
FEMA BEACH PROJECTS

Avoiding Problems Along the Way

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The CAT G Engineered Beach



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CAT G "Engineered Beaches"

- Is the Beach Eligible for Public Assistance?
 - Is it a “...a federally constructed shoreline under the specific authority of USACE (i.e., not a specifically authorized and constructed Coastal Storm Risk Management Project)”?
 - Is the Project the responsibility of an eligible applicant?



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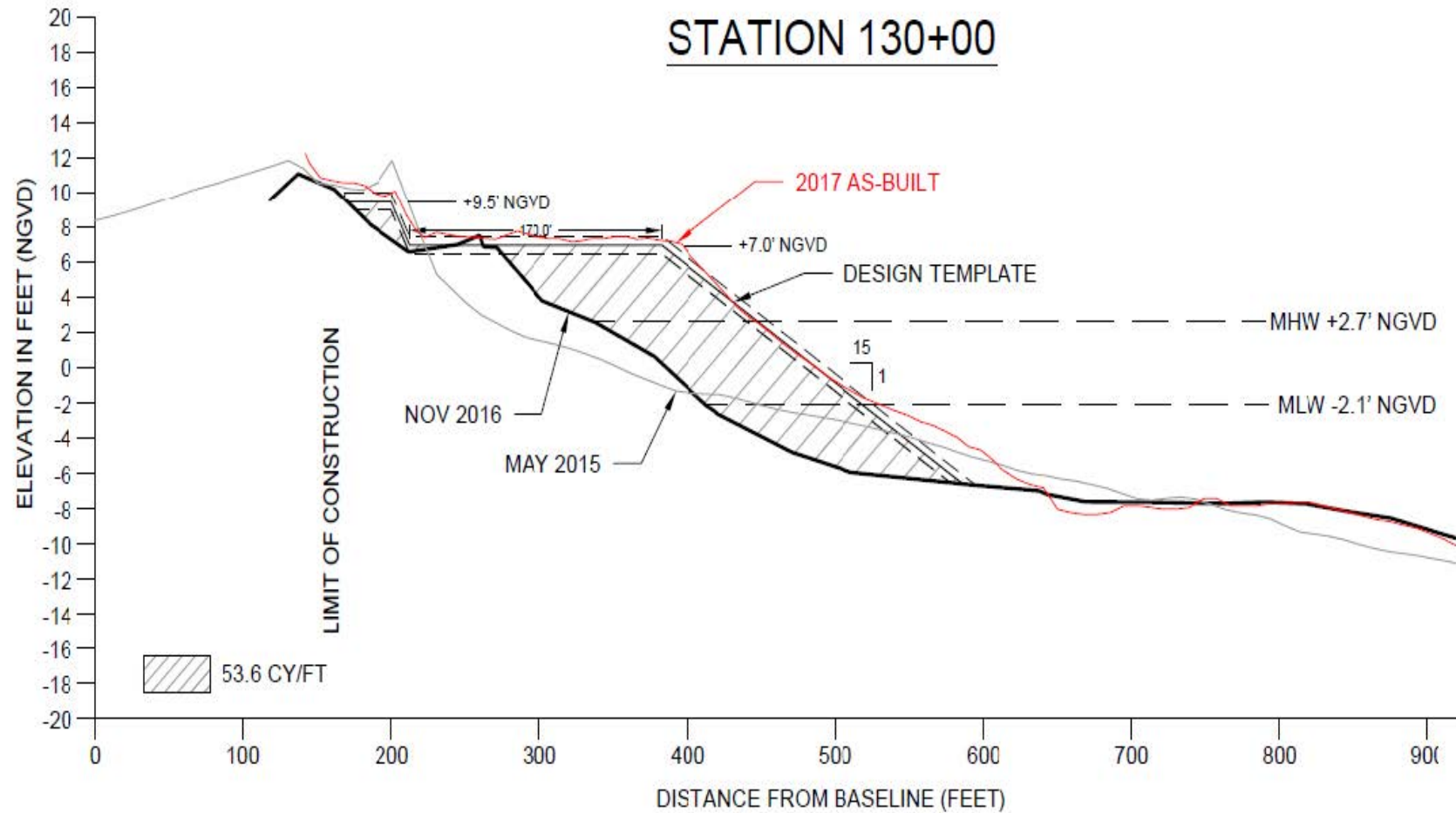
CAT G "Engineered Beaches"

- Is the Beach an Eligible Facility?
 - Was it designed?
 - “*designed elevation, width, and slope*”
 - “*placement of imported sand—of proper grain size”*



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CAT G Beach Design



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CAT G "Engineered Beaches"

- Is the Beach an Eligible Facility?
 - Has it been maintained?
 - Is There Evidence of Maintenance?
 - Does the Applicant Have A “Maintenance Program”?



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Determining Incident-Related Sand Loss



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Determining Incident-Related Sand Loss



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Determining Incident-Related Sand Loss



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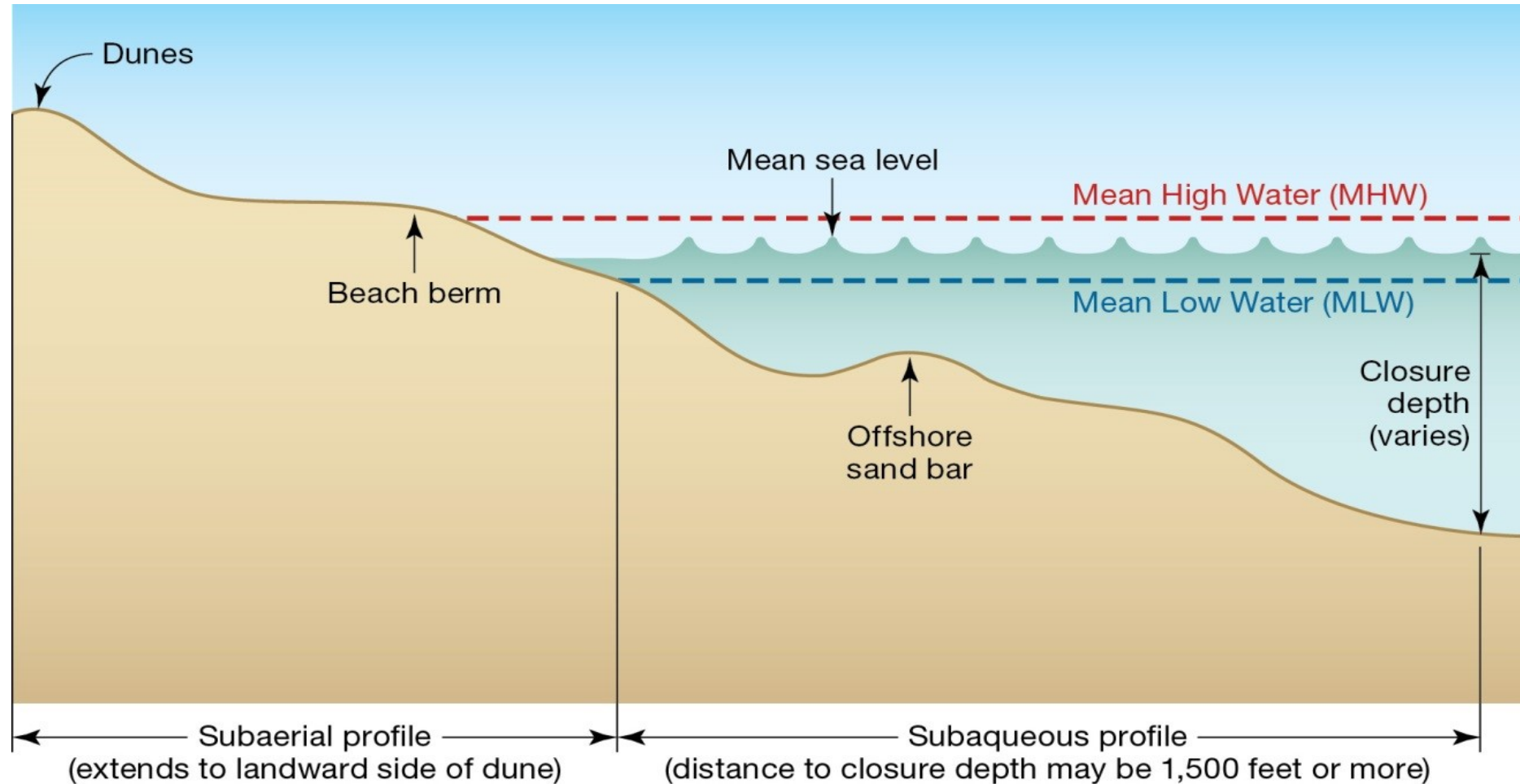
Incident-Related Sand Loss

- *The Applicant needs to substantiate the amount of sand claimed with pre-and post-incident profiles that extend at least to the seaward edge of the sub-aqueous nearshore zone (Depth of Closure) (see Figure 16. Typical Beach Profile). PAPPG v4, p. 181*



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Incident-Related Sand Loss (FEMA Beach)



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Incident-Related Sand Loss (FEMA Beach)



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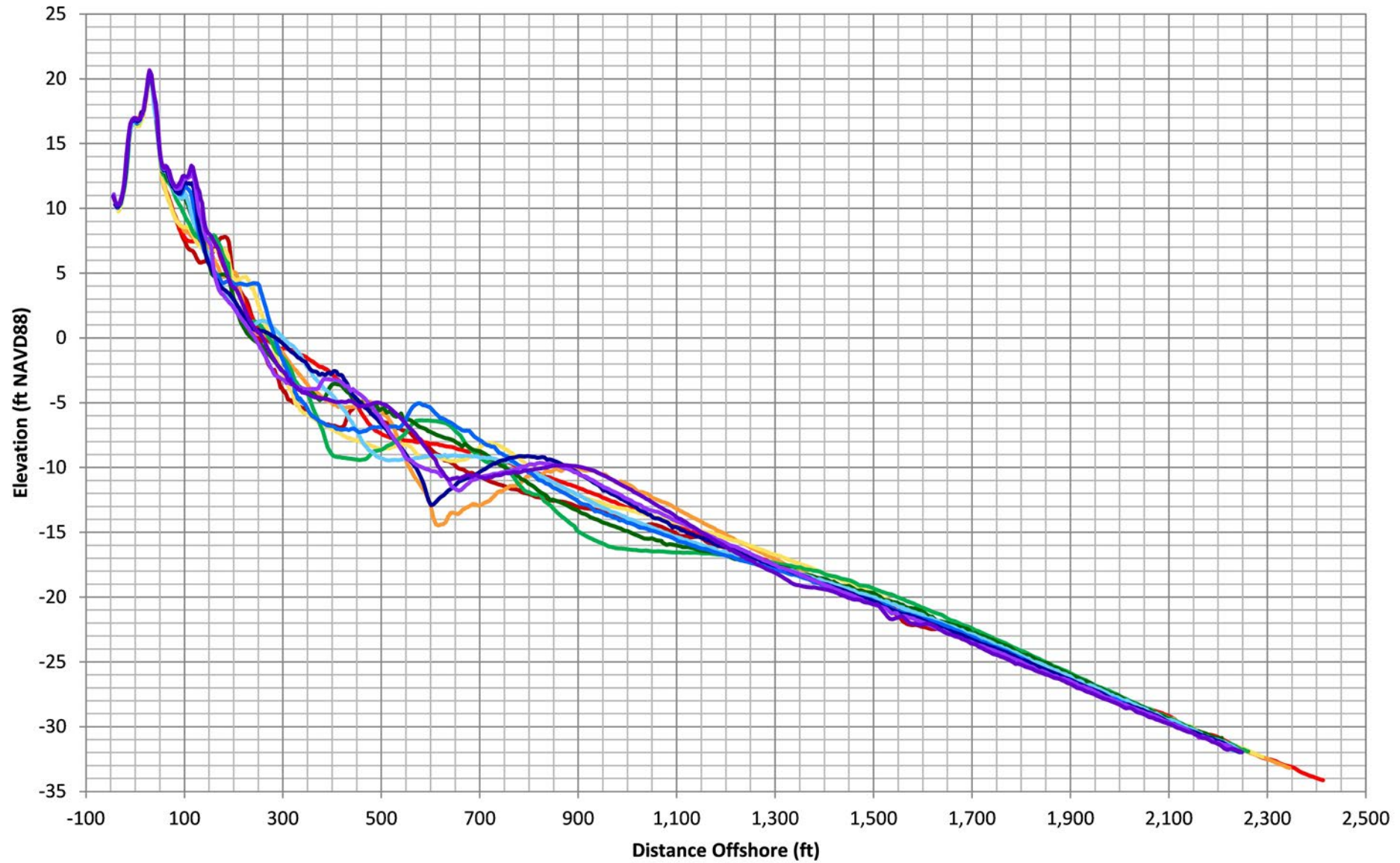
Depth of Closure

- The DOC is a theoretical depth along a beach profile where sediment transport is very small or non-existent, dependent on wave height and period, and occasionally, sediment grain size.
 - Can be observed or calculated
 - There can be disagreements...



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Bogue Banks Transect 31



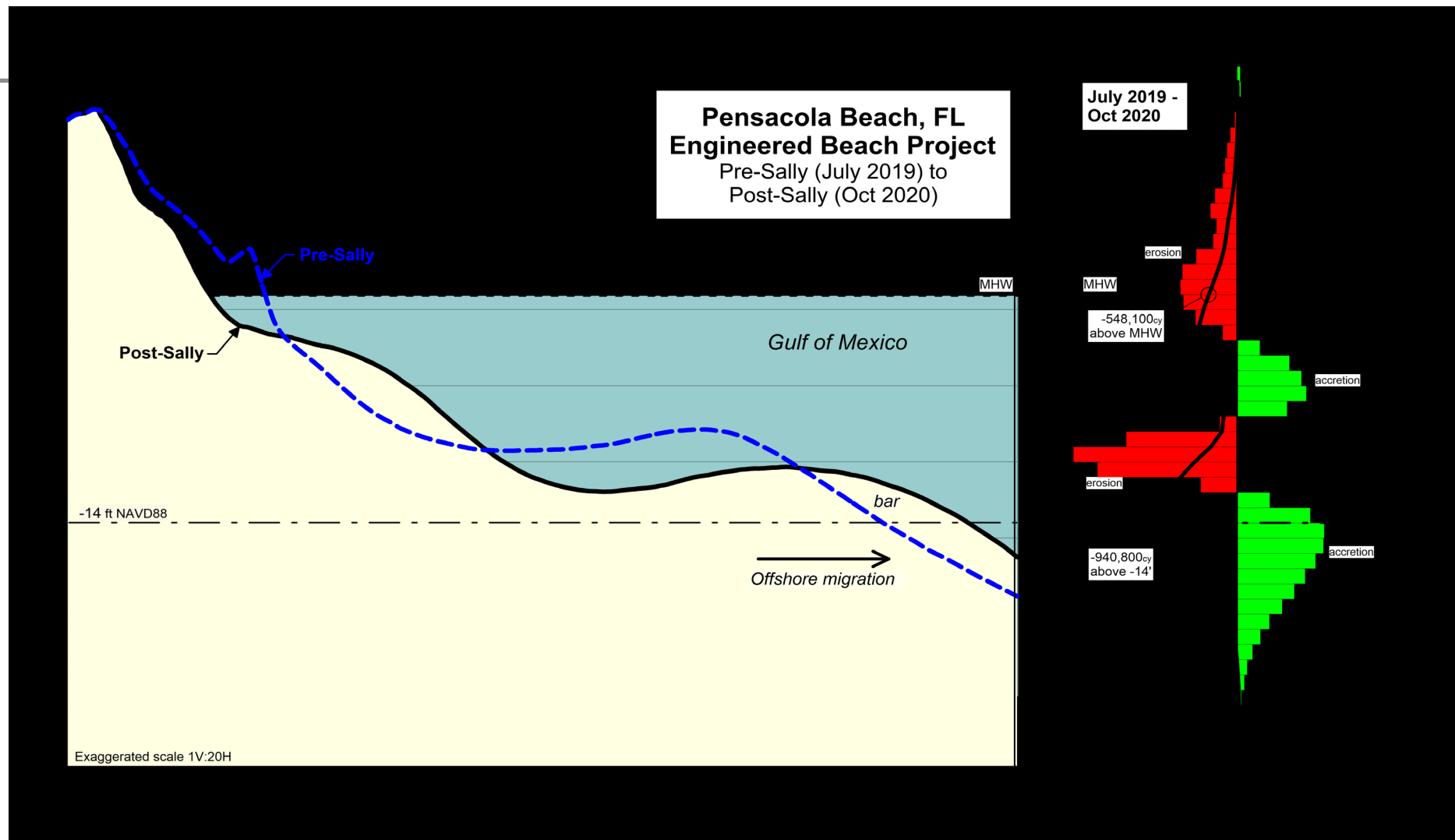
Pre and Post Storm Profiles

The amount of sand eligible for replacement is limited to the amount lost due to the incident. The Applicant needs to substantiate the amount of sand claimed with pre-and post-incident profiles that extend at least to the seaward edge of the subaqueous nearshore zone (Depth of Closure) (see Figure 16. *Typical Beach Profile*). (PAPPG, p. 181)



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Profiles / Pre and Post Storm



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Profiles / Pre and Post Storm

BRG: 267°W (T) POS: 30.339729°N, 87.093018°W ALT: 2ft



Pensacola BNP
22 Sep 2020, 16:14:39



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Incident Related Sand Loss

- *“The amount of sand eligible for replacement is limited to the amount lost as a result of the incident... The Applicant needs to adjust quantities to account for any erosion that occurred between the pre- and post-incident profiles.” (PAPPG, p. 181)*
 - Total Sand Loss must be adjusted for “Background Erosion”

Incident Related Loss = Total Sand Loss – Background Erosion



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Incident Related Sand Loss / PDA's

“...for the PDA which takes place immediately following the storm impacts, FEMA prefers to only look at the erosion from the dry beach and not speculate about beach profile changes below the mean high water line.”

*Coastal Engineering Support
for FEMA Preliminary Damage Assessments
Field Operating Guide*



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Preliminary Damage Assessments (PDA's)



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Preliminary Damage Assessments (PDA's)



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Preliminary Damage Assessments (PDA's)



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Irma PDA vs. PW Sand Loss

<u>Beach Project</u>	<u>PDA CY</u>	<u>PW CY</u>
Coral Cove	17,500	39,556
Juno Beach	192,000	1,352,890
Jupiter	72,500	4,945
Singer Island	20,000	18,645
Lantana	13,000	4,118



Fence, Plants and Rope



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Environmental Compliance



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Coastal Barrier Resource System Units



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Onshore Sand Mines



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Cost Estimate

- Hurricane Dorian Sand Loss = 288,000 CY
 - Hurricane Sally Sand Loss = 422,000 CY
- Total Eligible Sand Loss = 710,000 CY

Estimated Total Project Costs

Engineering Report / Bathymetric Surveys	\$80,000
Offshore Borrow Site Investigation/Analysis	\$500,000
Project Permitting	\$75,000
Final Project Design	\$40,000
Dredge Mobilization/Demobilization	\$4,000,000
Beach Fill Placement	\$7,500,000
Construction Administration / Management	\$180,000
TOTAL COST	\$12,375,000

Estimated Cost-In-Place = $\$12,375,000 / 710,000 = \$17.43 / \text{CY}$



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Cost Allocation

- Hurricane Dorian Sand Loss = 288,000 CY
- Hurricane Sally Sand Loss = 422,000 CY

Total Eligible Sand Loss = 710,000 CY

Estimated Cost-In-Place = $\$12,375,000 / 710,000 \text{ CY} = \$17.43 / \text{CY}$

Hurricane Dorian Cost Estimate = $288,000 \text{ CY} \times \$17.43 / \text{CY} = \$5,019,718$

Hurricane Sally Cost Estimate = $422,000 \text{ CY} \times \$17.43 / \text{CY} = \$7,355,460$



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Points to Keep in Mind

- Is the Beach Eligible for Public Assistance?
 - ✓ Responsibility of an Eligible Applicant?
 - ✓ Is it a Corps Beach?
 - ✓ Was it Designed and Maintained?
- Damage (DDD)
 - ✓ Pre- and Post Storm Profiles to Closure Depth?
 - ✓ Adjusted for Background Erosion?
 - ✓ Sand Fence and Plants?
- Scope of Work (SOW)
 - ✓ Is the work invoiced specified in the approved SOW?
- Cost Estimate
 - ✓ Reasonable Cost / CY (In Place)
 - ✓ Fence and Plants?



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Questions?



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