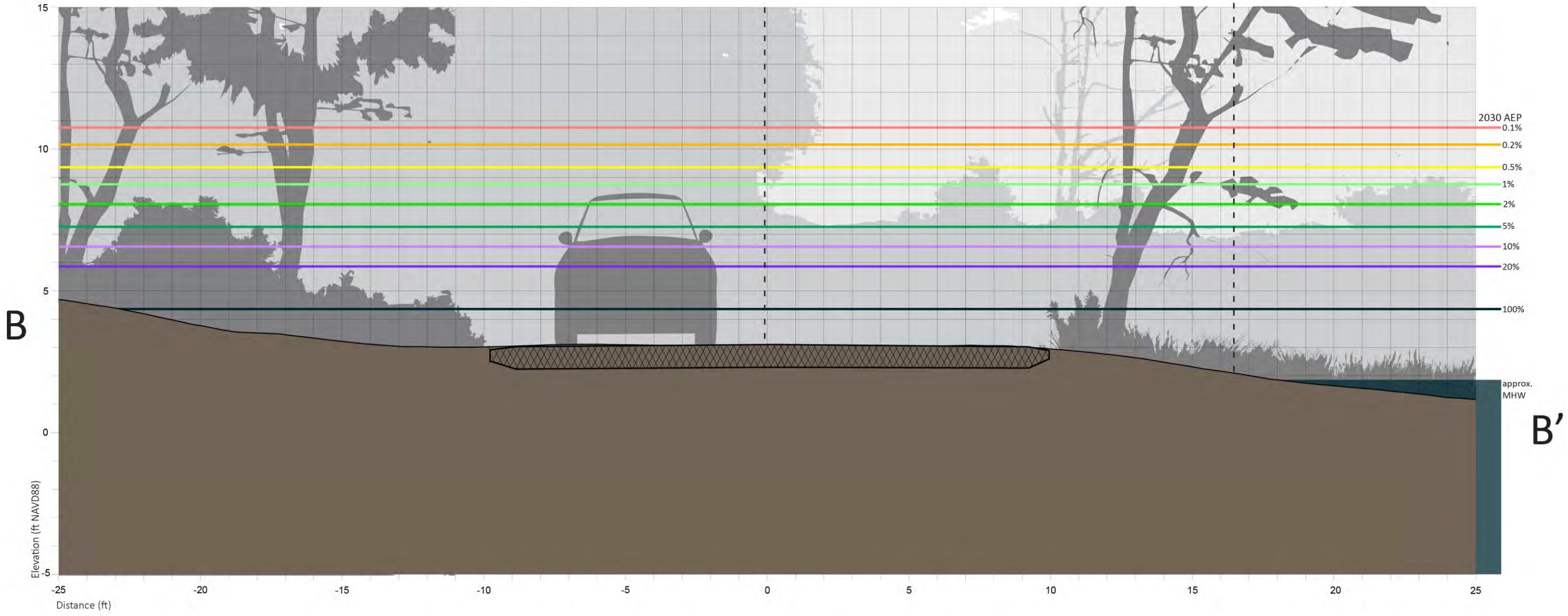


**EXISTING CONDITIONS**  
North Road, Harwich

Existing Unpaved Road  
Critical Elevation +2.9' NAVD88

- - - - -Salt Marsh- - - - -



# EXISTING CONDITIONS

North Road, Harwich



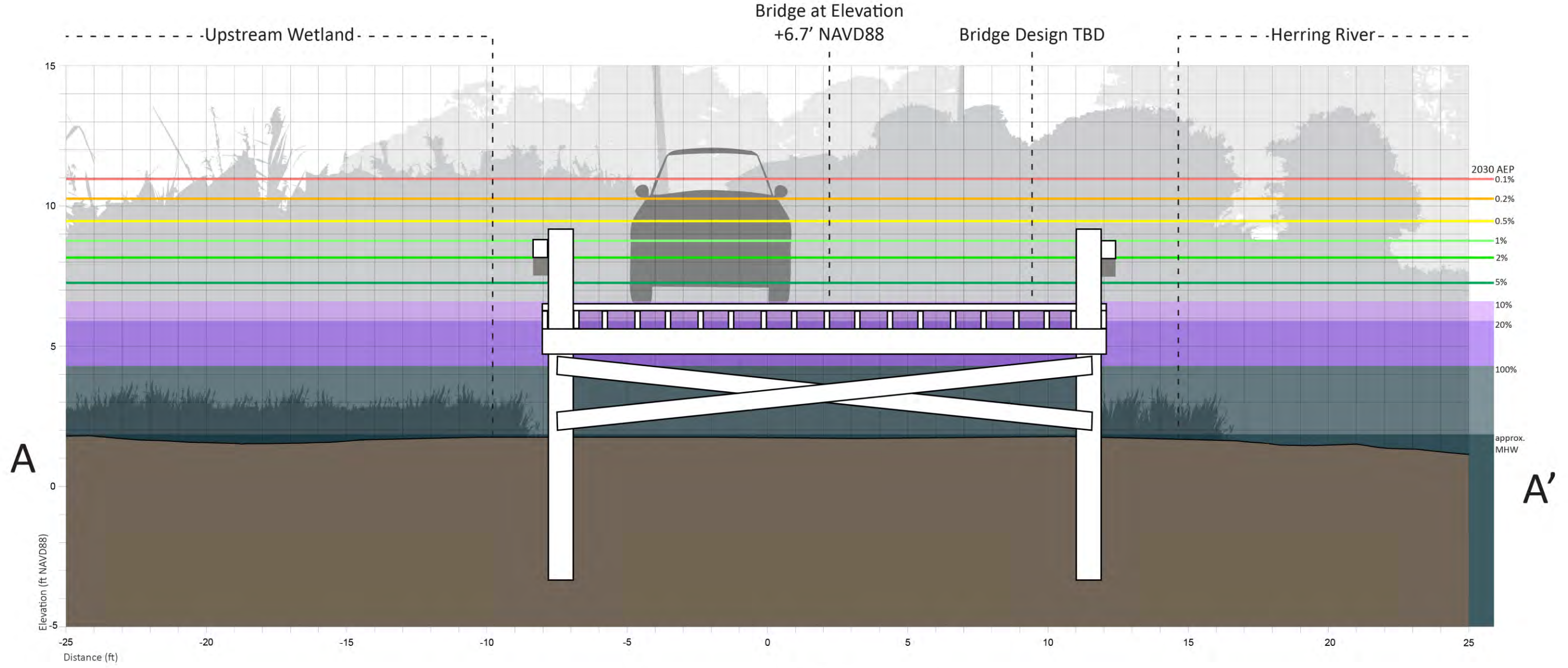


**ALTERNATIVE 1: GRAY**

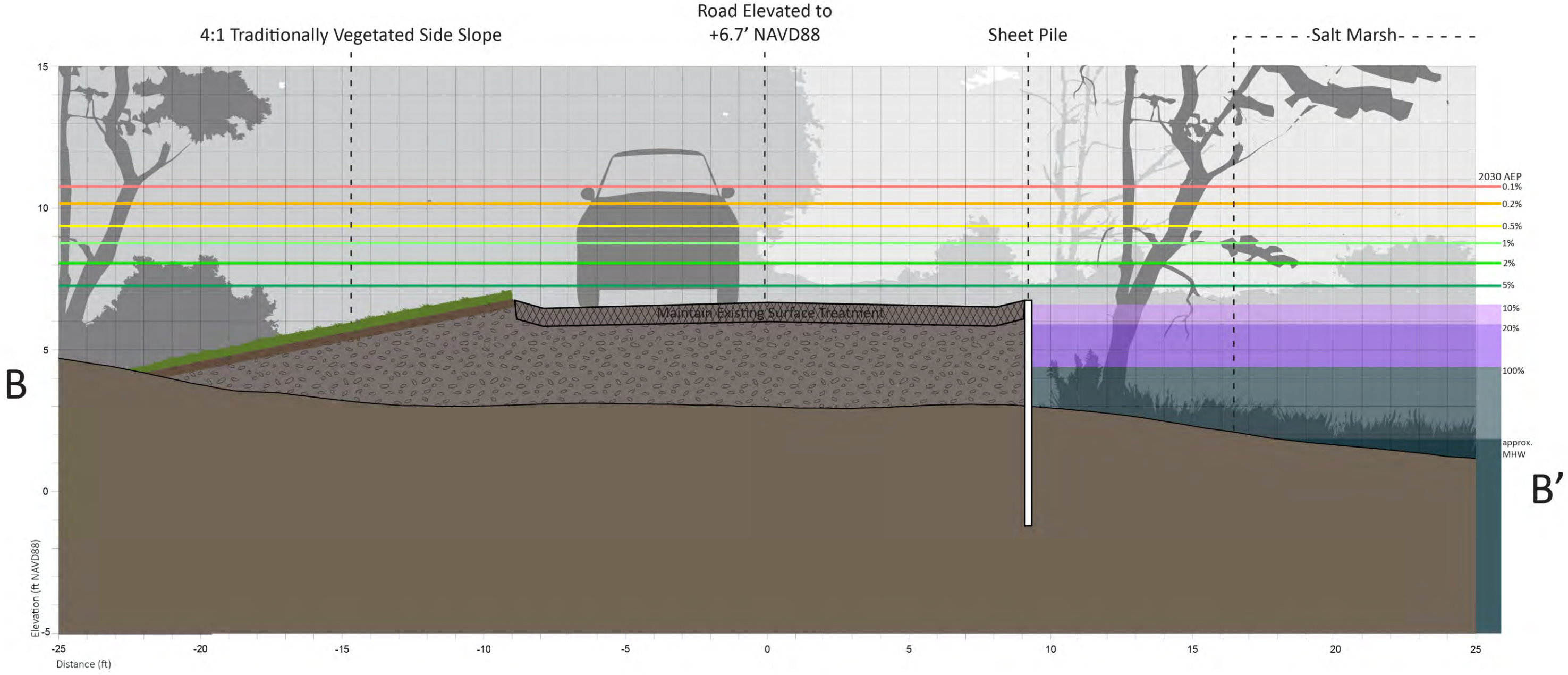
1,360 linear feet of town-owned road are elevated to 6.7' NAVD88 using 4:1 traditionally vegetated side slopes and sheet pile. A 40ft bridge span at the western end of the road allows for salt marsh migration and protects the road from erosion by Herring River.

Note: Project overlap with wetland areas, rights of way and property lines is approximate and needs confirmation with a site survey



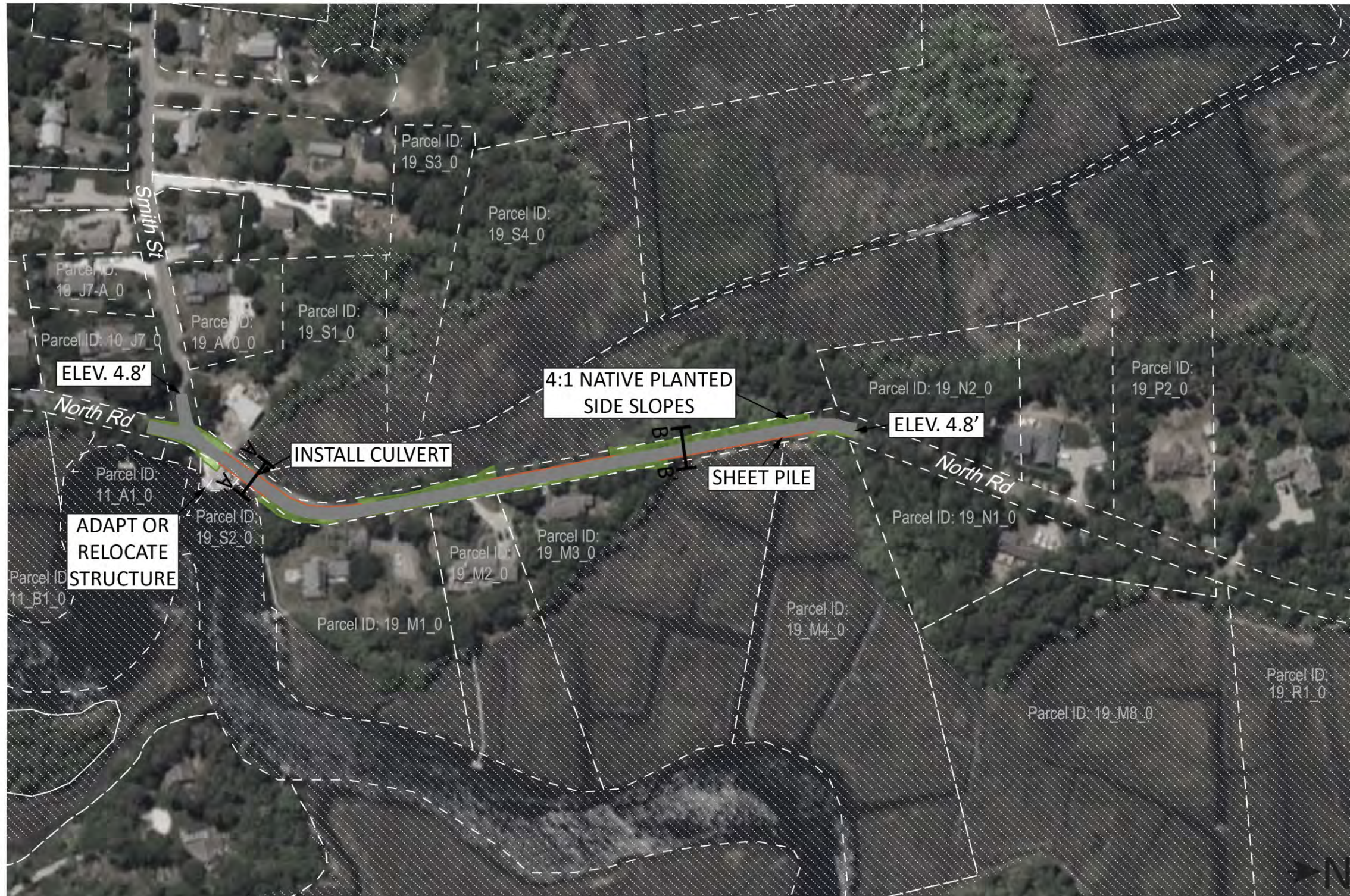


**ALTERNATIVE 1: GRAY**  
North Road, Harwich



**ALTERNATIVE 1: GRAY**  
North Road, Harwich



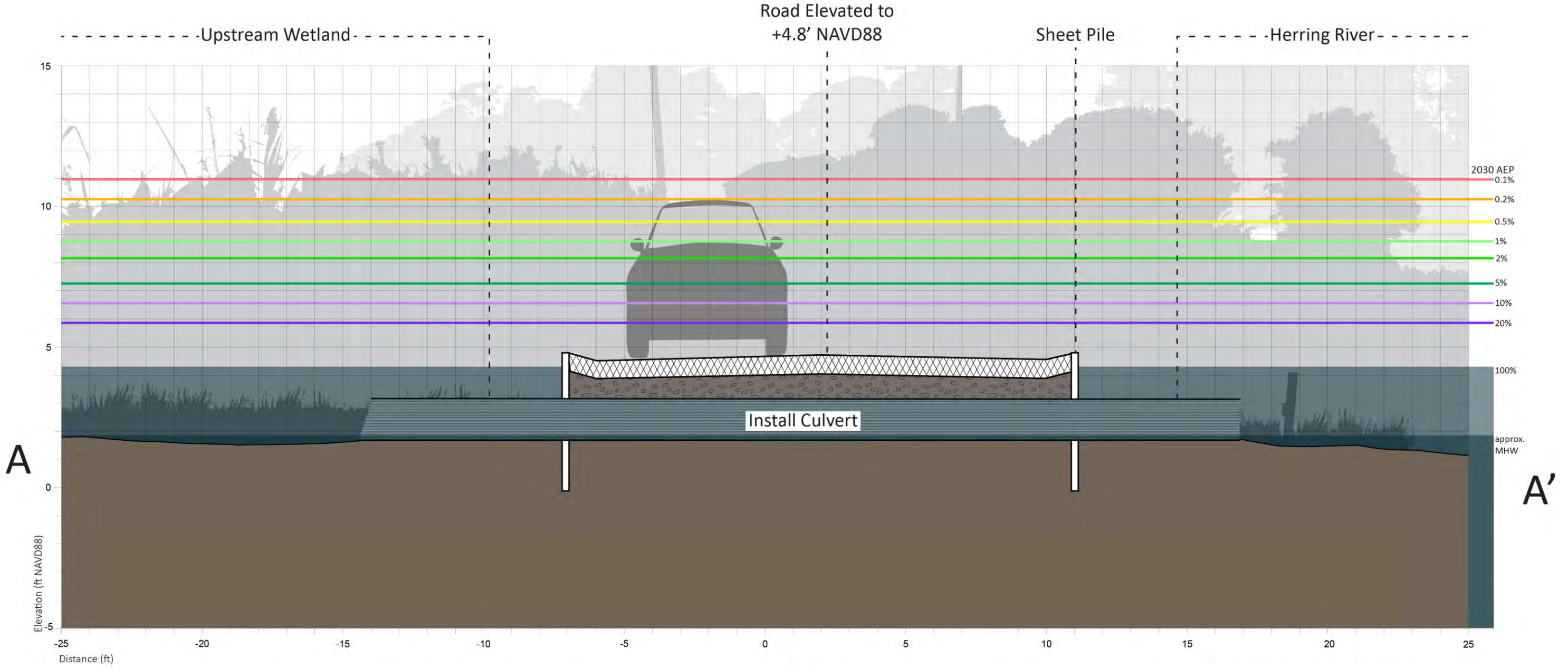


**ALTERNATIVE 2: HYBRID**

1042 linear feet of town-owned road are elevated to 4.8' NAVD88 using 4:1 native vegetated side slopes and sheet pile. A culvert is installed at the road's current low point to allow for salt marsh migration.

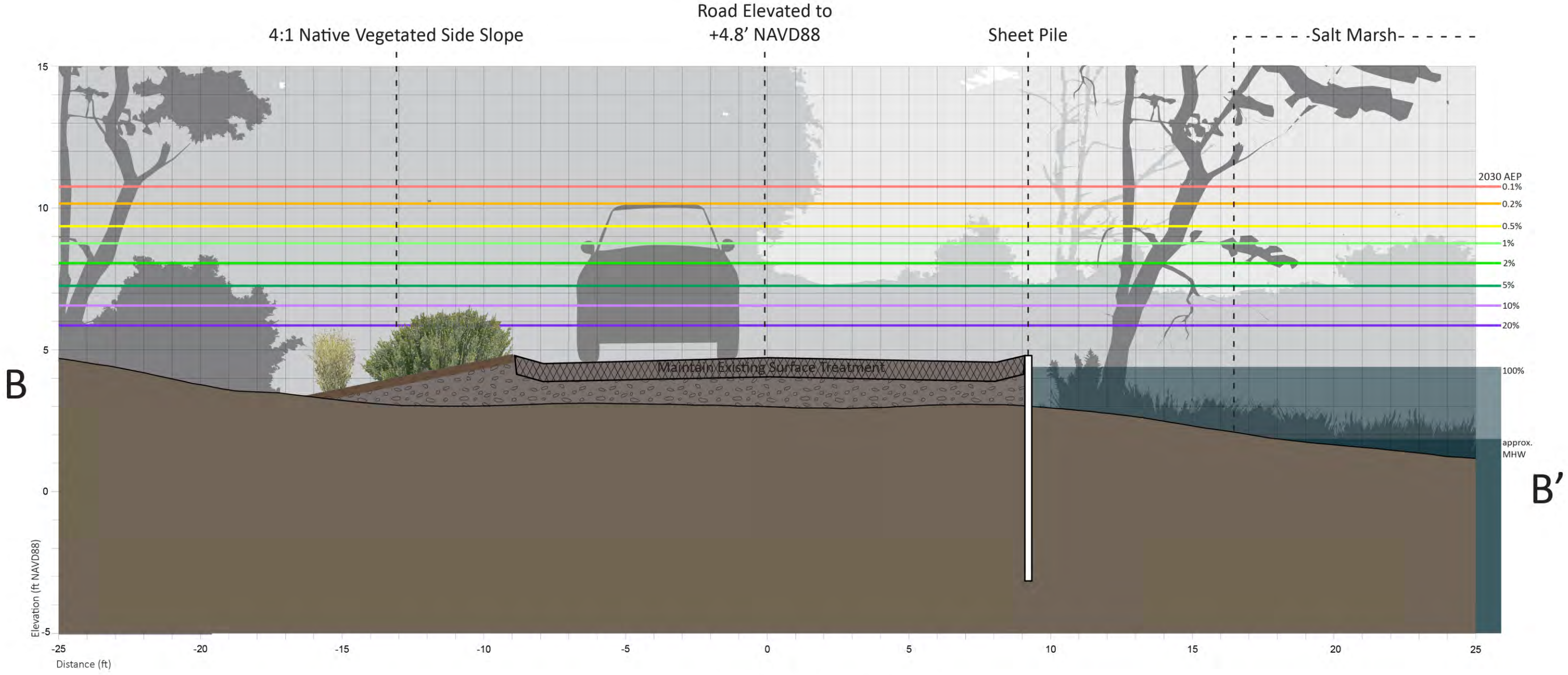
Note: Project overlap with wetland areas, rights of way and property lines is approximate and needs confirmation with a site survey





## ALTERNATIVE 2: HYBRID

North Road, Harwich



**ALTERNATIVE 2: HYBRID**  
North Road, Harwich



# NORTH ROAD, HARWICH

Summary of alternatives

	Description	Critical Elevation (NAVD88)	Annual Exceedance Probability			Vulnerable to Tidal Flooding†	Wetland Impacts	Impacts to Private Property	Estimated Cost*
			2030	2050	2070				
<b>EXISTING</b>	A segment of 18 foot wide road connecting marsh islands.	2.6 feet	100%	100%	100%	2030	N/A	N/A	N/A
<b>ALTERNATIVE 1: GRAY</b>	1,360 linear feet of town-owned road are elevated to 6.7' NAVD88 using 4:1 traditionally vegetated side slopes and sheet pile. A 40ft bridge span at the western end of the road allows for salt marsh migration and protects the road from erosion by Herring River.	6.7 feet	5%	20%	100%	No	New connection between river and marsh	Significant	\$2,030,000+ (bridge costs uncertain)
<b>ALTERNATIVE 2: HYBRID</b>	1042 linear feet of town-owned road are elevated to 4.8' NAVD88 using 4:1 native vegetated side slopes and sheet pile. A culvert is installed at the road's current low point to allow for salt marsh migration.	4.8 feet	20%	100%	100%	2070	New connection between river and marsh	Moderate	\$1,440,000

\*2023 installed material cost +40% escalation (through 2029) and 15% contingency. Excludes design, permitting, mobilization, stormwater and wastewater infrastructure, and site controls. Costs based on experienced contractor opinion and MassDOT costing data.

†Future tidal datums are approximate.