

Hingham Harbor Resiliency Project June, 2024 Update

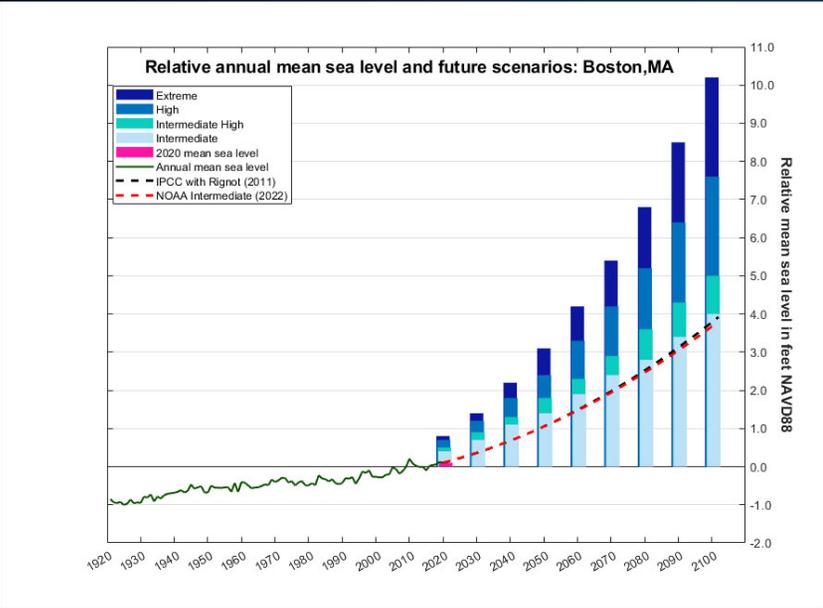


Sea Level Rise Evaluation and Coastal Design Guidance

- Evaluation of available sea level rise projections
- Analysis of available coastal processes data
- Wave transformation modeling to determine wave conditions along Hingham Harbor shoreline
- Determination of appropriate coastal structure elevations and dune dimensions to achieve present and future flood mitigation design conditions



Updated Federal SLR Projections (NOAA, 2022) Used as Guidance



Relative mean sea level (feet, NAVD88) projections for Boston, MA as presented in Sweet, et al., 2022

Scenario	Probabilistic projections	2030	2050	2070
NOAA - Intermediate	Conditions that are about as likely as not to occur or, in other words, a 50% chance of occurrence (RCP 8.5)	0.4	1.0	1.8

Coastal Analysis – Present and Future Conditions

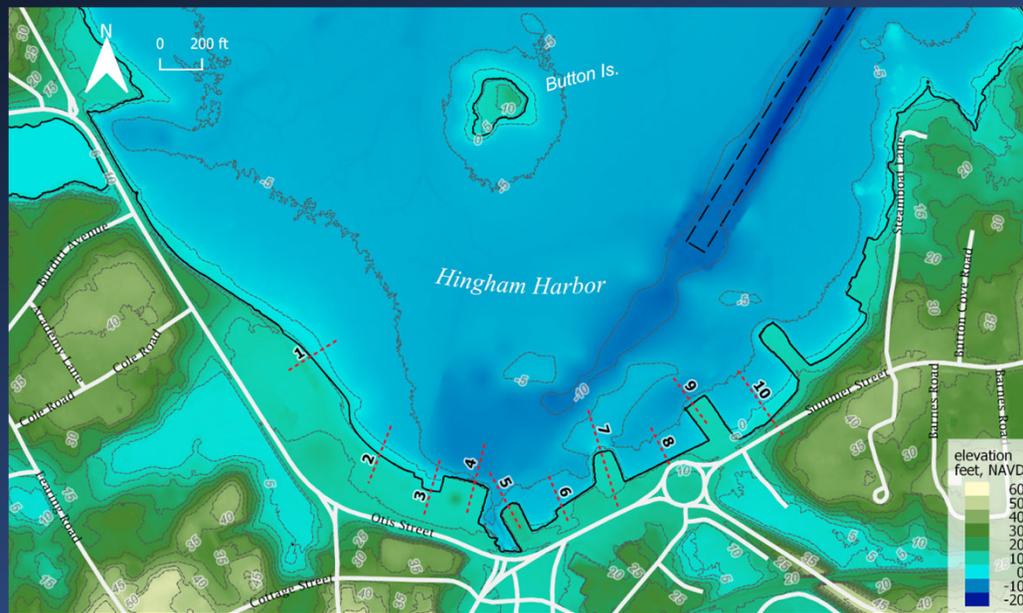


Table 3. Coastal analysis transects.

Transect no.	Transect description	Foth plan wall station	present condition	present crest elev. ft, NAVD	proposed intervention
1	Bathing Beach W, dune		beach	10.8	dune
2	Bathing Beach E, no dune		beach	8.5	dune
3	Otis Street	0+50	beach	8.7	dune/berm
4	Town Wharf	3+25	vertical wall	7.2	wall crest extension
5	Witney Wharf	11+50	vertical wall	10.5	wall crest extension
6	Summer Street, W of rotary	15+00	vertical wall	7.3	revetment
7	Kimball's Wharf	18+25	vertical wall/toe revetment	8.6	wall crest extension
8	Rotary	21+00	vertical wall	10.6	wall crest extension
9	Barnes Wharf	25+75	vertical wall	7.2	wall crest extension
10	Summer Street, E of rotary	31+00	vertical wall	9.6	wall crest extension

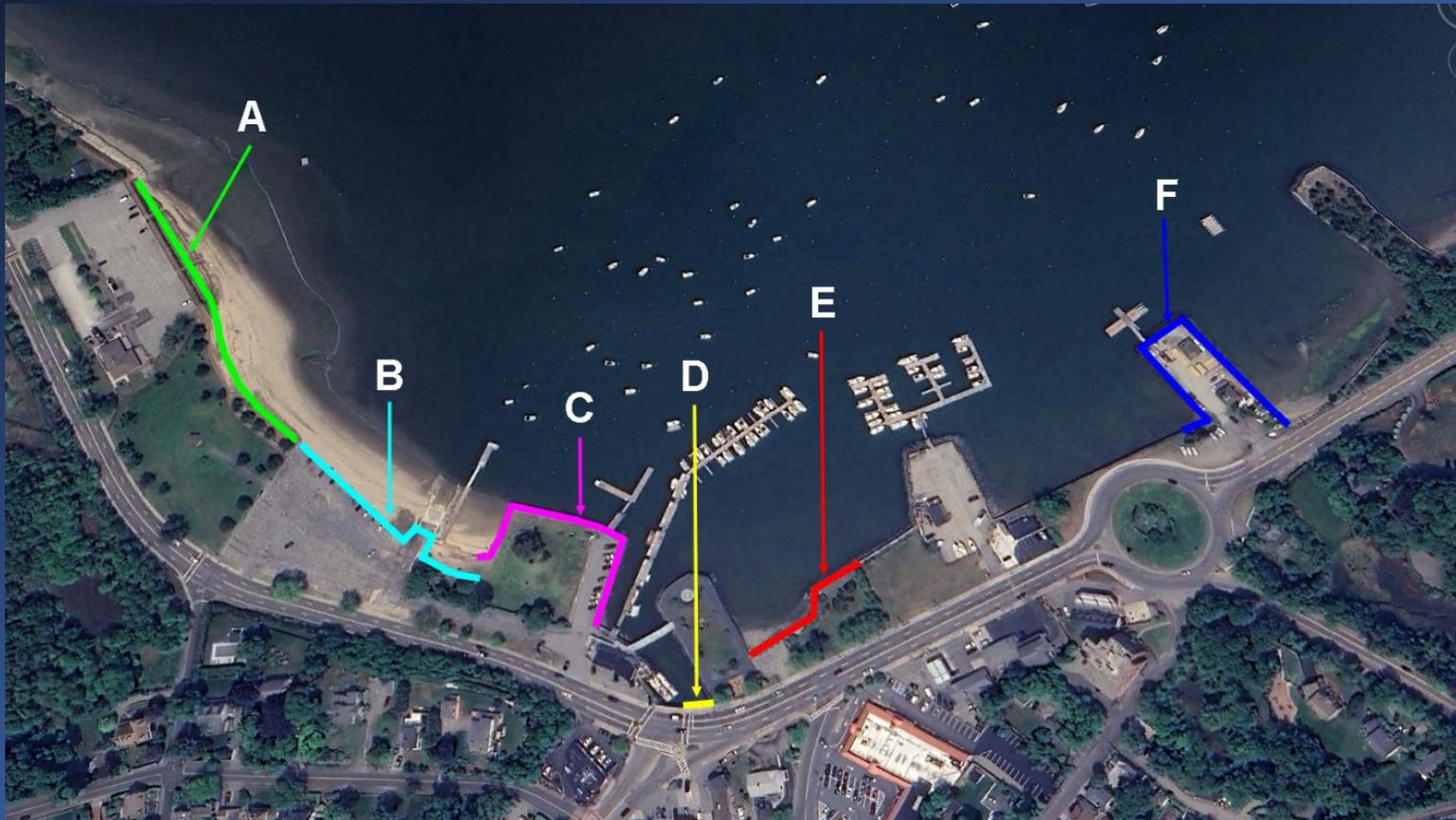
Coastal Analysis – Site Elevations

- 10 feet NAVD ~ 100-year storm surge level



Resiliency Design Areas

- Working with MassDOT Route 3A Improvement Project



Coastal Analysis – Required Coastal Structure Height

- Reduce wave overtopping to ensure paved surfaces are not damaged

Vertical wall crest elevations, in feet NAVD88, to prevent damage to paved surfaces from wave overtopping, for present, 2050, and 2070 sea level scenarios.

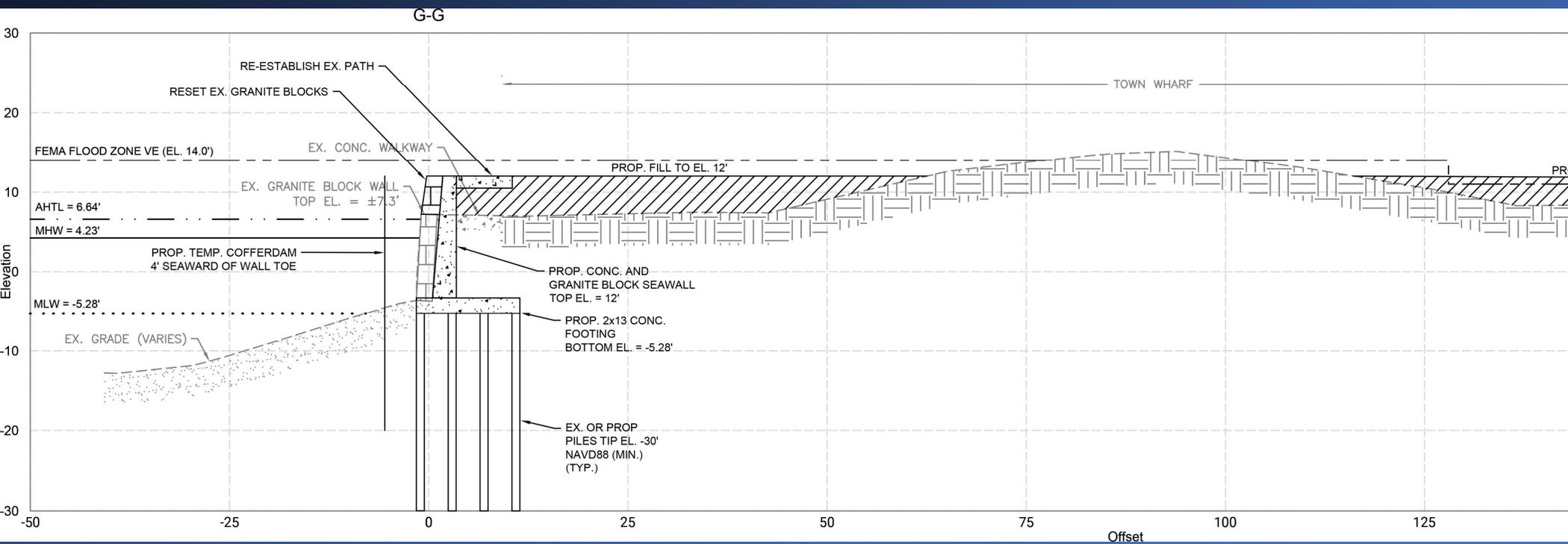
transect	Sea level scenario		
	present	2050	2070
4	11.0	12.1	12.9
5	11.0	12.0	12.9
7	10.9	12.0	12.9
8	10.9	12.0	12.8
9	10.9	12.0	12.8
10	11.0	12.1	12.9

Revetment slope crest elevations, in feet NAVD88, to prevent damage to paved surfaces from wave overtopping, for structures with 1:1.5 and 1:2.0 slopes, and for present, 2050, and 2070 sea level scenarios.

	Sea level scenario					
	present		2050		2070	
	1.5	2.0	1.5	2.0	1.5	2.0
slope						
Transect 6	13.0	11.9	14.0	12.9	14.8	13.7

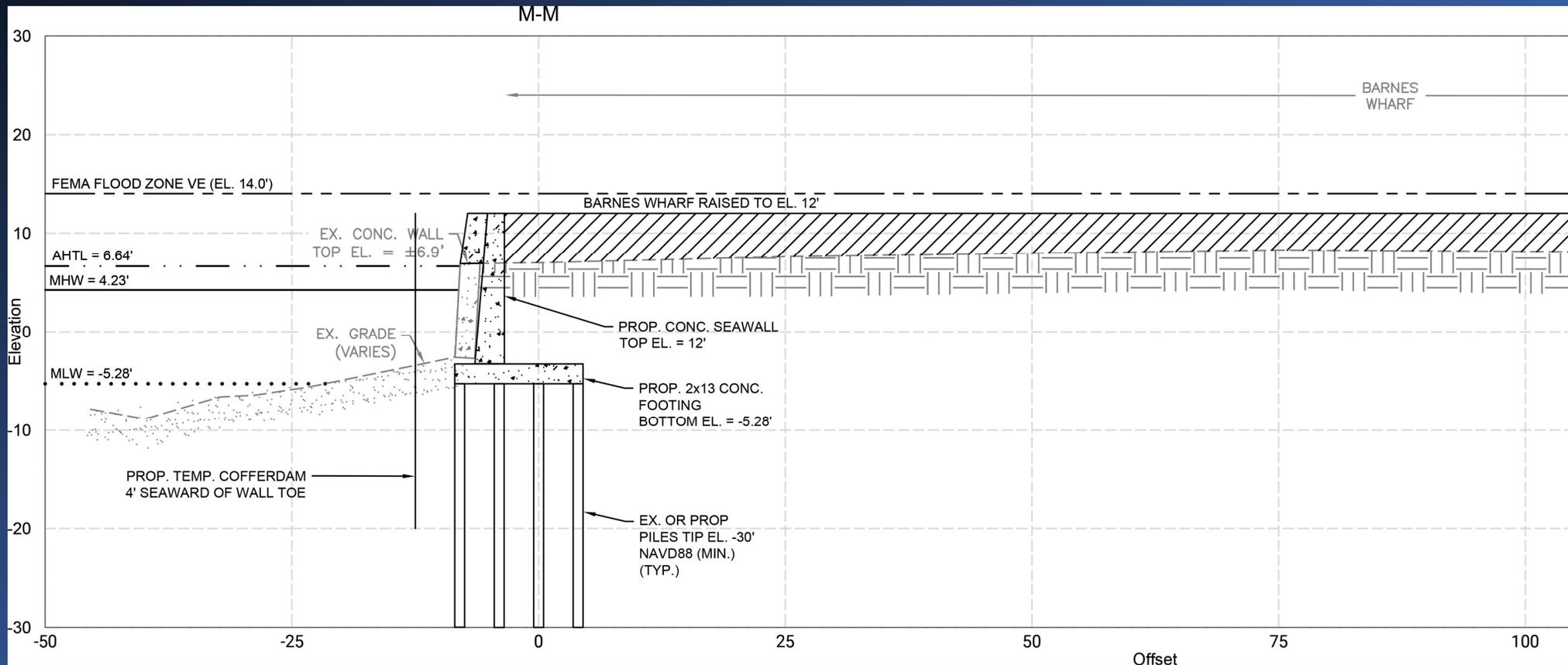
Increase Wharf Elevation to 12 feet NAVD

- Town Wharf (also move Harbormaster's Building to SW Corner near Boat Ramp)
- Barnes Wharf (also move building and pavilion to SE corner)

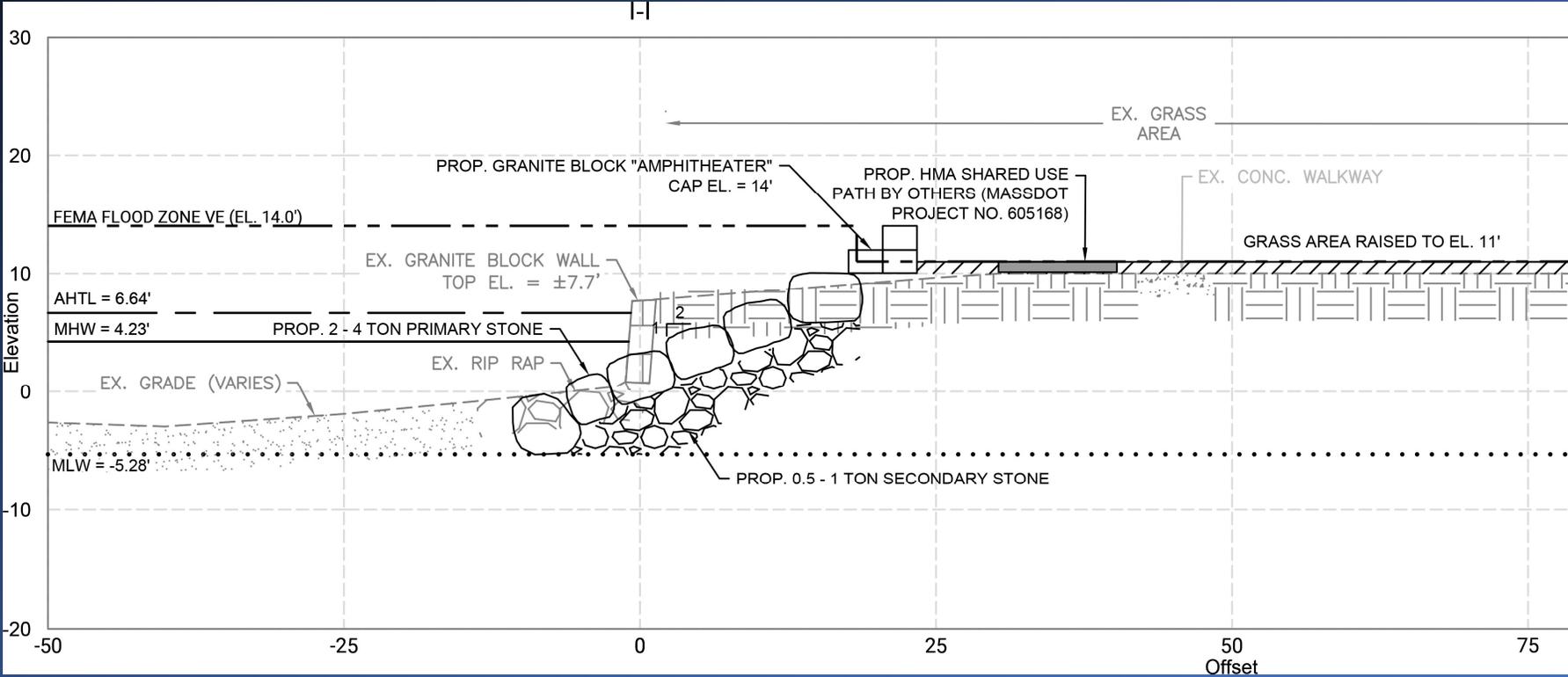


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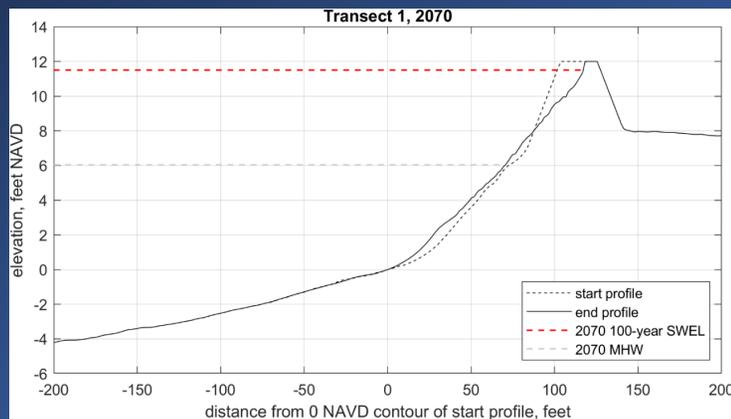
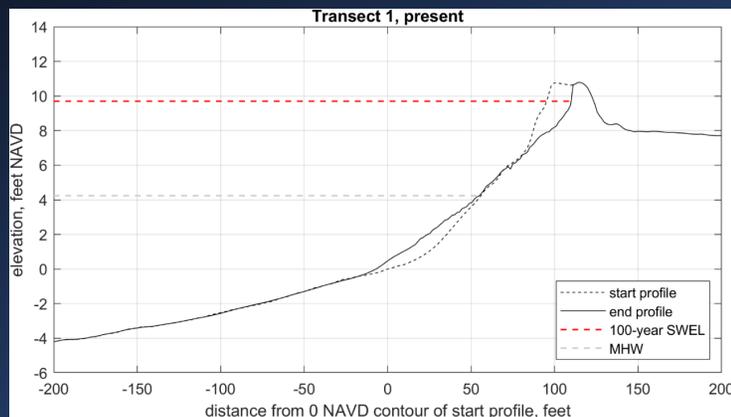


POW/MIA Memorial Park Revetment Improvement (14 feet NAVD)



Coastal Analysis – Required Dune Dimensions

- Ensure dune is not overtopped and volume will not be eroded during a major storm

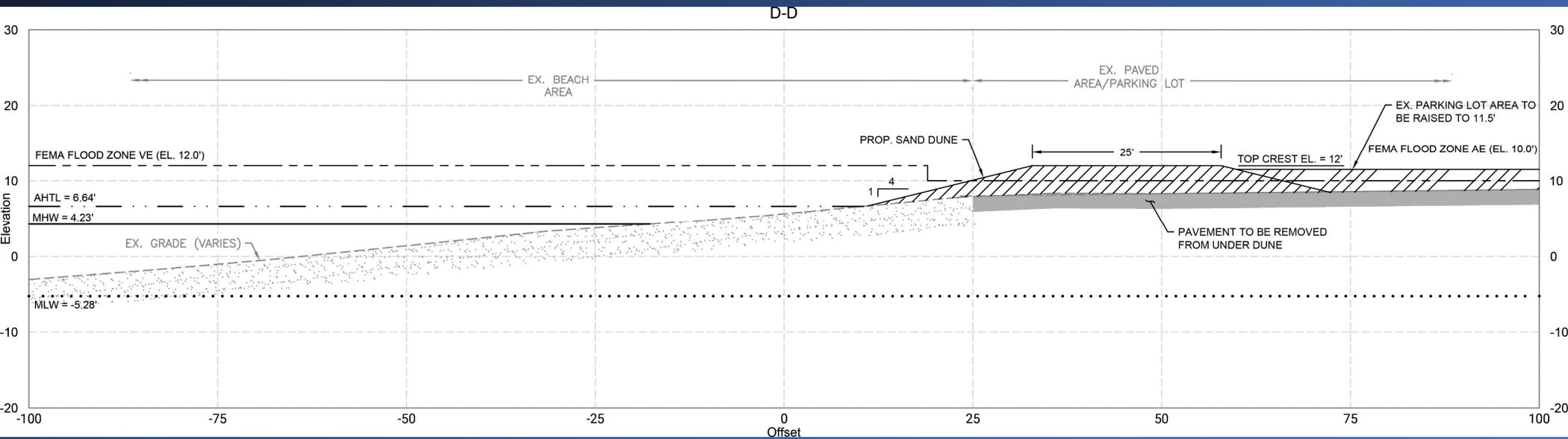


Dune crest elevations and crest widths, in feet NAVD88, to prevent wave overtopping and erosion during 100-year storm event; for present, 2050, and 2070 sea level scenarios.

	Sea level scenario					
	present		2050		2070	
	elevation	crest width (ft)	elevation	crest width (ft)	elevation	crest width (ft)
Transect 1	10.7	22	11.0	22	12.0	22
Transect 2	10.7	22	11.0	22	12.0	22

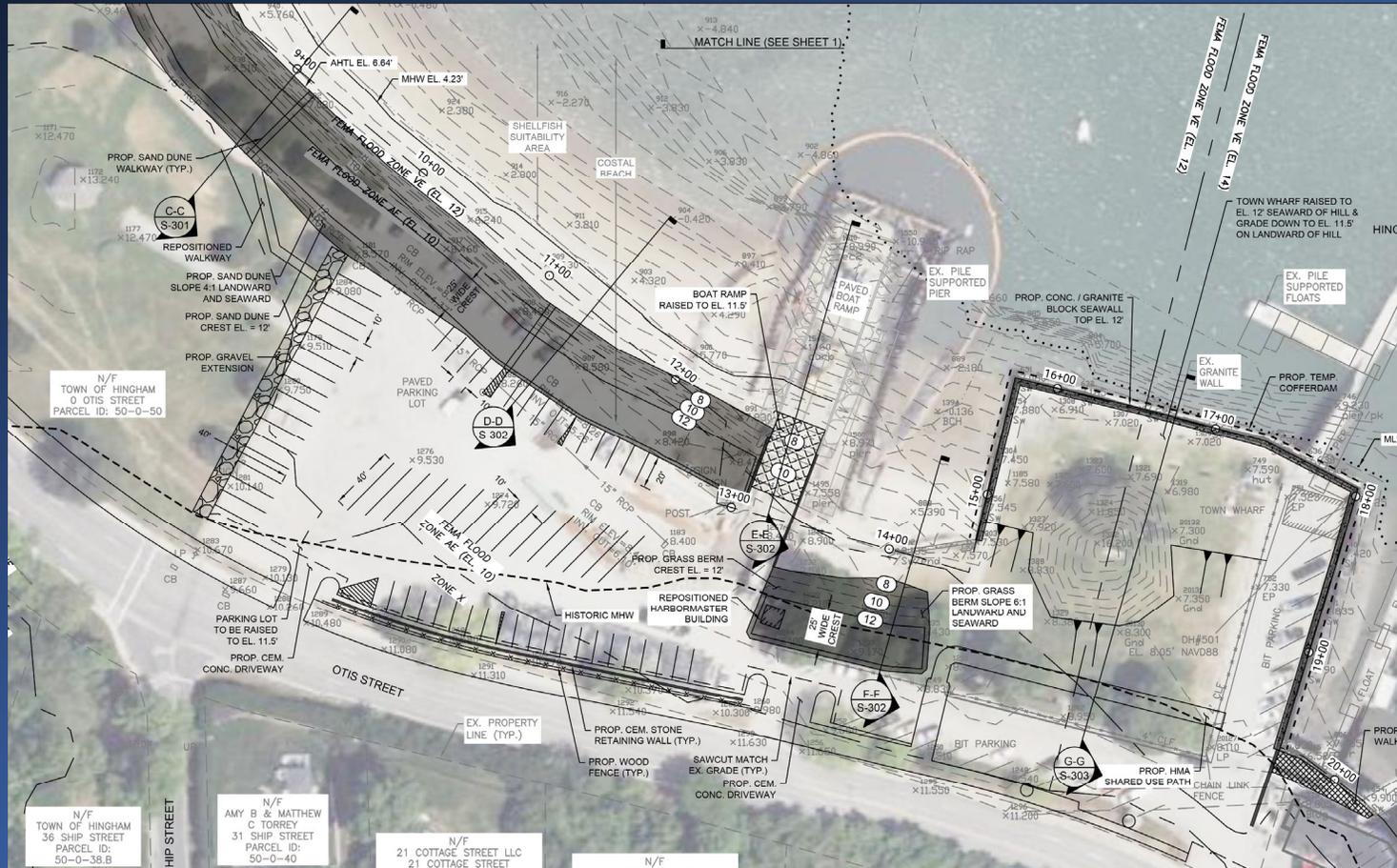
Coastal Dune and Berm Enhancement to Elevation to 12 feet NAVD

- Bathing Beach to Boat Ramp - Dune
- Boat Ramp to Town Wharf - Vegetated Berm



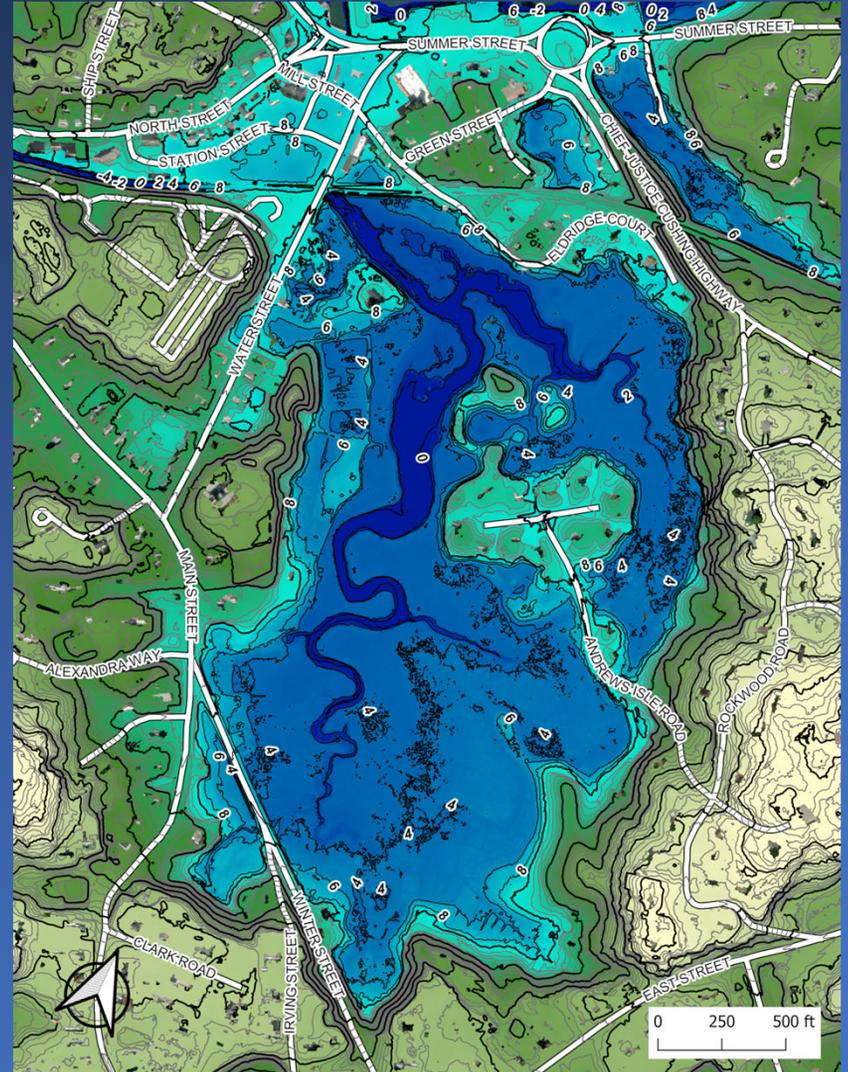
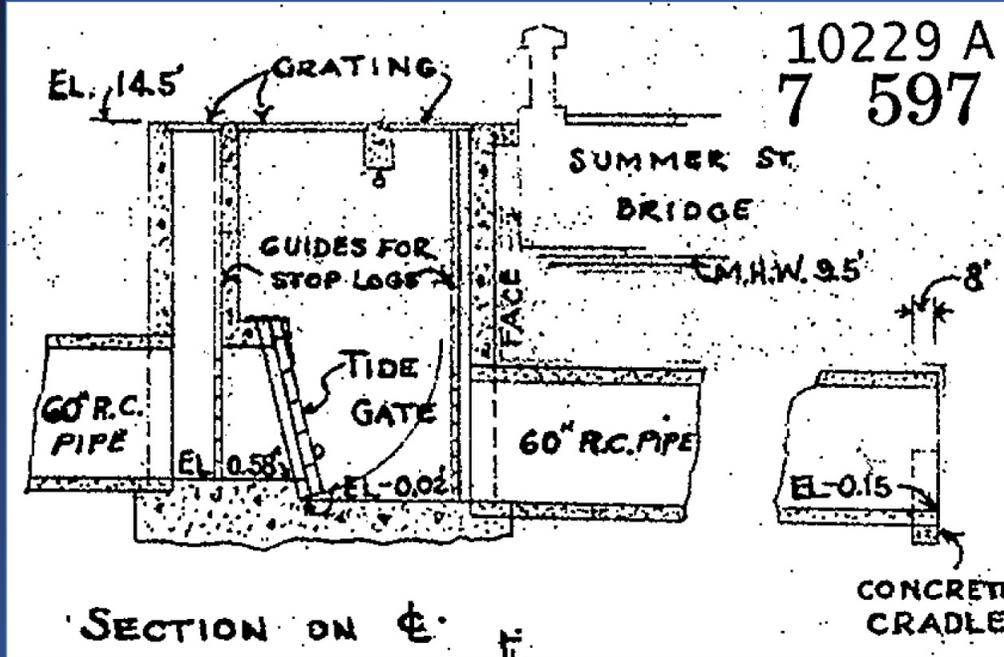
Coastal Dune and Berm Enhancement to Elevation to 12 feet NAVD

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Home Meadows Culvert

- Install new tide gate
- Gate will only be closed at extreme storm conditions



Questions

