BCDC Commission Meeting

San Francisco-Oakland Bay Bridge

Pier E3 Demonstration Project

April 2, 2015

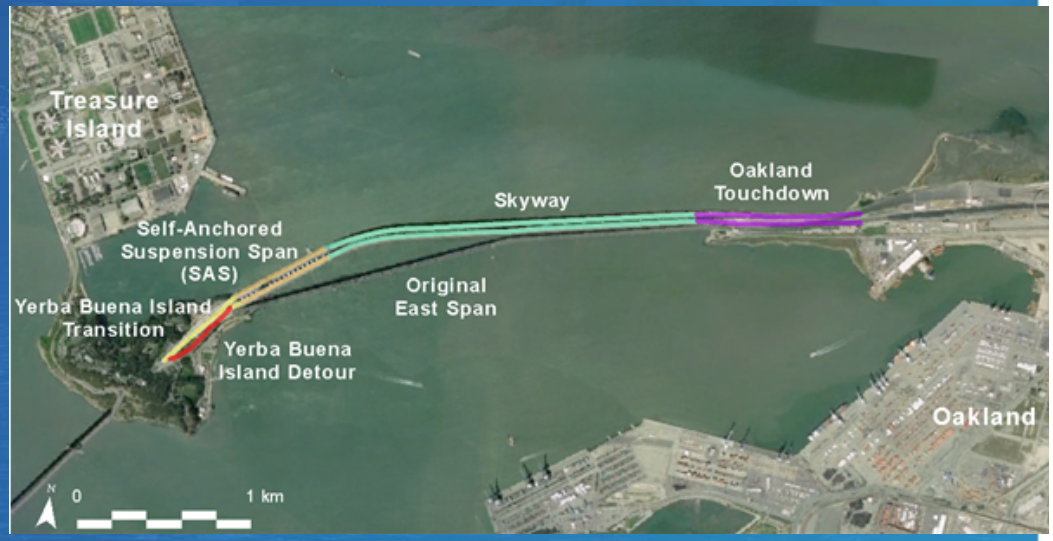
California Department of Transportation

Brian Maroney – SFOBB PM / Chief Engineer

Stefan Galvez – SFOBB Environmental Manager

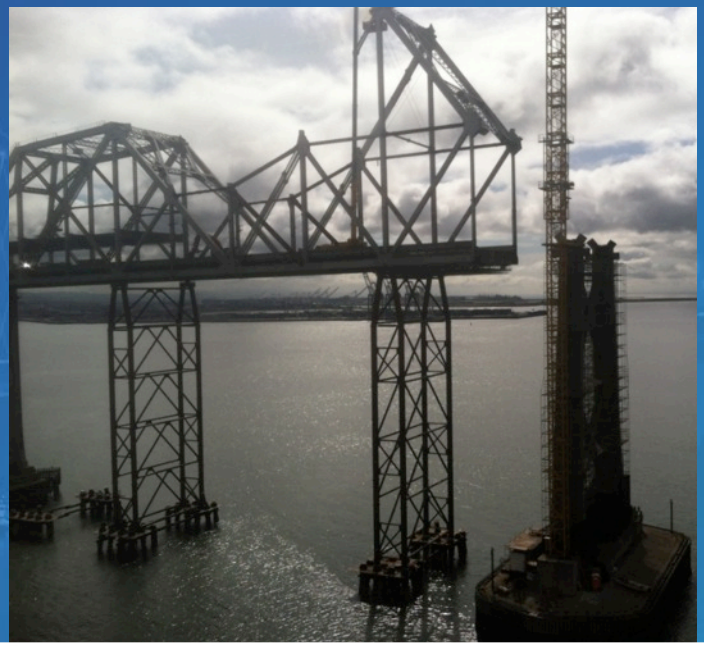
SFOBB Project Background & Updates

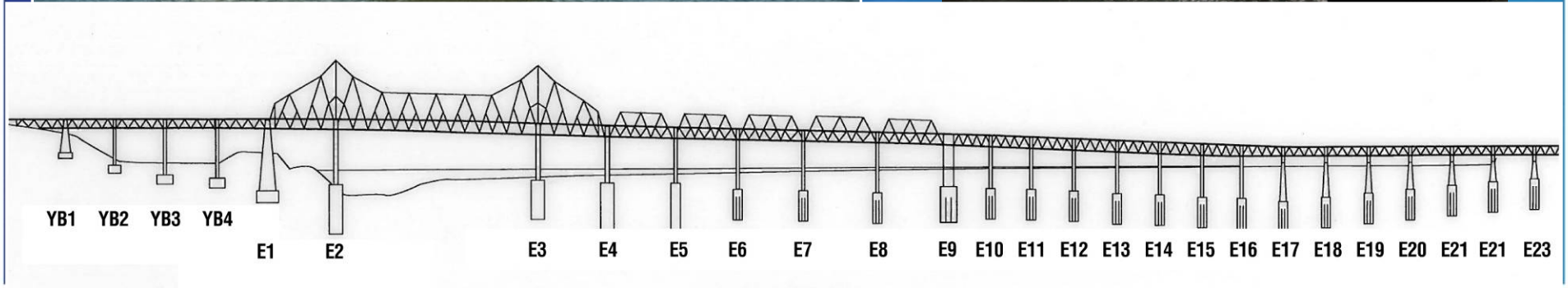
- Project EIS – Finalized in 2001 (CEQA Exempt)
- Regulatory Authorizations Issued in 2001
- Project Broken into Multiple Contracts
  - New bridge open 2013
  - Ongoing items:
    - EB On-ramp
    - Complete Bike Path and landing mid-2016
    - OTD Temp Parking Lot
  - Dismantling ongoing



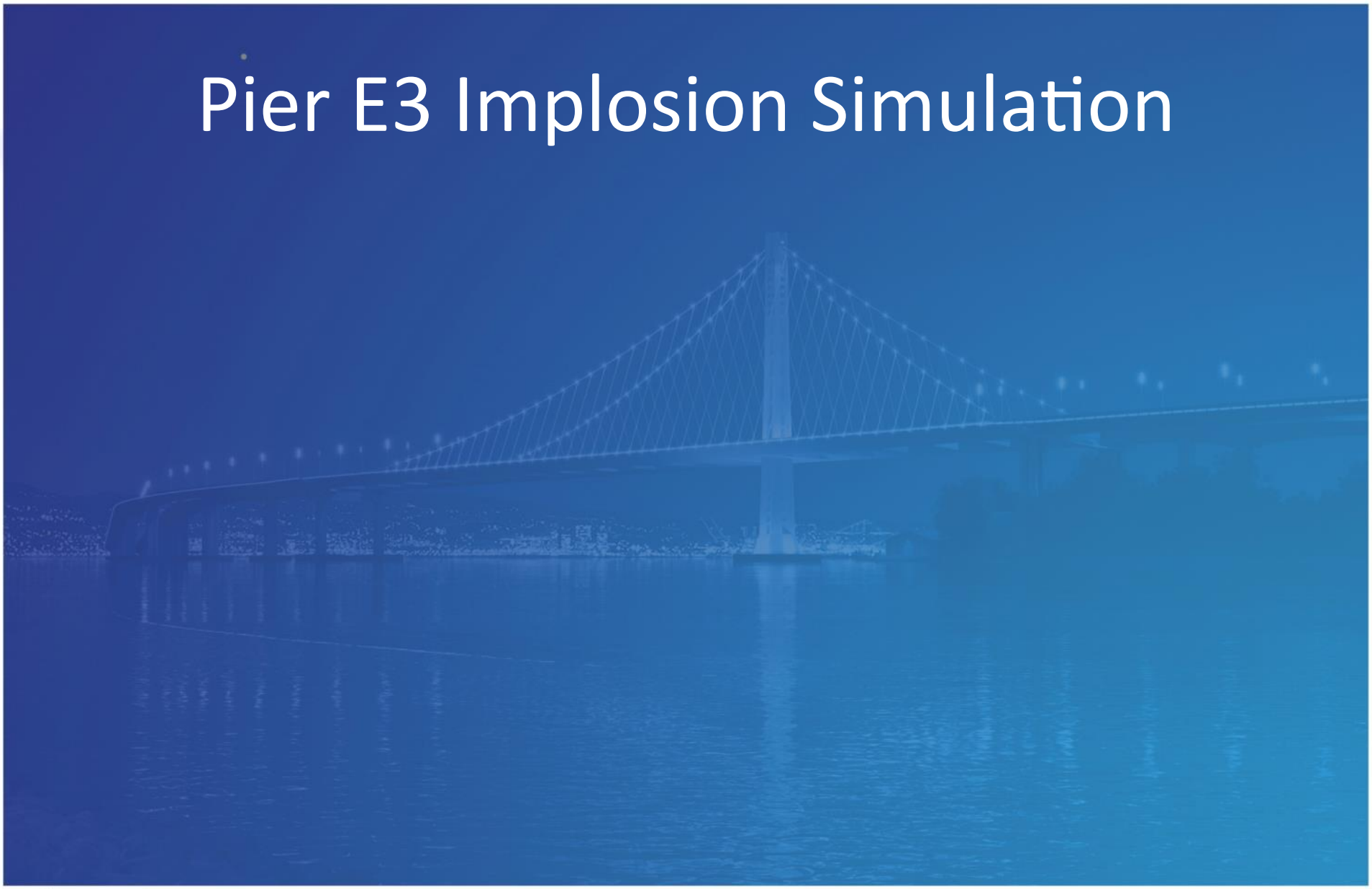
Dismantling Contracts

Pier E3 Demonstration Project





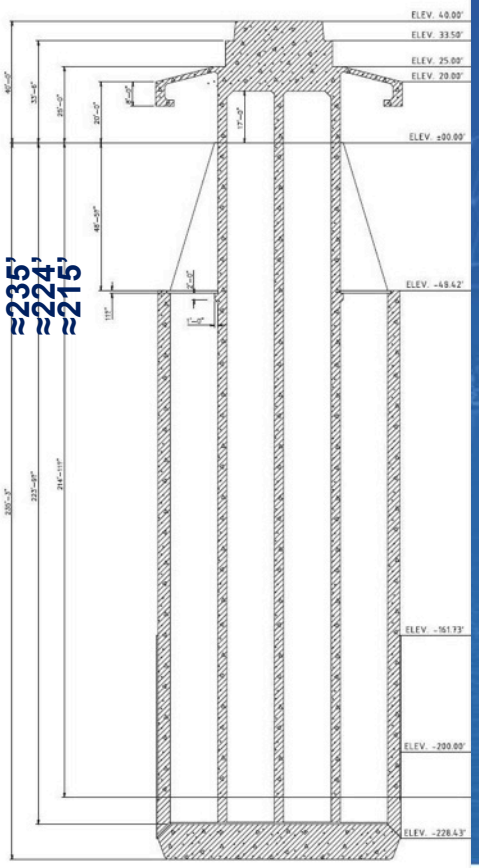
Pier E3 Implosion Simulation



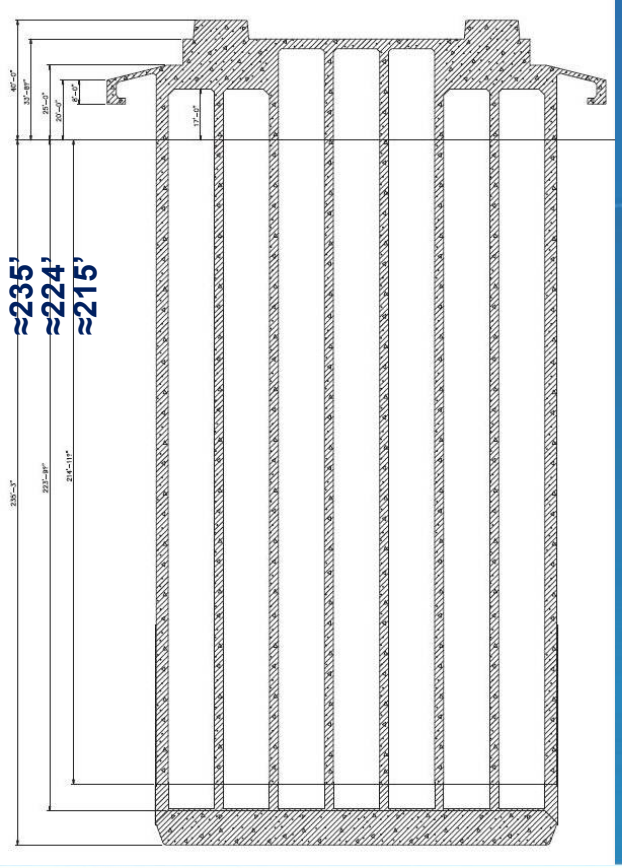
THE SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

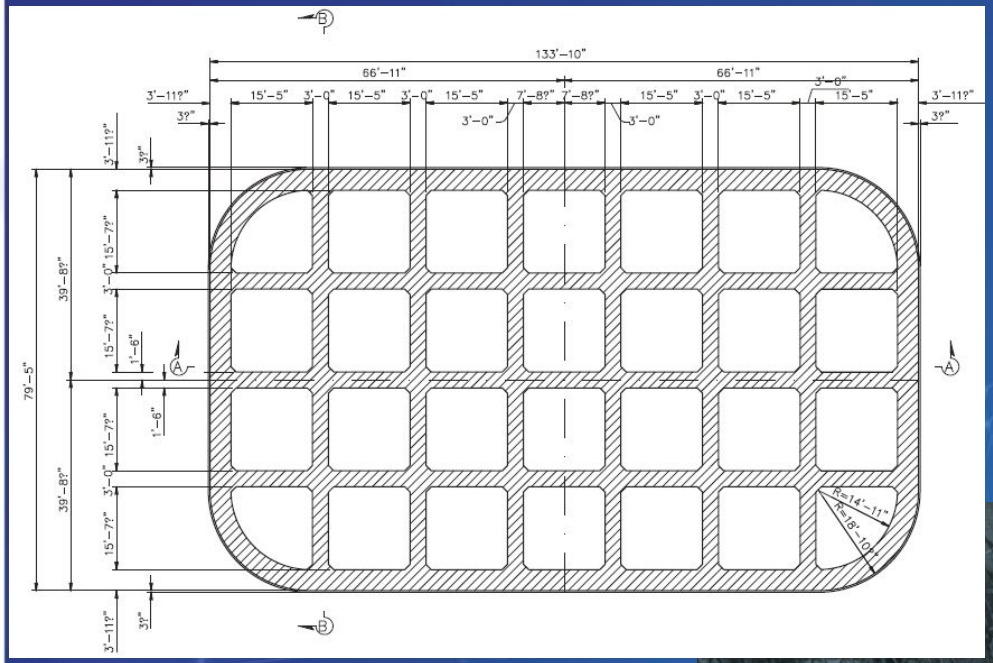
Description of Pier E3

Pier E3
Section Looking North



Pier E3
Section Looking East

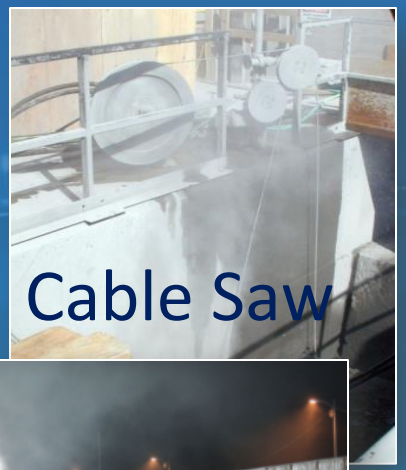



133'-10"
66'-11"
66'-11"
3'-11½"
15'-5"
3'-0"
15'-5"
3'-0"
15'-5"
7'-8½"
7'-8½"
15'-5"
3'-0"
15'-5"
3'-0"
15'-5"
3'-11½"
3½"
3'-11½"
3½"
79'-5"
39'-8½"
3'-0"
15'-7½"
15'-7½"
1'-6"
1'-6"
15'-7½"
3'-0"
15'-7½"
39'-8½"
3'-11½"
3½"
R=14'-11"
R=18'-10"

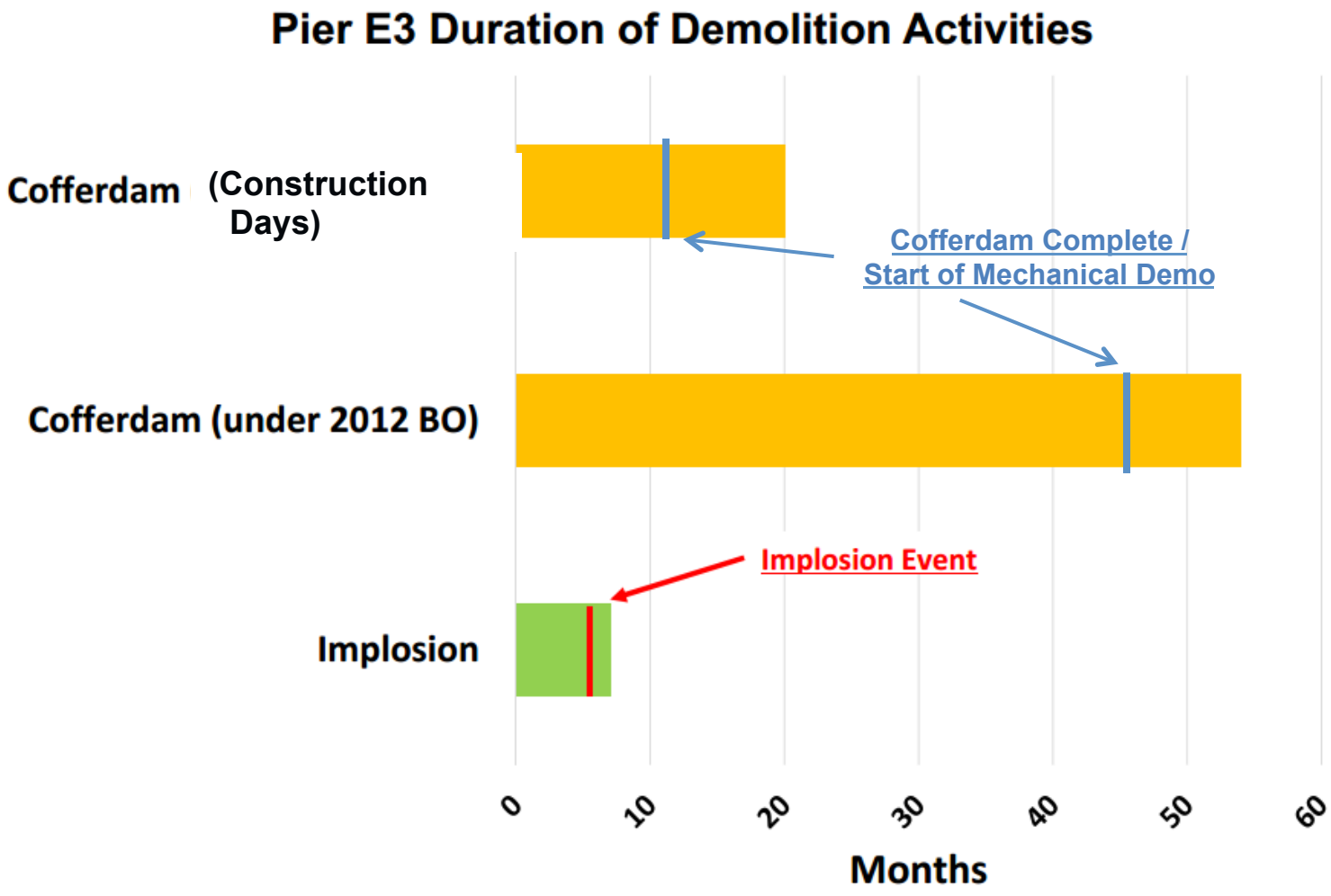
4-27-34
Pier E-3
4-615

Pier E3 Alternatives Analysis:
Cofferdam w/ Ram Hoe or Cable Saw

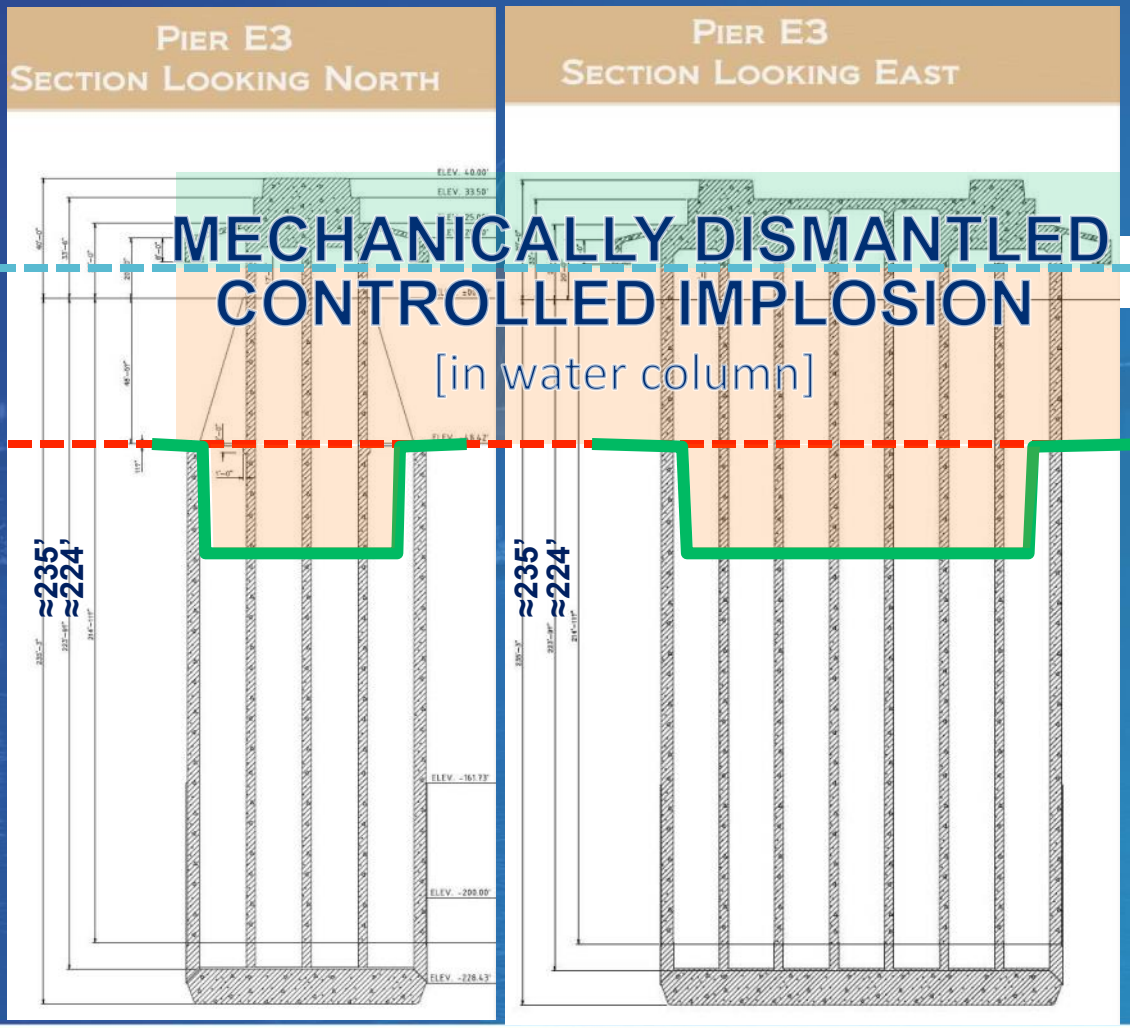
Cofferdam	Estimated # Piles
54" Pipe Piles	36
24" Pipe Piles	18
King Piles (H-Piles)	170
Sheet Piles	170
Total	**394**



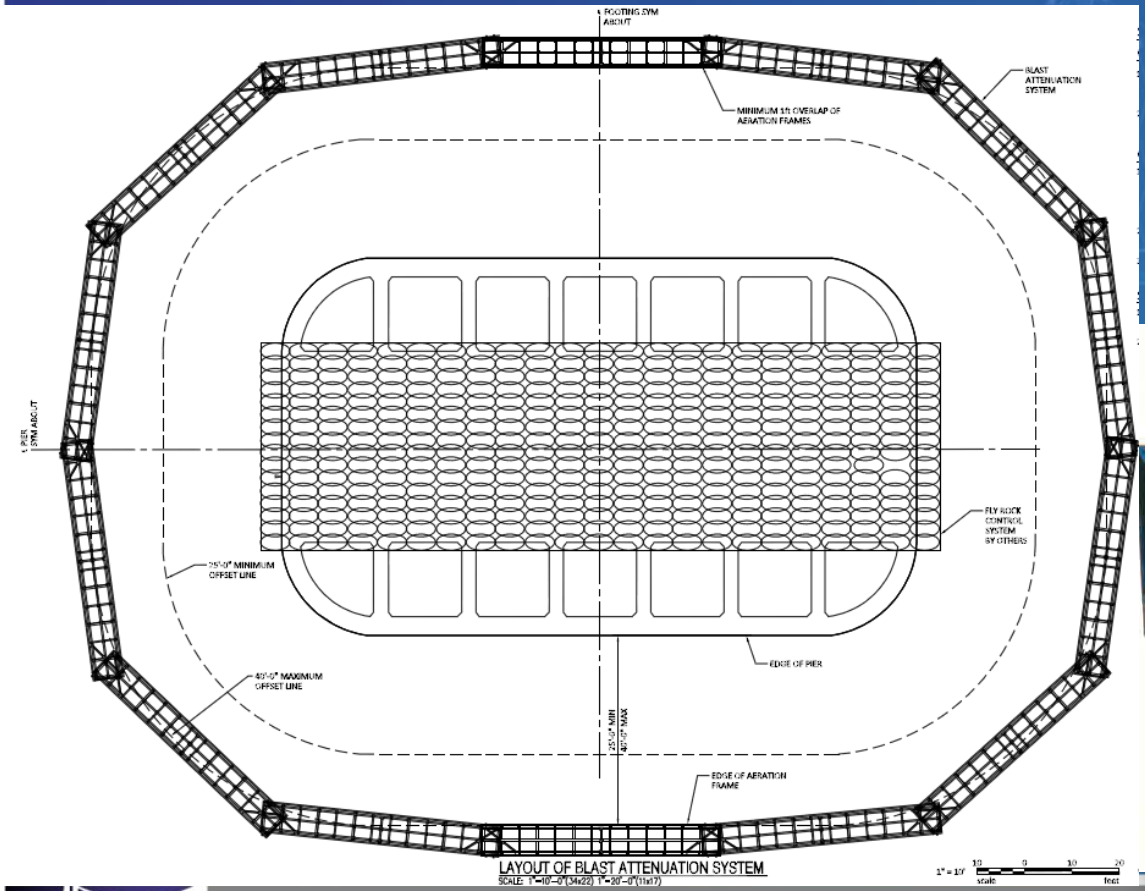
Alternatives Analysis

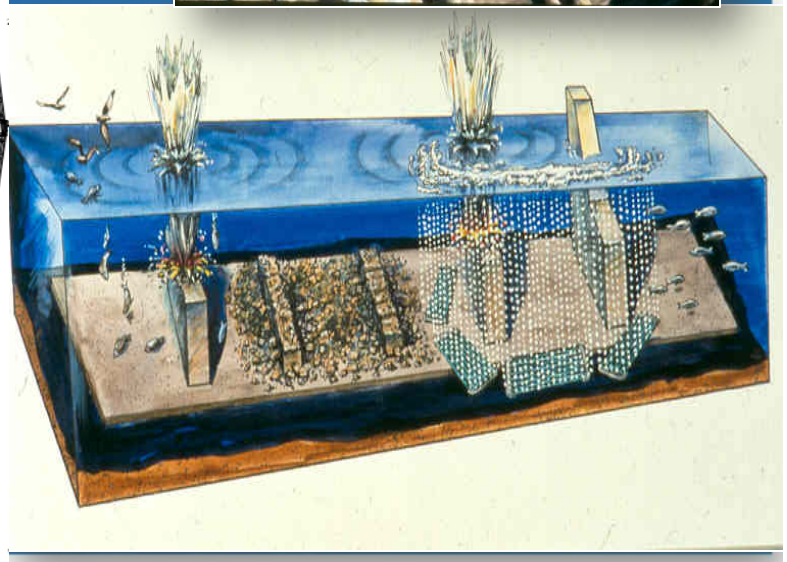


Depth/Elevation of Removal



Sound Attenuation





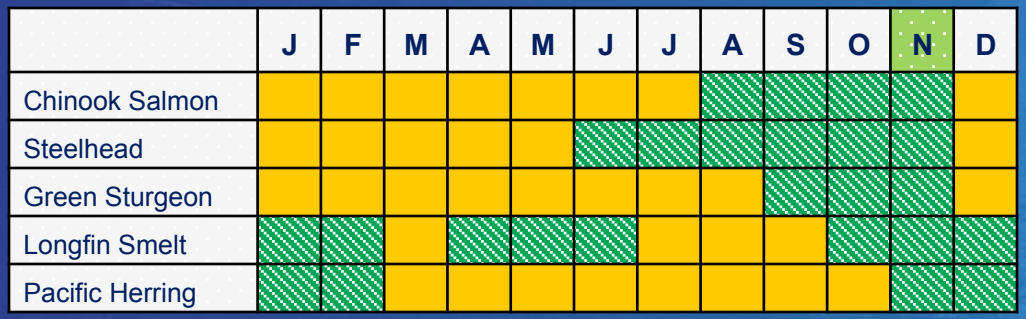
Implosion Scheduled for November

Optimal Times for Pier E3 blast based on presence of biological resources.

Some marine mammals & birds will be present; avoid impacts through exclusion zones and monitoring.

Fish cannot be avoided with exclusion zones.

Department conducted an analysis of the seasonal presence of listed and/or regulated fish.



Green boxes are months when fish species are not expected around Pier E3, or at low densities.

SFOBB Pier E3
Fish Hydroacoustic Thresholds
80% Attenuation BAS
Mar. 2015
80
Pier E3
206dB Peak - 820'
187dB SEL - 2,550'
183dB SEL - 4,000'

Fish Impact Analysis

Species	November Population (Central / South Bay) - # Individuals	# Individuals Potentially Affected		
		206 dB Peak	187 dB SEL	183 dB SEL
Coho Salmon	0	0	0	N/A
Chinook Salmon	0	0	0	N/A
Steelhead	0	0	0	N/A
Green Sturgeon	0*	0	0	N/A
Longfin Smelt	133,821	132 (0.1%)	1,075 (0.8%)	1,775 (1.3%)
Pacific Herring	301,213	246	1,641	N/A

* Juvenile green sturgeon can occur around Pier E3 throughout the year at low densities.

Bird Protection

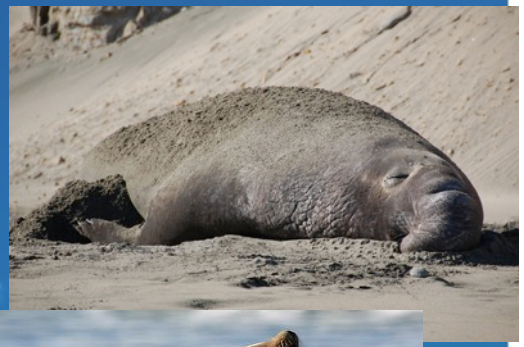
Potential Impacts

- In-water pressure waves (diving birds)

Avoidance and Minimization Measures:

- Deter diving birds prior to implosion
- Establish 500'Exclusion Zone for Listed Diving Birds
  - Listed diving birds:
    - CA Least Tern (CESA – Endangered)
    - Brown Pelican (CFGC – Fully Protected)
- Avian Biologists will monitor for species
- Implosion delayed if listed species dive into Exclusion Zone

Marine Mammals



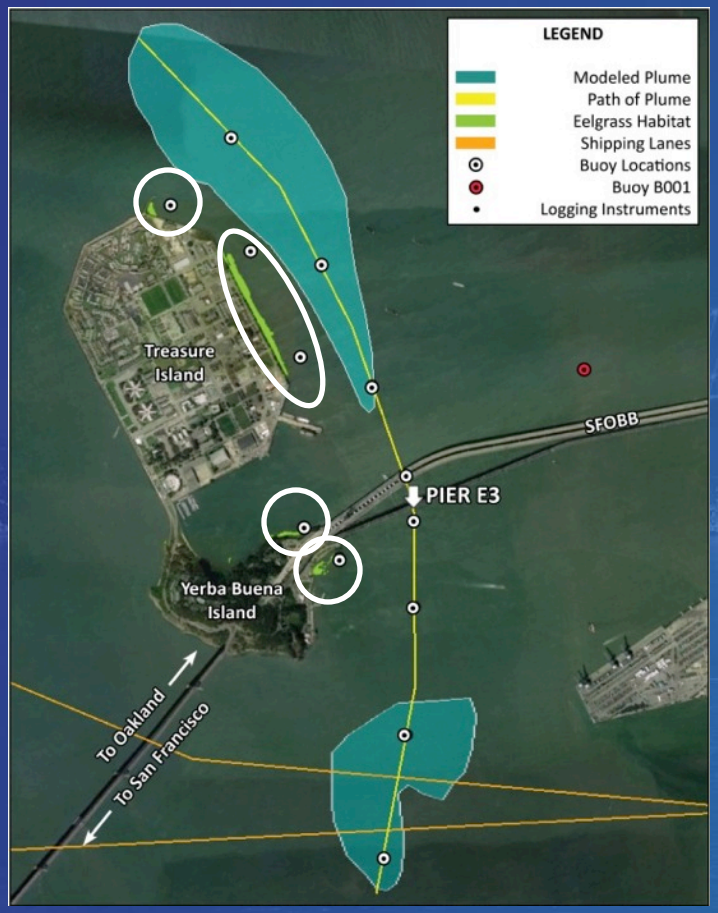
SFOBB Pier E3
Marine Mammal
Exclusion and
Harassment Zones
Mar. 2015
Level B Harassment
(Behavioral Harassment)
Zone - 9,700'
Pier E3
Marine Mammal Exclusion Zone - 1,160'
Level B Harassment (TTS) Zone - 5,700'
80

Marine Mammal Impact Analysis

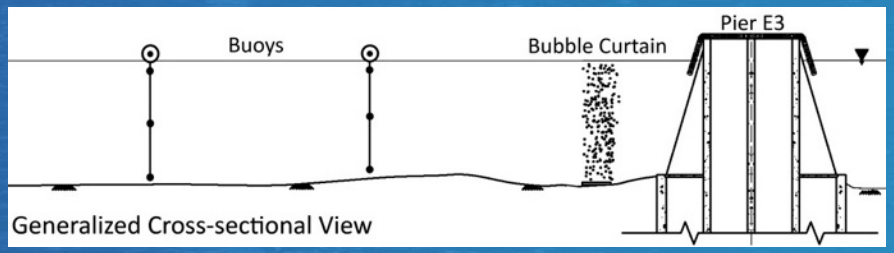
Species	Behavioral Response	Temp. Hearing Loss	Injury and/or Mortality
Pacific Harbor Seal	6	3	0
Northern Elephant Seal	1	0	0
California Sea Lion	0	0	0
Harbor Porpoise	1	0	0

* No controlled implosion will occur if individuals are within Level A threshold zones

Water Quality Monitoring



- Implode pier at High Slack Tide
- Potential Water Quality Impacts:
  - ↑ pH from breaking concrete
  - ↑ Turbidity from disturbing bay sediment
  - ↑ Dissolved oxygen from caisson cells
- Turbidity, pH, and DO exceedances will be temporary and reversible
- Extensive Monitoring Program



BCDC Permitting Milestones

Department Submitted Request for BCDC Major Amendment – March 30, 2015

Commission Briefing – April 2, 2015

Commission Hearing+ Vote – Summer 2015

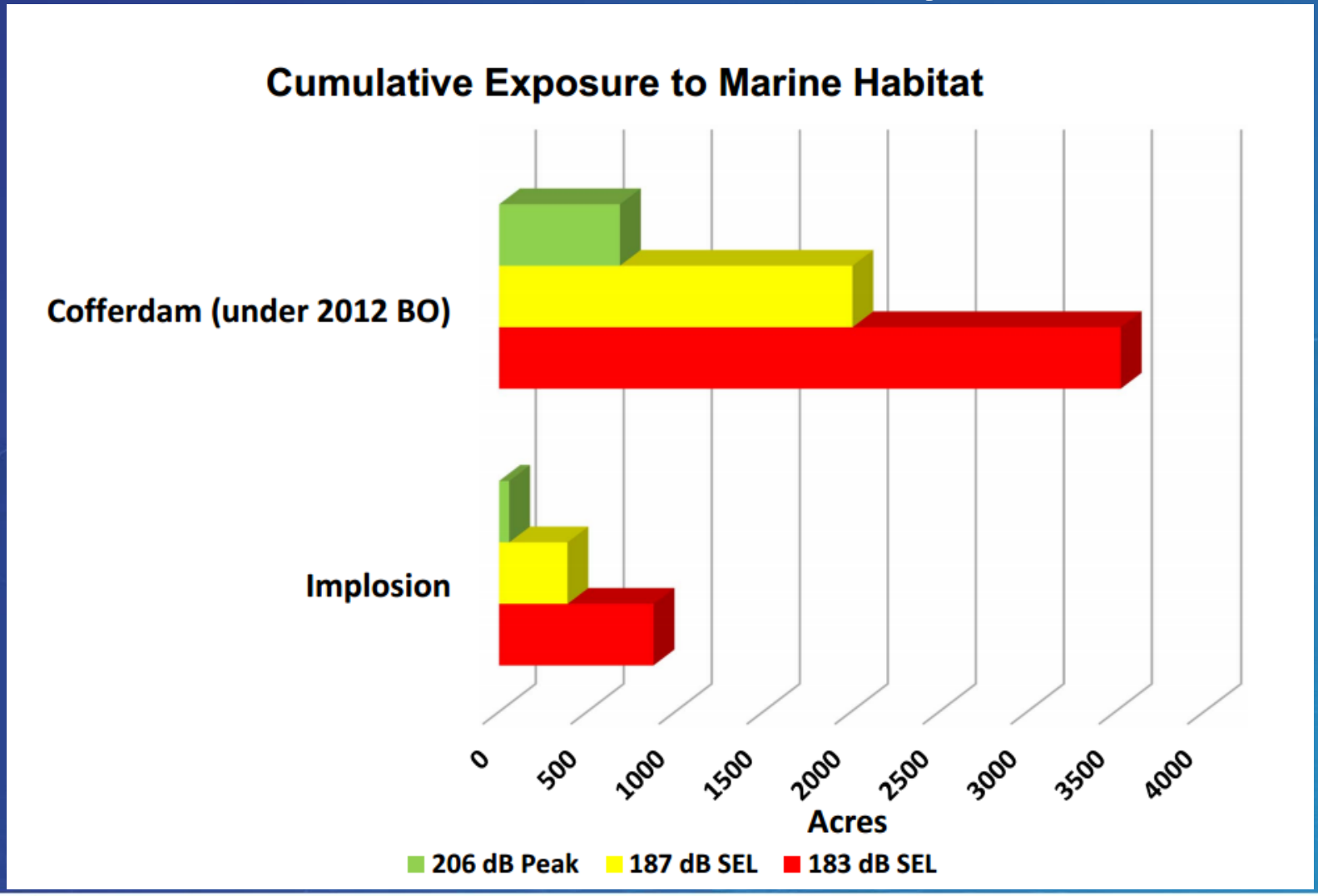
Amendment Approval –July 2015

Implode Pier E3 – November 2015

Biological Resources - Species

- Double-Crested Cormorant *(MBTA)*
- American Peregrine Falcon *(fully protected species, CFGC)*
- California Least Tern *(endangered)*
- Western Gull *(MBTA)*
- Pacific Herring *(State Managed Commercial Fishery)*
- Chinook Salmon & Steelhead *(endangered/threatened)*
- Green Sturgeon *(threatened)*
- Longfin Smelt *(threatened)*
- Marine Mammals *(MMPA)*
- Eelgrass Beds *(Special Aquatic Habitats)*

Alternatives Analysis



Fish Regulatory Thresholds

FHWG - Technical guidance on hydroacoustic effects to fish from pile driving

Interim Criteria for Injury to Fish [2008]

- 206 dB Peak sound pressure level [SPL]
- 187 dB accumulated Sound Exposure Level [SEL] - Fish > 2 grams
- 183 dB accumulated SEL – Fish < 2 grams
- 150 dB root-mean squared [RMS] – Behavioral (not injurious)

Fish – Methods

Fish Densities

- Calculated for November using SF Bay Study
- 5 year average (08'-12') for all species (except longfin smelt ['09-'13])

Extrapolated to area subject to 206 dB, 187 dB SEL, or 183 dB SEL to determine potential effect

Richmond-
San Rafael
Bridge
Pier E3
206dB Peak - 820'
187dB SEL - 2,550'
183dB SEL - 4,000'
Pacific
Ocean
San Francisco Bay
San Mateo-
Hayward
Bridge
80
580
101
24
880
280
92

Marine Mammal Regulatory Thresholds

Five functional hearing groups

Low-frequency cetaceans

Mid-frequency cetaceans

High-frequency cetaceans

Phocid pinnipeds

Otariid pinnipeds

Marine Mammals – Methods

Marine Mammal Densities

- Calculated from 14 years of observations during SFOBB Project [harbor seal, sea lion, harbor porpoise]
- 2004-2014 Stranding data from Marine Mammal Center [N. elephant seal]

Extrapolated to area subject to Level B or Level A Harassment to determine exposure

Marine Mammals – Area of Impact

Species	Level B Criteria		Level A Criteria			Mortality
	Behavioral Response	Temp. Threshold Shift (TTS)	Permanent Threshold Shift (PTS)	Gastro-intensinal Tract	Lung Injury	
Pacific Harbor Seal	9,700 ft	5,700 ft	1,160 ft	35 ft	450 ft	205 ft
Northern Elephant Seal	9,700 ft	5,700 ft	1,160 ft	35 ft	450 ft	205 ft
California Sea Lion	800 ft	470 ft	245 ft	35 ft	450 ft	205 ft
Harbor Porpoise*	44,500 ft	26,500 ft	5,800 ft	35 ft	450 ft	205 ft

* Unlikely to occur within area in November. Real-time acoustic monitoring proposed to confirm absence.

USFWS Bird Thresholds

USFWS Guidance

- Pile-driving effects to marbled murrelets (2012)
- 202 dB SEL = auditory injury
- 208 dB SEL = non-auditory [physical] injury

Essential Fish Habitat Analysis

Temporary Effects to:

- 1,026 acres of Essential Fish Habitat
  [Area around Pier E3 subject to 183 dB SEL]

No anticipated effects to eelgrass from:

- Pressure waves
- Sediment or turbidity plume [Water Quality Study]
- Equipment storage or staging

SFOBB EAST SPAN
FOUNDATION REMOVAL PROJECT

Port Mann Demo:
In-Water Pedestal Blast

KIEWIT/MANSON, AJV

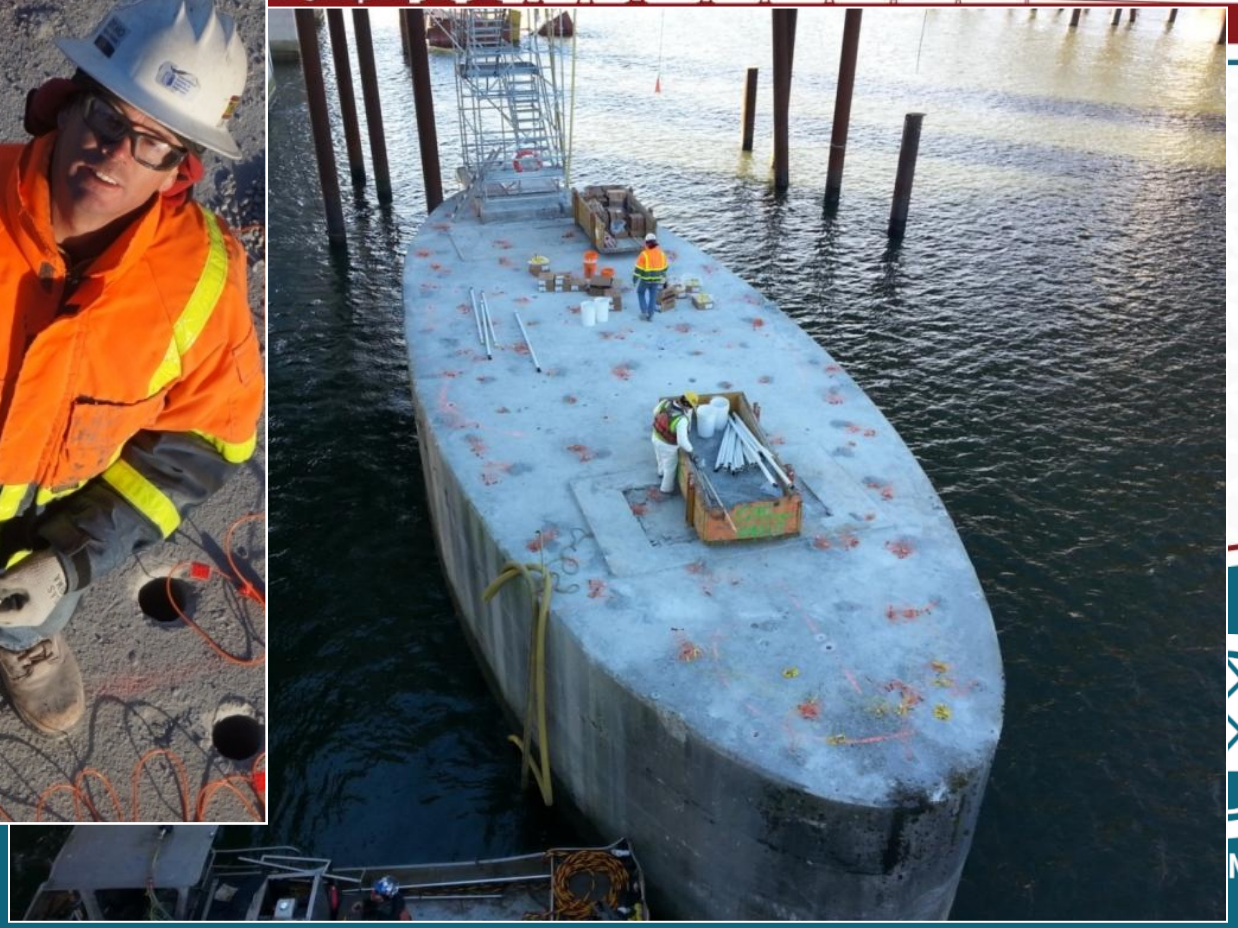
In-Water Piers

Drill & Load Explosives

SFOBB EAST SPAN
FOUNDATION REMOVAL PROJECT

/MANSON, AJV

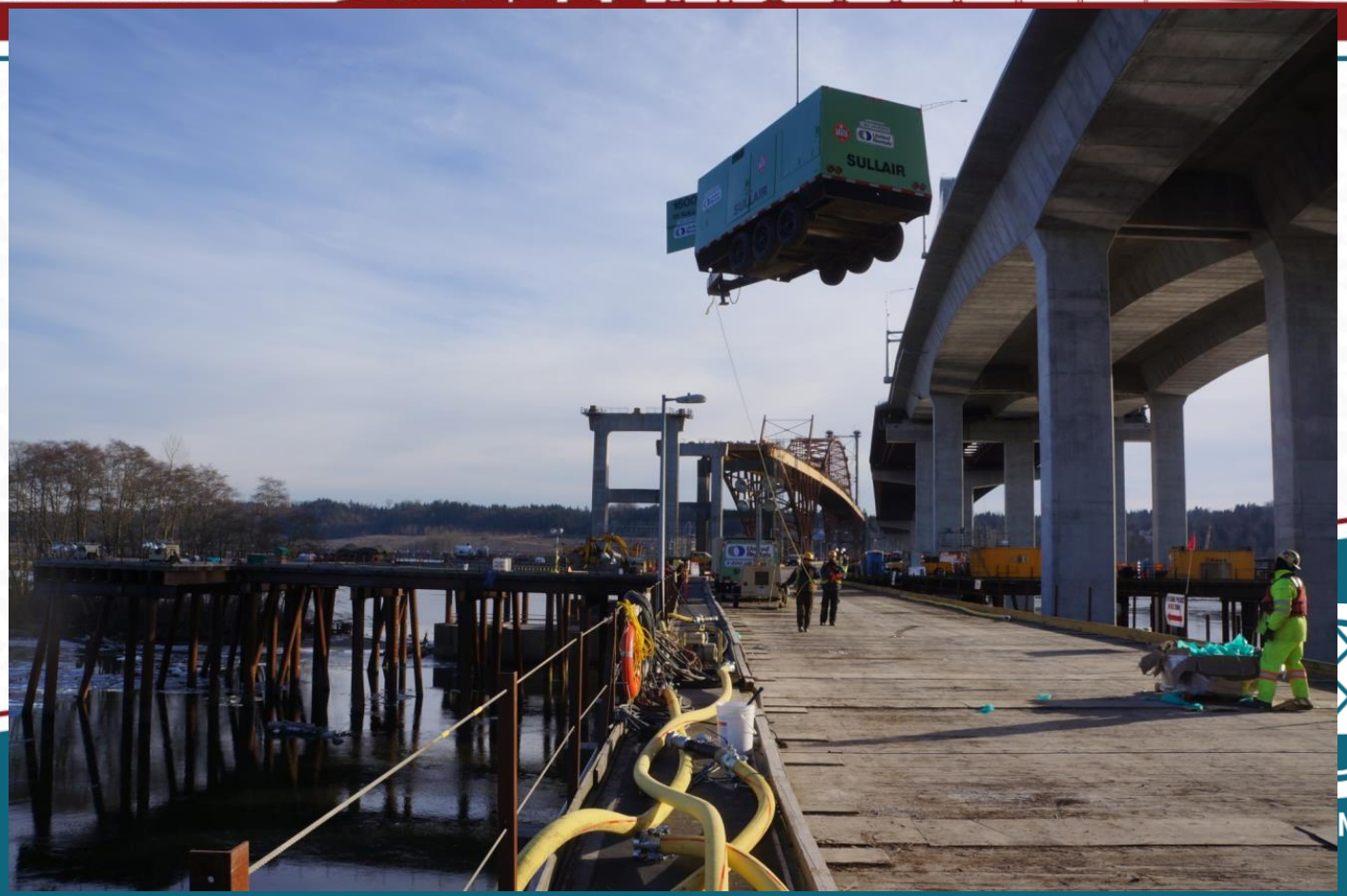
Drill & Load Explosives



Drill & Load Explosives

Blast Attenuation System (BAS) Installation

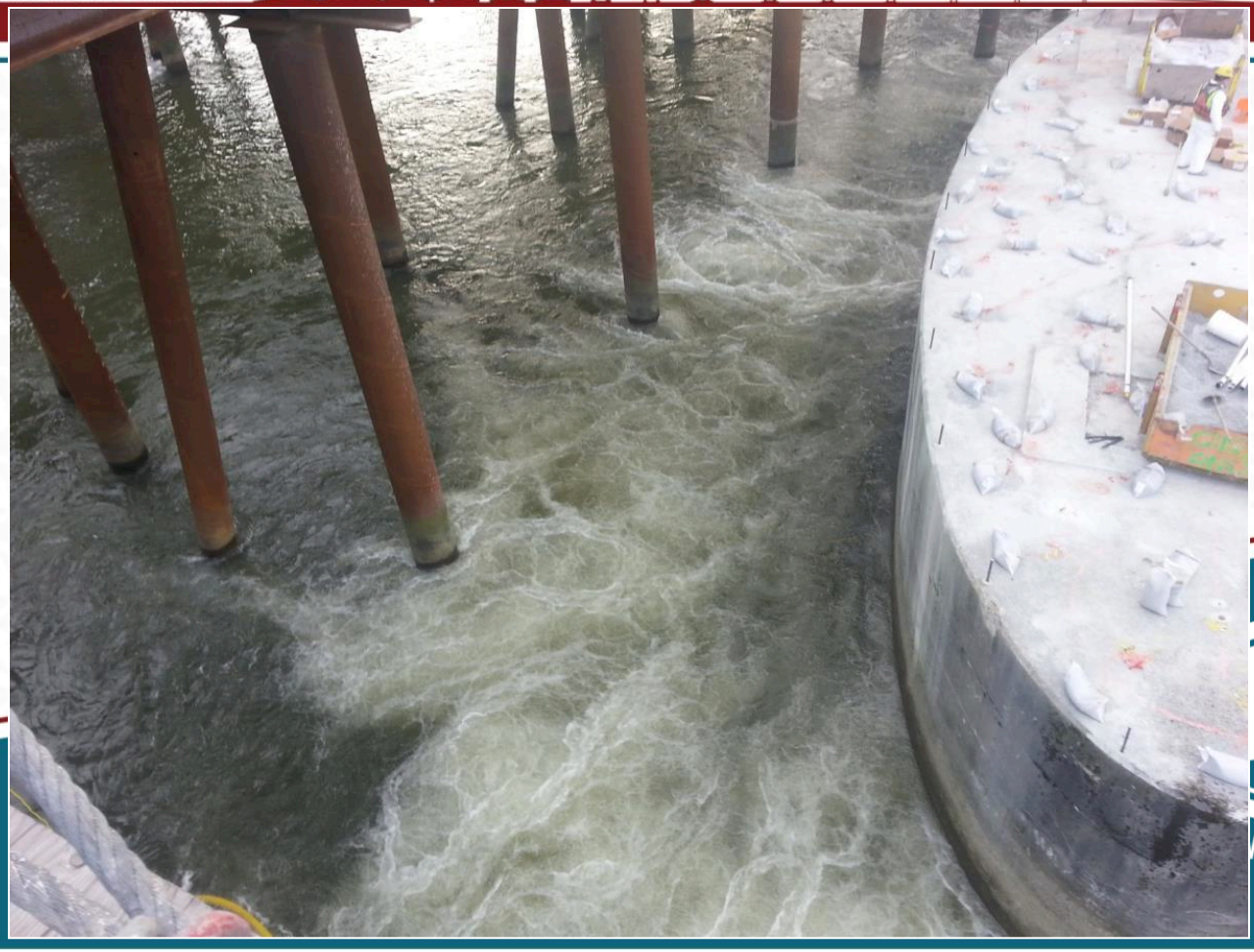
SFOBB EAST SPAN
FOUNDATION REMOVAL PROJECT



NSON, AJV

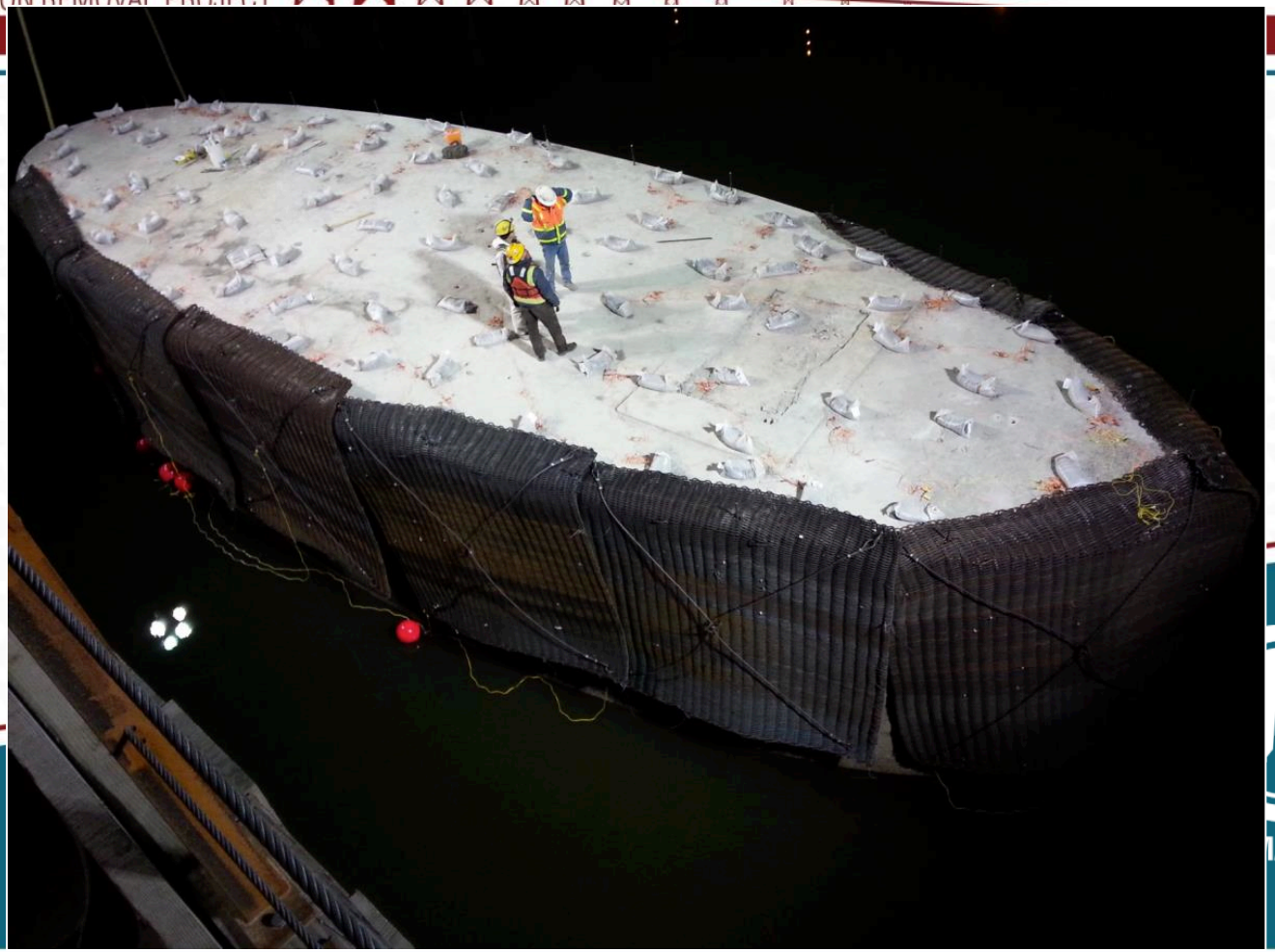
BAS Installation & Testing

SFOBB EAST SPAN
FOUNDATION REMOVAL PROJECT



MANSON, AJV

Blast Mat Installation



Blast Mat Installation

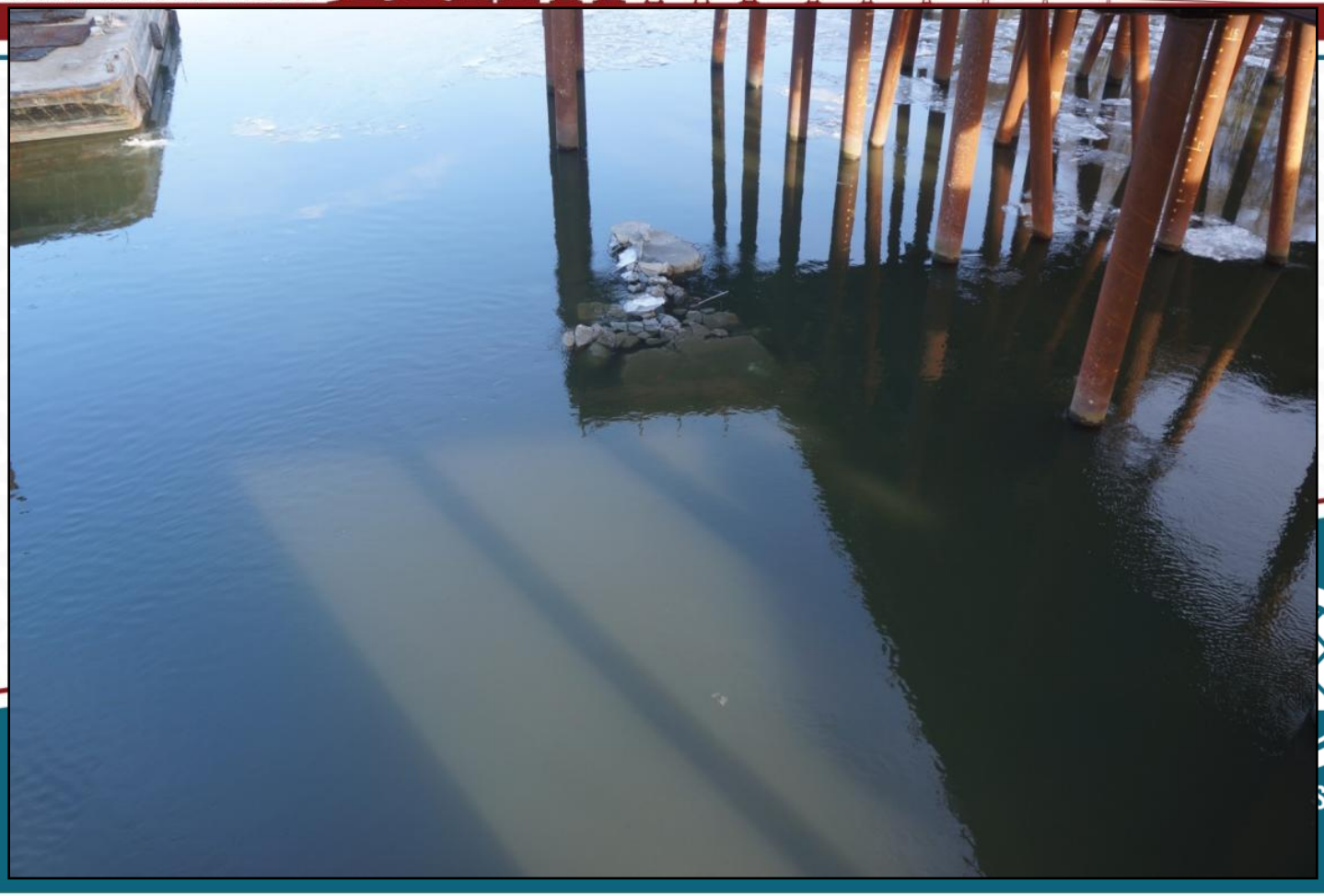
SFOBB EAST SPAN
FOUNDATION REMOVAL PROJECT

NSON, AJV

Pre-Blasting Setup

Post Blast Condition

SFOBB EAST SPAN
FOUNDATION REMOVAL PROJECT



SON, AJV

Blast Rubble Off-Loading