



Pine Creek Dike Elevation Increase Study

April 16, 2014

Presented To: Town of Fairfield Flood & Erosion Control Board
and Pine Creek Association by:

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Background

- **Constructed in late 1960's / early 1970's**
- **Additional capstone revetment installed in 1986**

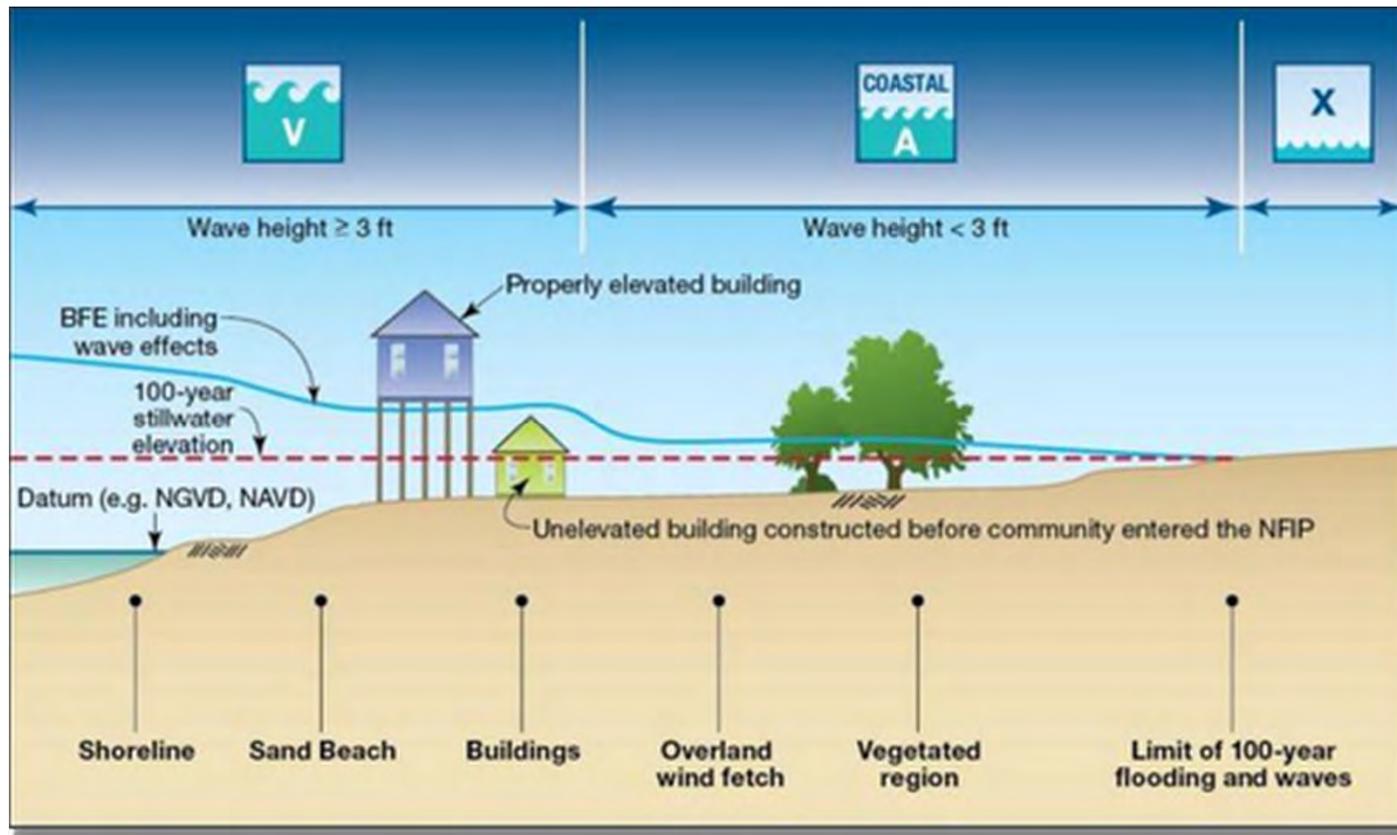


Background

- Serves as barrier between coastal VE zone and AE zone



Background



Storm Damage

- **Nearly overtopped during Super Storm Sandy – storm timing saved area from significant flooding**
- **Erosion from Sandy and Irene**





Scope of Feasibility Study

- **Visual Assessment**
- **Coastal Engineering Assessment**
- **Recommendations for Dike Height**
- **Opinion of Probable Cost**

Study Limits



Visual Assessment

Minor Displacement of Chink Stones



Revetment at Entrance to Pine Creek



Visual Assessment

Erosion at Top Of Revetment



Visual Assessment

Typical Earthen Section Within Pine Creek



Dock Structures and Vegetation Over Dike

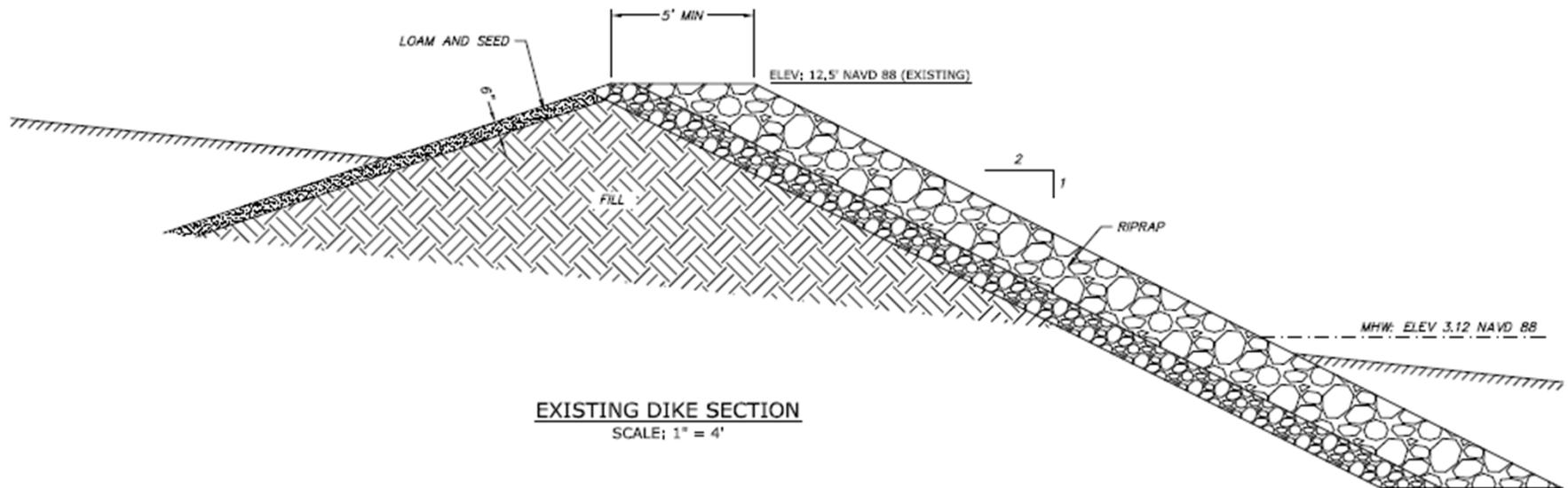


Visual Assessment

Dock Structures and Amenities over Dike



Coastal Engineering Assessment



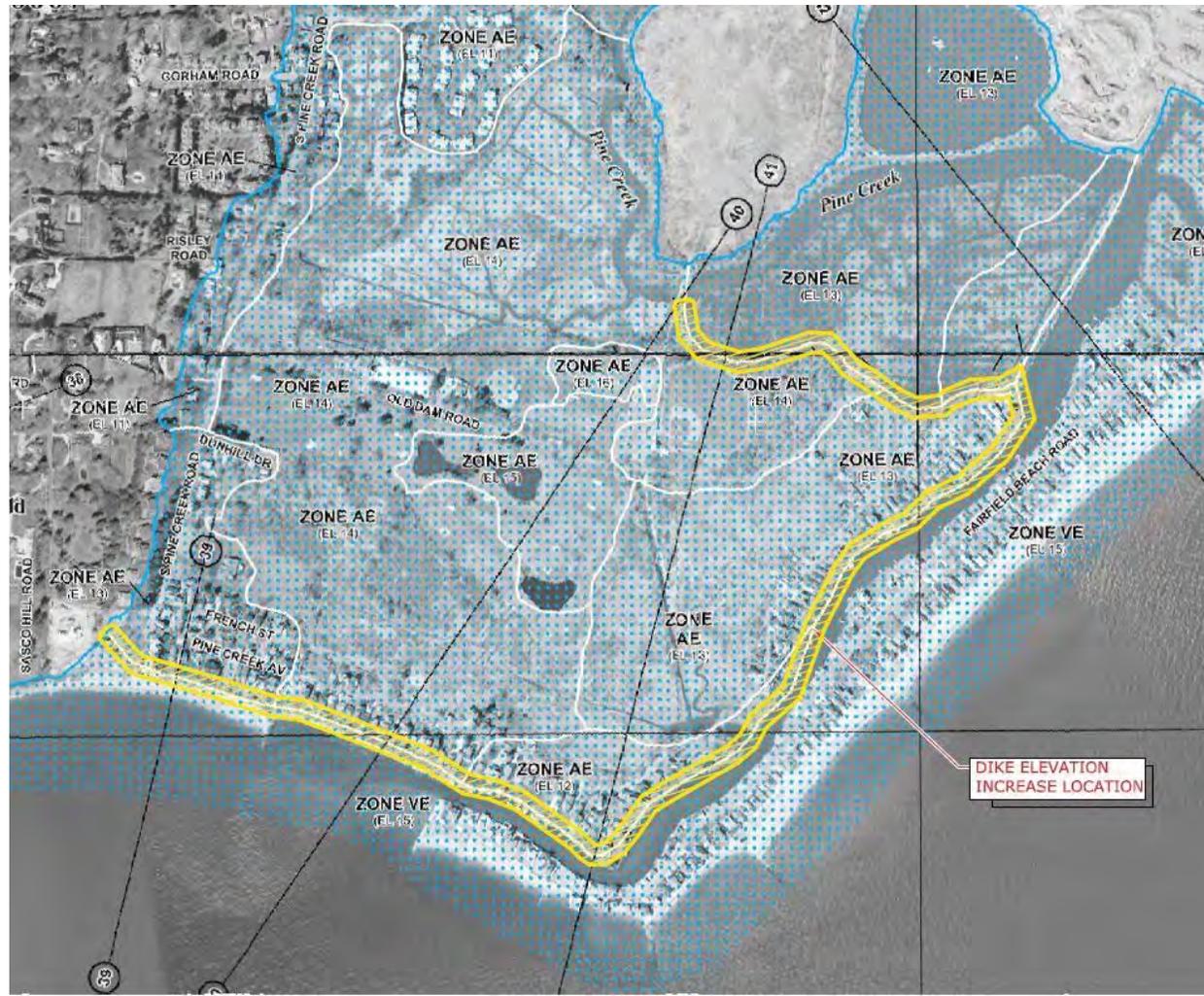
Coastal Engineering Assessment

- **Stillwater elevation during Sandy reached 100-Year stillwater elevation**
- **Total water level (stillwater elevation plus wave runup) did NOT reach FEMA Base Flood Elevation**

Storm Comparison	Sandy			FEMA
	H _s	H _{10%}	H _{1%}	H _{1%}
Wave Height (ft)	1.9	2.4	3.2	
SWL El. (ft NAVD 88)	10.3	10.3	10.3	10.2
Wave Runup (ft)	2.2	2.6	3.1	4.8 ⁽¹⁾
Base Flood Elevation (ft NAVD 88)	12.5	12.9	13.4	15.0

⁽¹⁾ Back-calculated from wave crest elevation at Transect 40

Coastal Engineering Assessment

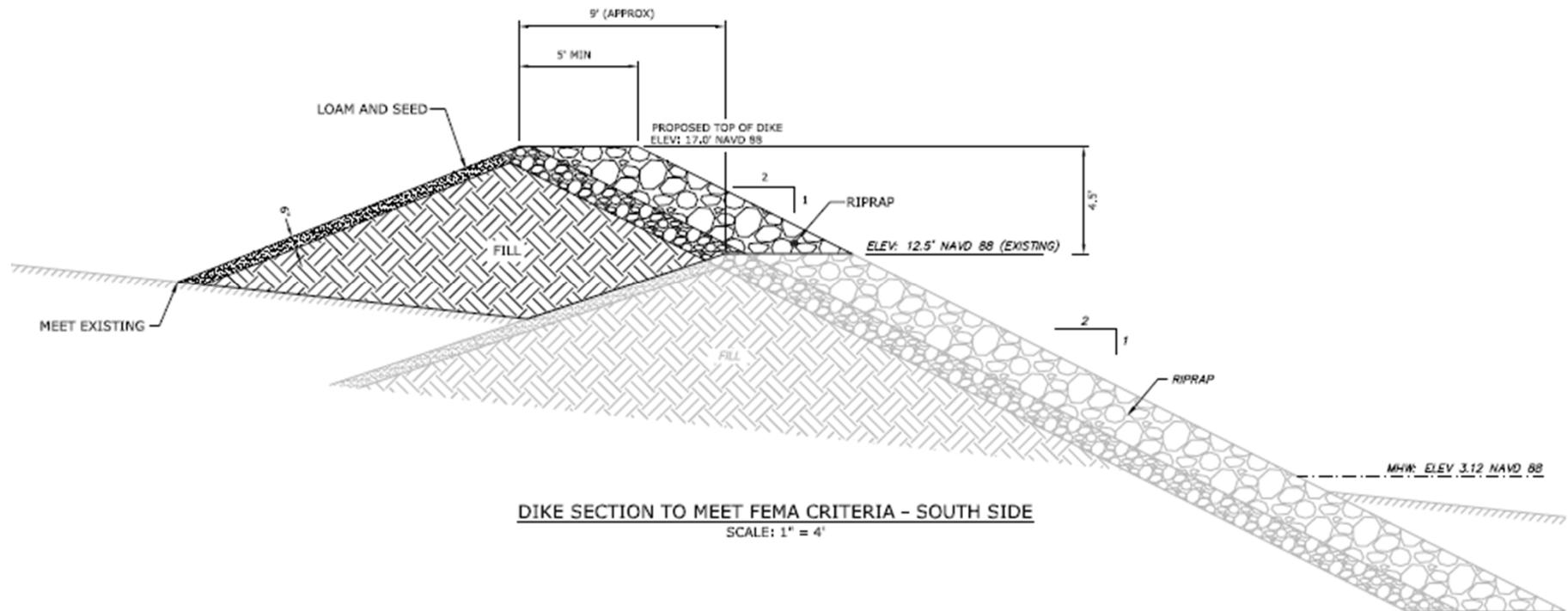




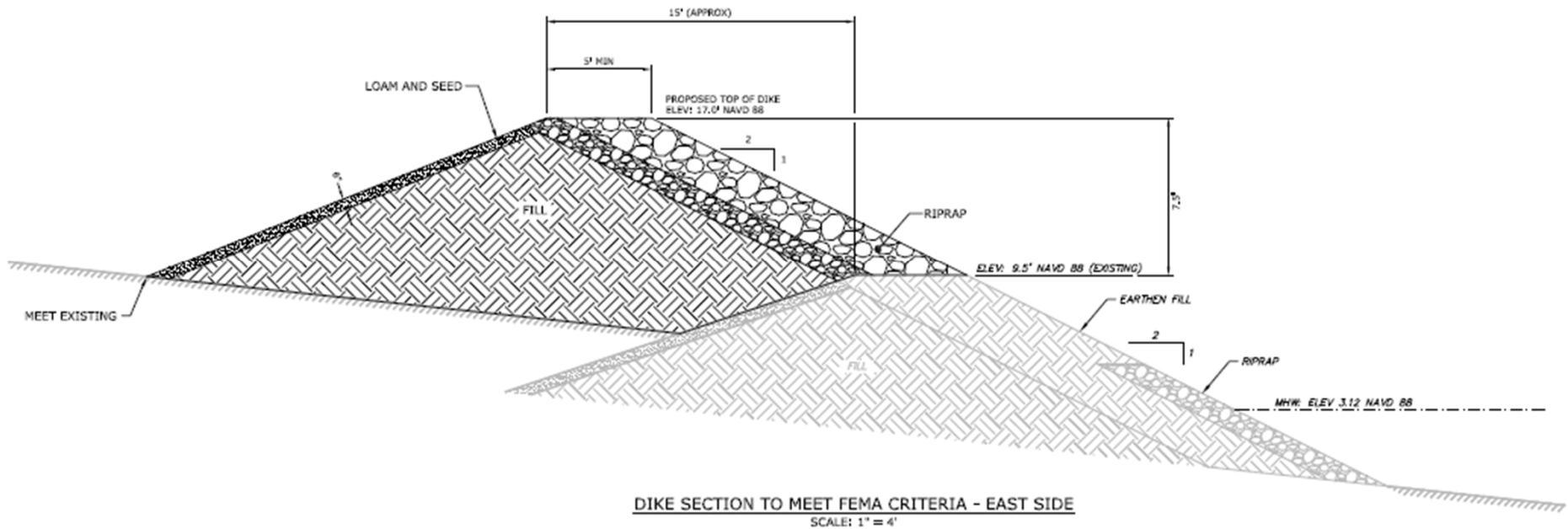
Coastal Engineering Assessment

- **Base Flood Elevation (BFE) = El. 15.0 NAVD 88**
- **FEMA Flood Hazard Mapping Criteria: 2' freeboard above BFE for coastal flood control structures**
- **Dike elevation would need to be raised to El. 17 to meet FEMA criteria (4.5' above existing on south side, 7.5' above existing on east side)**

Coastal Engineering Assessment



Coastal Engineering Assessment

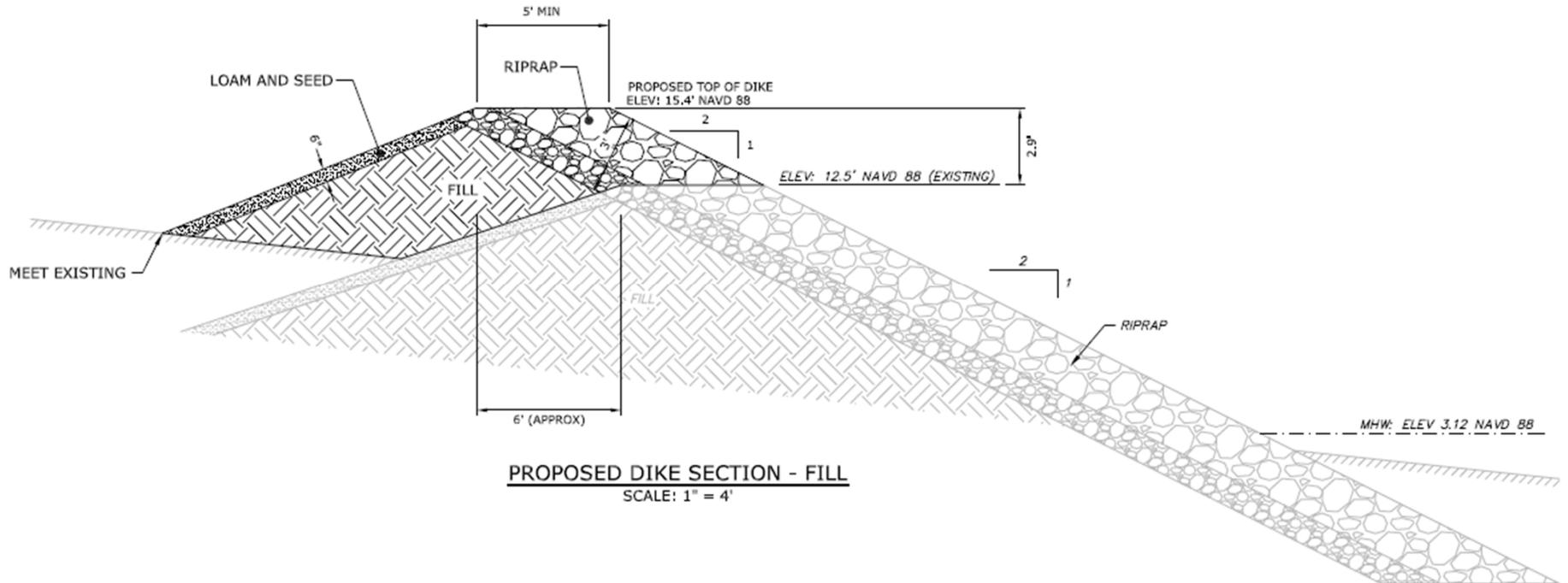




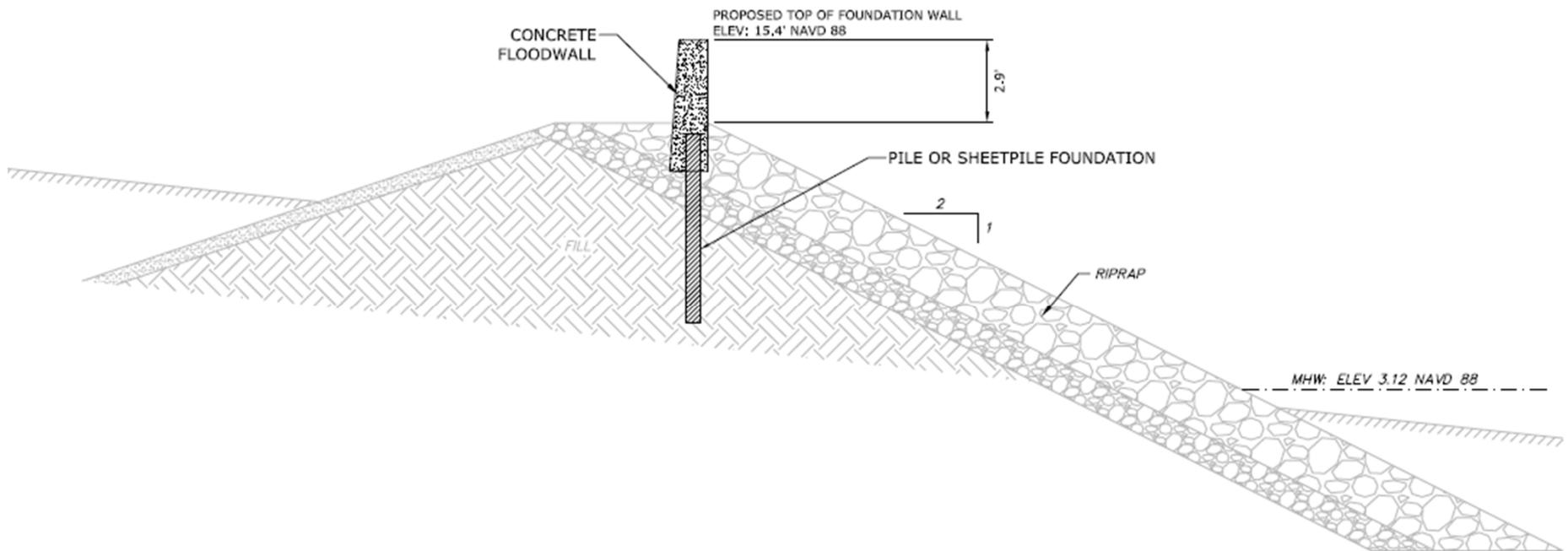
Elevation Increase Recommendations

- **Provide 2' of Freeboard above 1% Max. Wave Runup from Sandy**
- **Approximately 2.9' increase (El. 15.4 on south face, El. 12.4 on east face)**
- **Would provide protection from 100-Year storm on south side, 100-Year stillwater elevation within Pine Creek**

Elevation Increase Recommendations



Elevation Increase Recommendations



PROPOSED DIKE SECTION - FLOODWALL
SCALE: 1" = 4'



Elevation Increase Recommendations

- **Provides balance between additional flood protection and existing land use**
- **Estimated Cost: \$2,160,000 (earthen fill/riprap option)**



Questions?