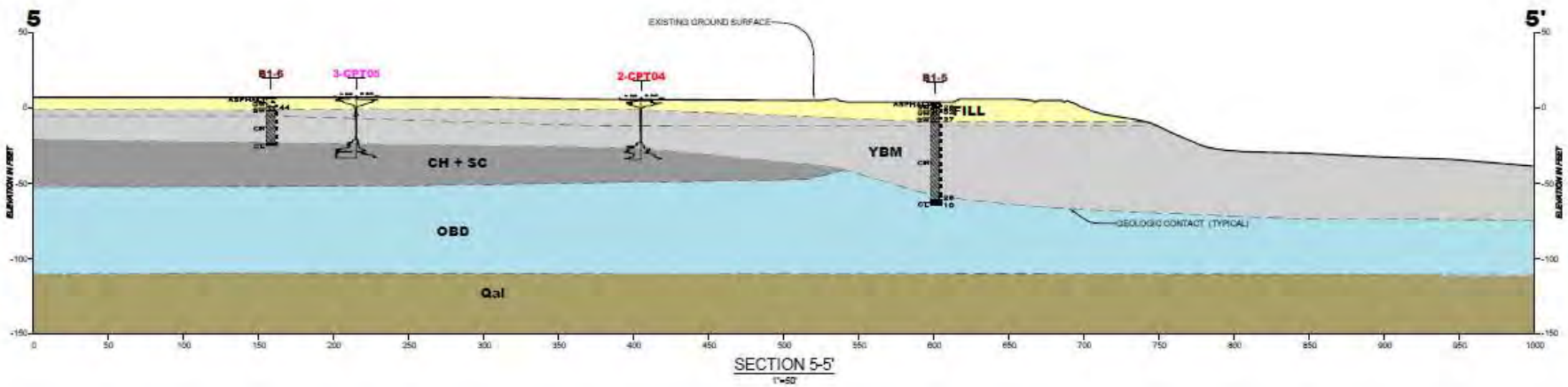
GEOTECHNICAL DISCUSSION

- **ENGEO**
  - **URI ELIAHU**
  - **JEFF FIPPIN**
  - **PEDRO ESPINOSA**

SUBSURFACE EXPLORATIONS

TYPICAL SUBSURFACE PROFILES



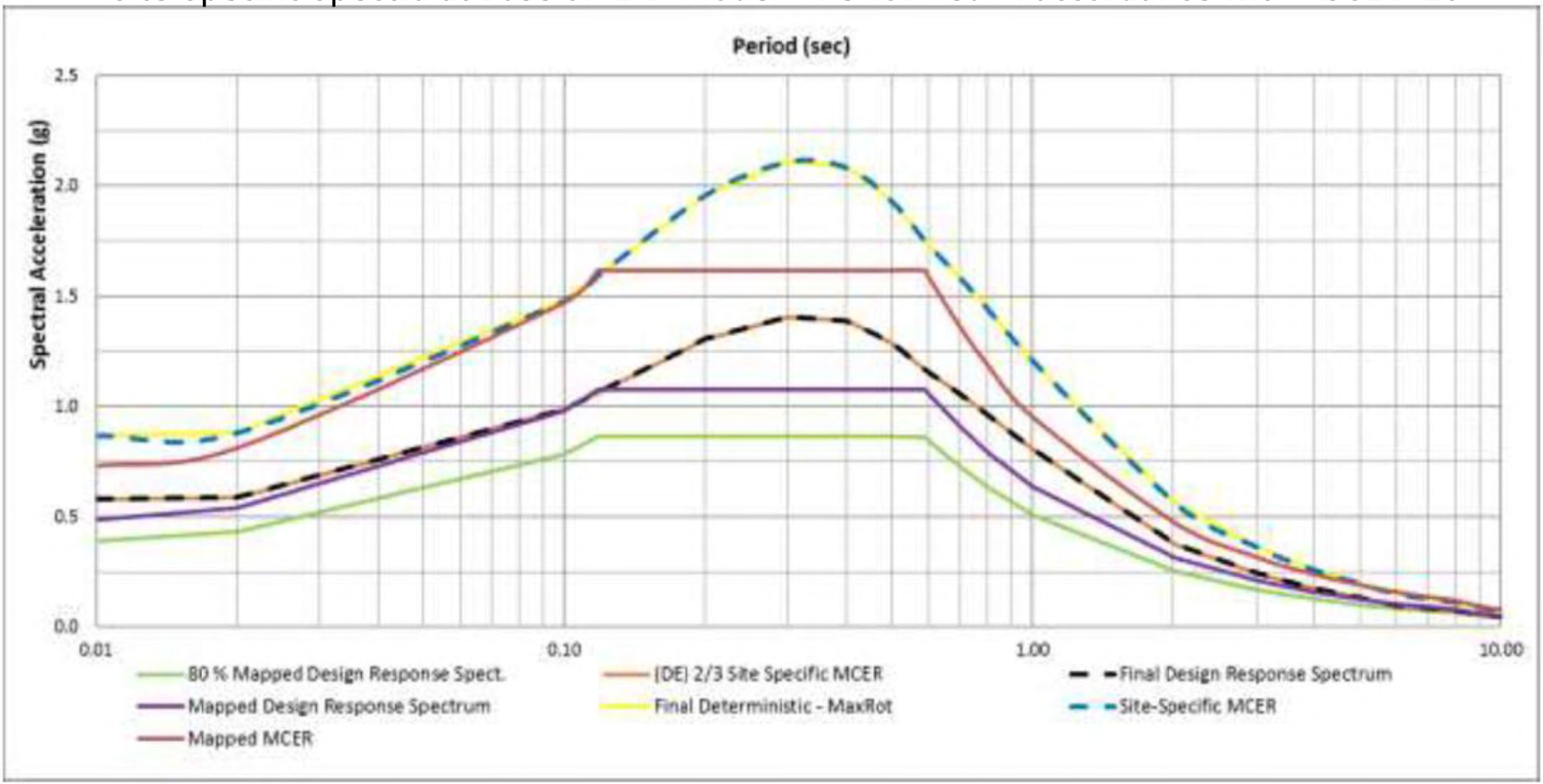


GEOTECHNICAL CRITERIA

- Seismic Site Class - E
  - Liquefiable non-engineered fill to be mitigated
- Performance of slopes due to seismic loading
  - Evaluation of performance at the Design Level Earthquake per ASCE 7-10
  - Lateral deformations within development footprint limited to 2 to 6 inches
  - Lateral deformations under wharf accounted for in Structural Analysis
- Mitigation of consolidation due to new loads and fill

GROUND RESPONSE ANALYSIS

Site-Specific Spectra at Base of 1-D Model – Performed in accordance with ASCE 7-10



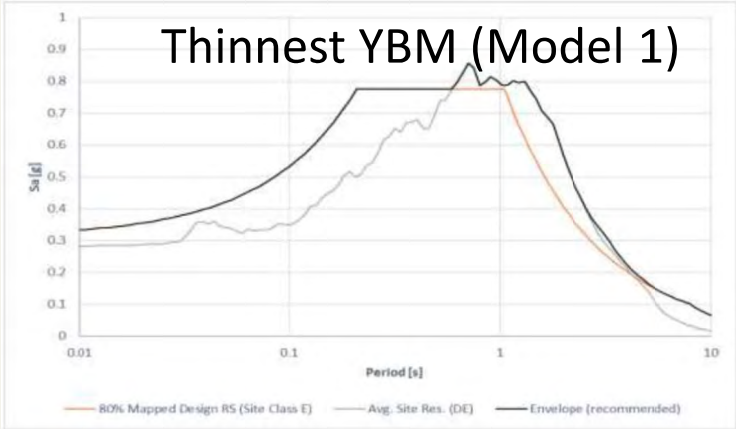
SELECTION OF TIME HISTORIES

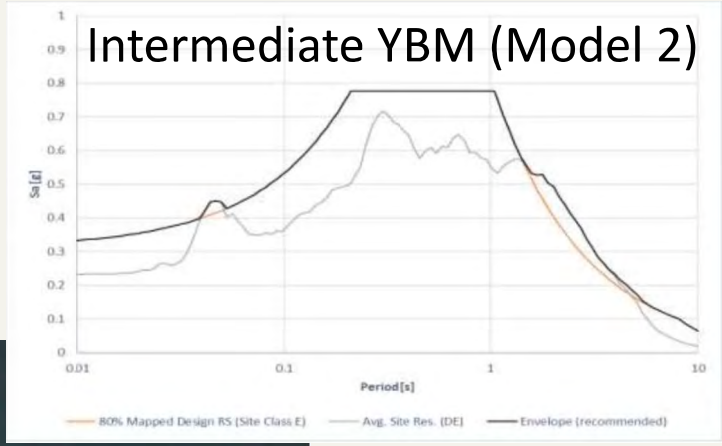
- Time histories from 7 historic earthquakes selected based on magnitude, distance, effective duration, presence of a pulse-like motion, and fault type

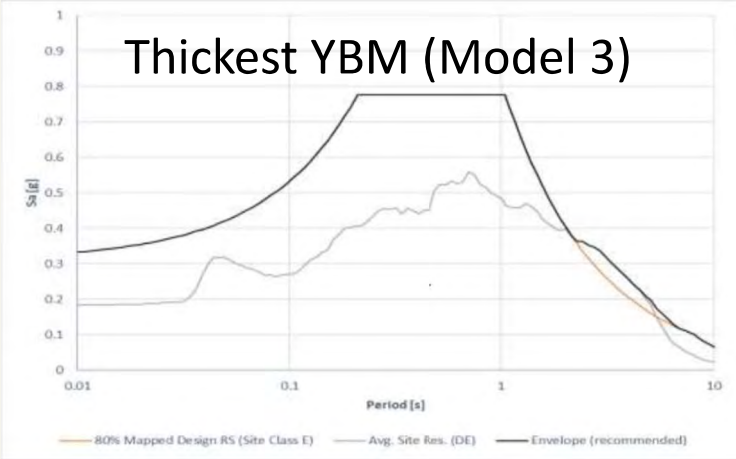
NO.	EARTHQUAKE	NGA #	PULSE PERIOD (sec)	MAG. (Mw)	R_{rup} (km)	FAULT TYPE	V_{S30} (m/sec)	D_{5-95} (sec)	PGA (g)
1	Imperial Valley-06	164	-	6.53	15.2	strike slip	472	36.4	0.23
2	Landers	850	-	7.28	21.8	strike slip	359	31.7	0.23
3	Northridge-01	1004	0.93	6.69	8.44	Reverse	380	8.50	1.20
4	Chi-Chi, Taiwan	1495	-	7.62	6.34	Reverse Oblique	359	26.8	0.32
5	Duzce, Turkey	1602	0.88	7.14	12.0	strike slip	294	9.00	1.11
6	Iwate, Japan	5780	-	6.90	20.8	Reverse	346	15.1	0.45
7	Darfield, New Zealand	6911	9.92	7.00	7.29	strike slip	326	9.50	0.66

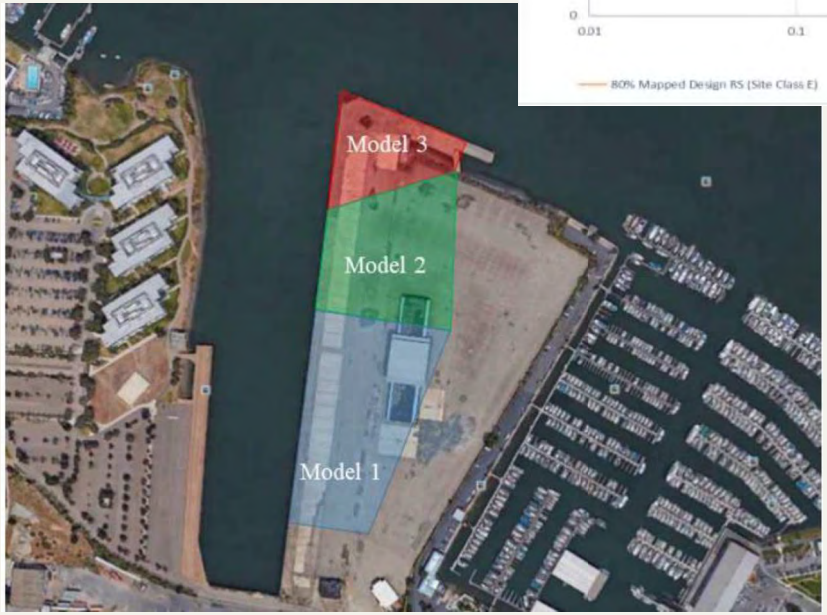
GROUND MOTION DEVELOPMENT

- 1-D ground-response analysis using DeepSoil and time histories matched to the site-specific spectra for 3 zones based on thickness of YBM



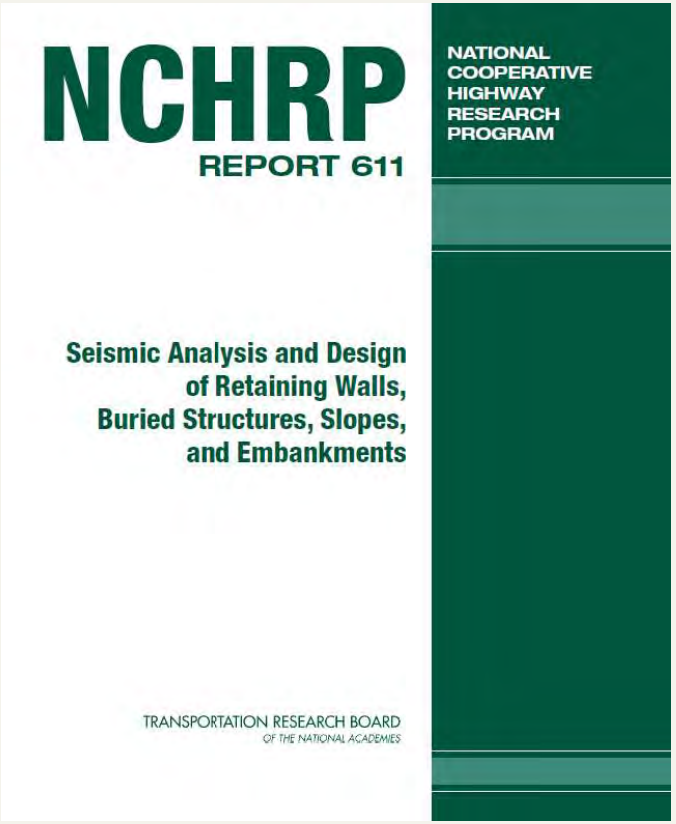






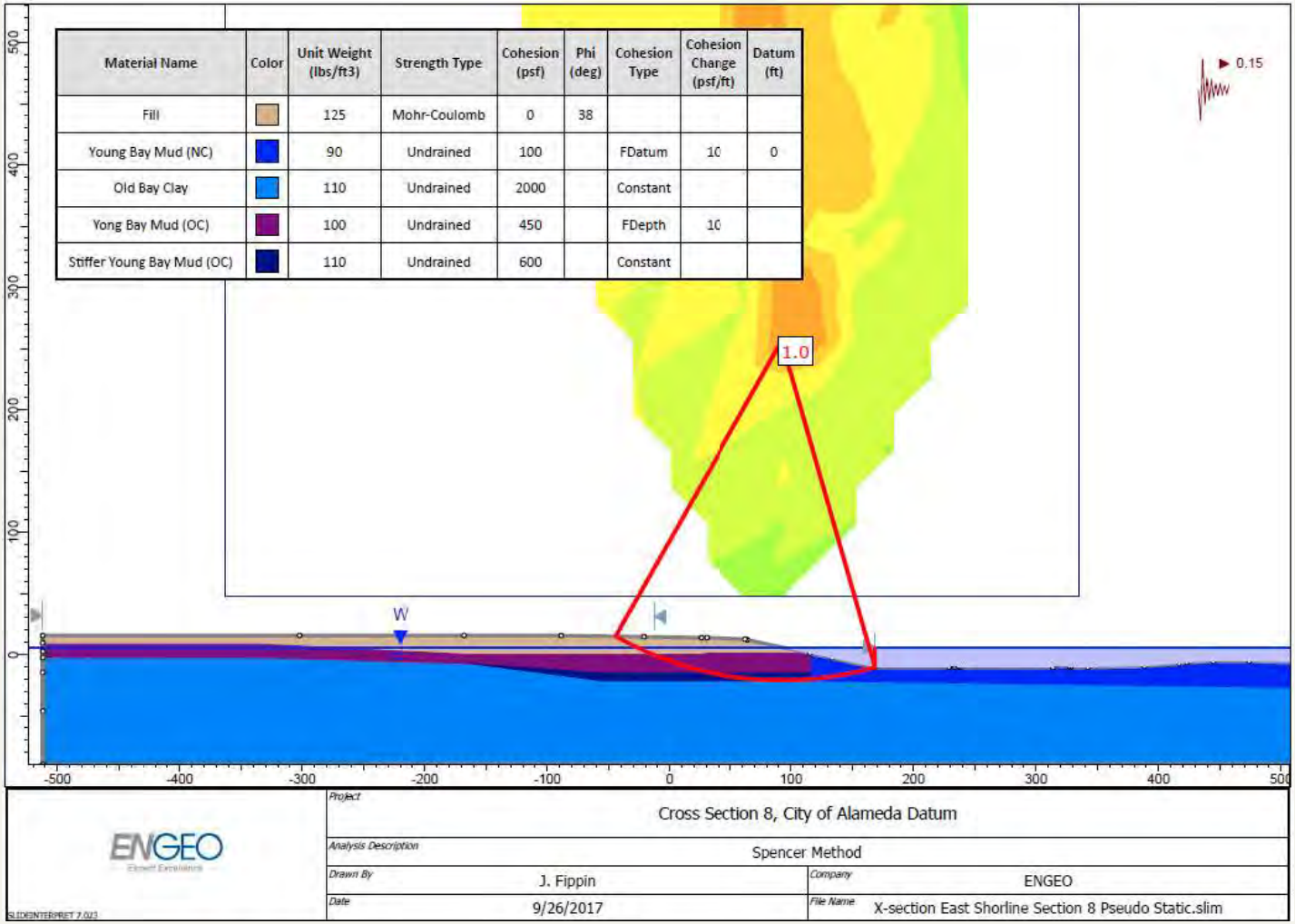
SCREENING ANALYSIS

- Evaluated slope stability using GLE approach in NCHRP 611
  - Factor PGA for wave scattering
  - Reduce factored PGA by ½ corresponding to approximately 2 to 6 inches lateral displacement
  - PGA = 0.33g per site-specific ground response
  - K_h = 0.15g



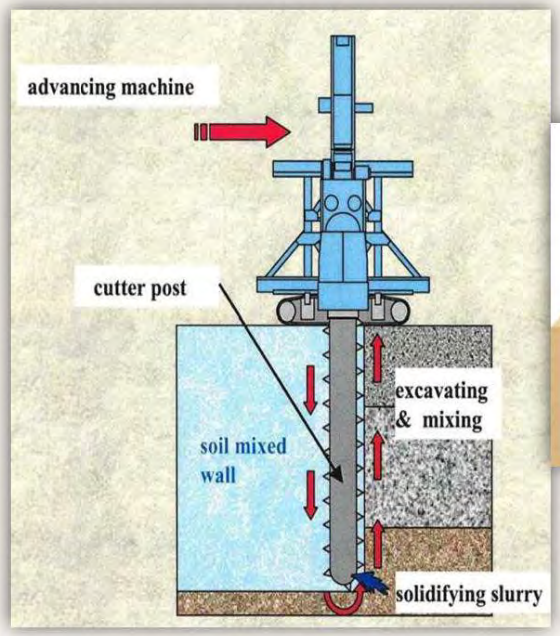
RESULTS OF SCREENING ANALYSIS

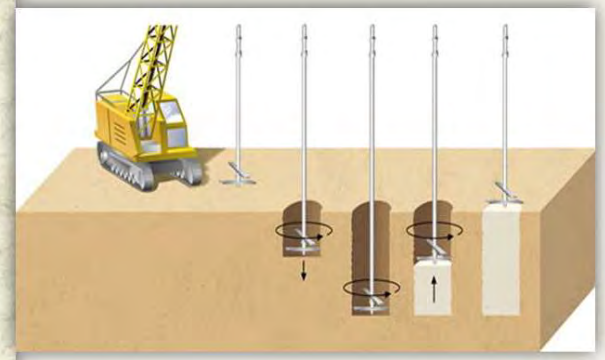
- Only eastern shoreline passed screening check
  - Due to setback from shoreline



DEEP SOIL MIXING (DSM)

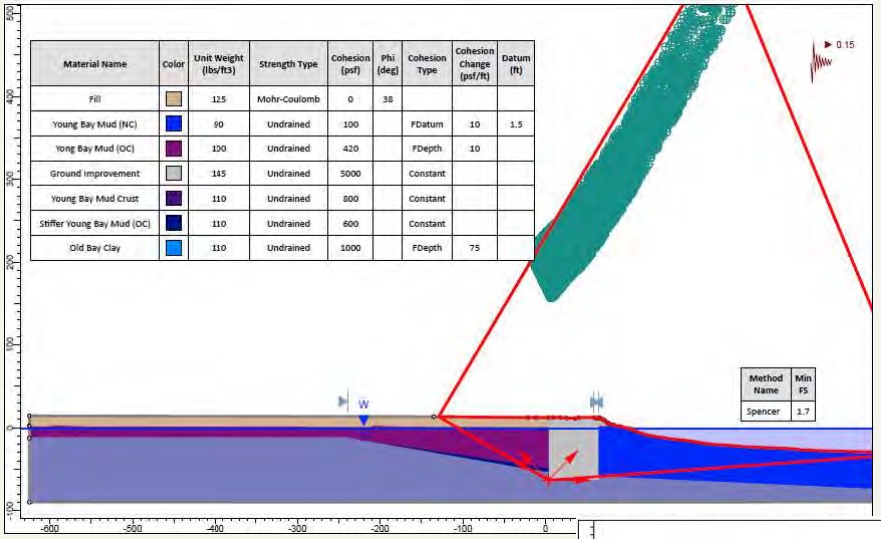
- Along western and northern shorelines
- Will decrease kinematic loads on wharf along western shoreline
- Will decrease lateral deformations in development footprint along northern and western shorelines

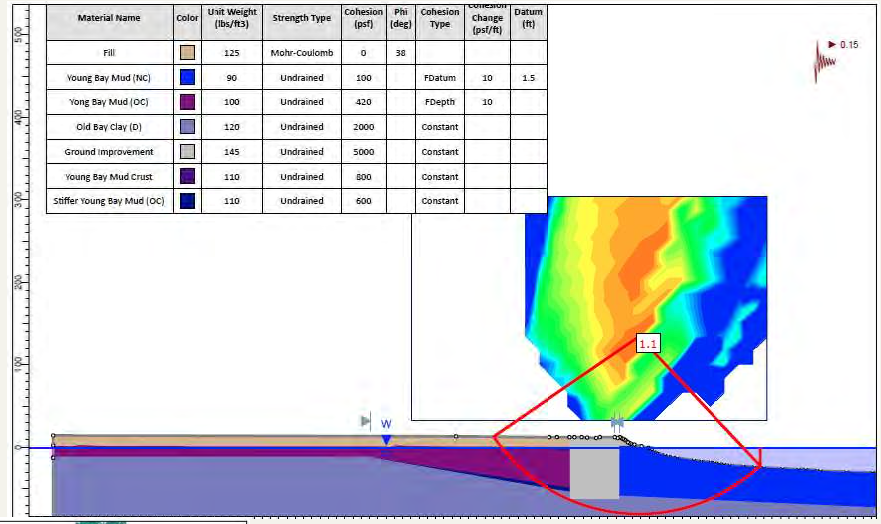


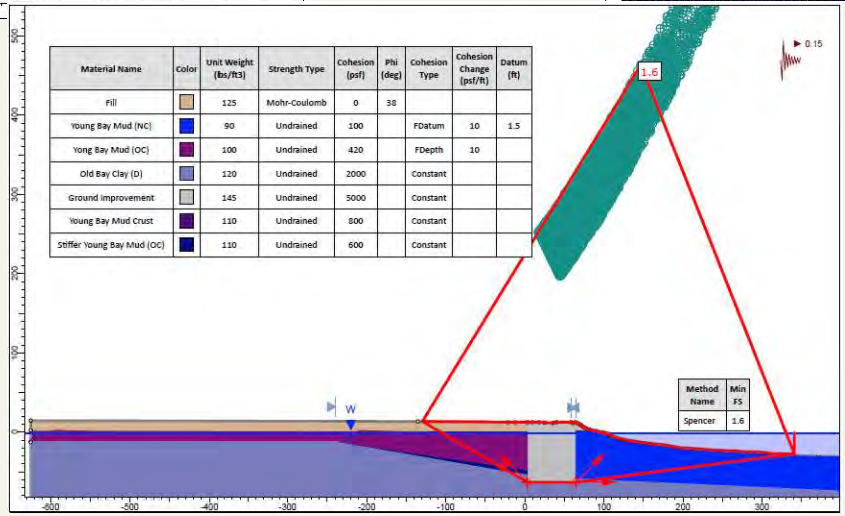


DSM VALIDATION

- DSM evaluated with same methodology as the screening analysis using wedges and circles under and through DSM



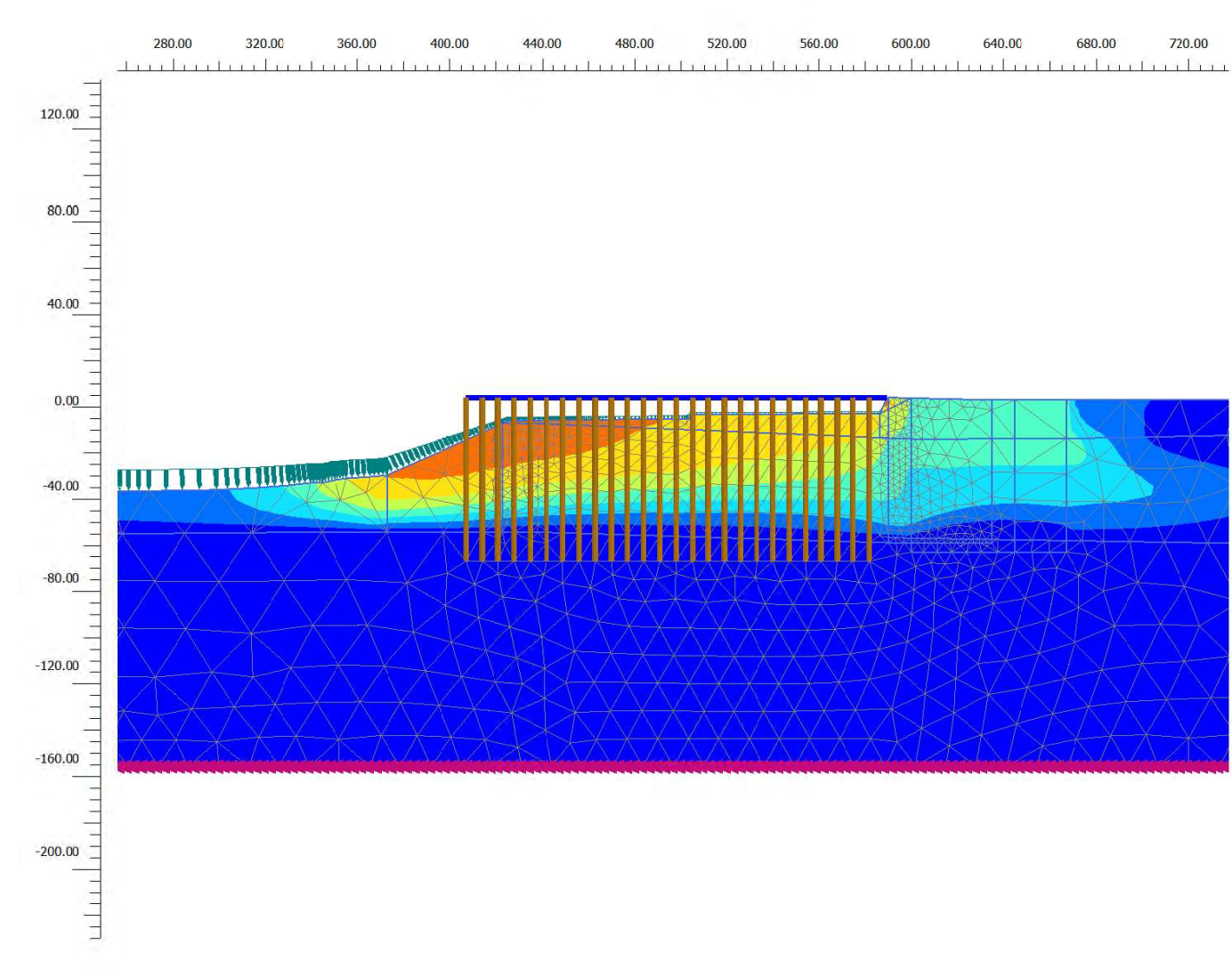




STABILITY AT WHARF

- Fully-Dynamic Numerical Analysis with Plaxis
  - Provides estimate of distribution of deformation
  - Evaluated 3 x-sections with 7 time-histories

EXHIBIT 8: Section 2-2 Horizontal Displacement



DEFORMATION DISTRIBUTION

EXHIBIT 11: Section 2-2 Horizontal Displacement At Middle of Pier

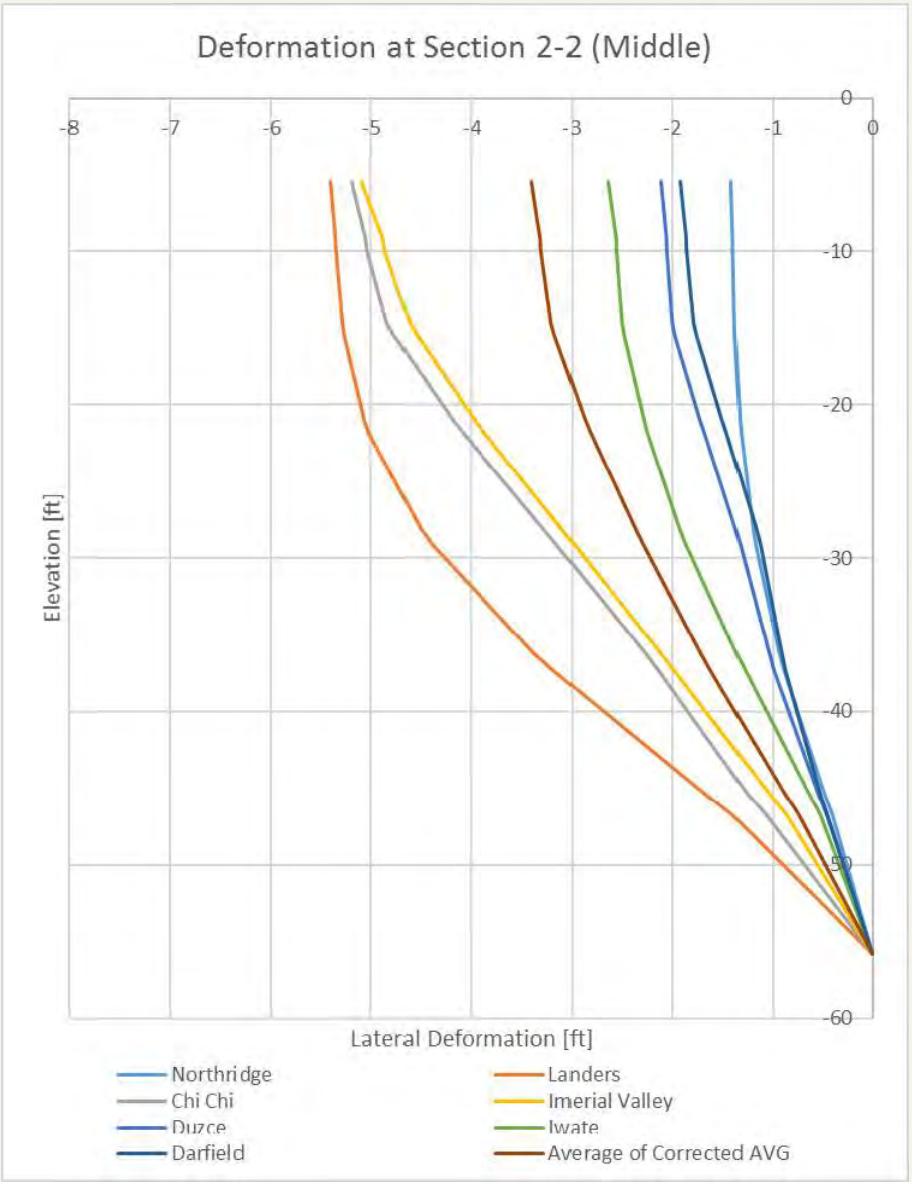
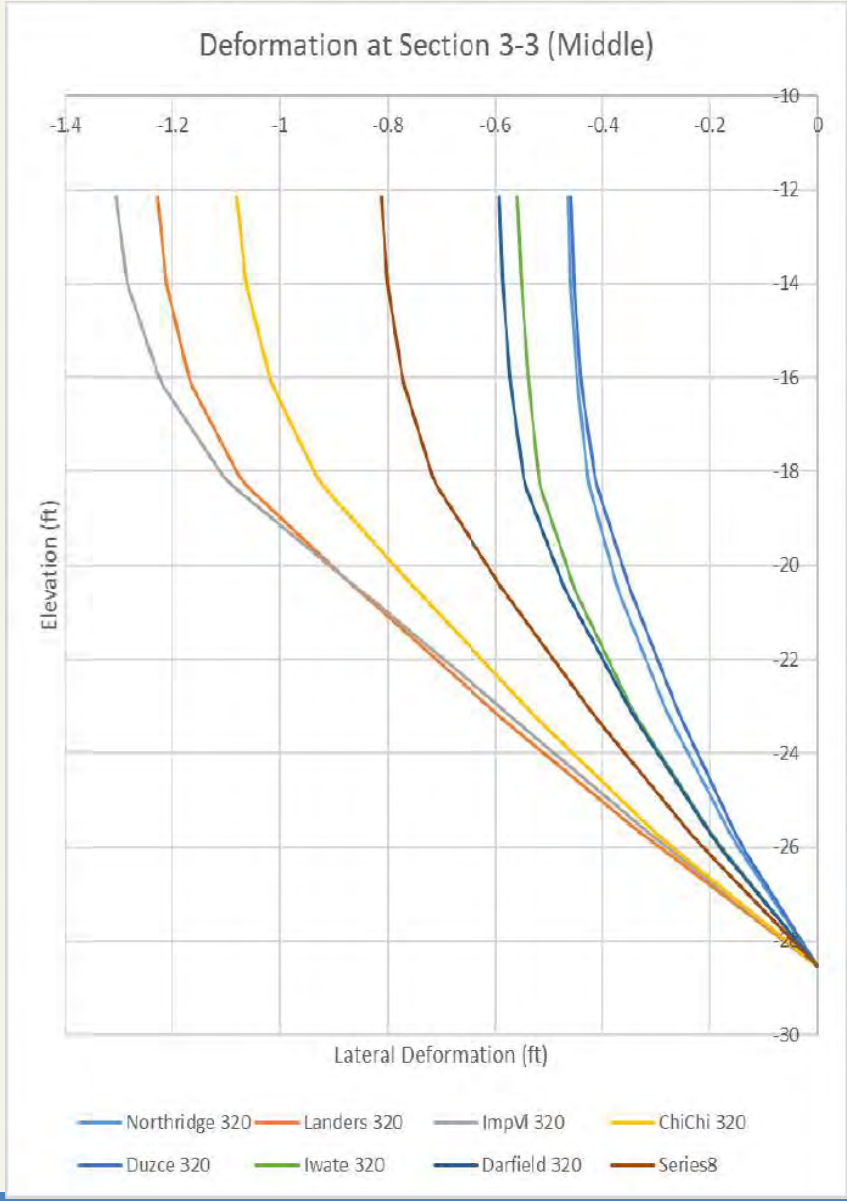


EXHIBIT 12: Section 3-3 Horizontal Displacement At Middle of Pier



SSI AND KINEMATIC LOADS

- Developed p-y (lateral load-deflection) “springs”
  - M&N will “push” the piles with the soil “springs” based on the deformations from Plaxis
  - This analysis will allow the estimation of shear and bending moments in the piles

Encinal Terminals - p-y Curves at Station 14+00

Section	Section 14+00						Nominal						
Material	Depth Below Mudline(feet)	p0 (psi)	y0 (in)	p1 (psi)	y1 (in)	p2 (psi)	y2 (in)	p3 (psi)	y3 (in)	p4 (psi)	y4 (in)	p5 (psi)	y5 (in)
Fill	0.5	0	0	24.0751	0.10678	37.45176	0.4875	42.93587	0.675	42.93587	0.81	42.93587	8
Fill	2.5	0	0	136.8909	0.10967	224.6803	0.4875	261.5603	0.675	261.5603	0.81	261.5603	8
Fill	4.9	0	0	216.8521	0.12162	404.9353	0.4875	490.6163	0.675	490.6163	0.81	490.6163	8
YBM	5.1	0	0	60.72	1.09227	83.49	2.83947	98.67	4.68693	106.26	5.85387	113.85	7.2
YBM	25	0	0	204	1.09227	280.5	2.83947	331.5	4.68693	357	5.85387	382.5	7.2
YBM	49.9	0	0	383.28	0.54613	527.01	1.41973	622.83	2.34347	670.74	2.92693	718.65	3.6
OBC	50.1	0	0	1050	0.17074	1500	0.71111	1800	1.47456	1950	2.031	2100	2.7318
OBC	55	0	0	1050	0.17074	1500	0.71111	1800	1.47456	1950	2.031	2250	3.6
OBC	60	0	0	1050	0.17074	1500	0.71111	1800	1.47456	1950	2.031	2250	3.6

Section	Section 14+00						Upper Bound						
Material	Depth Below Mudline(feet)	p0 (psi)	y0 (in)	p1 (psi)	y1 (in)	p2 (psi)	y2 (in)	p3 (psi)	y3 (in)	p4 (psi)	y4 (in)	p5 (psi)	y5 (in)
Fill	0.5	0	0	36.11265	0.10678	56.17764	0.4875	64.40381	0.675	64.40381	0.81	64.40381	8
Fill	2.5	0	0	205.3363	0.10967	337.0204	0.4875	392.3404	0.675	392.3404	0.81	392.3404	8
Fill	4.9	0	0	324.9782	0.12162	607.4029	0.4875	735.9245	0.675	735.9245	0.81	735.9245	8
YBM	5.1	0	0	91.08	1.09227	125.235	2.83947	148.005	4.68693	159.39	5.85387	170.775	7.2
YBM	25	0	0	306	1.09227	420.75	2.83947	497.25	4.68693	535.5	5.85387	573.75	7.2
YBM	49.9	0	0	574.92	0.54613	790.515	1.41973	934.245	2.34347	1006.11	2.92693	1077.975	3.6
OBC	50.1	0	0	1575	0.17074	2250	0.71111	2700	1.47456	2925	2.031	3150	2.7318
OBC	55	0	0	1575	0.17074	2250	0.71111	2700	1.47456	2925	2.031	3375	3.6
OBC	60	0	0	1575	0.17074	2250	0.71111	2700	1.47456	2925	2.031	3375	3.6

Section	Section						Lower Bound						
Material	Depth Below Mudline(feet)	p0 (psi)	y0 (in)	p1 (psi)	y1 (in)	p2 (psi)	y2 (in)	p3 (psi)	y3 (in)	p4 (psi)	y4 (in)	p5 (psi)	y5 (in)
Fill	0.5	0	0	18.05633	0.10678	28.08882	0.4875	32.2019	0.675	32.2019	0.81	32.2019	8
Fill	2.5	0	0	102.6882	0.10967	168.5102	0.4875	196.1702	0.675	196.1702	0.81	196.1702	8
Fill	4.9	0	0	162.4891	0.12162	303.7015	0.4875	367.9622	0.675	367.9622	0.81	367.9622	8
YBM	5.1	0	0	45.54	1.09227	62.6175	2.83947	74.0025	4.68693	79.695	5.85387	85.3875	7.2
YBM	25	0	0	153	1.09227	210.375	2.83947	248.625	4.68693	267.75	5.85387	286.875	7.2
YBM	49.9	0	0	287.46	0.54613	395.2575	1.41973	467.1225	2.34347	503.055	2.92693	538.9875	3.6
OBC	50.1	0	0	787.5	0.17074	1125	0.71111	1350	1.47456	1462.5	2.031	1575	2.7318
OBC	55	0	0	787.5	0.17074	1125	0.71111	1350	1.47456	1462.5	2.031	1687.5	3.6
OBC	60	0	0	787.5	0.17074	1125	0.71111	1350	1.47456	1462.5	2.031	1687.5	3.6

STRUCTURAL DISCUSSION

- **MOFFAT AND NICHOL**
  - **BRAD PORTER**
  - **SAM TOOLEY**
  - **MARC PIRCHER**
  - **DILIP TRIVEDI**

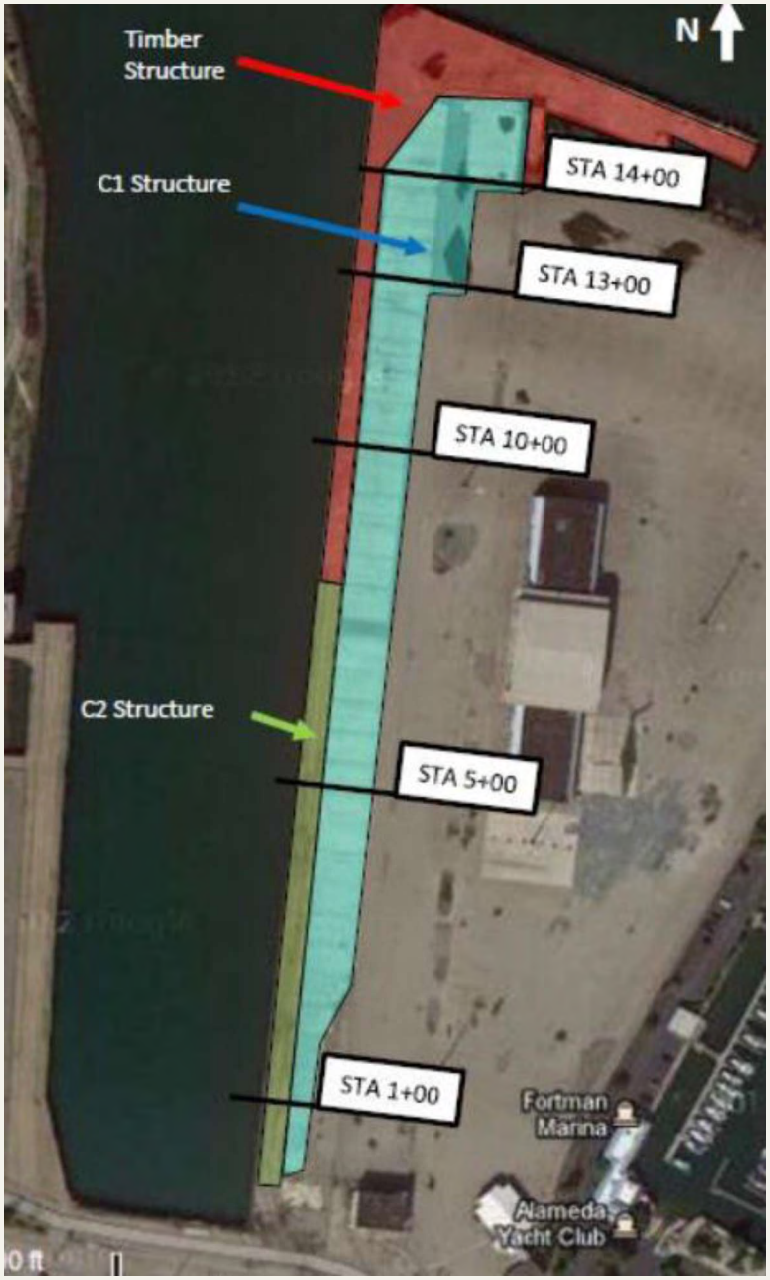
EXISTING WHARF

Concrete Wharf:

- C1 Structure (1927)
- C2 Structure (1962)

Timber Wharf:

- Timber Structure (1927)



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Concrete Wharf:

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Timber Wharf:

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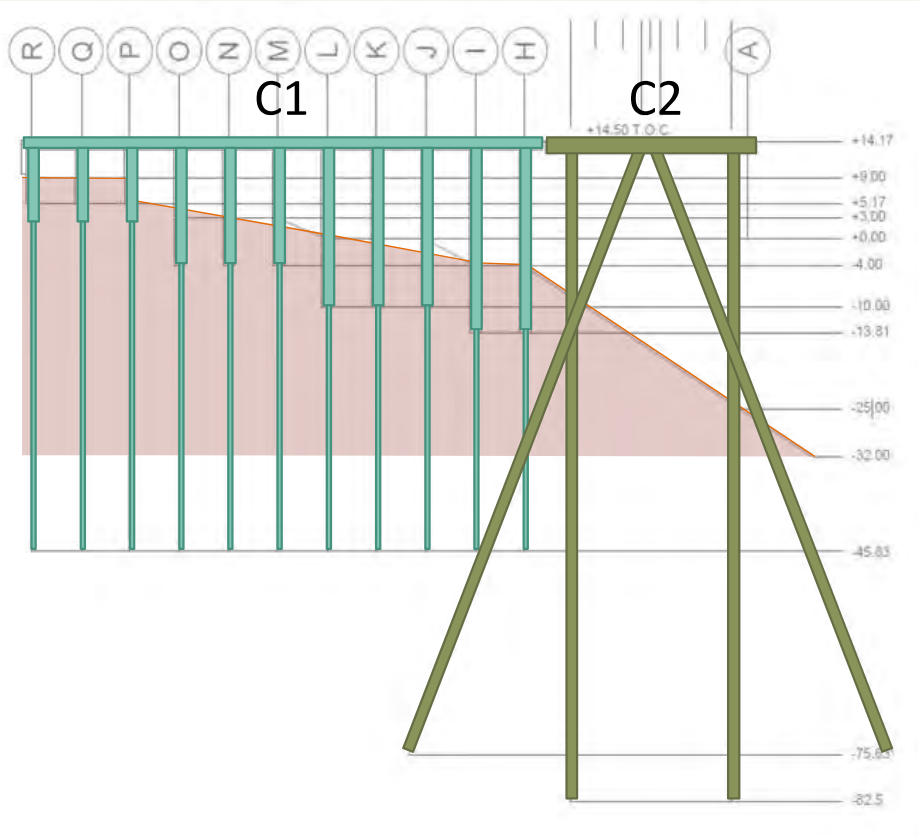
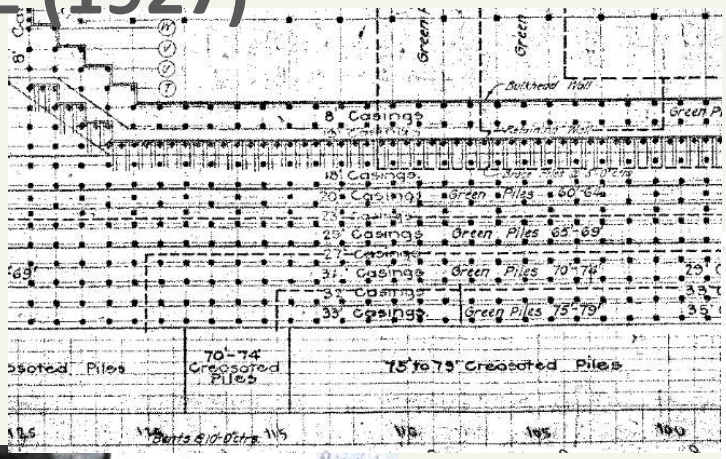


EXISTING WHARF

C1 STRUCTURE (1927)



Plan

Typical Condition

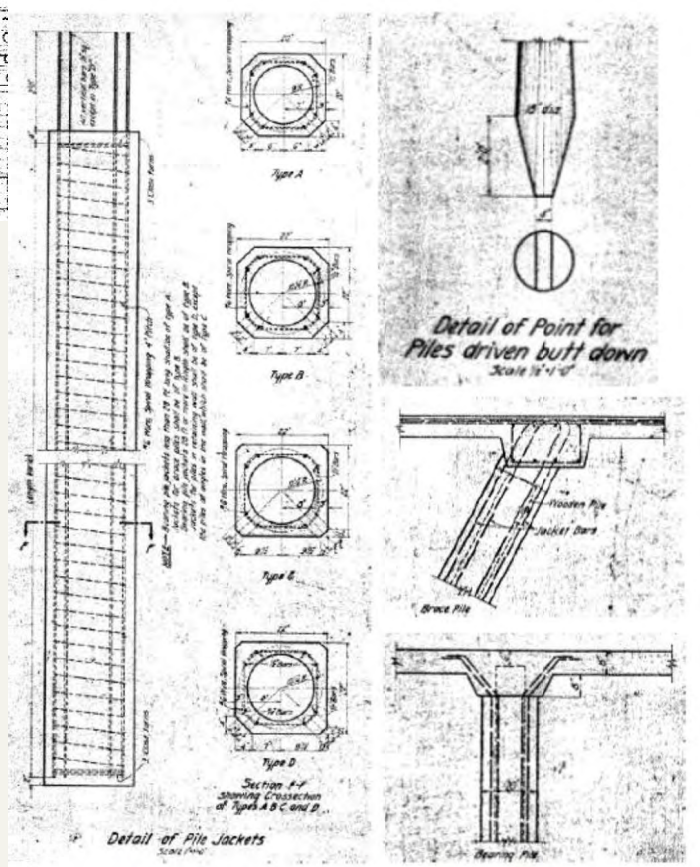
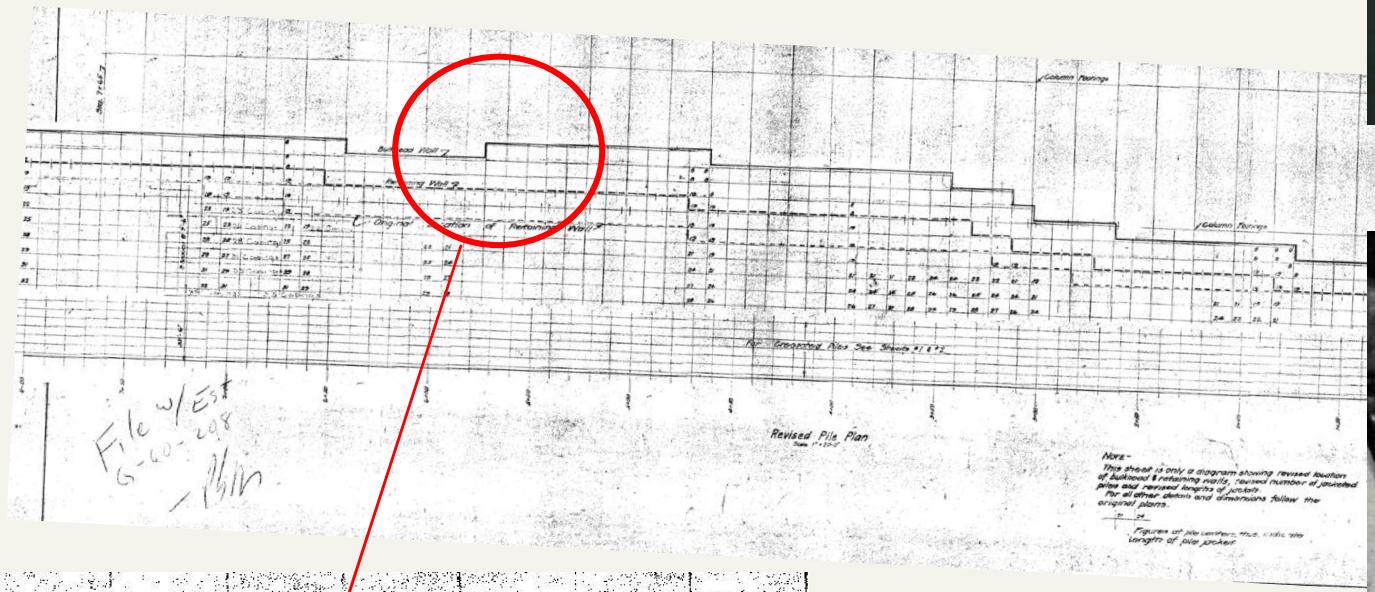


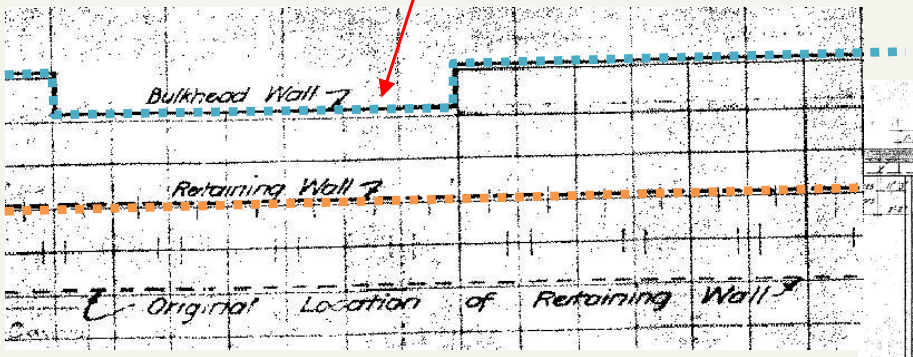
Figure 1-3 – Timber Pile with Concrete Pile Jacket

Timber Pile and Conc Casing (Jacket)

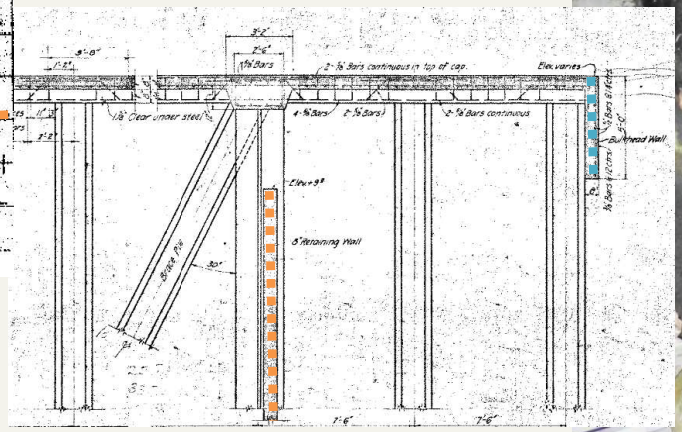
EXISTING WHARF

C1 STRUCTURE (1927)

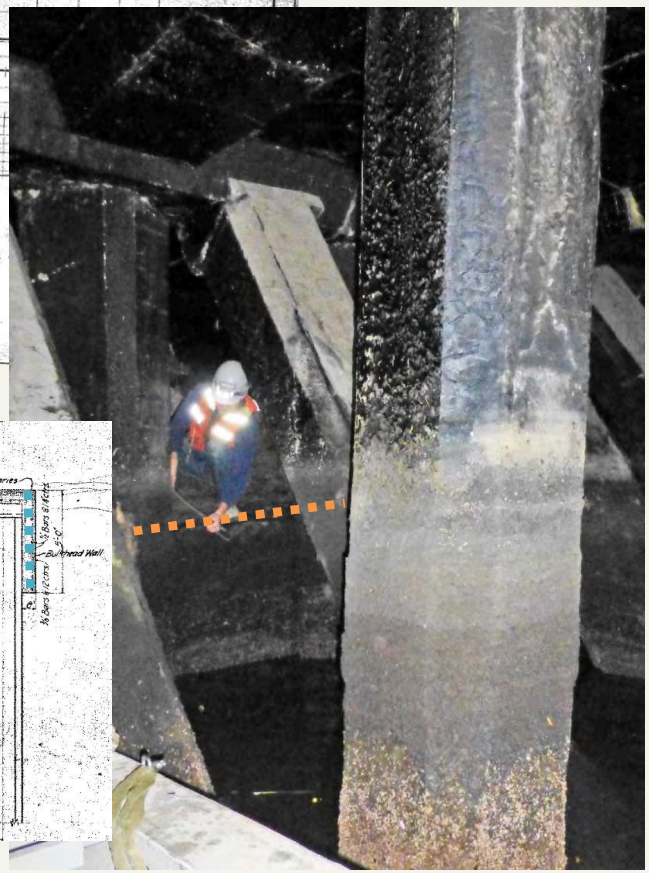




Plan



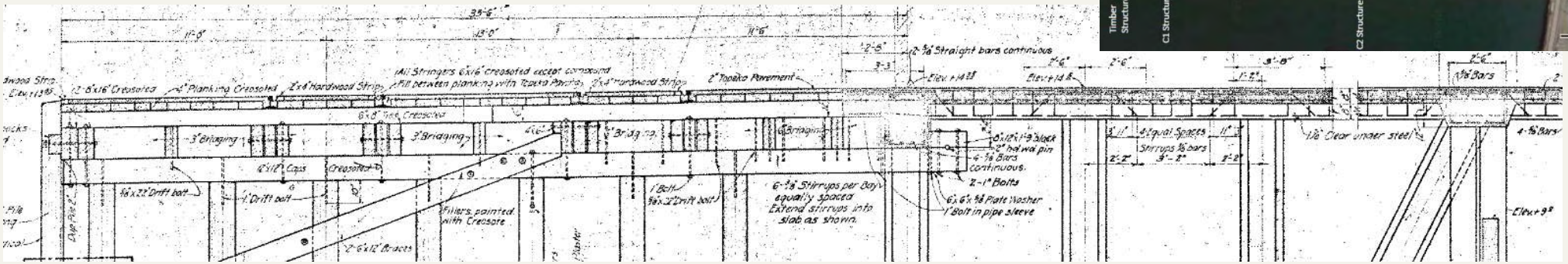
Section



Retaining Wall

EXISTING WHARF

TIMBER STRUCTURE (1927)



Plan

Timber Wharf Apron

Pile Damage, Wraps

EXISTING WHARF
C2 STRUCTURE (1962)

REGULAR BENT

KING PILE (2)

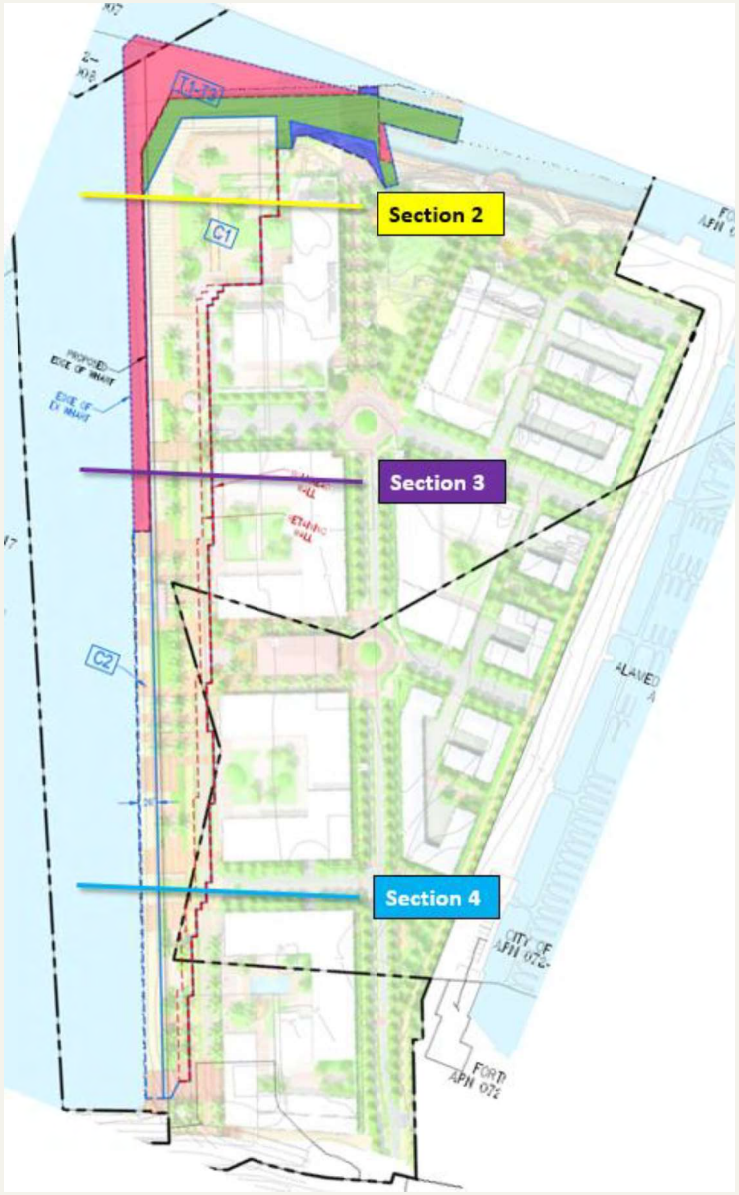
STRUCTURAL CRITERIA

Criteria

- Risk Category II (Before and After)
- Performance: Life Safety at DE
  - Allow Egress and Maintain Gravity Load Capacity
- DE: 2/3 MCE (Determined by Engeo)

Approach

- Method: ASCE 61-14 Pushover Analysis
  - Displacement Capacity
  - Substitute structure based demand displacement



STRUCTURE MODELING

- 3D models, 2D pushovers
  - 100% U1 + 30% U2 push direction
  - Seismic Mass w/ 10% Live
- Nonlinear Soil P-Y, T-Z, U-W
  - Upper / Lower bound soil properties for inertial only response
- Nonlinear steel & concrete hinges
  - ASCE 61-14 Life-Safety Values
  - Existing Concrete jacket not composite w/ timber
- Timber: NDS-15 LRFD

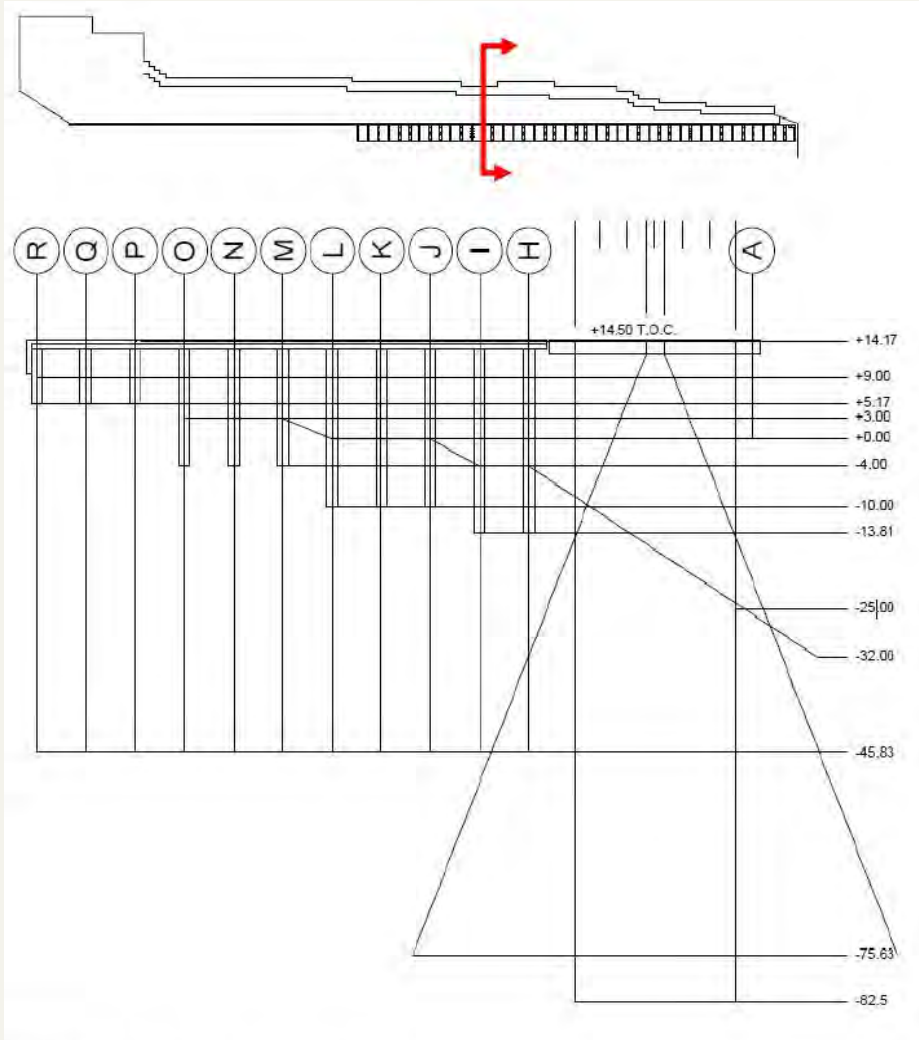
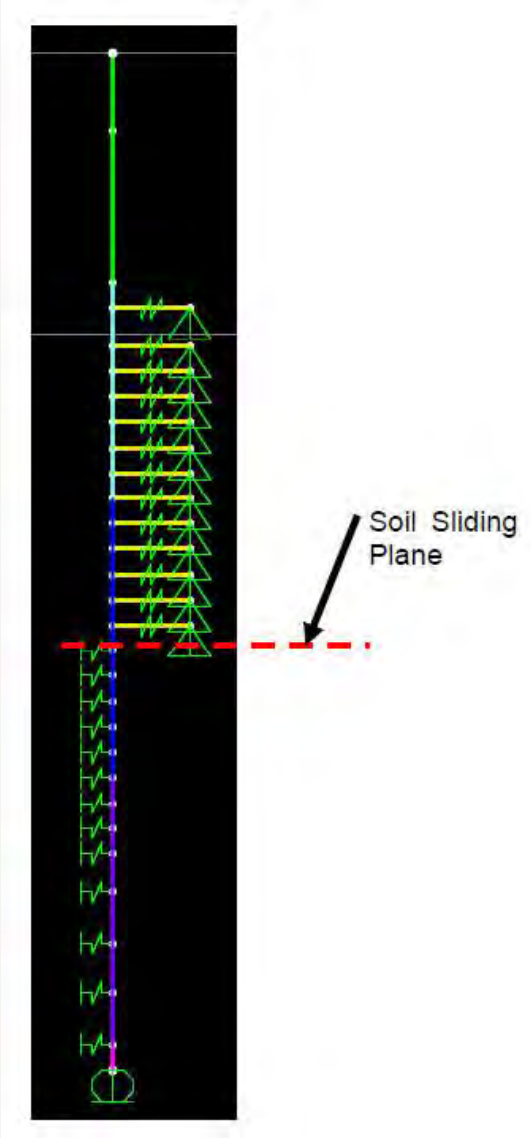


Figure 10: Typical Section at Station 5+10

KINEMATIC LOAD MODELING

- Kinematic w/ 2 node springs
- Soil properties: Best-Est. to match PLAXIS
- Combined Inertial and Kinematic
  - 100% Kinematic + 25% Inertial
  - 25% Inertial + 100% Kinematic
- Possible timber rupture in-ground response allowed



STRENGTHENING (AS NECESSARY)

- Achieve ASCE 61-14 Displacement Capacity
- If necessary, add:
  - Ductility – modify connection at deck
  - Stiffness – add Dolphins, monopiles, etc.
- Isolate structural portions based on Modal Analysis

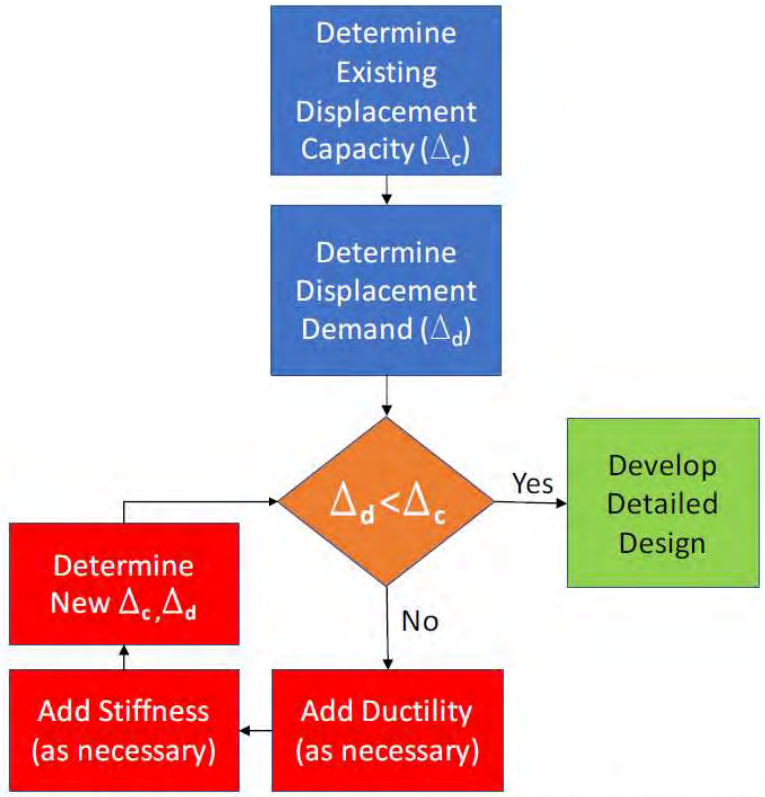
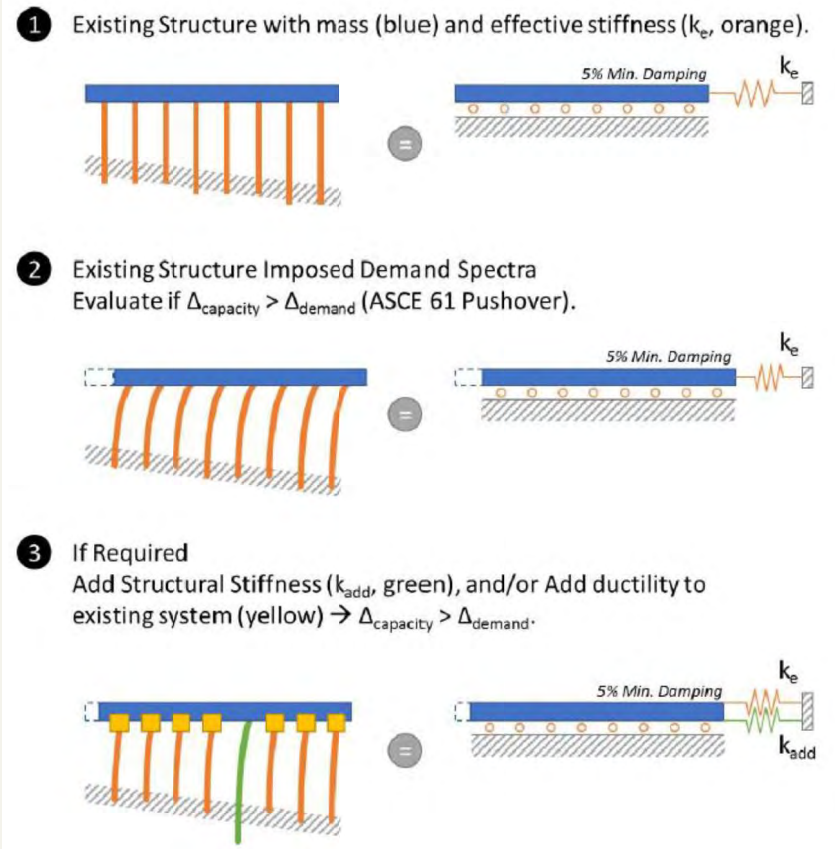


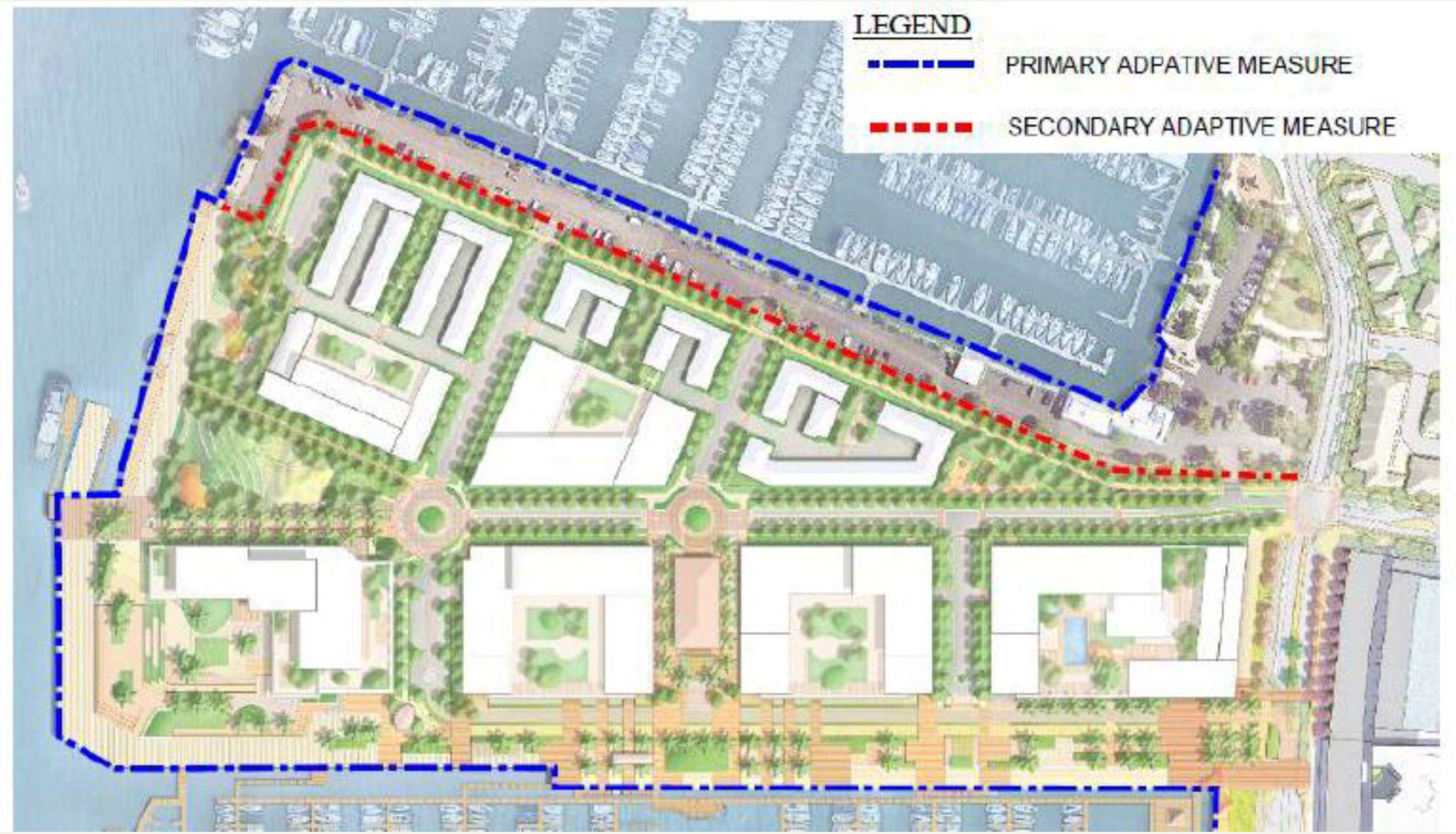
Figure 4: Performance Based design with Existing Structures



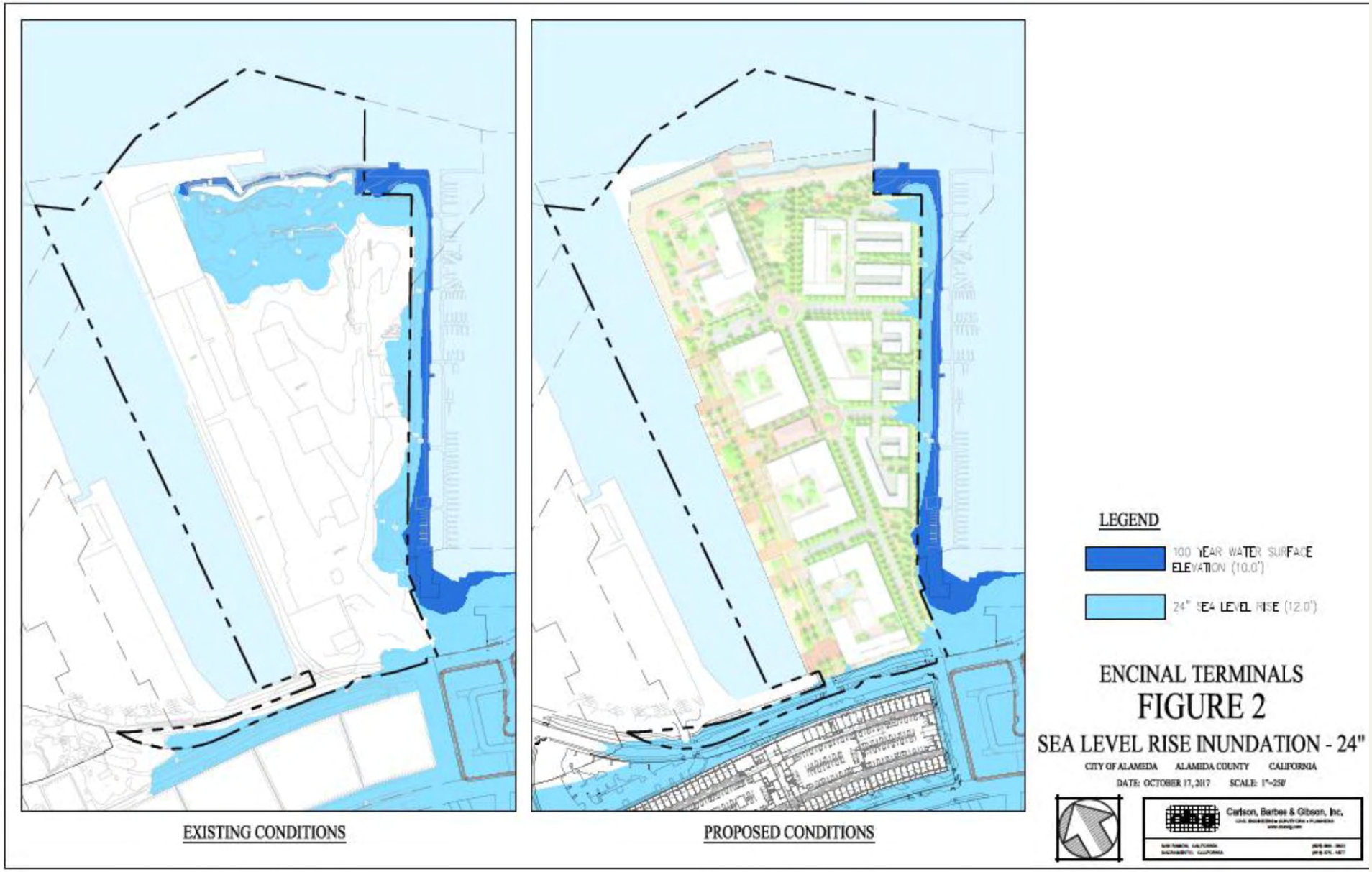
SEA LEVEL RISE DISCUSSION

- **CARLSON BARBEE GIBSON**
  - **ANGELO OBERTELLO**
- **MOFFAT AND NICHOL**
  - **DILIP TRIVEDI**

SEA LEVEL RISE



SEA LEVEL RISE



SEA LEVEL RISE

EXISTING CONDITIONS

PROPOSED CONDITIONS

LEGEND

100 YEAR WATER SURFACE ELEVATION (10.0')

36" SEA LEVEL RISE (13.0')

ADAPTIVE MEASURE (13.0')– ENCINAL TERMINALS

ADAPTIVE MEASURE (13.0')– REGIONAL

ENCINAL TERMINALS

FIGURE 3

SEA LEVEL RISE INUNDATION - 36'

CITY OF ALAMEDA ALAMEDA COUNTY CALIFORNIA

DATE: OCTOBER 30, 2017 SCALE: 1"=250'

Carlson, Barbee & Gibson, Inc.

ENCINAL TERMINALS: a new mixed use waterfront community

SEA LEVEL RISE ADAPTIVE MEASURES: POST 36”

PROPOSED CONDITIONS

LEGEND

- 100 YEAR WATER SURFACE ELEVATION (10.0')
- 66" SEA LEVEL RISE (15.5')
- ADAPTIVE MEASURE (15.5')– ENCINAL TERMINALS
- ADAPTIVE MEASURE (15.5')– REGIONAL

ENCINAL TERMINALS

FIGURE 4

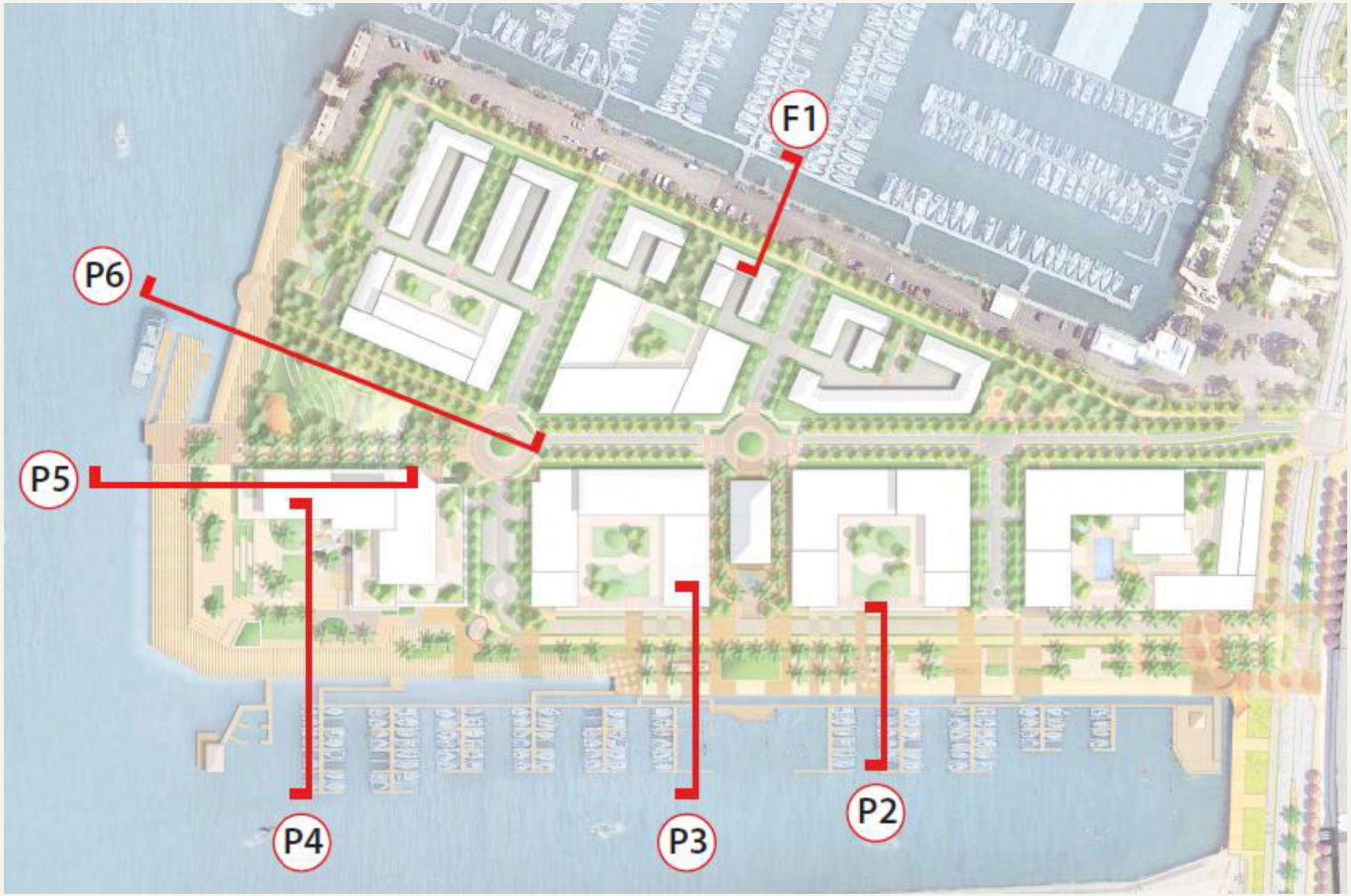
SEA LEVEL RISE INUNDATION - 66"

CITY OF ALAMEDA ALAMEDA COUNTY CALIFORNIA

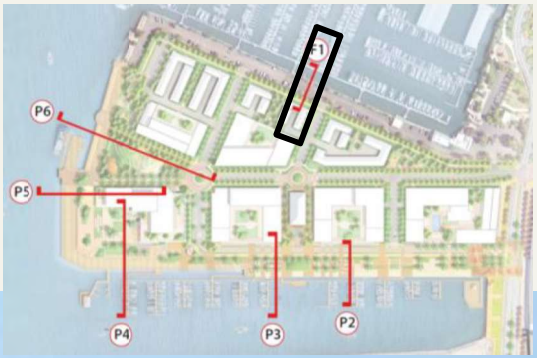
DATE: OCTOBER 30, 2017 SCALE: 1"=250'

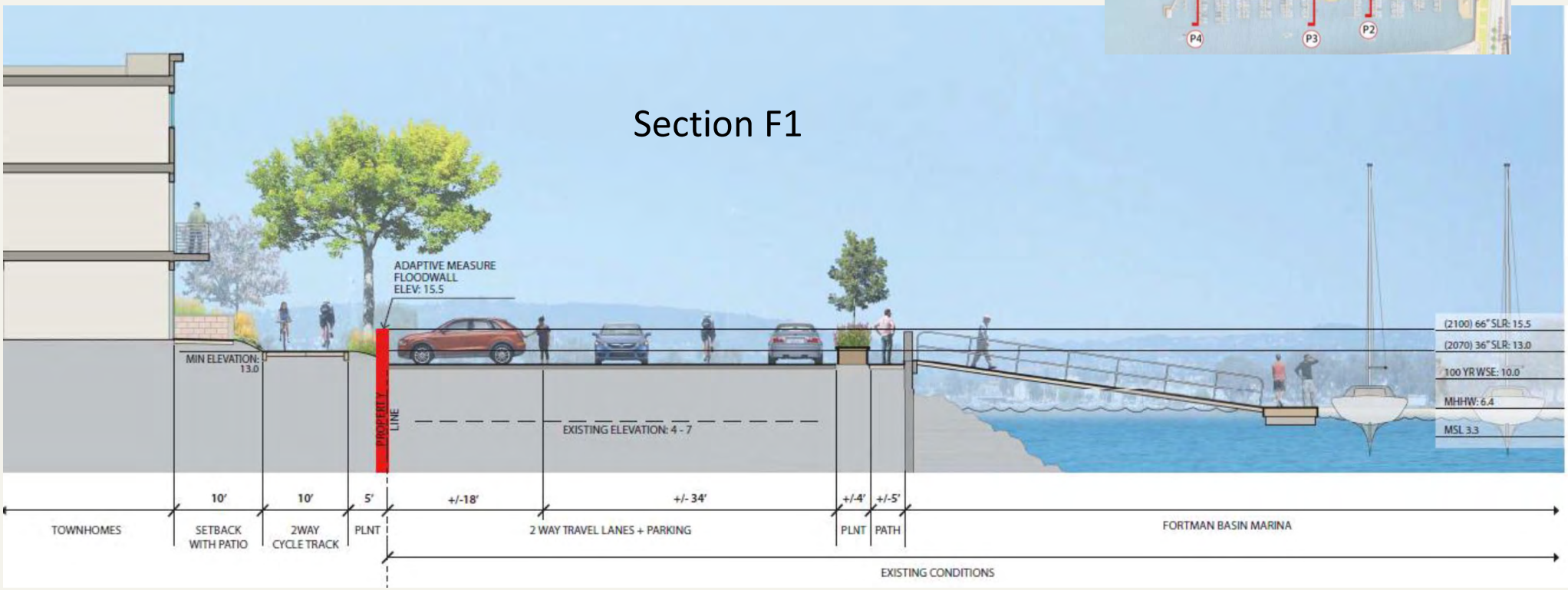
Carlson, Barbee & Gibson, Inc.

ILLUSTRATIVE SECTIONS

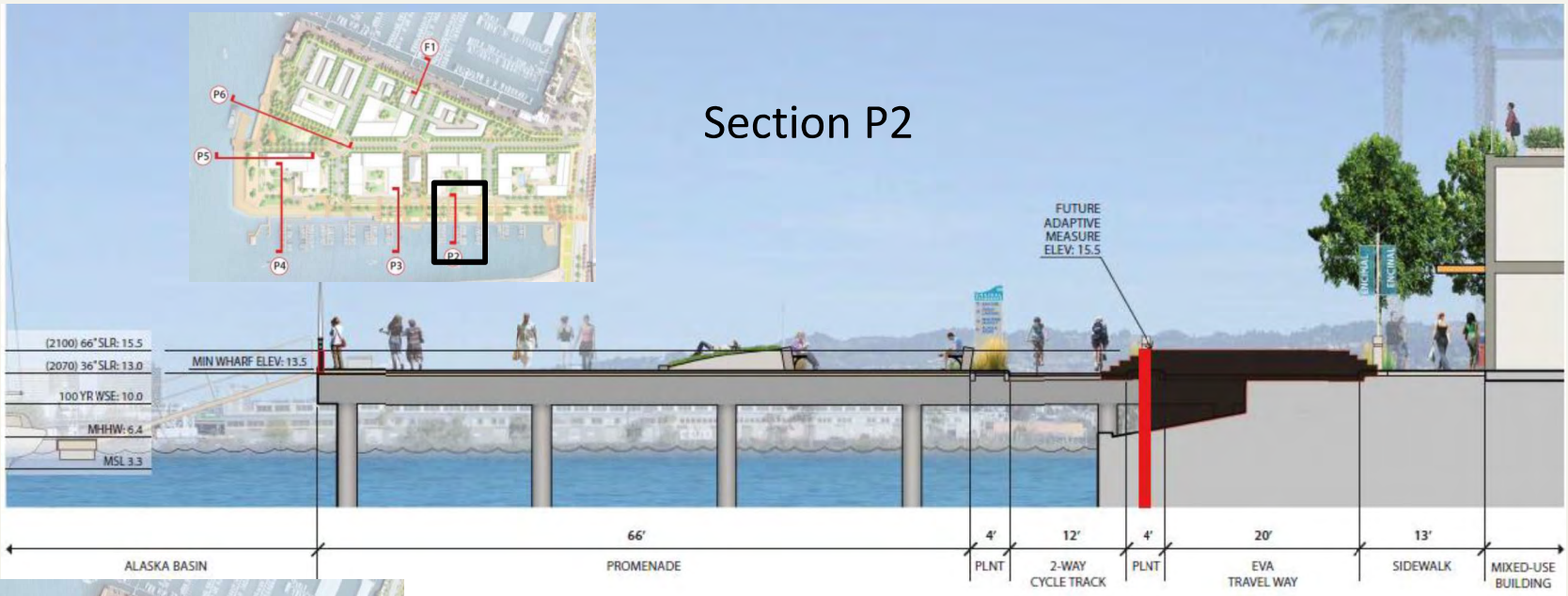


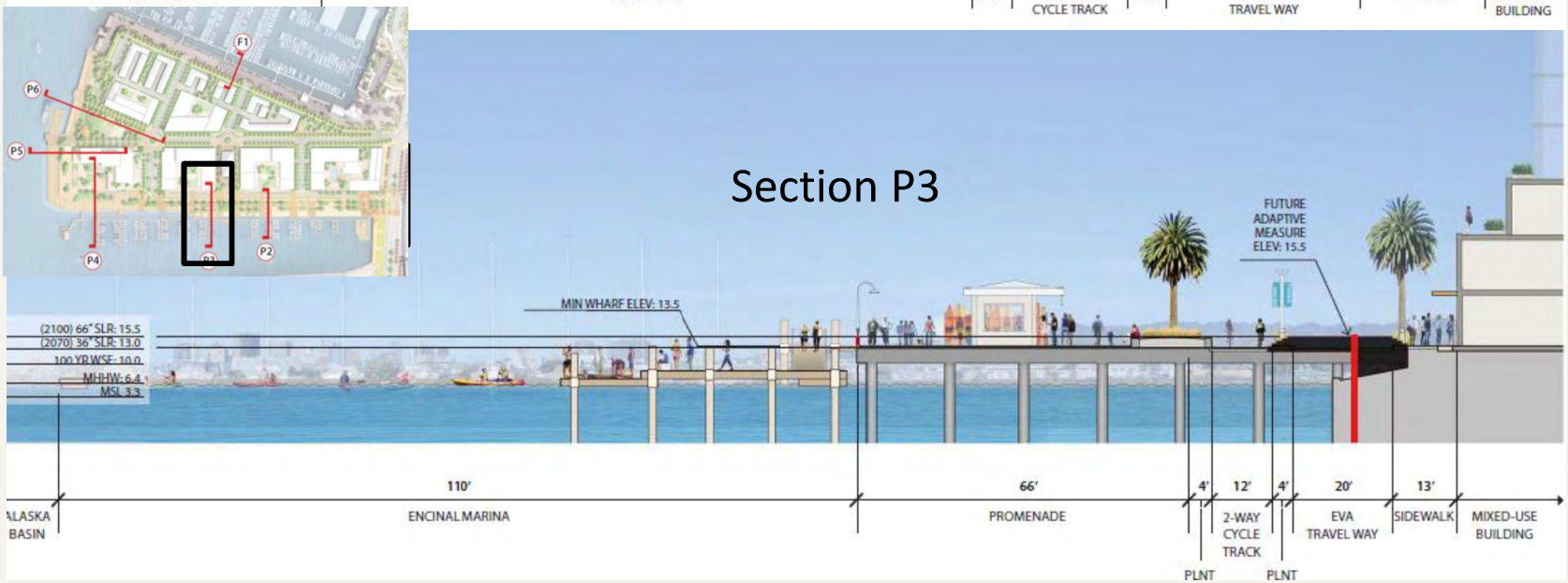
SEA LEVEL RISE ADAPTIVE MEASURES: SECTIONS POST 24”



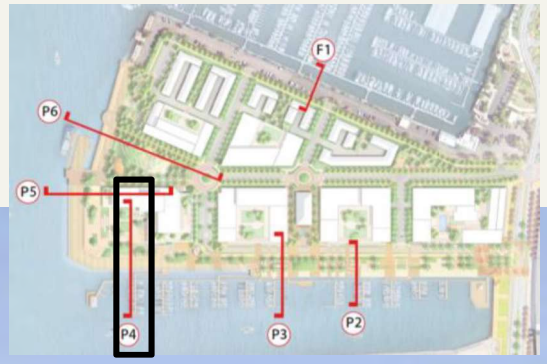


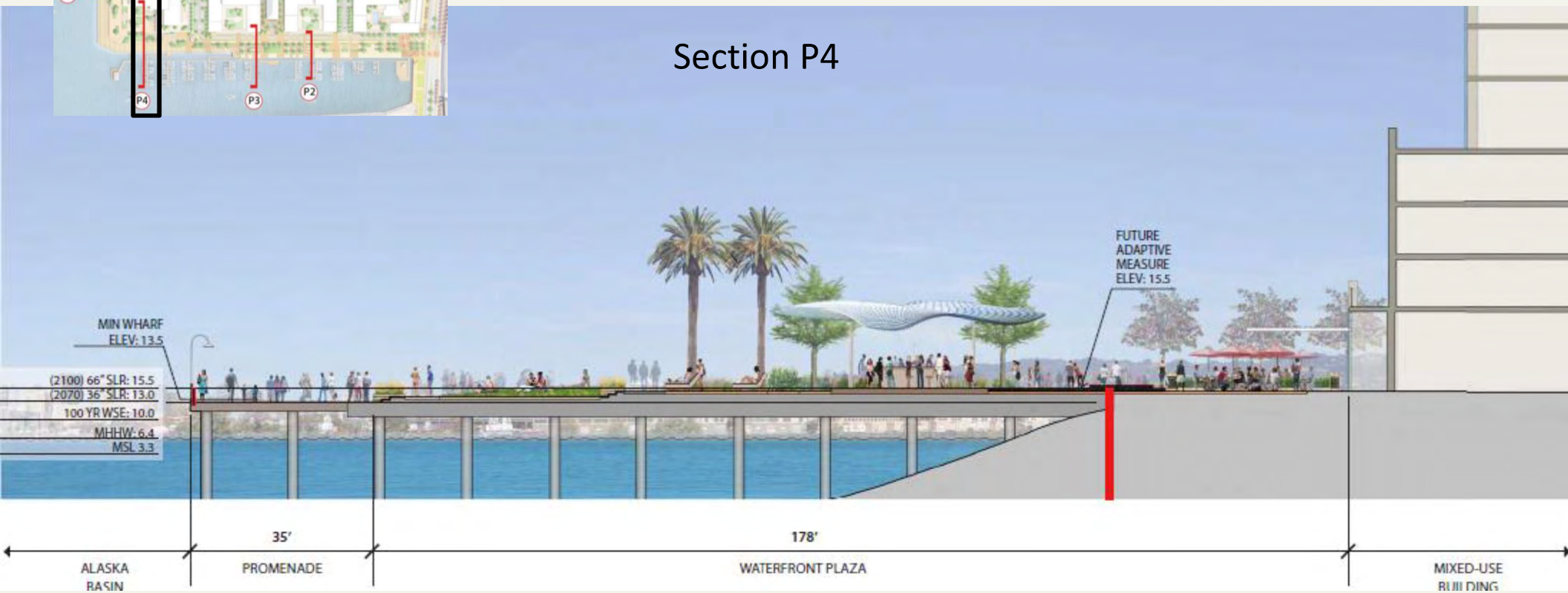
SEA LEVEL RISE ADAPTIVE MEASURES: SECTIONS



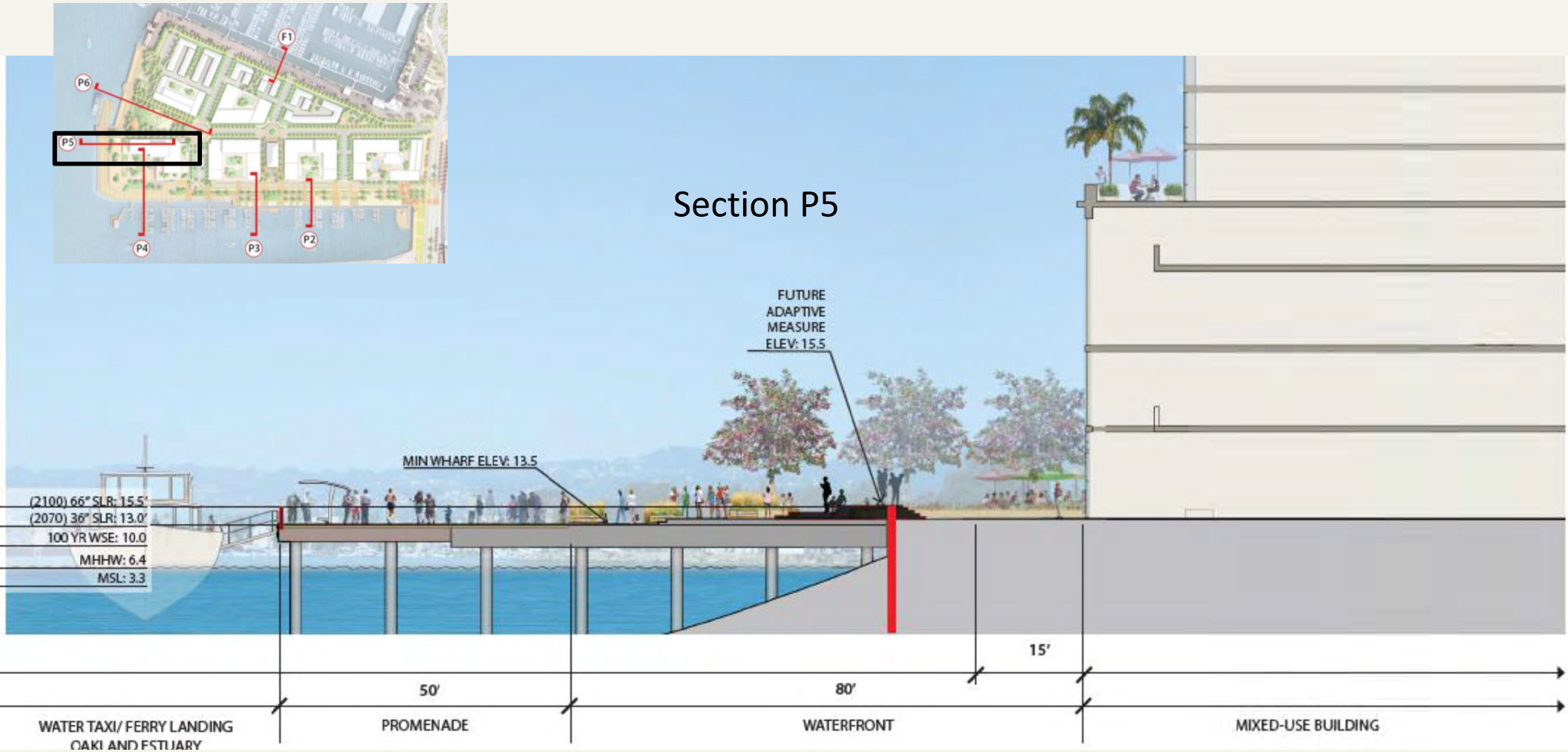


SEA LEVEL RISE ADAPTIVE MEASURES: SECTIONS

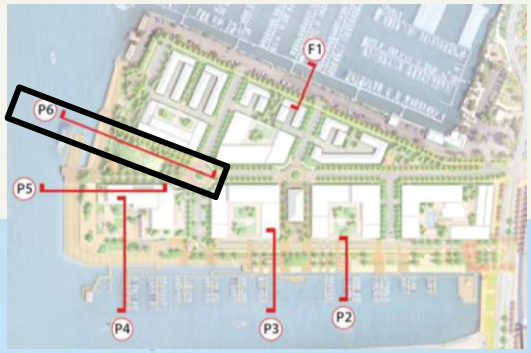


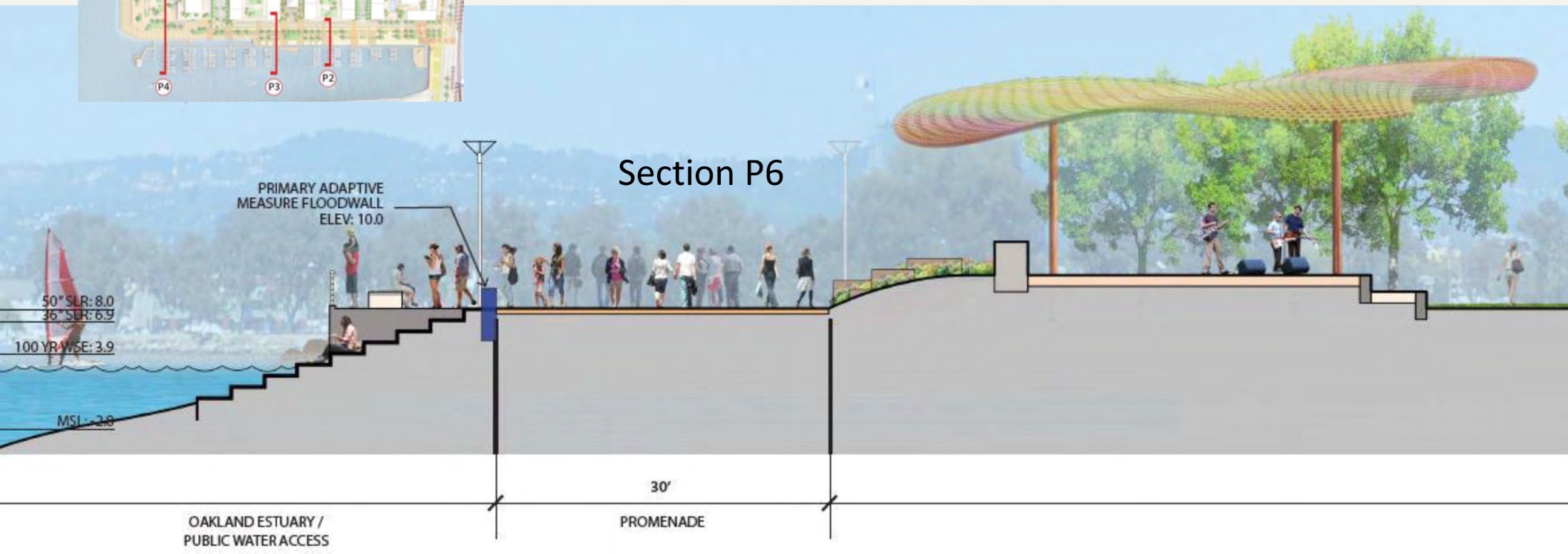


SEA LEVEL RISE ADAPTIVE MEASURES: SECTIONS



SEA LEVEL RISE ADAPTIVE MEASURES: SECTIONS





QUESTIONS/DISCUSSION

TIM LEWIS COMMUNITIES
PRESENTATION TO BCDC ENGINEERING CRITERIA REVIEW BOARD

ENCINAL TERMINALS

Alameda, California

November 1, 2017

- Tim Lewis Communities
- Page/BMS Design Group
- VTBS Architects
- Carlson, Barbee & Gibson, Inc.
- Moffat & Nichol
- Engeo
- Power Engineering
- Briscoe Ivester