



# **Balboa Island Seawall - Protecting Property and City Infrastructure from Sea Level Rise**

**CALIFORNIA  
MARINE AFFAIRS AND NAVIGATION CONFERENCE  
January 10, 2018**

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Public Works Department



# Overtopping Due To High Tides and Wind/Boat Waves (South Bay Front, 2010)



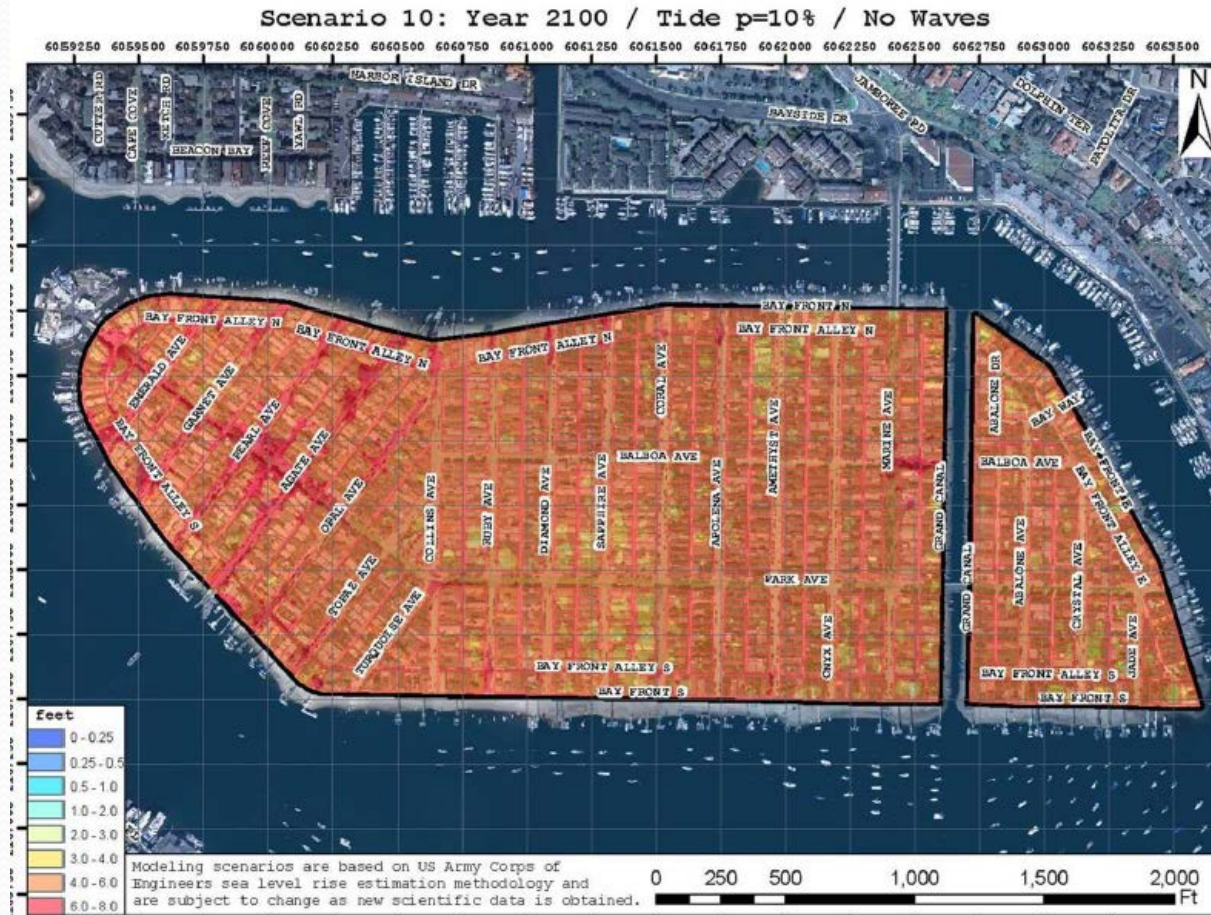
# Significant Flooding in 2005 and 2010



When tide gates are closed for high tides, flooding on the island is a combination of seawall overtopping and rainfall.

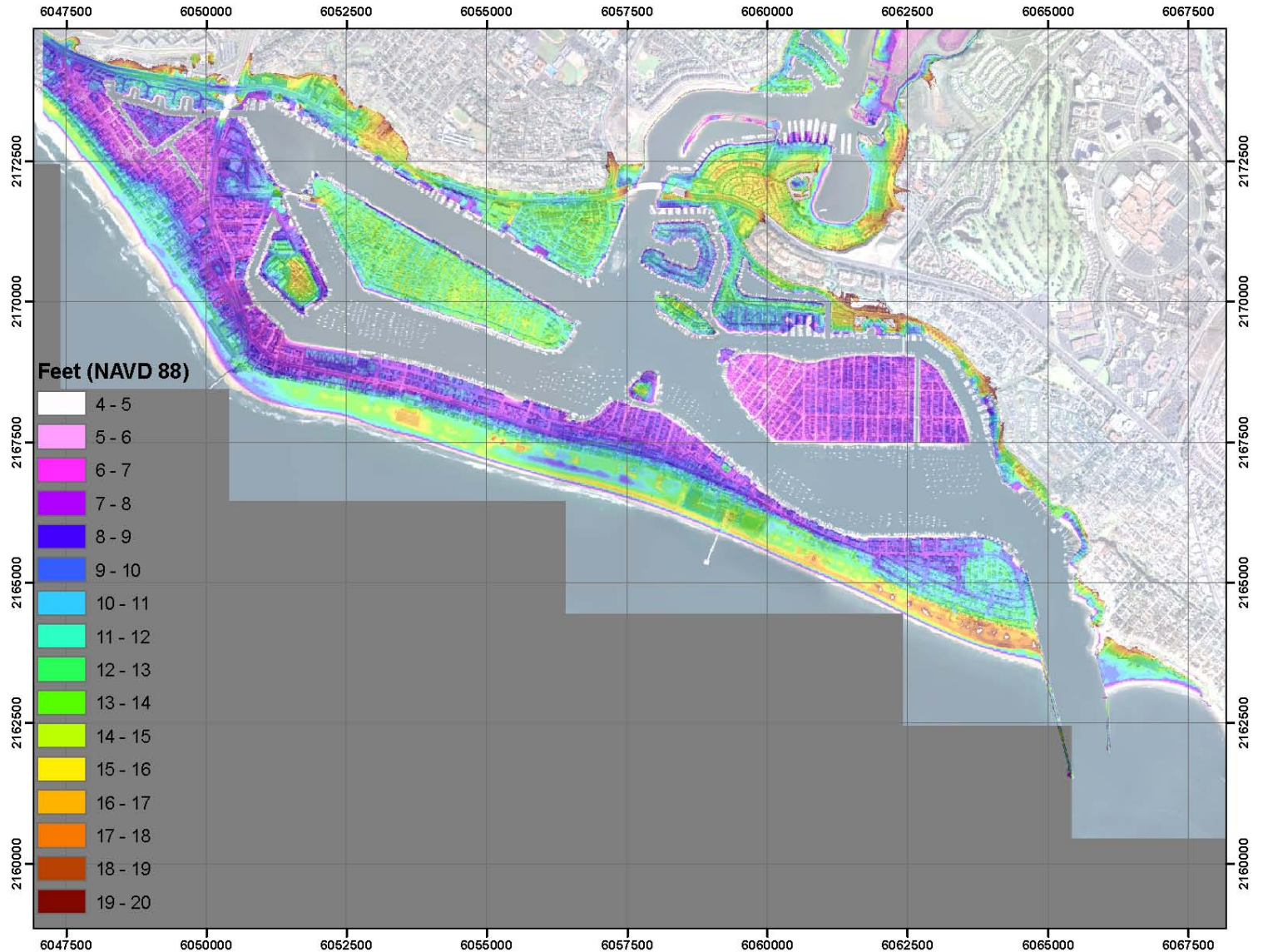


# The front cover of a 2006 issue of the Daily Pilot shows Balboa Islands underwater.



This exhibit from the City 2011 analysis.

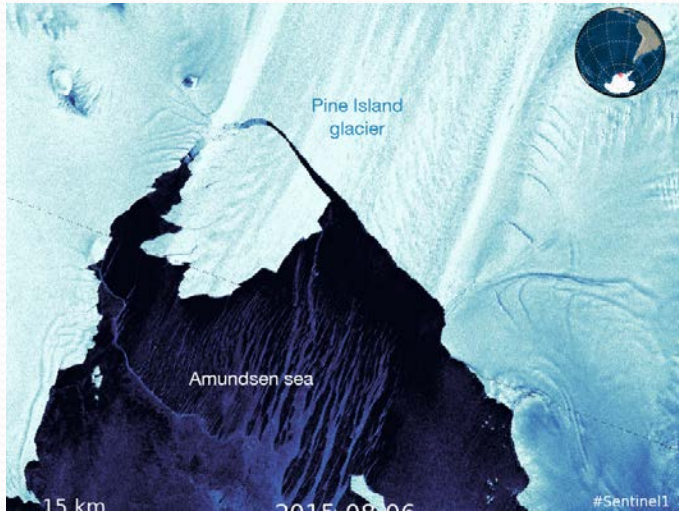
# Topography Around the Bay



# Projected Sea Level Rise – 2100

- Mean sea level rise is expected to be in the range of 24-36 inches.
- California State Coastal Conservancy in 2009 adopts a Climate Change Policy that agencies should prepare for a 55-inch sea level rise by 2100. (high confidence)
- California Coastal Commission (2015) recommends planning for a 66-inch sea level rise by 2100.

# 10 foot sea level rise by 2100?



California Coastal Commission considers having coastal communities prepare plans for 10-foot sea level rise by the end of century.

# Areas prone to flooding if 66-inch sea level rise by 2100

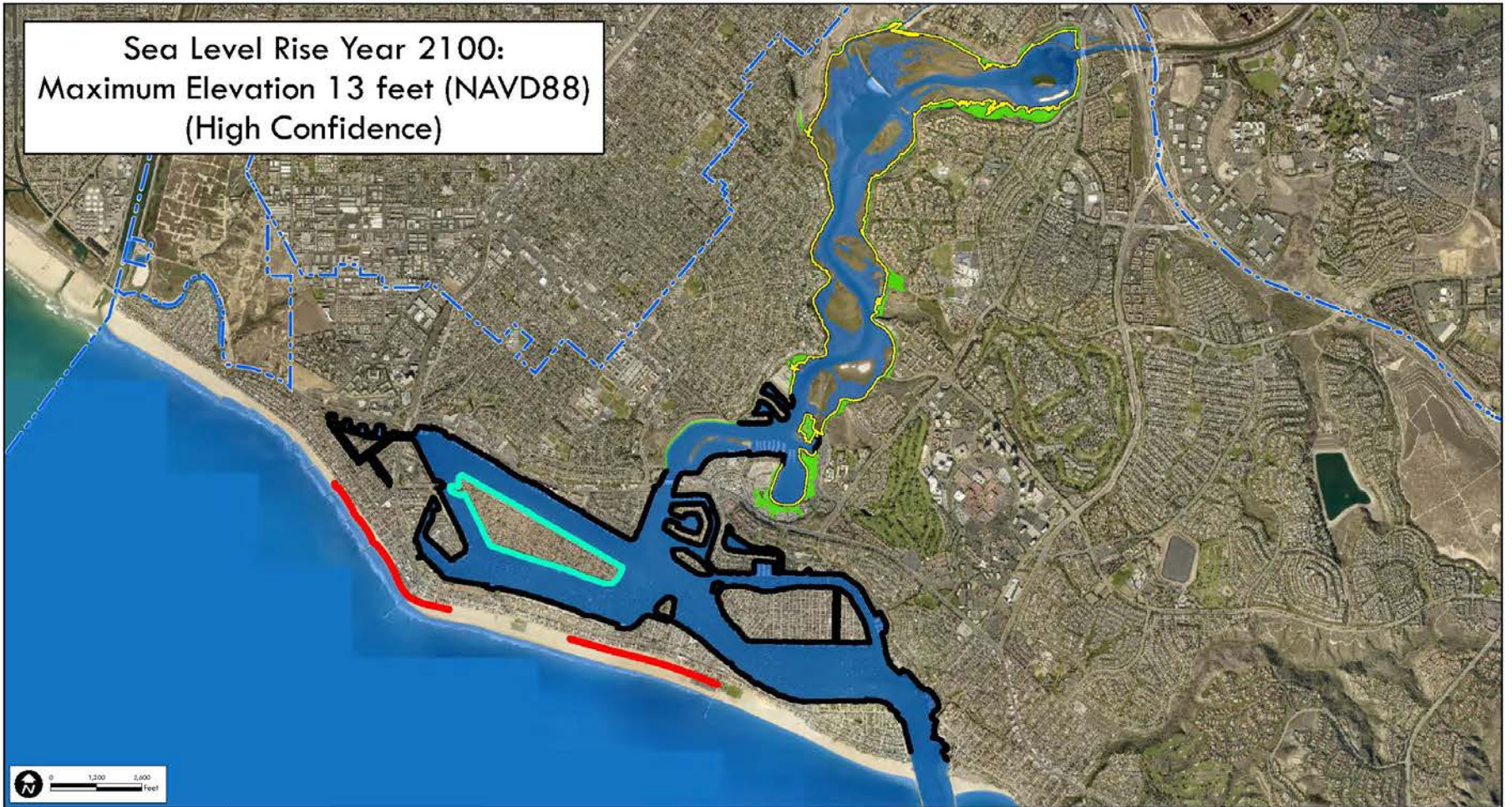




# Public and Private Seawalls & Bulkheads in Newport Harbor (~18 linear miles)



Sea Level Rise Year 2100:  
 Maximum Elevation 13 feet (NAVD88)  
 (High Confidence)



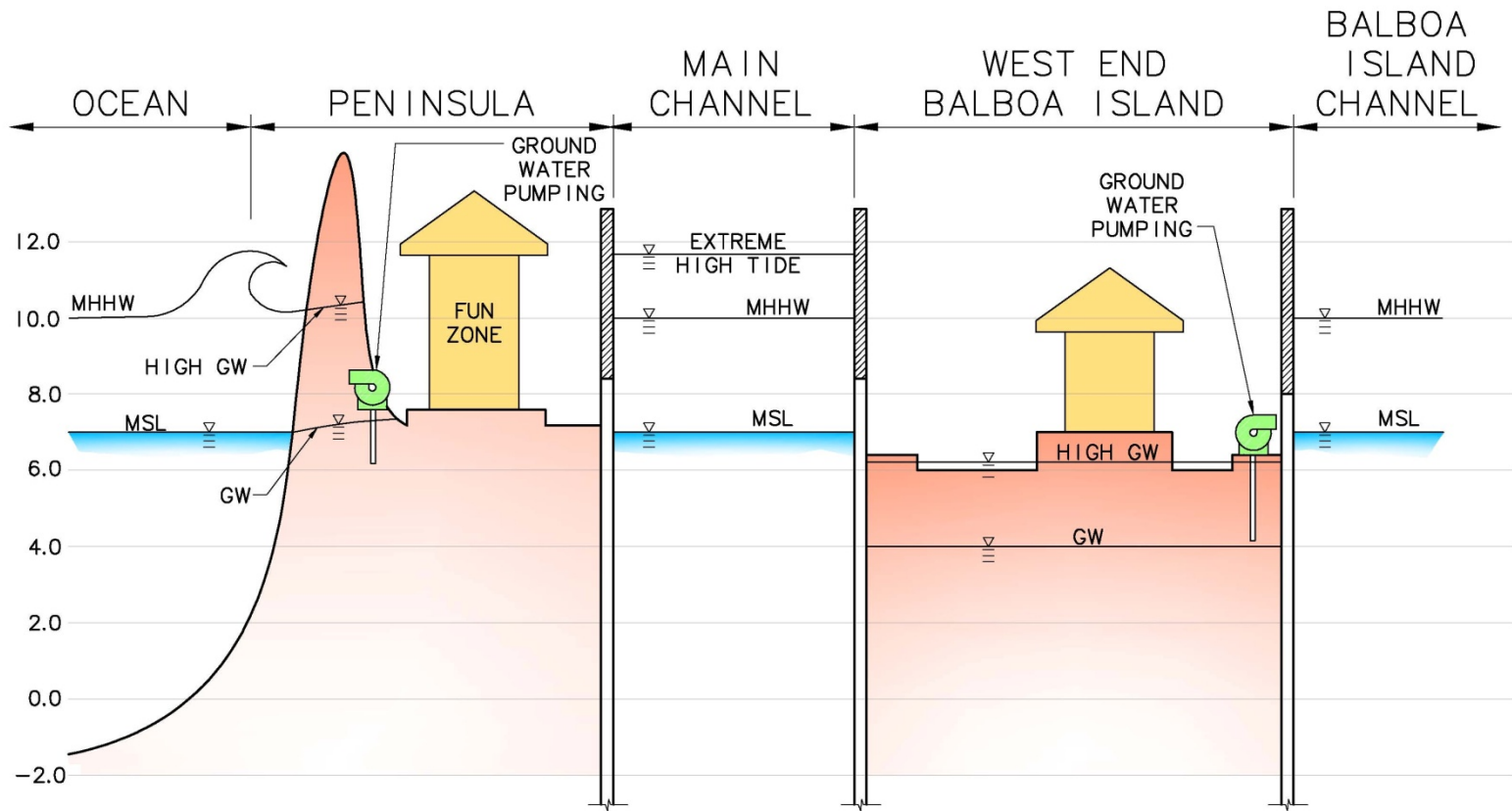
- Seawalls and Bulkheads
- Amending Shore Protection
- Beach Berms
- Mean High Tide 2015 - 4.5 ft. (NAVD88)
- Extreme High Tide 2015 - 7.5 ft. (NAVD88)
- Extreme High Tide 2100 - 13 ft. (NAVD88) - Inundation Area (High Confidence)



City of Newport Beach  
 GIS Division  
 August 13, 2015

SeaWolox2.mxd

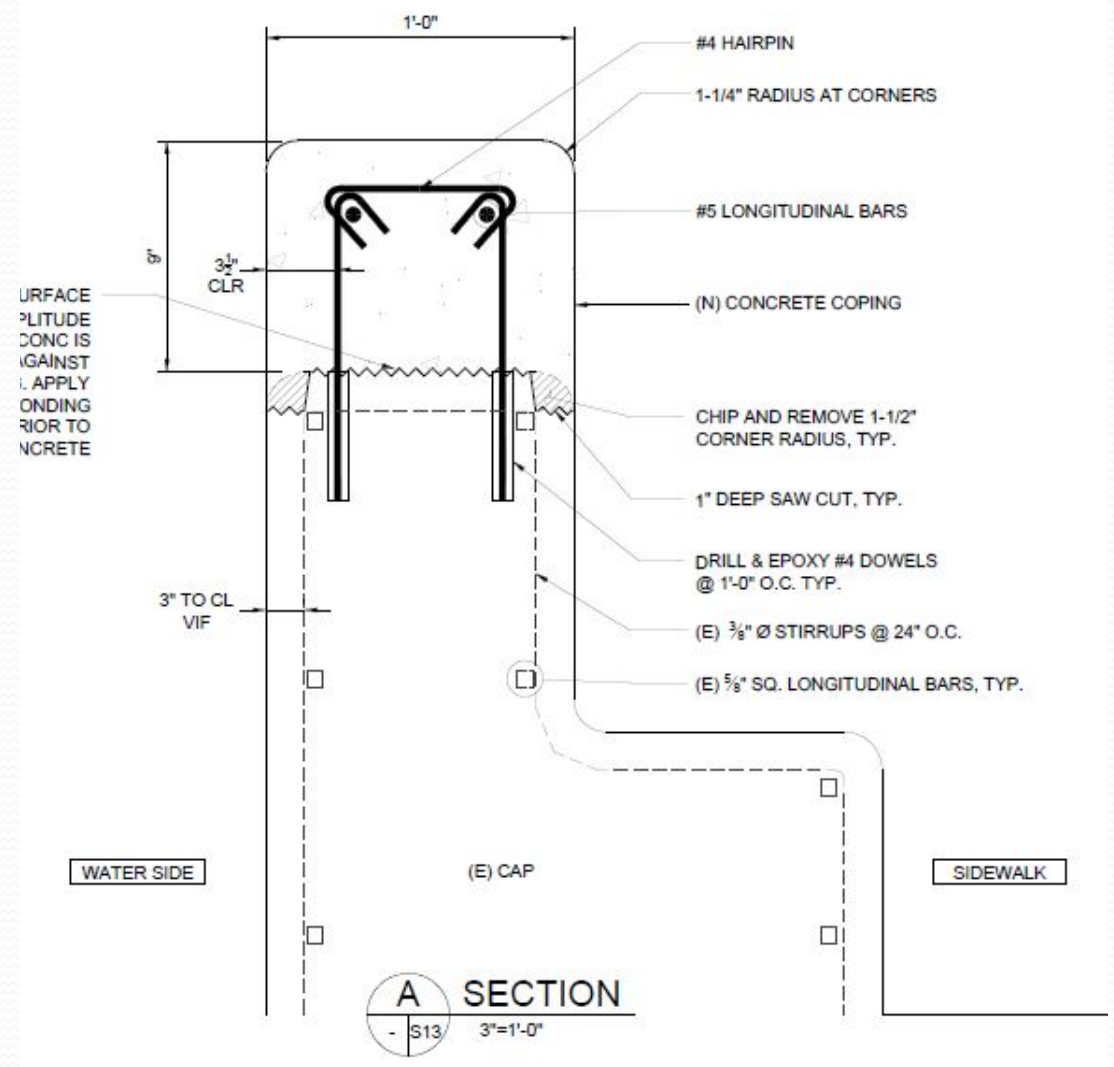
# Higher Seawalls and Beach Berms Protect the Harbor (2100)



GW = GROUNDWATER

MSL = 2.59' NAVD88 (2.77' MLLW)

# Balboa Island: The Immediate "Solution"



# Drilling holes for dowels. Jack-hammering corners.



# Dowels installed. Forms



# 9-Inch High Cap



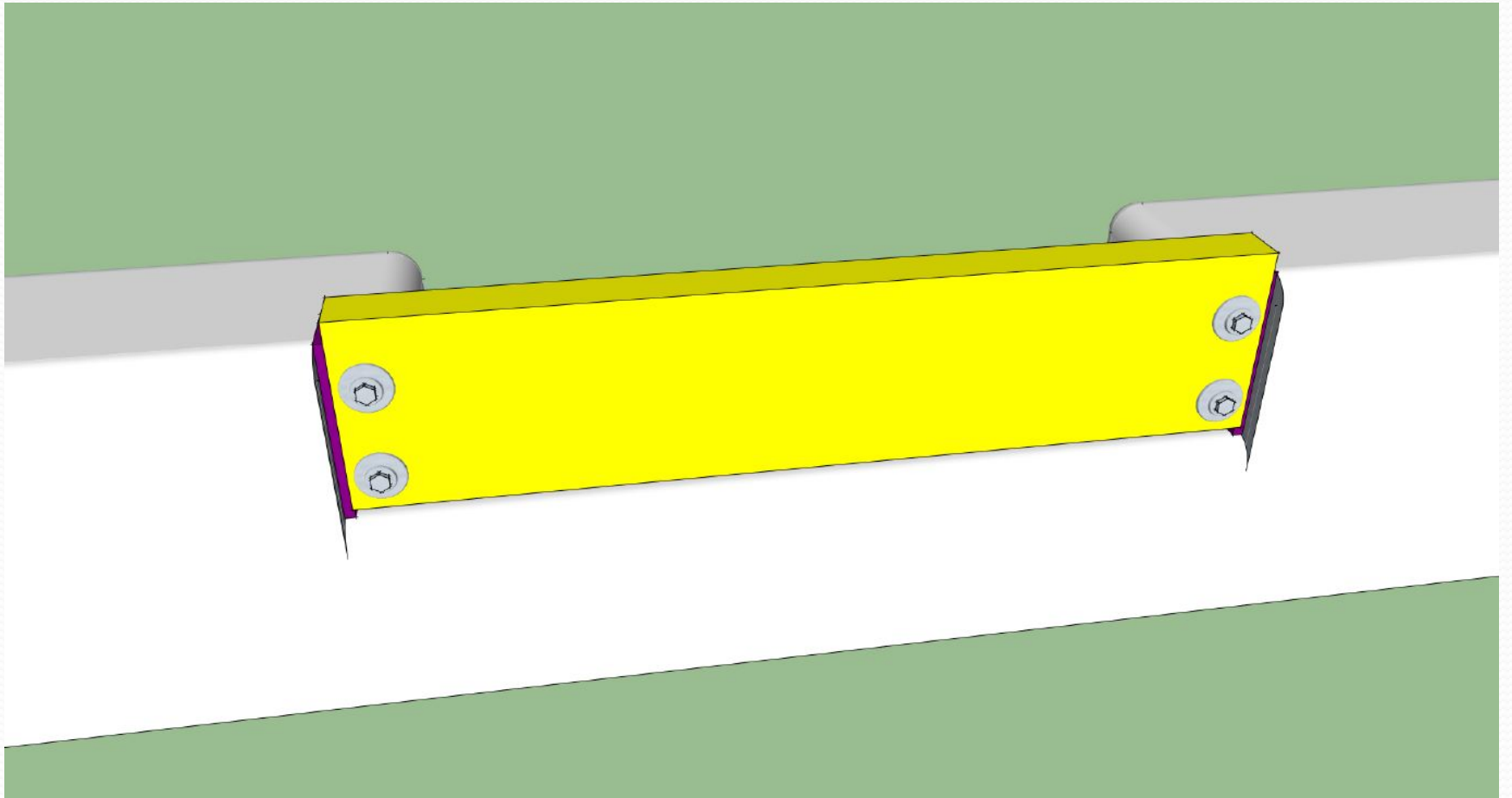


IF ALL TREES TRIMMED  
8 FT. HIGH - TRIMMING  
TOLDS  
PERSONS WALKING DOGS  
MUST REMOVE FEELS  
REPORTED BY THEIR  
OWNER AND MUST CARRY  
BAGGAGE FOR THE  
DURATION OF THE TRIP

DON'T  
JUMP!

**NO** ALCOHOLIC BEVERAGES  
SMOKING  
PICNICS  
LITTERING  
GLASS ON BEACHES OR WALKS  
DISCS ON BAY BEACHES  
BICYCLES ON WALKS





“Sleeper”  
Step to  
Private  
Docks



# Stepping Up and Over onto Private Dock

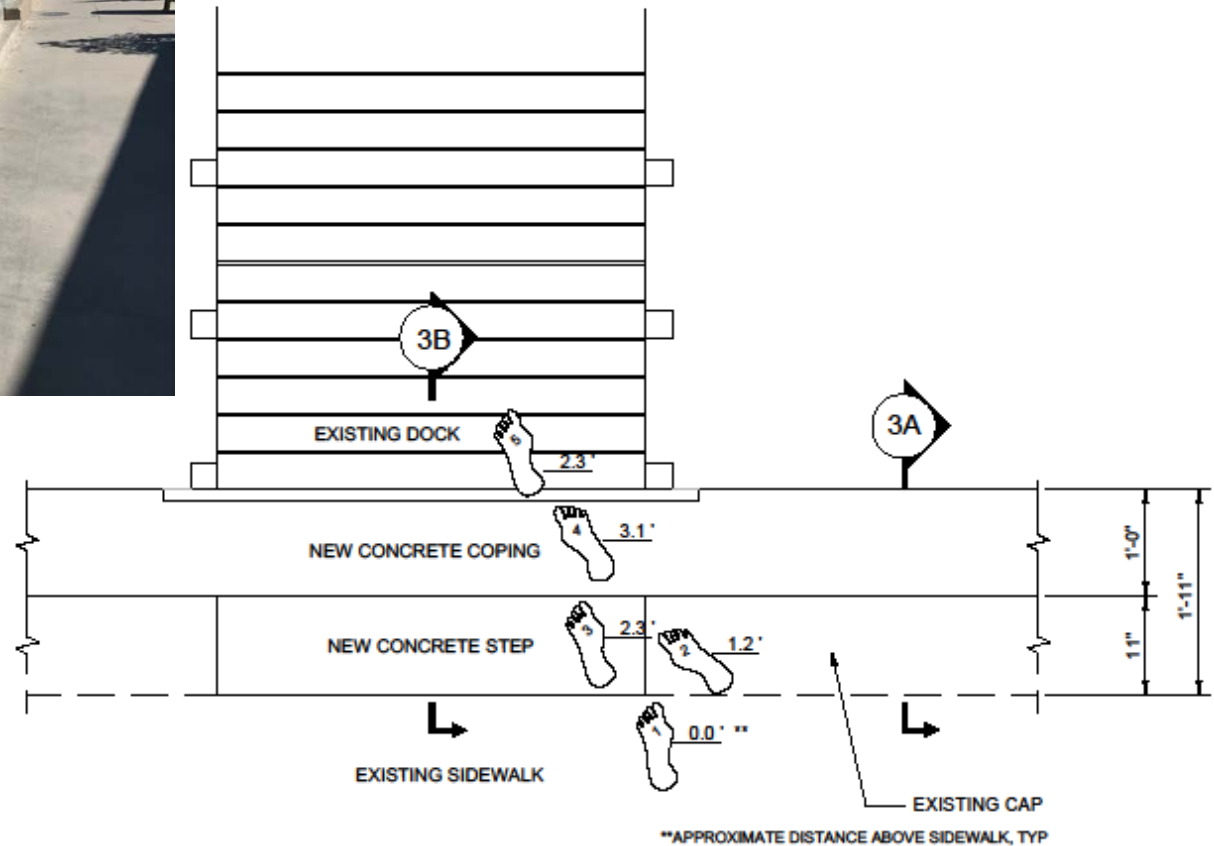


EXHIBIT C – PLAN VIEW SHOWING NEW CONCRETE STEP AT PRIVATE DOCK

NTS

# When Would Seawalls be Replaced?

- Harbor seawalls over 60 years old.
- Seawalls around Balboa Island are 79-89 years old.
- Seawall useful lifetime ~75 + years.



Newport Harbor 1955

# Pending: Stormwater Pump Stations





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