

WETLAND STATEMENT OF FINDINGS

COLO 316317 York River Shoreline Stabilization Phase 1 and 2

Colonial National Historical Park

York County, Virginia

Recommended:

Superintendent, Colonial National Historical Park Date

Concurred:

Chief, Water Resources Division, Washington Office Date

Approved:

Northeast Regional Director Date

INTRODUCTION

Executive Order (EO) 11990, *Protection of Wetlands*, requires the National Park Service (NPS) and other federal agencies to evaluate likely impacts of actions in wetlands. NPS *Director's Order 77-1: Wetland Protection*, (NPS 2002a) and *Procedural Manual 77-1* (NPS 2012c) provide NPS policies and procedures for complying with EO 11990.

This statement of findings has been prepared to comply with EO 11990. The *Repair and Stabilize the York River Shoreline to Protect the Colonial Parkway Environmental Assessment* (EA) for the Repair and Stabilize the York River to Protect the Colonial Parkway project includes a phased approach to completing the entire project (NPS 2012a). As described in the EA, future statements of findings will be prepared on a phase-by-phase basis as preliminary design plans are advanced to construction-ready documents. In a Finding of No Significant Impact (FONSI) (NPS 2012b), the NPS selected the alternative for repairing and installing shoreline stabilization along the York River to protect the Colonial Parkway.

This statement of findings evaluates the impacts to wetlands for Phase 1A, Phase 1B, and Phase 2 of the proposed project, which include the following:

- Phase 1A - Stabilize the shoreline from Felgates Creek to approximately 7,400 linear feet (LF) downstream
- Phase 1B – Stabilize the shoreline from just upstream of the Naval Weapons Station pier for 2,000 LF in an upstream direction
- Phase 2 – Stabilize the shoreline from just south of Indian Field Creek to approximately 3,200 LF downstream to tie into the upstream end of Phase 1B.

SITE DESCRIPTION

Colonial National Historical Park (the park) is located in the southern tidewater region of the Commonwealth of Virginia, on the peninsula between the James and York Rivers (Figure 1). Measuring 10,221 acres in size, “it encompasses most of Jamestown Island, site of the first permanent English settlement in North America, and Yorktown, scene of the culminating battle of the American Revolution” (NPS 1993). The parkway links these two units of the park, providing a scenic 23-miles long drive and connectivity to other colonial sites, including Williamsburg. It is a resource listed in the National Register of Historic Places (National Register), in recognition of its association with the National Park Service’s (NPS) legacy of designed parkways that were built for conservation and interpretive purposes, particularly with respect to historic resources.

Approximately 4.2 miles of the parkway lie in close proximity to the York River. While riverbank erosion has been a recognized issue for years and has been combated via the placement of structural defenses or “armor” along the shoreline, strong storms in late 2009 markedly increased shoreline recession. Though the NPS has performed “spot treatments” to address areas of particularly aggressive erosion, more comprehensive action is required in the near term to prevent further landward migration of the shoreline and subsequent undermining of the parkway at multiple locations.

The NPS owns and maintains the parkway surface, including a minimum 500-foot-wide right-of-way outside the limits of the Jamestown and Yorktown units of the park. As such, the NPS is solely responsible for all maintenance of the roadway and of vegetation and other natural and cultural resources within this right-of-way. In accordance with the park’s General Management Plan (GMP), the NPS must “maintain the [parkway] for safety while retaining the integrity of its design as a scenic roadway.”

PURPOSE AND NEED FOR ACTION

The parkway is both a means of transportation and the primary means by which visitors to the park can interpret the landscape history of early colonial settlements and life between Jamestown and Yorktown. It offers a variety of viewsheds, pull-offs, and roadside markers for motorized and bicycle traffic. The purpose of the project is to protect the parkway from the imminent threat of shoreline erosion along the York River and associated landward migration of the shoreline, particularly in areas where it runs in close proximity to the parkway. Action is needed at this time to mitigate and remediate the effects of historic and continuing storm damage to the parkway. Furthermore, the project would reduce the risk of erosion along areas of the shoreline that are not directly adjacent to the parkway, but where recession is nevertheless occurring and where cultural resources have been identified. Action would be taken in these areas to ensure the integrity of the resources.

The project also acknowledges Secretary of the Interior Order No. 3289, Amendment No. 1, Section 3a (DOI 2010), which requires that each bureau and office of the Department of the Interior consider and analyze potential climate change impacts when undertaking long-range planning exercises and making major decisions regarding the use of Department resources. The planning of the shoreline stabilization project would consider rates of sea-level rise and ensure the resulting design is adaptable to future conditions.

Lastly, the shoreline stabilization project would provide opportunities (where appropriate) to enhance or restore tidal wetland features as part of the overall shoreline management strategy. This is consistent with Executive Order 11990, which in part directs the federal agencies “. . .to preserve and enhance the natural and beneficial values of wetlands...” and to “. . . strive to achieve a longer-term goal of net gain of wetlands Servicewide.”

PROPOSED ACTION

Phase 1A - Phase 1A of the project includes the installation of approximately 930 linear feet of living shoreline at the upstream end of the project area near the Felgates Creek bridge. This component will include five free-standing, armor stone sills and a breakwater covering 116,683 SF of jurisdictional area and 39,265 SF of sand fill to create vegetated marsh and sand backshore where an existing pocket beach will be stabilized through placement of two spur structures creating a smooth beach-upland transition that dissipates wave energy. Stone will be added in front of the first sill to elongate the toe and establish a seven-foot-wide area of oyster habitat. Moving to the east, 5,595 linear feet of existing riprap revetment will be rebuilt by re-armoring the structure with larger stone and raising the crest of the revetment to elevation +10. The spur at the downstream end of the pocket beach will be the transition between the living shoreline and a segment of recently rehabilitated sill structure.

The living shoreline will include six free-standing, armor stone sills and sand fill that will create 16,644 square feet of stable, sandy, intertidal shoreline and 15,461 square feet of vegetated backshore. A series of six stone sills will be installed as follows, from north (upstream) to south (downstream): Sill #1 (169 LF), Sill #2 (95 LF), Sill #3 (100 LF), Sill #4 (96 LF), Sill #5 (195 LF), and Sill/Spur #6 (105 LF). Gaps between the structures will be very narrow, with most less than 20 LF in width. The sills will sit in 1 to 3 feet of water, and they will have crest elevations between +4.0 and +6.0 feet above MLW, see attached design sheets. The beaches/backshore structures associated with the sills will meet the bank between 2.5 and 5.0 feet above MLW depending on specific site conditions. Backshore plantings will include the installation of native tidal estuarine species and may include saltmarsh cordgrass (*Spartina alterniflora*) at

lower elevations and saltmeadow hay (*Spartina patens*) at higher elevations. The project also includes the installation of a 100 LF long stone spur at the downstream end of the beach with a crest elevation of 6 feet above MLW.

The existing revetment has lost its original shape over time and rock has migrated into the nearshore zone. Improvements to the revetment will take place within the footprint of the existing structure by reconstructing the toe, face and crest apron with new armor stone. The face of the revetment will slope upwards at a 2:1 slope to a crest elevation of +10 feet MLW. The previously graded embankment above the revetment exhibits head cuts or erosional areas that will be stabilized through the placement and compaction of fill material to re-establish a consistent 2:1 slope down to the back of the new revetment. A linear berm feature will be installed along the length of the project area in locations where the grassed flank of the parkway drains across the top of the embankment. This berm will prevent overland flow over the embankment for storms up to a 100yr event. Seven existing outfall pipes will be replaced, and four new outfalls will be installed to address upland drainage along the parkway. Because of the sensitive archeological areas within the project site, excavation will be limited to pipe replacement and new outfall installation. Bank work will be limited to clearing and grubbing and filling head cuts.

Upon completion the work areas will be stabilized with marsh and backshore vegetation and the banks will be planted with warm season grasses for a complete, stable shoreline from the river to the top of the embankment.

Phase 1B - Phase 1B will modify the existing embayment created by the five experimental breakwaters. On the upstream side, the existing partially attached structure will be accentuated to create a 75' spur structure with a +6 head elevation. The last remaining breakwater will be elongated and raised to create a 140' long structure with a crest elevation of +6. This structure will be placed in front of the existing *spartina alterniflora* patch in the lee of the existing structure. In the embayment, minor sand fill will be placed to establish the appropriate beach planform. At the back of the embayment, where the scarp exists, a revetment will be installed to ensure protection of the Colonial Parkway. The crest of the structure will follow the existing upland scarp, with elevations varying from +8 to +10 and back to +7. Beyond this embayment, the existing revetment will be reconstructed on new fills that will restore the escarpment and create a bank slope that ties into the stable, treed embankment above.

Phase 2 - Phase 2 includes the installation and rehabilitation of a series of stone sills with spur heads to accentuate the geomorphic features that have developed along the shoreline in response to the impinging wave climate. The upstream end of this phase will tie into a recently rebuilt sill coming out of the mouth of Indian Field Creek. Beginning where the rebuild ends, approximately 375 LF of an existing sill structure will be raised and rebuilt. From here, a 100' long stone spur will be built to accentuate an existing pocket beach. This existing beach area will be stabilized by the placement of an additional spur feature on the downstream side, and sand fill will be placed to transition the beach into the low escarpment at the backshore. This spur at the downstream end of the beach will transition to a sill, followed by the installation of three more sills that will tie into an existing failed revetment. These sills will be placed approximately 10 feet channelward of the existing marsh edge. Sand fill will be placed in the marsh, and it will be planted with saltmarsh cordgrass (*Spartina alterniflora*) to establish a wider marsh fringe. Moving downstream, approximately 880 feet of the existing failed revetment will be rebuilt in place, then it will transition into another spur feature to accentuate and protect an existing pocket beach feature. This beach feature will be further stabilized with another spur structure on the downstream side, and sand fill will be placed on the pocket beach to create a stable beach planform and gradual backshore transition. This backshore will be planted with saltmeadow cordgrass (*Spartina patens*) and shrubs such as yaupon holly (*Ilex vomitoria*) or groundsel tree (*Baccharis halimifolia*). The new spur will tie into an existing failed revetment, approximately 500 feet of which will be rebuilt in-place as a sill. This sill will transition to a spur at an embayment that will be established during Phase 1B. Stone sills and

spurs will be designed with a crest of +3.5 to +6 feet, while the revetments will crest at +3.5 feet MLW. Improvements to the revetments will require stone to be placed waterward of MLW and will slightly extend the toe of the revetment 4 to 5 feet beyond the current revetment. The face of the revetment will slope upwards at an approximate 1:1 slope.

WETLANDS DELINEATION

A wetlands delineation was completed June 2, 2022. Field staff involved in this delineation included Doug DeBerry, David (Clay) Robertson, and Dakota Hunter. Staff qualifications are discussed below.

Doug DeBerry, PhD is a Senior Environmental Scientist working out of VHB's Williamsburg Office. He has over 29 years of experience working on projects involving wetland delineation, floristic inventory, endangered species surveys, mitigation planning and monitoring, NEPA coordination, stream assessment, and environmental permitting. He is certified as a Professional Wetland Scientist (PWS), Professional Wetland Delineator (PWD-VA), and a U.S. Fish and Wildlife Service Approved Surveyor for all protected plant species in Virginia.

David (Clay) Robertson is an Environmental Scientist in VHB's Williamsburg Office with over 13 years of experience in wetland delineation and natural resource inventory and assessment. Clay has worked extensively throughout VHB's corporate footprint and has a strong working knowledge of botanical and wildlife species within that geographic region. Much of Clay's wetland delineation work over the past 10 years has been focused on the Mid-Atlantic region, and he has extensive experience in coastal habitats like COLO.

Dakota Hunter is an Environmental Scientist in VHB's Williamsburg Office with over 3 years of professional experience (in addition to three summers as an undergraduate/graduate college intern at VHB). His background researching plant community dynamics on wetland mitigation sites provides a strong foundation for his work as a vegetation ecologist and wetland scientist. For VHB, he has put these skills to work in wetland delineations and other natural resource inventory and assessment tasks for a variety of ecosystems, physiographic regions, and public and private sector clients. Dakota has abundant experience working with multiple GIS programs and a variety of GPS hardware, and is trained in botanical surveys for site suitability analyses and post-construction monitoring on complex restoration sites, as well as development management strategies for revegetation projects.

Wetlands in the Study Area

Phase 1A and 1B Combined - Based on VHB's investigation, wetlands within the approximately 1.5 mile study area include (besides the York River) approximately 0.75 acres of estuarine emergent marsh (E2EM), 1.14 acres of estuarine intertidal rocky shore (E2RS), 0.10 acres of estuarine scrub- shrub (E2SS), 1.29 acres of estuarine intertidal unconsolidated shore (E2US), 0.18 acres of palustrine emergent marsh (PEM), and 0.26 acres of palustrine scrub-shrub (PSS) wetlands.

Vegetation in wetlands was dominated by species with a facultative (FAC), facultative-wet (FACW), or obligate wetland (OBL) indicator status, and met either Hydrophytic Vegetation Indicator 1 (Rapid Test) or Hydrophytic Vegetation Indicator 2 (Dominance Test). Common species found in wetlands onsite were Jesuit's bark (*Iva frutescens*), smooth cordgrass (*Spartina alterniflora*), saltmeadow cordgrass (*Spartina patens*), and seashore saltgrass (*Distichlis spicata*). Uplands onsite consisted of similar species as wetlands but lacked hydric soils and hydrology.

Phase 2 - Based on VHB's investigation, wetlands within the approximately 1-mile study area include (besides the York River) approximately 1.43 acres of estuarine emergent marsh (E2EM), 0.27 acres of estuarine intertidal rocky shore (E2RS), 0.04 acres of palustrine emergent marsh (PEM), 0.49 acres of estuarine scrub- shrub (E2SS), 3.02 acres of estuarine intertidal unconsolidated shore (E2US), 0.14 acres of palustrine forested (PFO), and 0.76 acres of palustrine scrub-shrub (PSS) wetlands.

Vegetation in wetlands was dominated by species with a facultative (FAC), facultative-wet (FACW), or obligate wetland (OBL) indicator status, and met either Hydrophytic Vegetation Indicator 1 (Rapid Test) or Hydrophytic Vegetation Indicator 2 (Dominance Test). The estuarine marsh habitats are vegetated with smooth cordgrass (*Spartina alterniflora*), saltmeadow cordgrass (*Spartina patens*), and seashore saltgrass (*Distichlis spicata*) with patches of reed grass (*Phragmites australis*), black needle rush (*Juncus roemerianus*), and seaside goldenrod (*Solidago sempervirens*). Estuarine scrub-shrub areas have Jesuit's bark (*Iva frutescens*) and saltbush (*Baccharis halimifolia*) as the dominant plants. Palustrine areas are vegetated with soft rush (*Juncus effusus*) and various sedges in the emergent areas, and forested areas have loblolly pine (*Pinus taeda*), hackberry (*Celtis occidentalis*), and red maple (*Acer rubrum*). There has been no submerged aquatic vegetation (SAV) observed in the project area.

In between the parkway pavement and the river lies a variety of upland habitat types to include mowed meadows and patches of upland woody saplings, shrubs, and mature trees. Vegetated marsh, forested wetlands, and exposed sandy beach line the river edge. Upland vegetation includes hackberry (*Celtis occidentalis*), eastern red cedar (*Juniperus virginiana*), loblolly pine (*Pinus taeda*), black cherry (*Prunus serotina*), wax myrtle (*Morella cerifera*), black locust (*Robinia pseudoacacia*), Chinese privet (*Ligustrum sinense*), poison ivy (*Toxicodendron radicans*), roundleaf greenbrier (*Smilax rotundifolia*), Japanese honeysuckle (*Lonicera japonica*), muscadine (*Vitis rotundifolia*), and English ivy (*Hedera helix*).

Wetlands Functional Assessments

A wetland functional assessment was performed pursuant to NPS policy. Five representative tidal emergent wetland areas along the shoreline of the York River were assessed: Sandy Point West, Sandy Point East, Mason Row, Navy Pier, and Felgate Creek Wetlands. The functional assessment effort focused on riverside tidal wetlands that could be affected by the shoreline stabilization project. A summary of the wetlands functional assessment, as well as maps and evaluation forms, is found in the attached Bellfield Straight Functions and Values Assessment Memo and the attached Indian Field Creek Functions and Values Assessment Memo.

Based on the application of the Highway Methodology functional assessment model, all assessed wetland areas retain several functions and values attributed to their important tidal fringe position within the greater York River ecosystem. For all five of these areas, principal functions/values include Marine Fish/Shellfish Habitat, Sediment/Shoreline Stabilization, Wildlife Habitat, Recreation, and Visual Quality/Aesthetics. Sandy Point West and East Wetlands add the benefit of accessibility and ease of access, making them prime locations for Educational/Scientific Value. The functional capacity of Sandy Point East Wetland is similar to others due to interspersed habitat types and beneficial uses; however, the presence of the invasive common reed (*Phragmites australis*) in several locations reduces wildlife habitat functions, decreases biological diversity, and has a negative effect on visual quality and aesthetic values.

Based on the Highway Methodology model (USACE 1995) and best professional judgment, this assessment suggests that Sandy Point West and Mason Row Wetland retain slightly higher functional capacity relative to the other assessed wetlands. All identified wetland areas retain most wetland functions and values typically attributable to coastal fringe marshes and their value is enhanced by being part of public land with accessibility to the area from the nearby Colonial Parkway. Sandy Point East wetland is similar in this respect but slightly degraded by invasive species colonization.

IMPACTS ANALYSIS

Portions of this project include renovation of existing sills and revetments; this work is not discussed further in the impacts analysis, as it is an excepted action from the Statement of Findings and compensation requirements per Section 4.2.17 - Maintenance, repair, or renovation. Conditions and Best Management Practices (BMPs) referred to in Section 4.2.2 of PM 77-1 will be followed to maintain consistency with PM 77-1 Section 4.2.

The following impacts do not fall under excepted actions and are included in the analysis for this Statement of Findings:

Phase 1A and 1B Combined

Direct impacts to wetlands, tidal shores and waters include the following:

Structure 1 - This is a 168' long, 16' wide armor stone sill is a free-standing structure that will have approximately 1,564 sq ft (~0.04 acre) of impact to subaqueous habitat and approximately 1,124 sq ft (~0.03 acre) of impact to non-vegetated estuarine habitat. Stone will be added in front of the first sill to elongate the toe and establish a seven-foot-wide area of oyster habitat.

Structure 2 - This is a 95' long, 16' wide armor stone sill is a free-standing structure that will have approximately 506 sq ft (~0.01 acre) of impact to subaqueous habitat and approximately 1,012 sq ft (~0.02 acre) of impact to non-vegetated estuarine habitat.

Structure 3 - This is a 100' long, 16' wide armor stone sill is a free-standing structure that will have approximately 600 sq ft (~0.01 acre) of impact to non-vegetated estuarine habitat.

Structure 4 - This is a 96' long, 16' wide armor stone sill is a free-standing structure that will have approximately 1,536 sq ft (~0.01 acre) of impact to non-vegetated estuarine habitat.

Structure 5 - This is a 195' long, 16' wide armor stone sill is a free-standing structure that will have approximately 780 sq ft (~0.02 acre) of impact to subaqueous habitat and approximately 2,340 sq ft (~0.05 acre) of impact to non-vegetated estuarine habitat.

Structure 6 - This is a 105' long stone spur that varies from 15' to 30' in width, and will have approximately 525 sq ft (~0.01 acre) of impact to subaqueous habitat and approximately 2,100 sq ft (~0.05 acre) of impact to non-vegetated estuarine habitat.

Structure 7 - This is a 100' long, 30' wide stone spur that will have approximately 1,000 sq ft (~0.02 acre) of impact to subaqueous habitat and approximately 600 sq ft (~0.01 acre) of impact to non-vegetated estuarine habitat.

Structure 16 - This is a 75' long stone spur that varies from 15' to 25' in width, and will have approximately 1,250 sq ft (~0.03 acre) of impact to subaqueous habitat and approximately 400 sq ft (~0.01 acre) of impact to non-vegetated estuarine habitat.

Structure 18 - This is a 140' long, 30' wide stone spur that will have approximately 3,300 sq ft (~0.08 acre) of impact to subaqueous habitat and approximately 480 sq ft (~0.01 acre) of impact to non-vegetated estuarine habitat.

Structure 19 – Approximately 220' of this 1400' structure would be new construction; the remaining length of this structure is repair to an existing structure. The new construction will have approximately 1,080 sq ft (~0.02 acre) of impact to subaqueous habitat and approximately 4,320 sq ft (~0.1 acre) of impact to non-vegetated estuarine habitat.

In total, approximately 0.3 acre of non-vegetated estuarine habitat and approximately 0.29 acre of subaqueous habitat will be impacted by the project due to placement of stone spurs as part of Phase 1 of this project.

Gaps between Structures 1 through 5 will be very narrow, with most less than 20 LF in width. The area behind the structures will be backfilled with sand and planted with appropriate native species to create a more stable, improved estuarine habitat structure. The total area of impact from sand fill will be approximately 3,460 sq ft (~0.08 acre) to subaqueous habitat, 127 sq ft (~0.003 acre) to vegetated estuarine habitat, 35,678 sq ft (~0.82 acre) to non-vegetated estuarine habitat, and 2,685 sq ft (~0.06 acre) to palustrine habitat.

Phase 2

Direct impacts to wetlands, tidal shores and waters include the following:

Structure 9 – This 155' long, 30' wide stone spur will be added to the end of an existing revetment to accentuate an existing pocket beach, for a total impact of approximately 4,650 sq ft impact to non-vegetated estuarine wetland.

Structure 10 – This 262' long spur feature will be 28' at its widest and taper to 17' wide, for a total impact area of approximately 4,421 sq ft impact to non-vegetated estuarine and approximately 1,474 sq ft of subaqueous habitat. This spur will stabilize the existing pocket beach on the downstream side of the beach. Beach fill will be placed to establish a stable beach transitioning into the low existing escarpment on the backshore.

Structures 11, 12, and 13 – Structure 10 will transition into these three sills. Structure 11 will be 210' long, Structure 12 will be 100' long, and Structure 13 will be 105' long. Each of these structures is approximately 16' wide at the base, for a total impact from these three structures of approximately 6,640 sq ft impact to subaqueous habitat.

Structure 14 – This stone spur is approximately 50' long, 28' wide at the base and ties into an existing revetment, for a total impact of approximately 1,400 sq ft to subaqueous habitat.

Structure 15 – This structure includes a new stone spur added to each end of an existing revetment that will be reconstructed. The new stone spur at the north end of this structure is approximately 100' long, 28' wide at the base, and the new stone spur at the south end of this structure is approximately 50' long and 22' wide at the base, for a total impact of approximately 2,925 sq ft to subaqueous habitat and approximately 975 sq ft to non-vegetated estuarine habitat.

In total, approximately 10,046 square feet (~0.23 acre) of non-vegetated estuarine habitat and approximately 12,439 sq ft (~0.29 acre) of subaqueous habitat will be impacted by the project due to placement of stone spurs as part of Phase 2 of this project.

The area behind the structures will be backfilled with sand and planted with appropriate native species to create a more stable, improved beach habitat structure. The total area of impact from sand fill will be

approximately 6,869 sq ft (~0.16 acre) to subaqueous habitat, 1,809 sq ft (~0.04 acre) to vegetated estuarine habitat, 36,461 sq ft (~0.84 acre) to non-vegetated estuarine habitat, and 225 sq ft (~0.005 acre) to palustrine habitat.

Alternatives Considered

Two action alternatives and a no action alternative were considered. A full description of these alternatives is included in Chapter 2 of the 2012 EA.

Under the No-action Alternative, no comprehensive or planned and designed shoreline improvements would be carried out. Repairs to existing shoreline defenses would be carried out as needed in response to an observed and imminent threat to the parkway caused by continued landward migration of the shoreline, storm-related or otherwise. Other maintenance activities would include occasional removal of excess vegetation from riverbank slopes (particularly along Bellfield Straight), where such vegetation may pose a threat to bank stability and/or block the viewshed of the York River. The No-action Alternative was not chosen as the selected alternative because the alternative does not meet the purpose and need. The existing structures along the York River shoreline are deficient in their capacity to defend upland resources against shoreline erosion and would remain in their current configuration.

Alternative 2 was determined to be the Preferred Alternative, and is discussed above in detail under “Proposed Action.” The Preferred Alternative was chosen because it best met the project’s purpose and need while simultaneously minimizing impacts to natural resources and offering the best opportunity for restoring shoreline function and habitat.

Alternative 3 is very similar to the Proposed Action, but with some differences. Under Alternative 3, the shoreline treatment, means of access, and necessary equipment would be identical to Alternative 2, but with the use of a wooden sill rather than a rock sill at Reach 1A, and would not include the creation of a pocket beach in this area. Alternative 3 also included the use of sheet piling instead of rehabilitating the existing revetments; the installation of the sheet piling would require the use of a pile driver which may require a more impactful access route as well as additional bank cuts than what would be required for Alternative 2. Although Alternative 3 does meet the purpose and need of the project, it was not chosen as the Preferred Alternative because the substantial use of sheet piling would limit the degree of habitat restoration and would have greater wetlands impacts relative to Alternative 2.

How preferred alt minimizes impacts to the greatest extent practicable

Avoidance and minimization measures were applied throughout the design to preserve and enhance wetland environments along the shoreline and limit impacts to sensitive wetland resources. Existing structures will be rehabilitated to the greatest extent possible to minimize the need for new structures.

Justification for the Use of Wetlands

A majority of the proposed action will occur in previously disturbed areas due to the existing revetments and the study area’s proximity to the parkway. As described in the 2012 EA and FONSI, pursuing the No-action Alternative would leave the parkway vulnerable to damage by shoreline recession. Portions of the parkway adjacent to the proposed project area are especially at risk due to riverbank slumping and the formation of gully erosion close to the roadway.

Due to the nature of the proposed action and its proximity to the York River, associated efforts will necessarily result in minor impacts to the abutting wetlands in this area. Specifically, the proposed action has been designed to protect the parkway from imminent threat of shoreline erosion along the York River and associated landward migration of the shoreline. The shoreline stabilization project provides an

opportunity to enhance or restore tidal wetland features as part of the overall shoreline management strategy.

Permanent impacts to wetlands occur where proposed structures intersect mapped wetlands. Impacts associated with the application of sandy fill behind structures and the associated burial of wetland features are deemed to be temporary, as these areas will be revegetated with native wetland species consistent with the current vegetative assemblage. In addition, it is anticipated that in many instances, sandy fill will be “feathered” into existing marsh fragments, resulting in a relatively thin veneer of sand through which the existing vegetation can emerge and persist.

Proposed Wetland Compensation

The living shoreline consisting of the five free-standing, armor stone sills and a breakwater in Phase 1A and 1B will create vegetated marsh and sand backshore, where an existing pocket beach will be stabilized through placement of two spur structures creating a smooth beach-upland transition that dissipates wave energy. The beaches/backshore structures associated with the sills will meet the bank between 2.5 and 5.0 feet above MLW depending on specific site conditions. The area shoreward of the sills will be filled with clean sand to create a stable beach with a gradual backshore transition. Backshore plantings will include the installation of native tidal estuarine species and include saltmarsh cordgrass (*Spartina alterniflora*) at lower elevations and saltmeadow hay (*Spartina patens*) at higher elevations.

Total project impact acreage: 3.12 acres. Approximately 0.53 acre of non-vegetated estuarine habitat and approximately 0.58 acre of subaqueous habitat will be impacted by the project due to placement of stone spurs and sills. The total area of impact from sand fill will be approximately 0.24 acre to subaqueous habitat, 0.043 acre to vegetated estuarine habitat, 1.66 acres to non-vegetated estuarine habitat, and 0.065 acre to palustrine habitat.

Compensation – Phase 1A & 1B: The living shoreline in Phase 1A and 1B combined will include sand fill behind the sills that will create 16,644 square feet (0.38 acre) of stable, sandy, intertidal shoreline, 15,461 square feet (0.35 acre) of *Spartina patens* vegetated backshore, 11,888 sq ft (0.27 acre) of vegetated intertidal zone, 10,589 sq ft (0.24 acre) of non-vegetated sandy backshore, and 52,921 sq ft (1.21 acres) of rocky intertidal zone at the toes of all structures.

Compensation – Phase 2: The living shoreline in Phase 2 will include sand fill behind the sills that will create 15,587 sq ft (0.36 acre) of stable, sandy, intertidal shoreline, 27,721 sq ft (0.64 acre) of *Spartina patens* vegetated backshore, 6,577 sq ft (0.15 acre) of vegetated intertidal zone, 18,187 sq ft (0.42 acre) of non-vegetated sandy backshore, and 16,791 sq ft (0.39 acre) of rocky intertidal zone at the toes of all structures.

Total compensation acreage: 5.41 acres. Restoration of the vegetated marsh and sand backshore habitats include the establishment of 0.74 acre of stable, sandy, intertidal shoreline, 0.99 acre of *Spartina patens* vegetated backshore, 0.42 acre of vegetated intertidal zone, 0.66 acre of non-vegetated sandy backshore, and 1.6 acres of rocky intertidal zone. Existing populations of invasive *Phragmites australis* will be removed from within the project area as part of this project. There are three populations of *Phragmites* in the project area, all located within the Phase 2 area, and each consisting of 0.28 acres, 0.58 acres, and 0.14 acres. All three of these populations will be removed, for a total of 1.0 acre of restored habitat.

Schedule for Project Completion

This project will be constructed as a single effort, with construction beginning in early 2023 and continuing into fall 2023. Removal of *Phragmites* communities will occur concurrently with project construction.

Timeframe for Full-Functioning Wetlands

It is anticipated that it will take two growing seasons to achieve fully functioning estuarine emergent wetlands.

Monitoring and Maintenance of Compensation Areas

The compensation areas will be evaluated at the end of the next growing season following plant installation and for one additional year thereafter. Monitoring will be carried out between June and September of each monitoring period. At a minimum, the annual monitoring report will:

- Reference the regulatory permits authorizing the project activity
- Include a summary of the work accomplished
- Include photos of new planting areas with the photo locations identified on a plan view figure of the project site
- Include the following information from the photo stations:
 - Photographs from the station
 - Percent cover of herbaceous vegetation, visually estimated within a ten-foot radius
 - Species composition (including all species present as well as an indication of dominant species)
 - Identify any invasion of the mitigation site by undesirable species (e.g., *Phragmites*) and quantify the extent of invasion by percent cover. Outline what corrective measures are planned to control any undesirable species.

Performance Criteria

If the new *Spartina patens* and *Spartina alterniflora* planting areas have not successfully become vegetated within the monitoring time periods, the NPS may be required to augment the plantings to meet a minimum of 75% vegetative coverage during the next growing season. After the two-year time period, additional monitoring requirements will be determined if needed.

Funding Source for Compensatory Mitigation

The cost of compensatory mitigation has been factored into the construction cost of the project and is accordingly consistent with D.O. 77-1, Section 5.2.3.

In addition to the compensation activities outlined above, the NPS will, where feasible, implement additional mitigation measures to minimize environmental impacts related to the proposed action. The following is a list of actions that could be considered:

- Equipment use in vegetated wetland areas will be avoided to the greatest extent possible. Mats composed of individual timbers cabled together will be used to minimize impacts where avoidance is not possible.
- A contractor kickoff meeting will be held to ensure that all workers are apprised of proper protocol to follow in the event of an emergency, including contact information for first responders.
- Appropriate measures will be employed to prevent or control spills of fuels, lubricants, or other contaminants from entering waterways or wetlands. These include safe handling and refueling procedures and proper deployment of containment measures such as oil booms. Actions will be consistent with state water quality standards and Clean Water Act Section 401 certification requirements. A hazardous spill plan will be approved by the park prior to construction. This plan will state what actions will be taken in the case of a spill, notification measures, and preventive measures to be implemented, such as the placement of refueling facilities, storage, and handling of hazardous materials, etc.

- Regulations require that a Stormwater Pollution Prevention Plan (SWPPP) must be prepared prior to submitting a registration statement for permit coverage under the Virginia Stormwater Management Permit (VSMP).
- During the shoreline stabilization design phase, the NPS will prepare and implement Erosion and Sediment Control Plans that comply with the Virginia Erosion and Sediment Control Law. The NPS will be responsible for overseeing on-site contractors, conducting regular field inspections, and taking prompt action against non-compliance, if necessary. Appropriate erosion and siltation controls will be maintained during construction, and all exposed soil or fill material will be permanently stabilized at the earliest practicable date. A Type II turbidity curtain will be used to minimize the movement of turbid water away from the construction site. A Type II curtain extends from the water surface below the water line to the river bottom and is rated for a slight current of no greater than five feet per second and mild wind conditions. A float in the top of the curtain and weights along the bottom keep the curtain hanging vertically in the water.
- Best management practices (BMPs) for drainage and sediment control will be implemented to prevent or reduce nonpoint source pollution and minimize soil loss and sedimentation in drainage areas. BMPs will include all or some of the following actions, depending on site-specific requirements:
 - Disturbed areas will be kept as small as possible to minimize exposed soil and the potential for erosion;
 - Regular site inspections will occur during construction to ensure that erosion control measures were properly installed and are functioning effectively.
- Should high wave and water conditions be forecasted, equipment will be moved to a safe location within the study area or to another location outside the study area.
- The contractor will not leave vehicles idling for more than five minutes when parked or not in use.
- Wildlife collisions will be reported to park personnel.
- If required, stockpile materials will be placed in grassy areas at the mouths of Felgates Creek and Indian Fields Creek so as to avoid impacting previously undisturbed or unmaintained areas. Erosion prevention and sediment control measures will be placed down-gradient of each area to contain any potential spills or sediment run-off.
- Plantings will consist of native plant material and will be obtained and used in accordance with NPS policies and guidance. In an effort to avoid introduction of non-native/noxious plant species, no hay or straw bales will be used during revegetation or for temporary erosion control.
- Management techniques will be implemented to foster rapid development of target native plant communities and to eliminate invasion by exotic or other undesirable species. Techniques may include the use of hydroseeding and a tackifier, plant inspection at delivery and before installation to ensure plant health, plant installation during appropriate planting windows and with due regard for tide forecasts, and inspection of installed plants. Planted areas will be monitored after construction to determine if efforts are successful or if plant mortality warrants replanting and/or controlling non-native plant species (per monitoring plan discussed above).

CONCLUSION

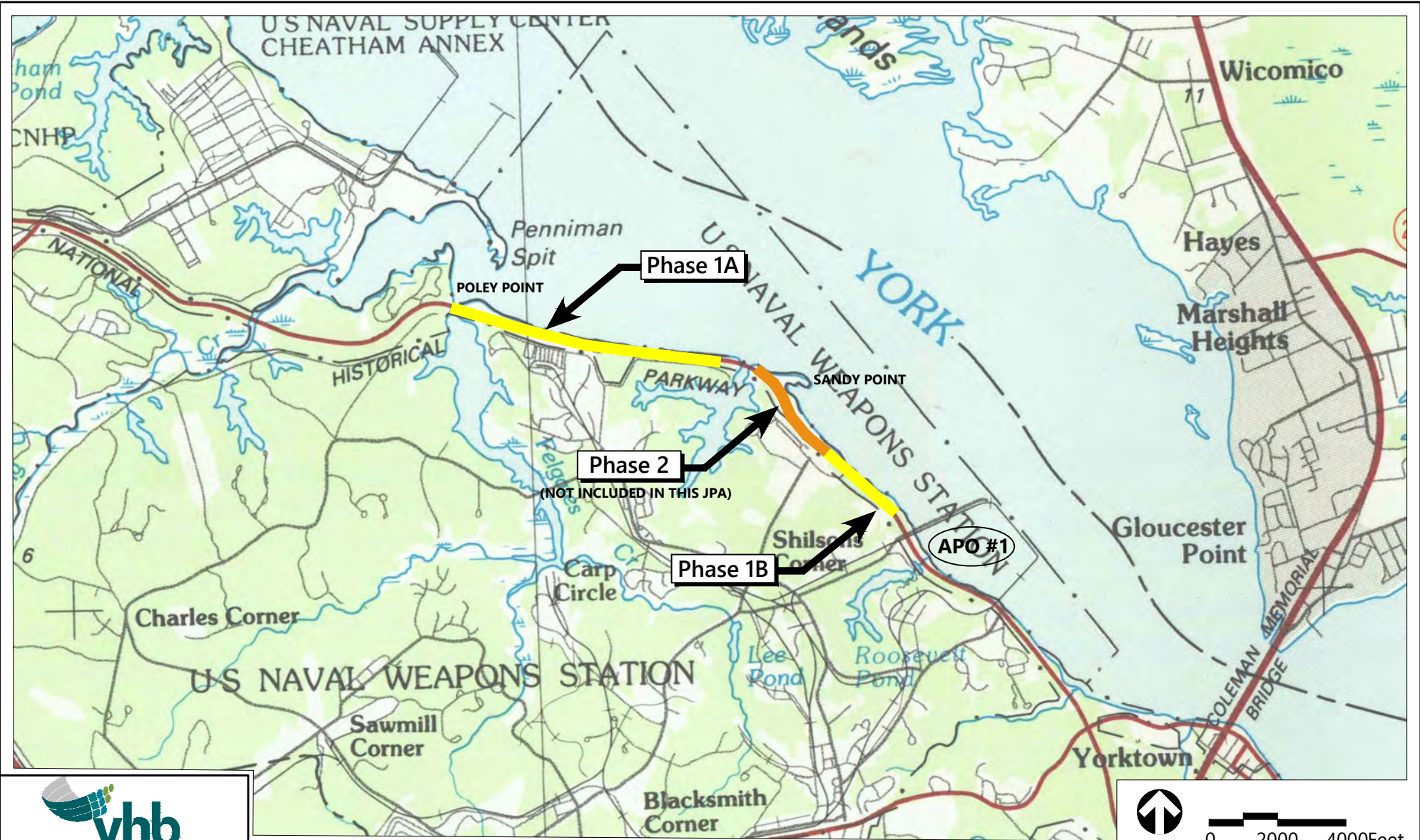
The protection of people and property, including natural resources, is of high priority to NPS. The proposed action will occur primarily in areas that have been previously disturbed and NPS concludes that no other practicable alternative exists for the proposed project. The project is designed to minimize impacts to wetlands and will compensate for those unavoidable impacts via the creation of wetlands of the same type and with the same functions and values. The total area of wetland impact is 3.12 acres. The total area of compensation is 5.41 acres. Therefore, compensation for the loss of estuarine emergent wetlands will be provided at a ratio of 1.73 acres of restoration to every 1 acre of wetland impact.

satisfying the “no net loss of wetlands” policy contained in DO 77-1. Mitigation will also include the implementation of best management practices during and after construction. Due to the location of the proposed action, proximal to the mouth of the York River (at the Atlantic Ocean), the proposed action will not result in impacts to the existing 100-year flood hazard area because the ocean provides infinite storage for floodwaters.

While the proposed project will result in direct adverse impacts to wetlands via permanent loss at the location of shoreline treatment structures, the project includes compensation to a degree that offsets the area of wetlands impacted. Moreover, the project is designed to reduce the risk of existing wetlands being degraded or lost to storm-induced erosion; the likelihood of which would otherwise increase if left undefended, particularly as sea-level continues to rise and wave energy impinges farther inland. Accordingly, the NPS finds that this proposed action is consistent with the policies and procedures of EO 11988 as well as NPS Director’s Order 77-1: Wetland Protection, including the “no net loss of wetlands” policy, and Director’s Order 77-2: Floodplain Management.

COLO York River Shoreline Stabilization

Phase 1 Drawings





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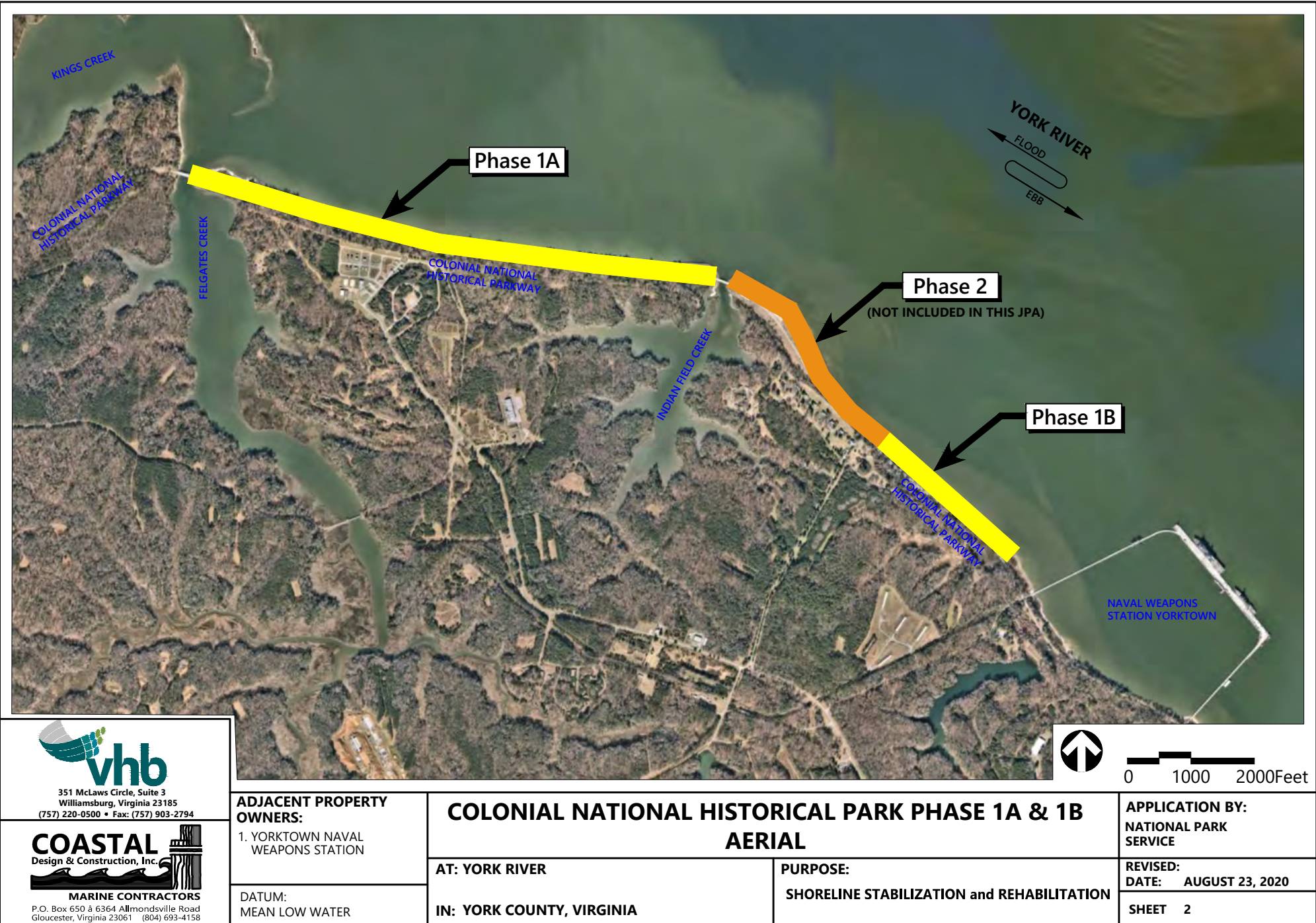
MARINE CONTRACTORS
P.O. Box 650 • 6364 Allmondsville Road
Gloucester, Virginia 23061 (804) 693-4158

ADJACENT PROPERTY OWNERS: 1. YORKTOWN NAVAL WEAPONS STATION
DATUM: MEAN LOW WATER

COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B LOCATION MAP
AT: YORK RIVER
IN: YORK COUNTY, VIRGINIA

PURPOSE: SHORELINE STABILIZATION and REHABILITATION

APPLICATION BY: NATIONAL PARK SERVICE
REVISED: DATE: AUGUST 23, 2020
SHEET 1



Total Impact Areas

3,460 SF	SAND FILL, SUBAQUEOUS
127 SF	SAND FILL, VEGETATED ESTUARINE
35,678 SF	SAND FILL, NON-VEGETATED ESTUARINE
2,685 SF	SAND FILL, PALUSTRINE
48,321 SF	STONE FILL, SUBAQUEOUS
134 SF	STONE FILL, VEGETATED ESTUARINE
68,228 SF	STONE FILL, NON-VEGETATED ESTUARINE
10 SF	STONE FILL, PALUSTRINE
138 SF	TEMP IMPACT, SUBAQUEOUS
174 SF	TEMP IMPACT, VEGETATED ESTUARINE
71 SF	TEMP IMPACT, NON-VEGETATED ESTUARINE
3,730 SF	TEMP IMPACT, PALUSTRINE

Total Resulting Habitat Areas

16,644 SF	NV SANDY INTERTIDAL
15,461 SF	S PATENS BACKSHORE
11,888 SF	S ALTERNIFLORA INTERTIDAL
10,589 SF	NV SANDY BACKSHORE
52,921 SF	ROCKY INTERTIDAL

Notes

General

- WETLAND DELINEATION WAS COMPLETED BY VHB BETWEEN MAY 31 AND JUNE 2, 2022
- THE EXISTING CONDITIONS SHOWN ON THIS PLAN ARE COMPILED BY PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHY DATED 2-28-2022 BY NV5 AND MINIMAL ON-THE-GROUND-SURVEY PERFORMED BY VHB DURING JULY 2022.
- THE EXISTING TOPOGRAPHY SHOWN ON THIS PLAN IS COMPILED BY PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHY DATED 2-28-2022 BY NV5.
- MERIDIAN SOURCE:
HORIZONTAL: VIRGINIA STATE PLANE COORDINATE SYSTEM SOUTH ZONE NAD83.

VERTICAL: MLW.
- THIS PROPERTY SHOWN HEREON LIES WITHIN FLOOD ZONE X (AREAS OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) , ZONE AE AND ZONE VE AS INDICATED ON THE FLOOD INSURANCE RATE MAP (FIRM) FOR YORK COUNTY VIRGINIA ON COMMUNITY PANEL NUMBER 5119C0068D AND 51199C0064D, MAP REVISED JANUARY 16, 2015.



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DATUM:
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COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B LEGEND AND GENERAL NOTES

AT: YORK RIVER

IN: YORK COUNTY, VIRGINIA

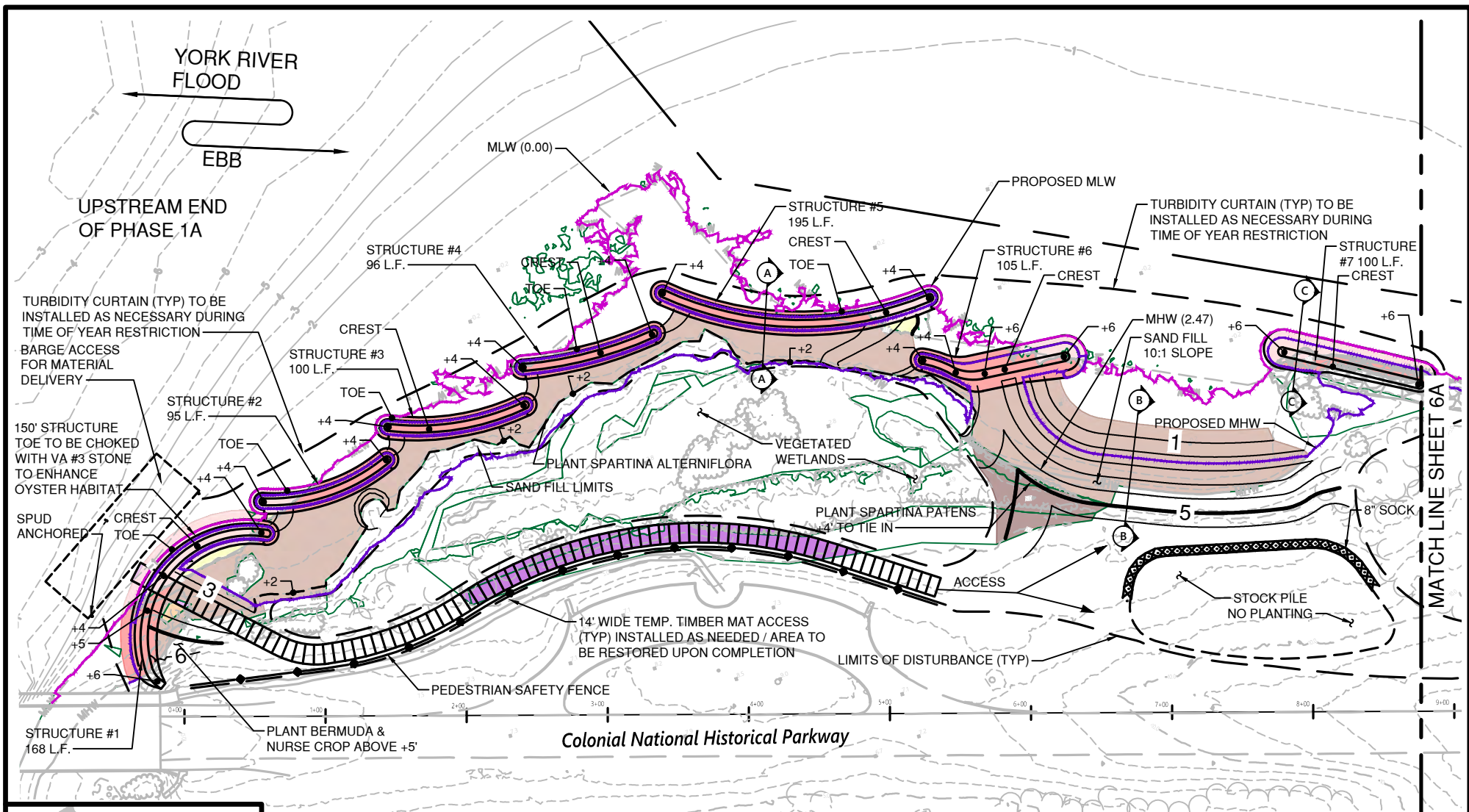
PURPOSE:

SHORELINE STABILIZATION and REHABILITATION

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SHEET 4



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 Gloucester, Virginia 23061 (804) 693-4158

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DATUM:
 MEAN LOW WATER

**COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B
 LAYOUT, IMPACT AREAS**

AT: YORK RIVER

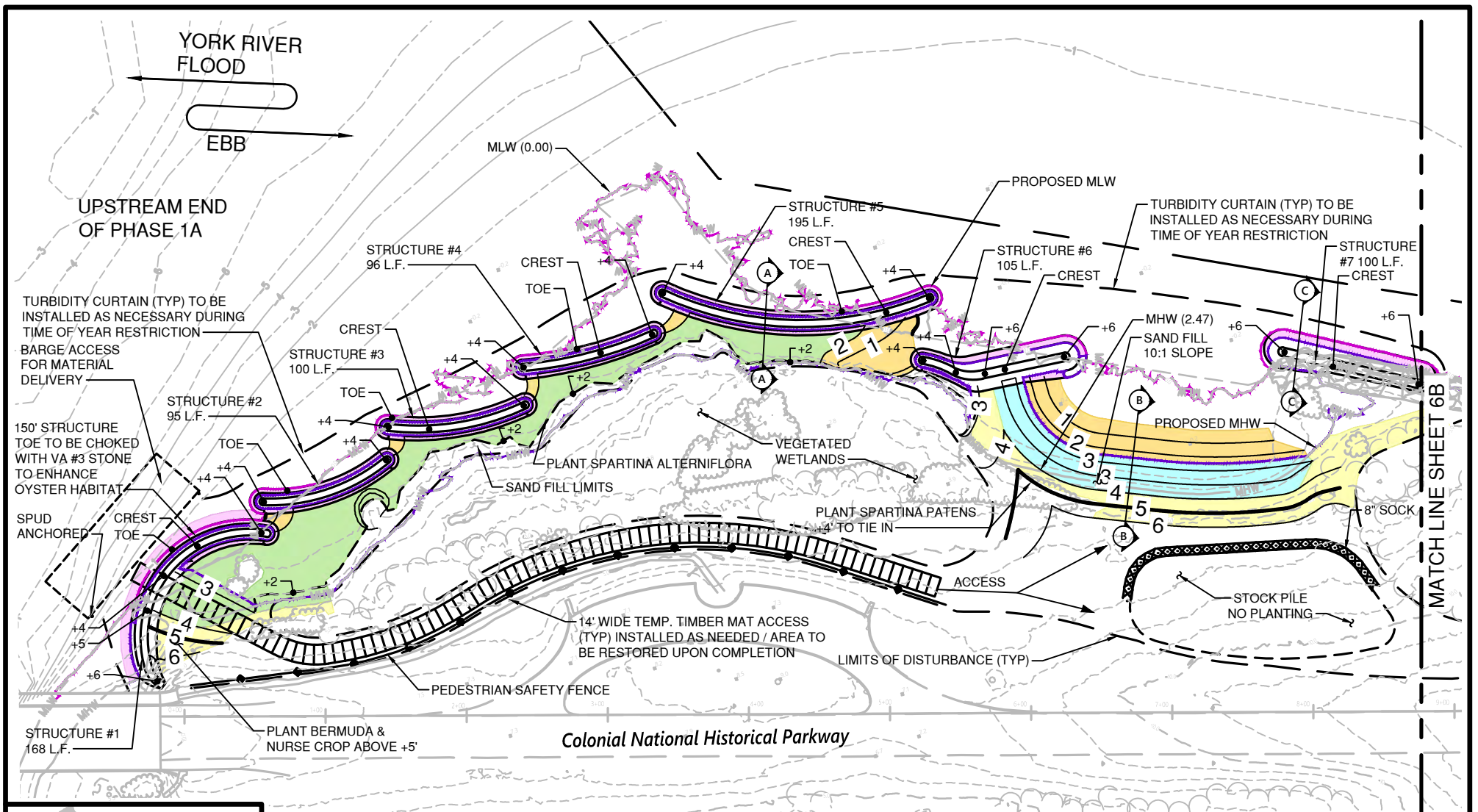
IN: YORK COUNTY, VIRGINIA

PURPOSE:
 SHORELINE STABILIZATION and REHABILITATION

APPLICATION BY:
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REVISED:
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SHEET 5A



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 Gloucester, Virginia 23061 (804) 693-4158

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COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B HABITAT AREAS

AT: YORK RIVER

IN: YORK COUNTY, VIRGINIA

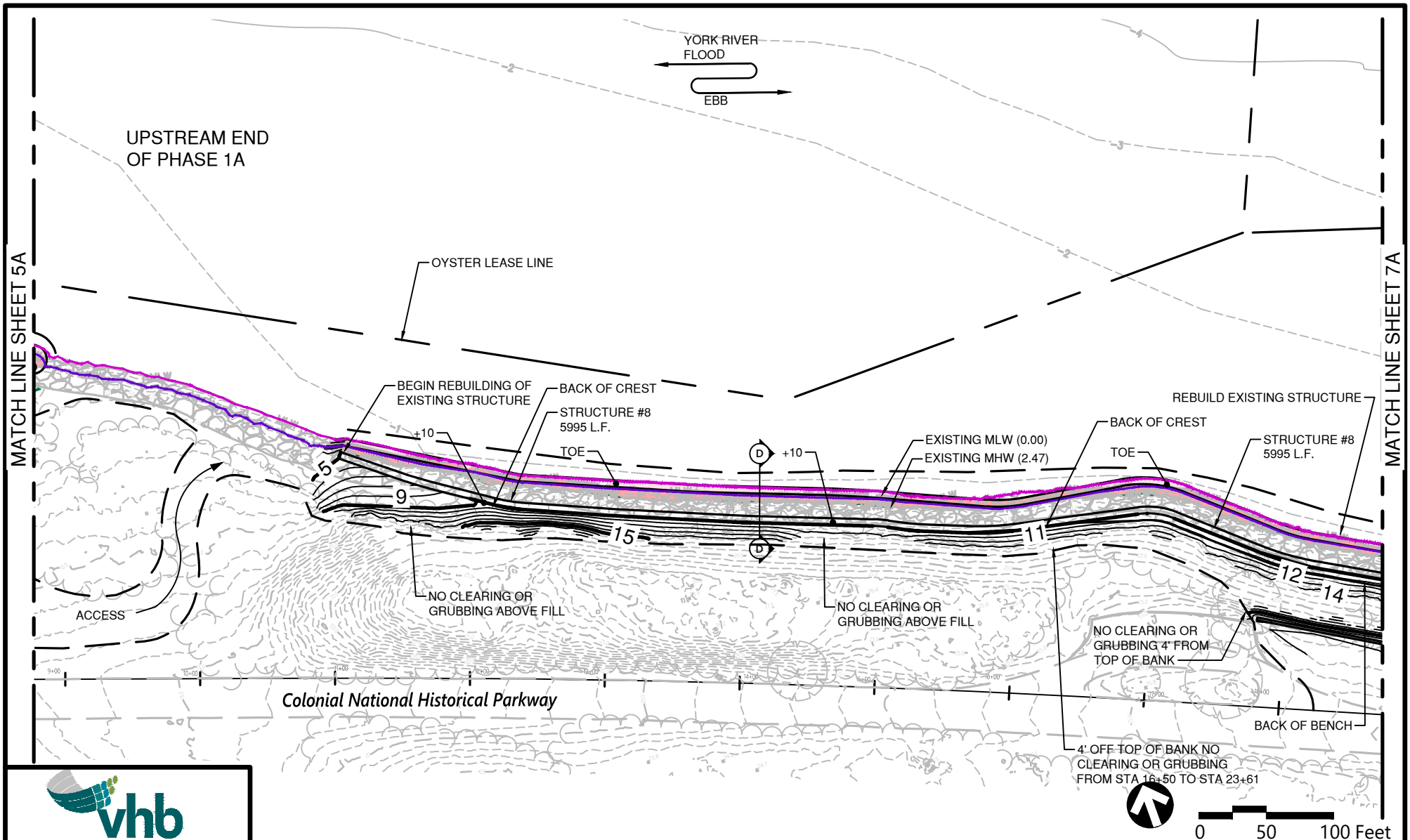
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COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B LAYOUT, IMPACT AREAS

AT: YORK RIVER

IN: YORK COUNTY, VIRGINIA

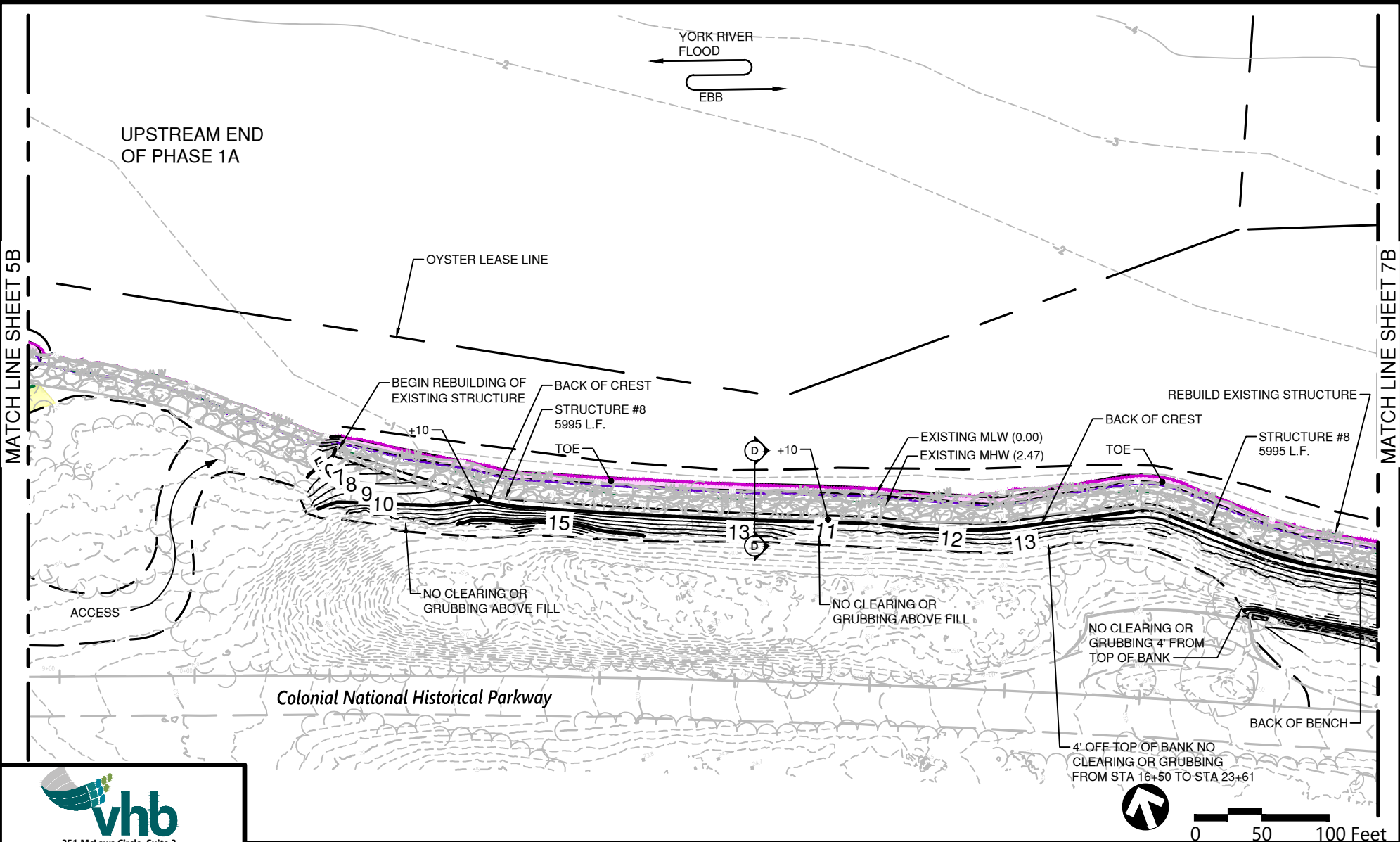
PURPOSE:

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APPLICATION BY:
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REVISED:
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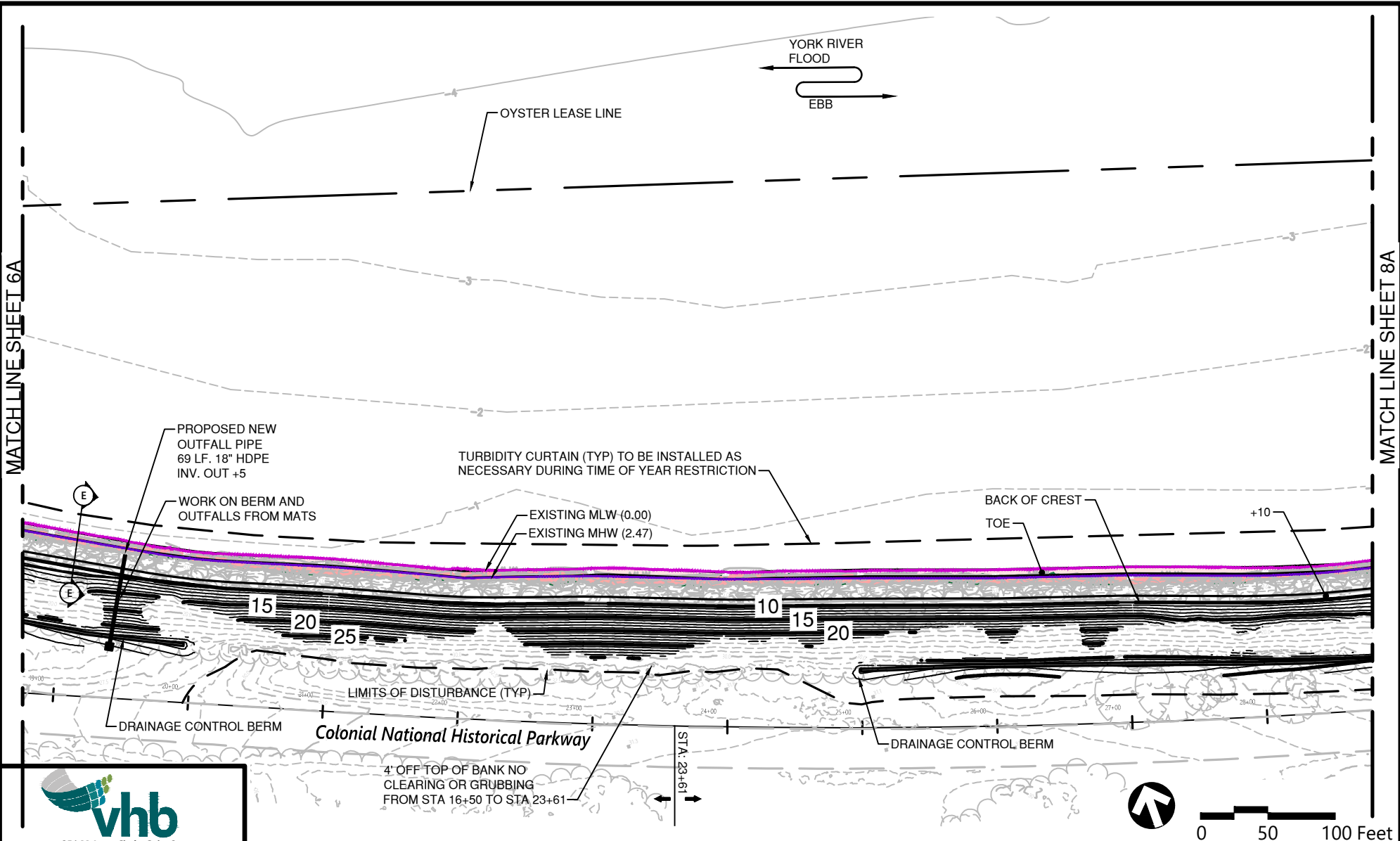


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IN: YORK COUNTY, VIRGINIA	PURPOSE: SHORELINE STABILIZATION and REHABILITATION	SHEET 6B





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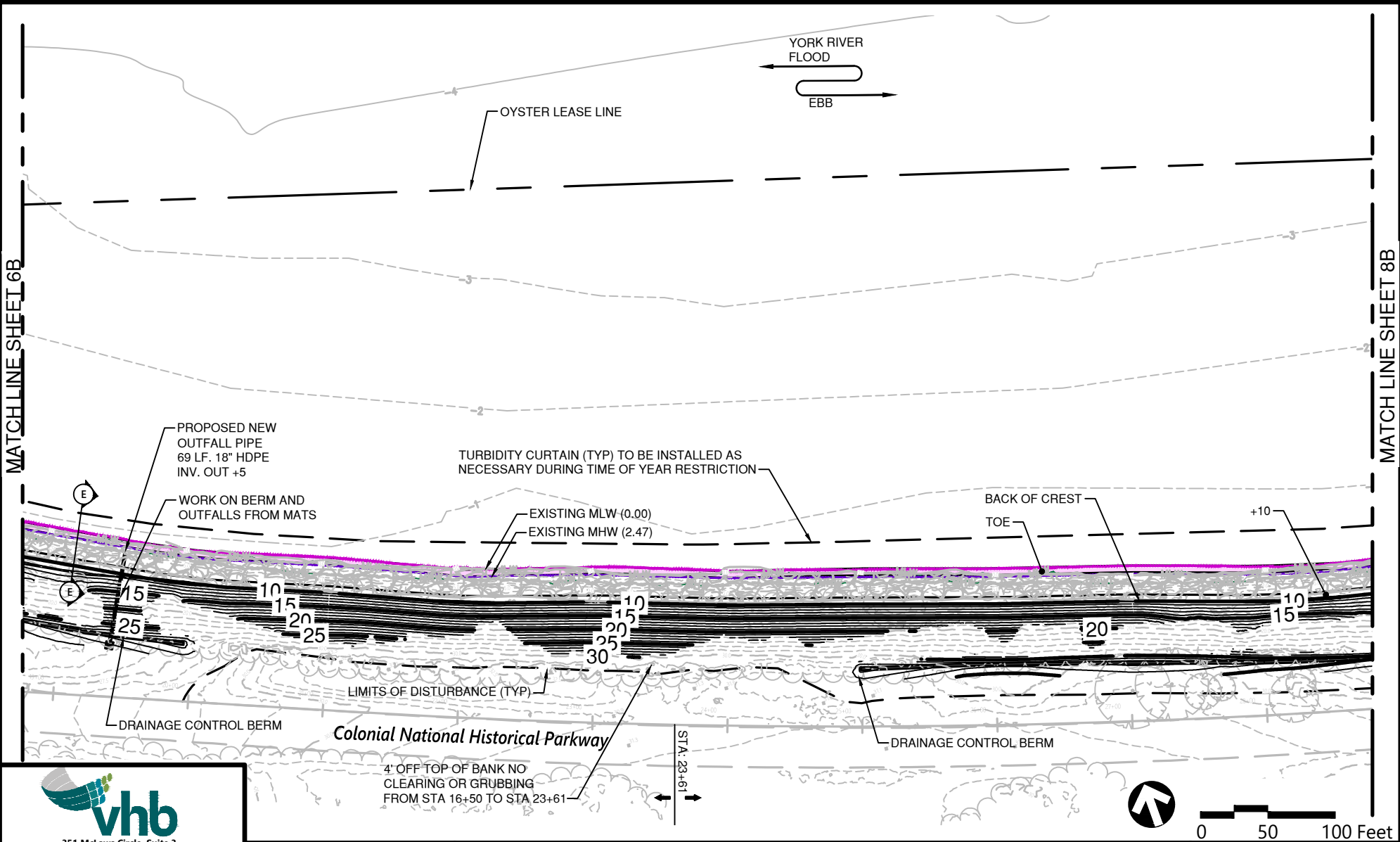
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IN: YORK COUNTY, VIRGINIA	

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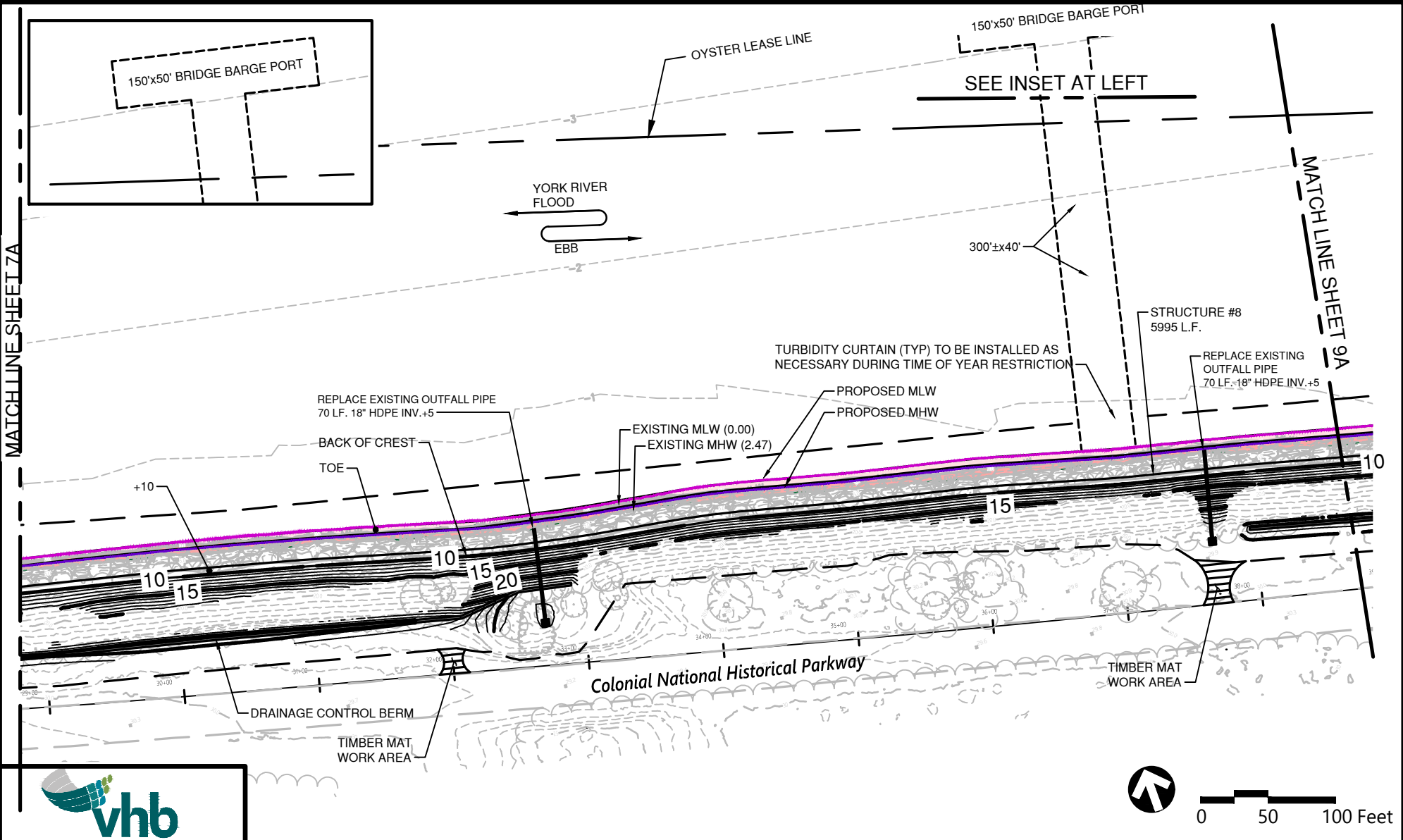


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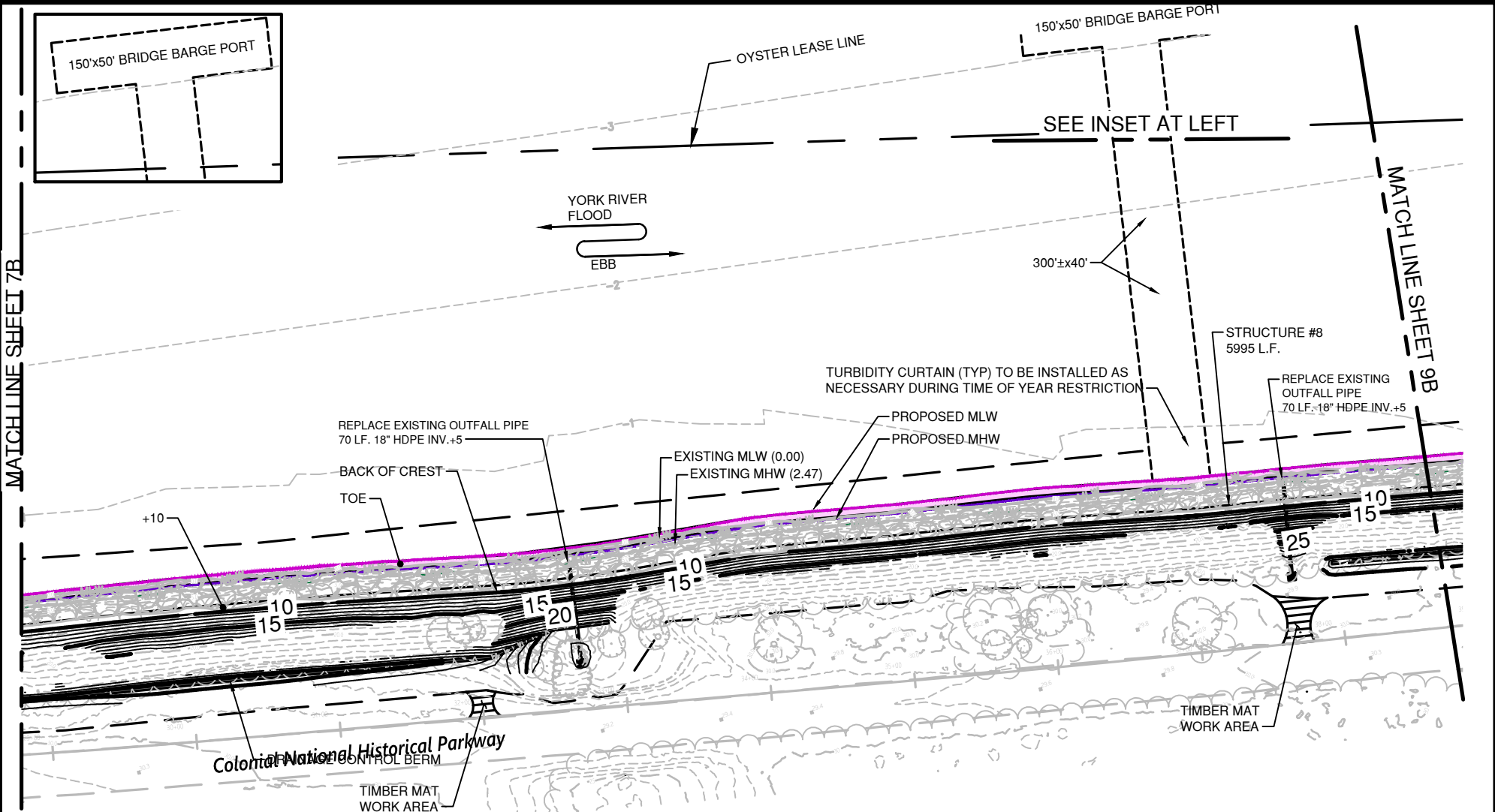
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IN: YORK COUNTY, VIRGINIA	

APPLICATION BY: NATIONAL PARK SERVICE
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AT: YORK RIVER

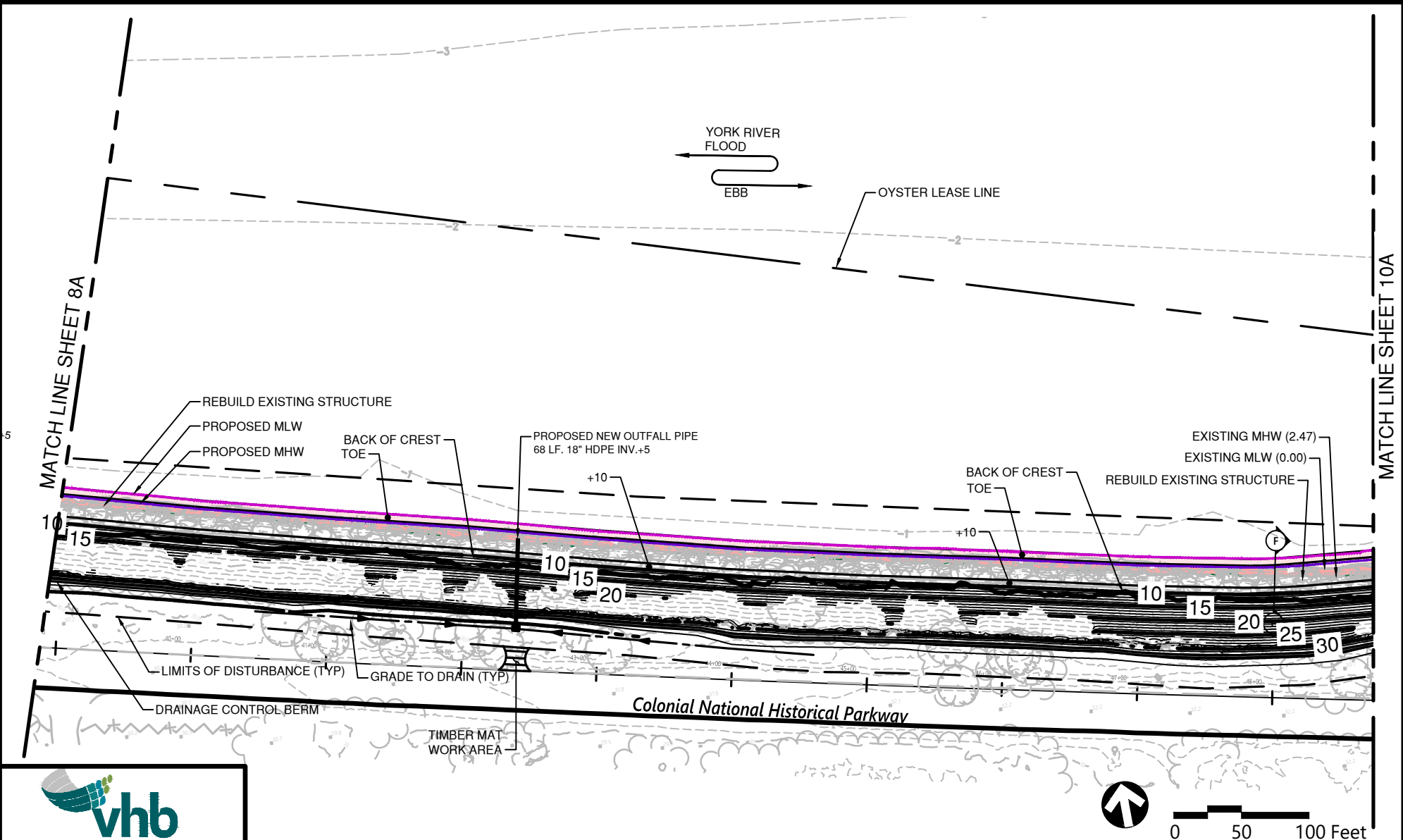
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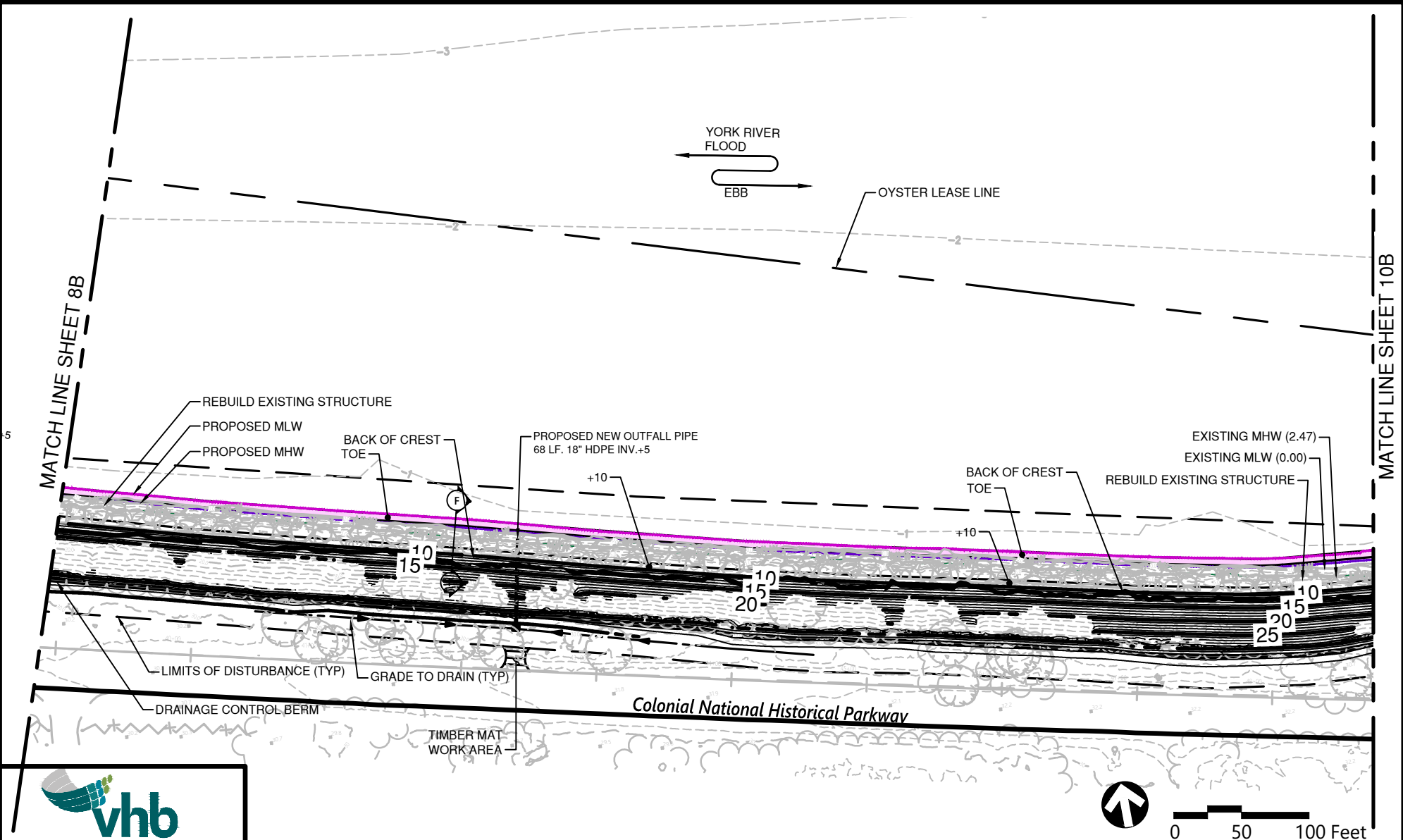



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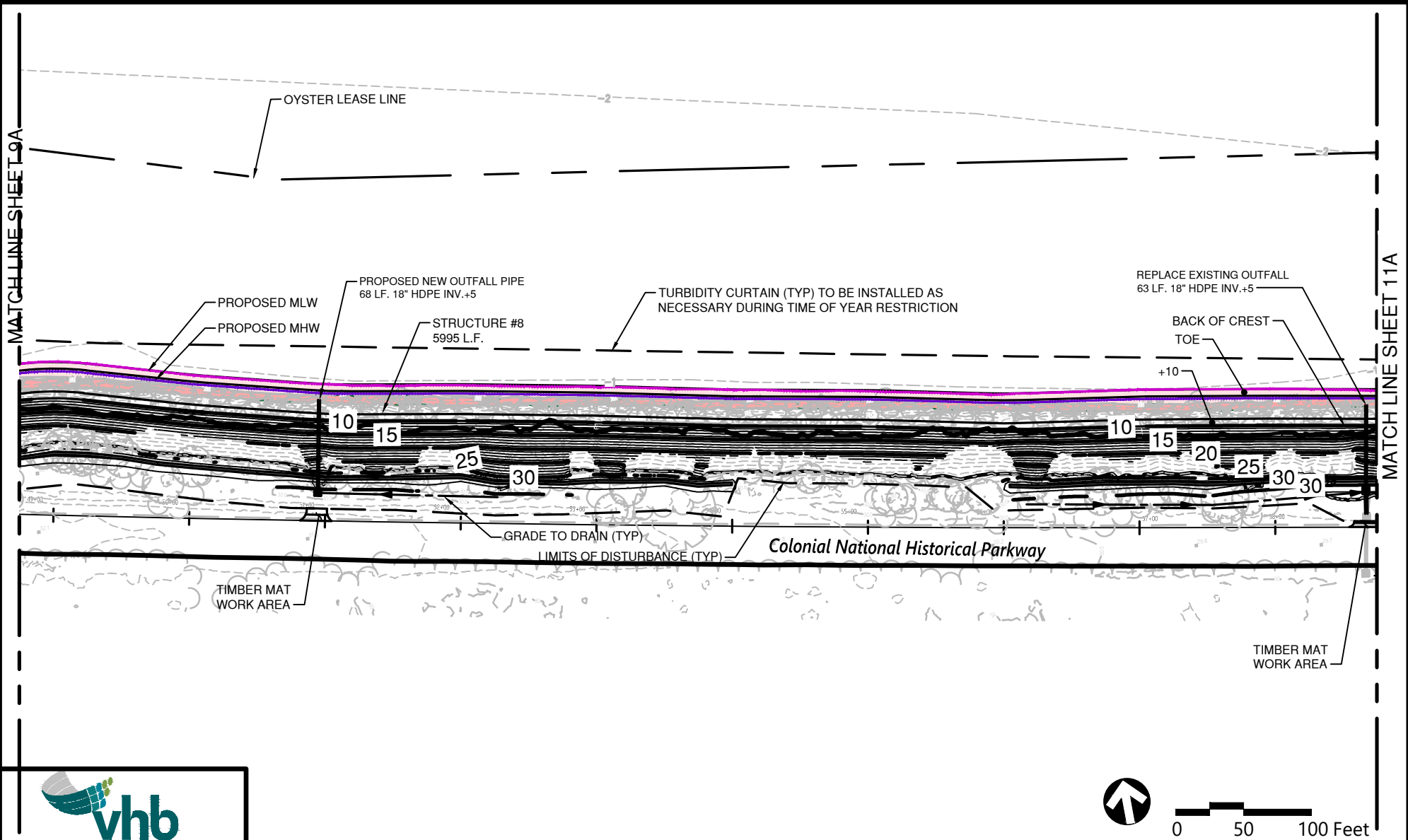
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COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B HABITAT AREAS
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COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B
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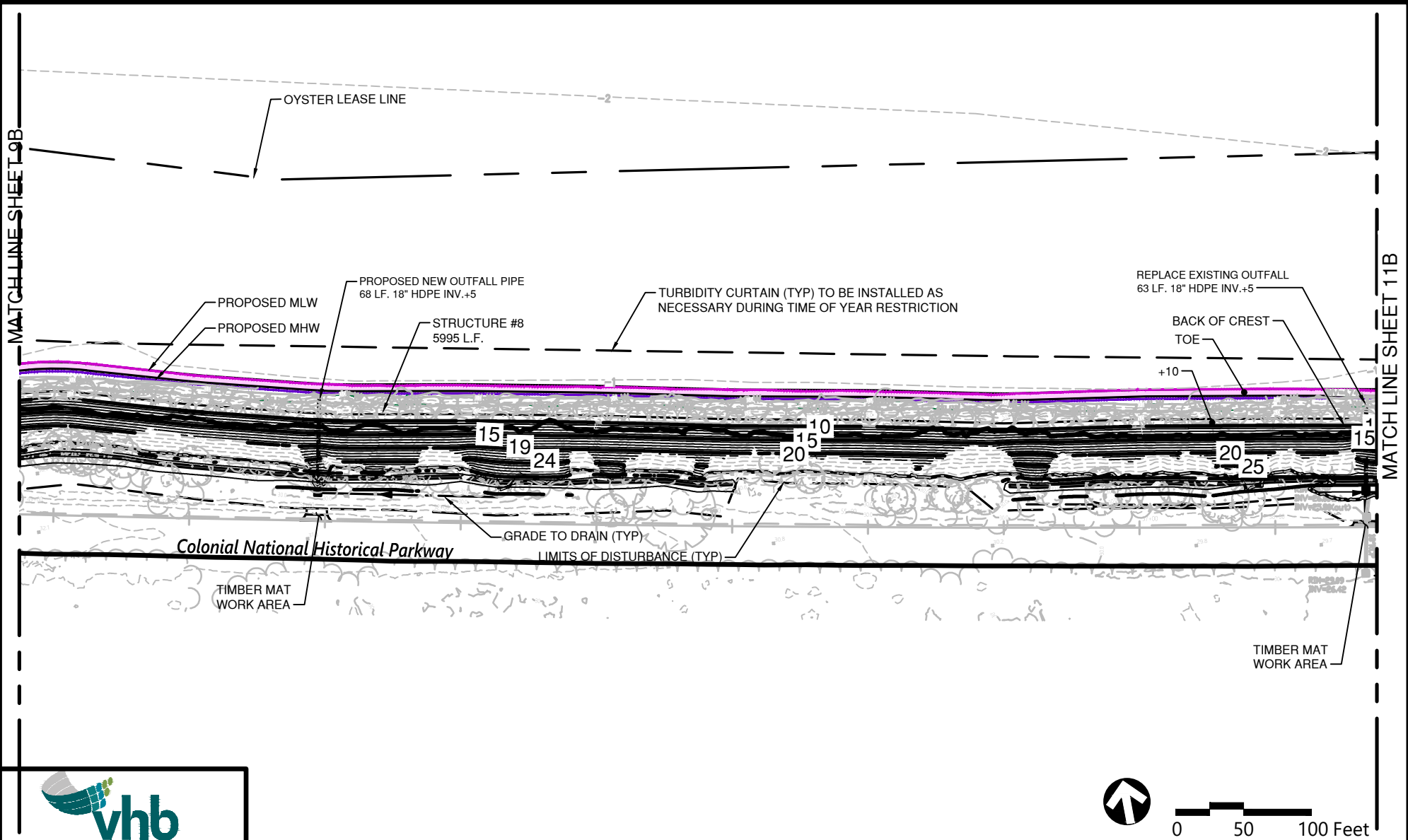
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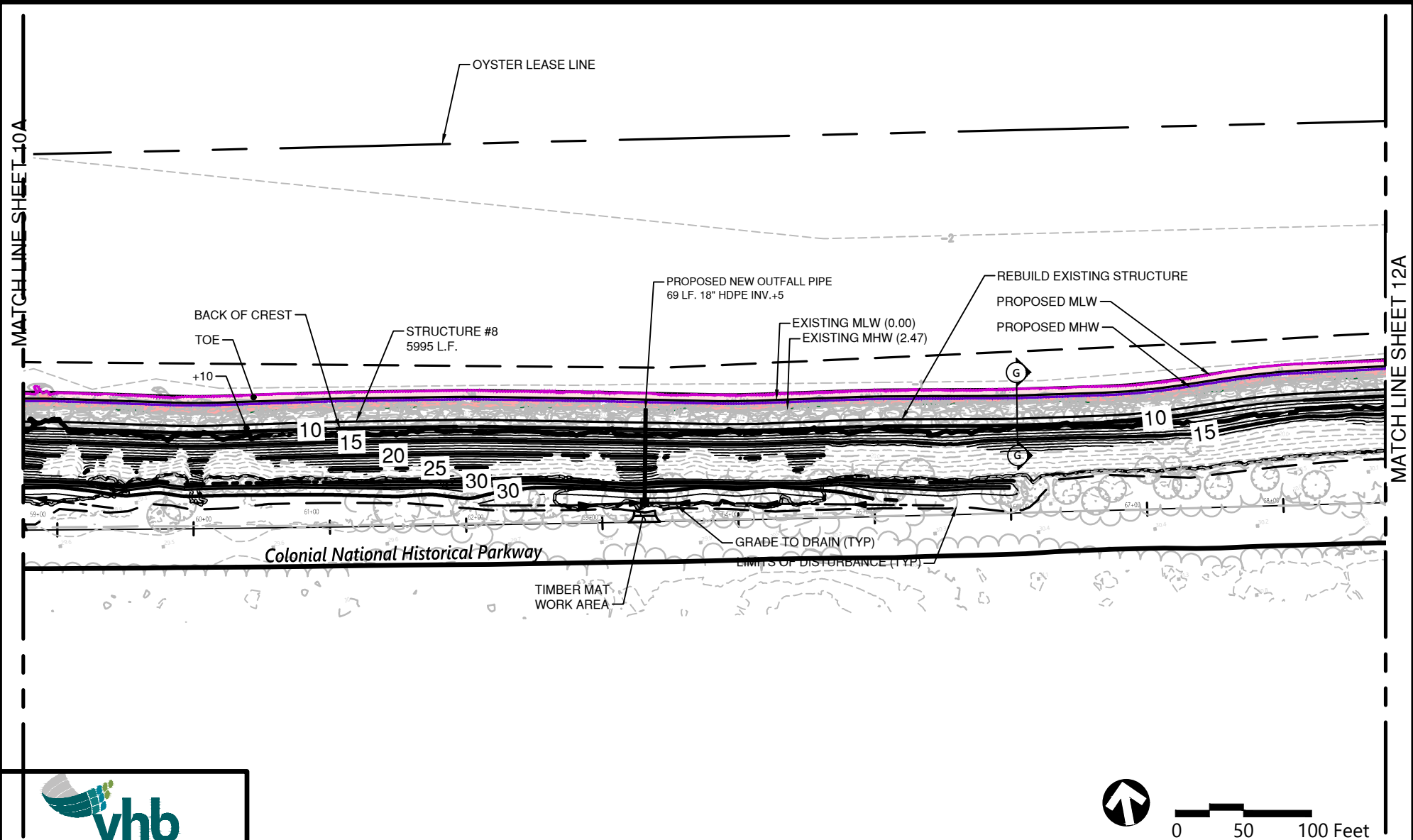
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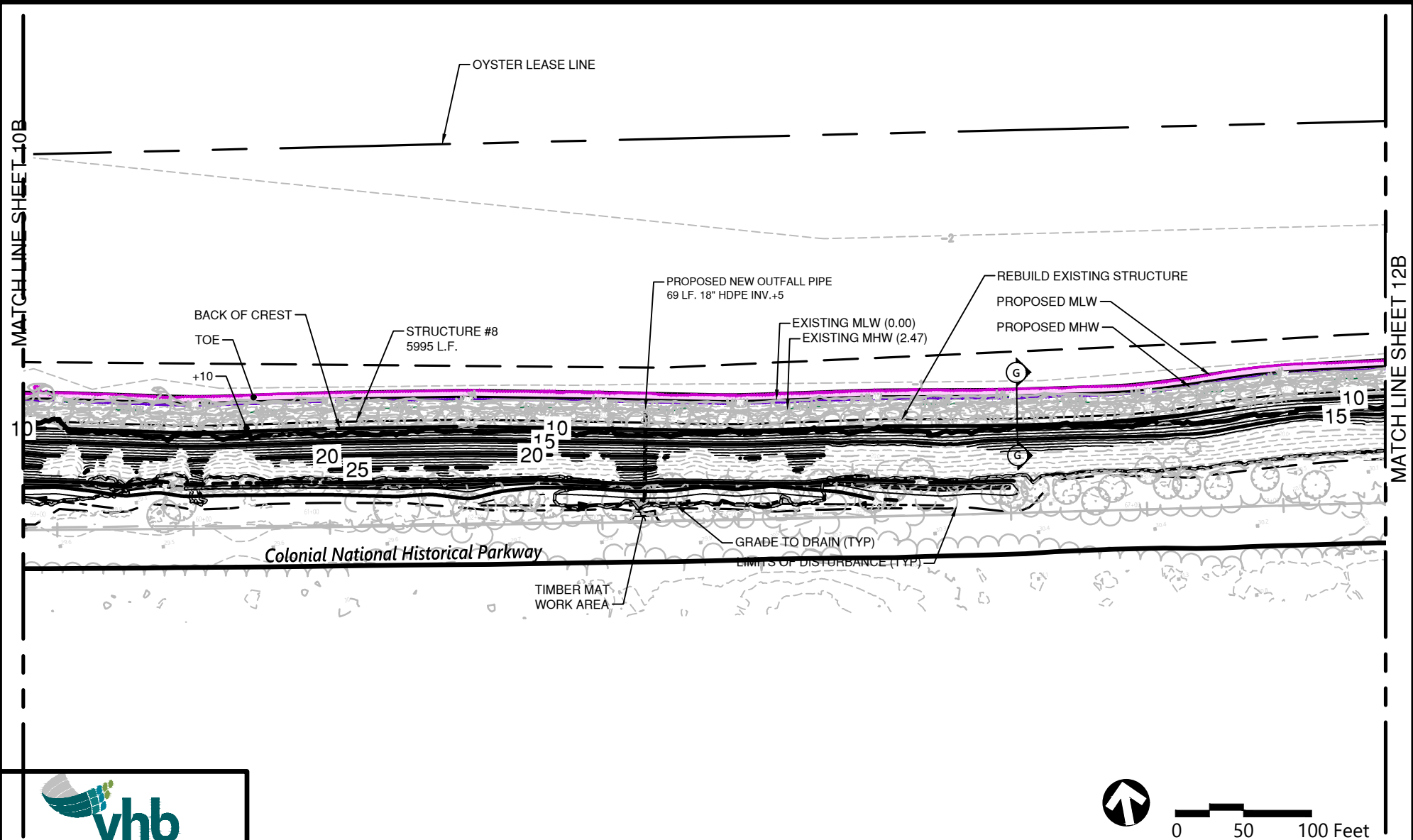
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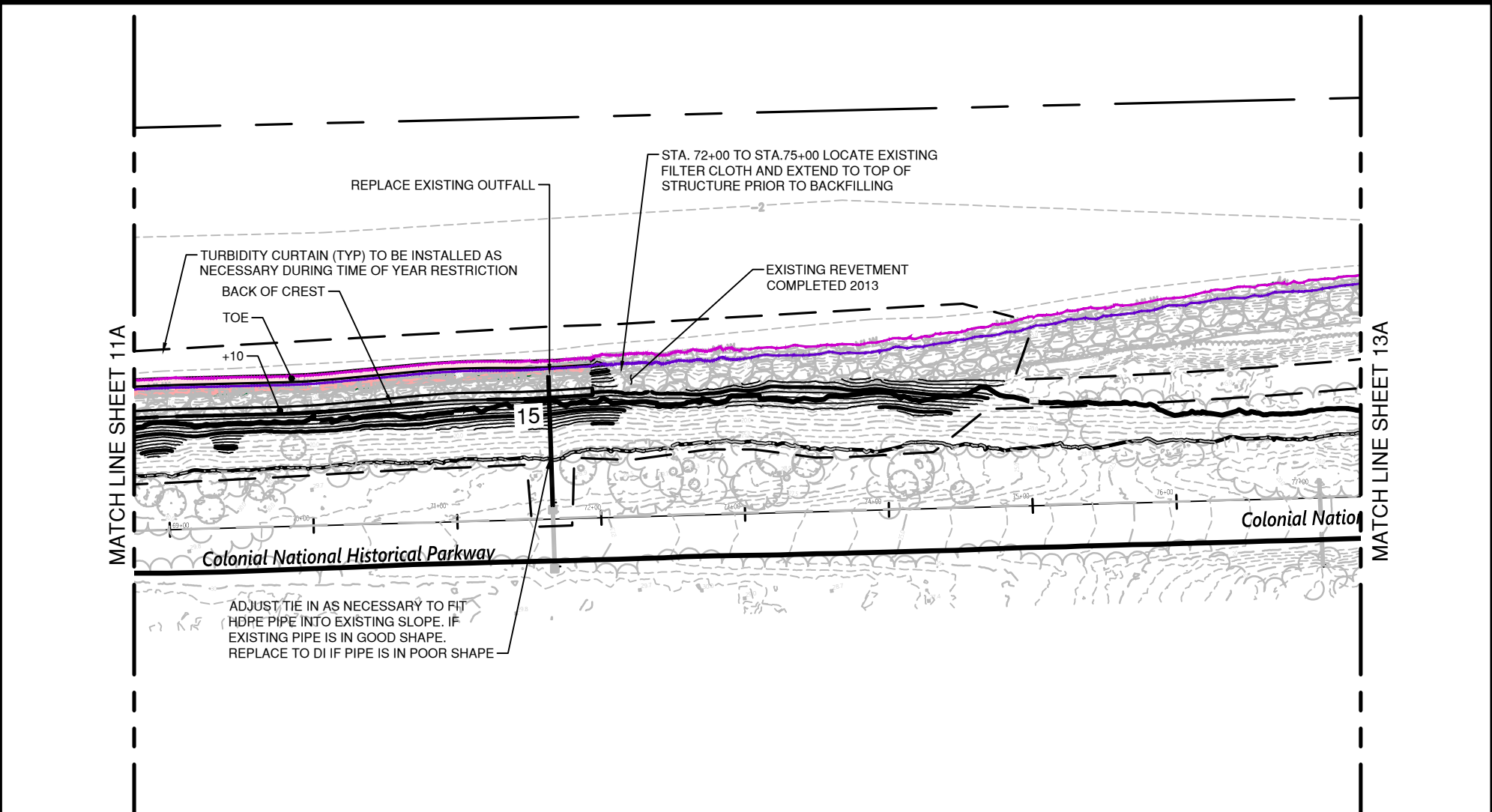
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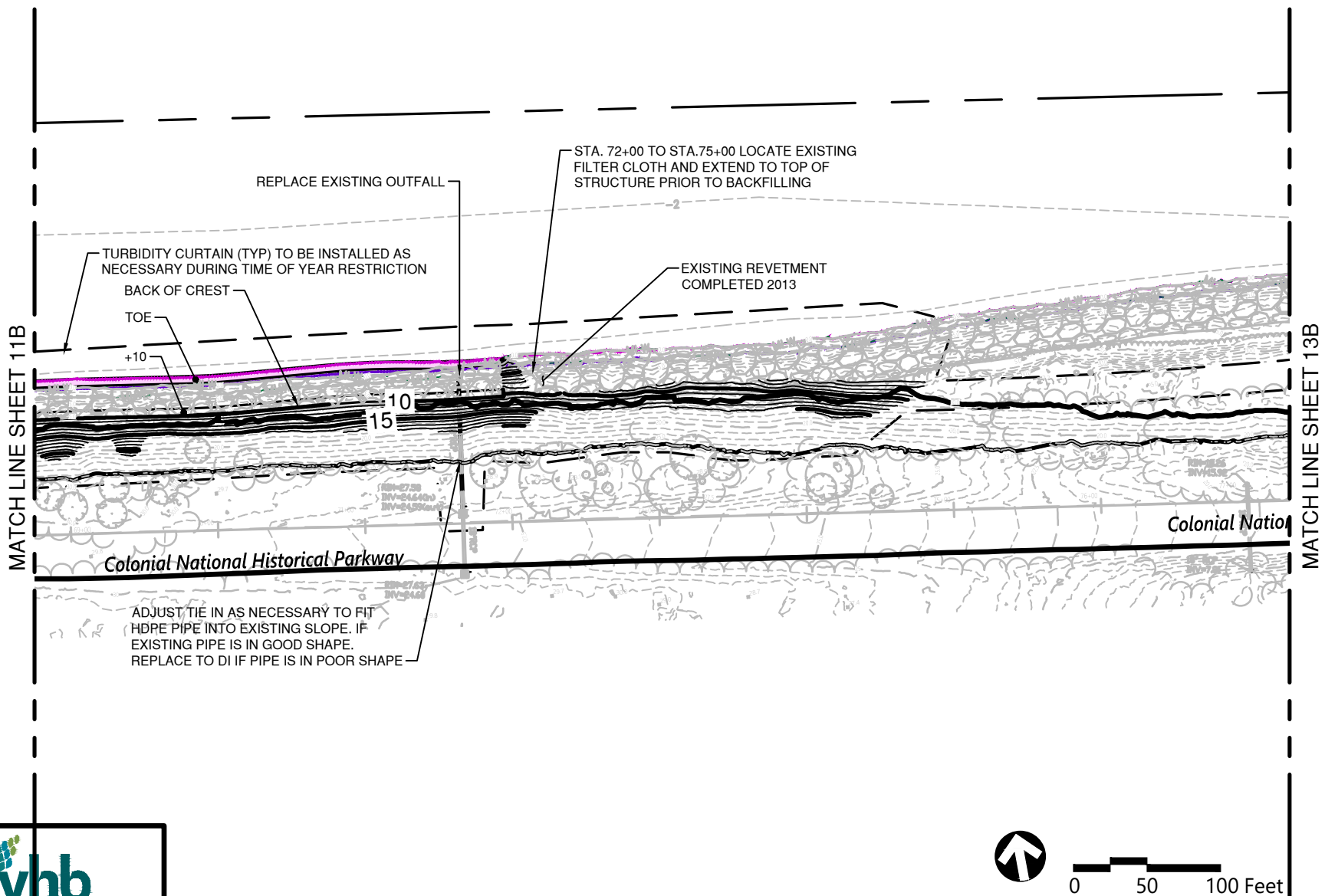


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DATUM: MEAN LOW WATER	AT: YORK RIVER	PURPOSE: SHORELINE STABILIZATION and REHABILITATION	REVISED: DATE: AUGUST 23, 2020
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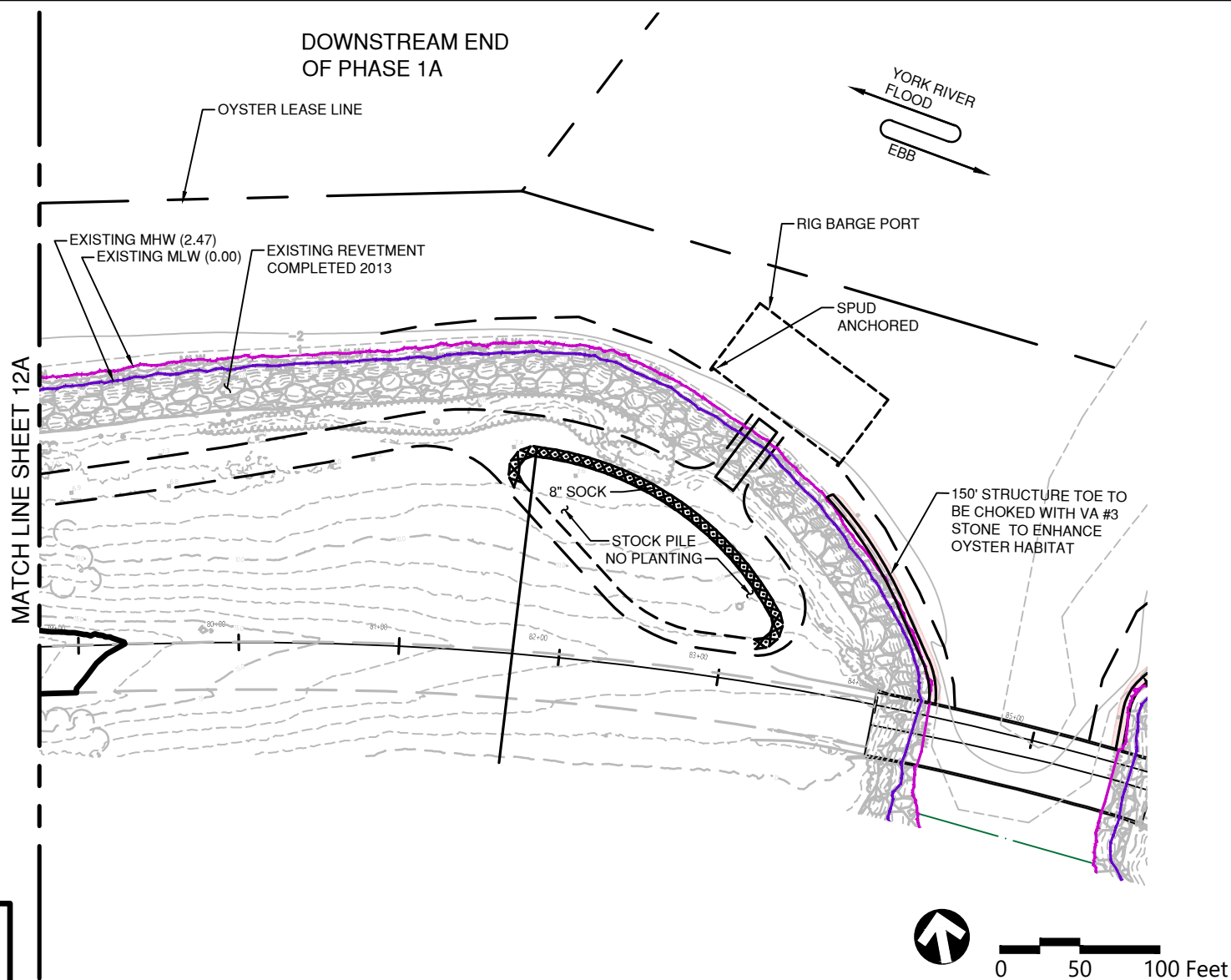
PURPOSE:

SHORELINE STABILIZATION and REHABILITATION

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COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B
LAYOUT, IMPACT AREAS

AT: YORK RIVER

IN: YORK COUNTY, VIRGINIA

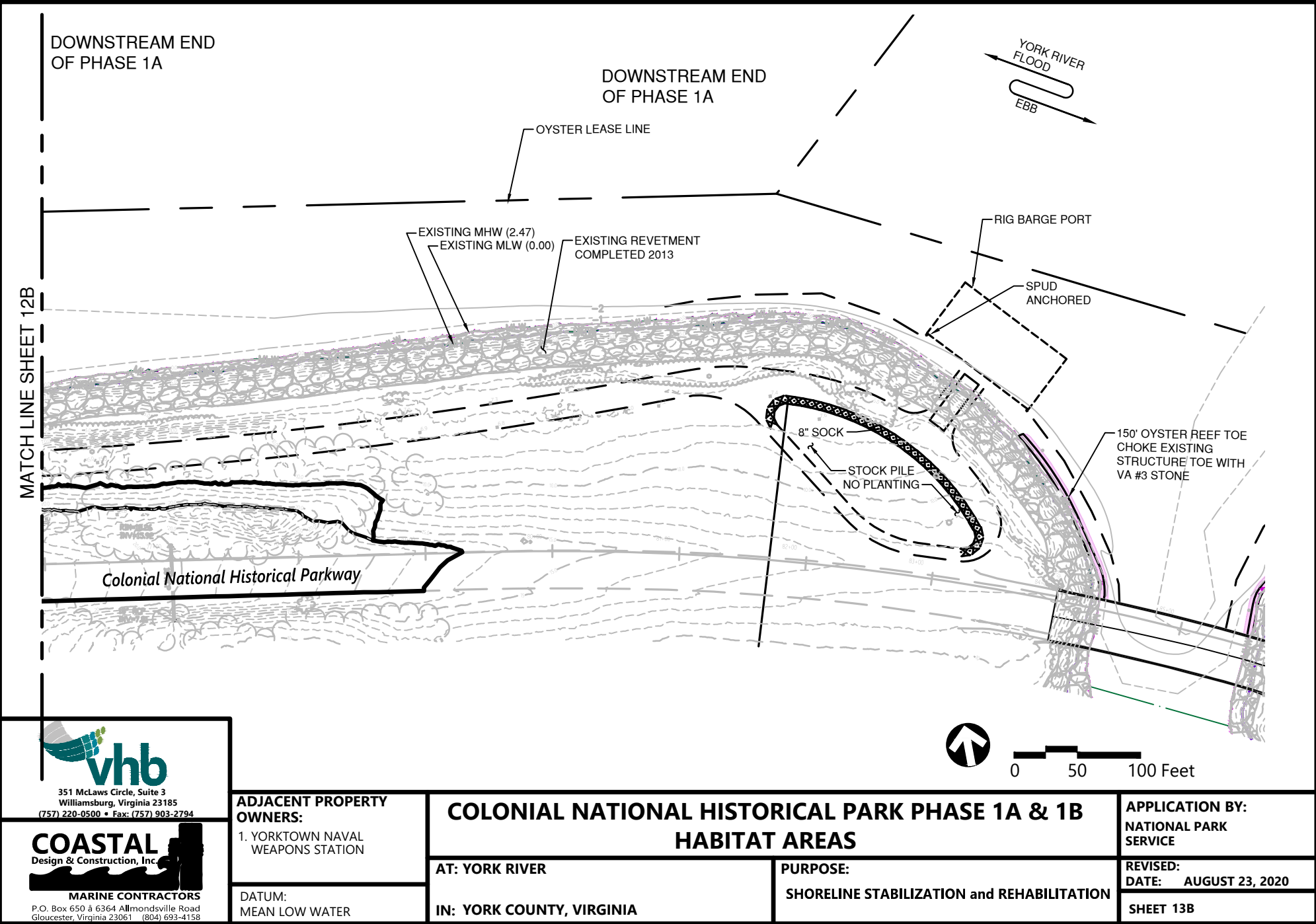
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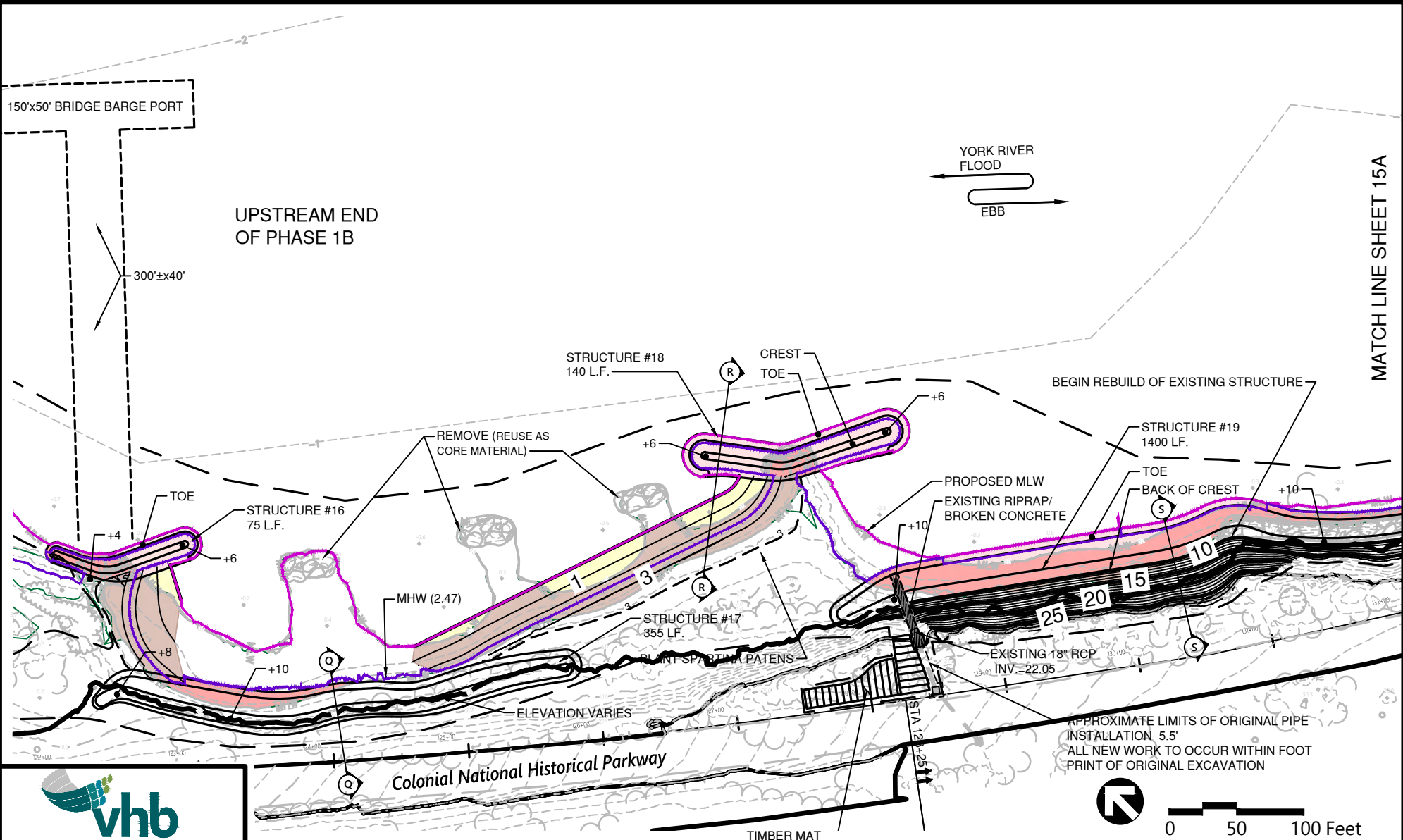
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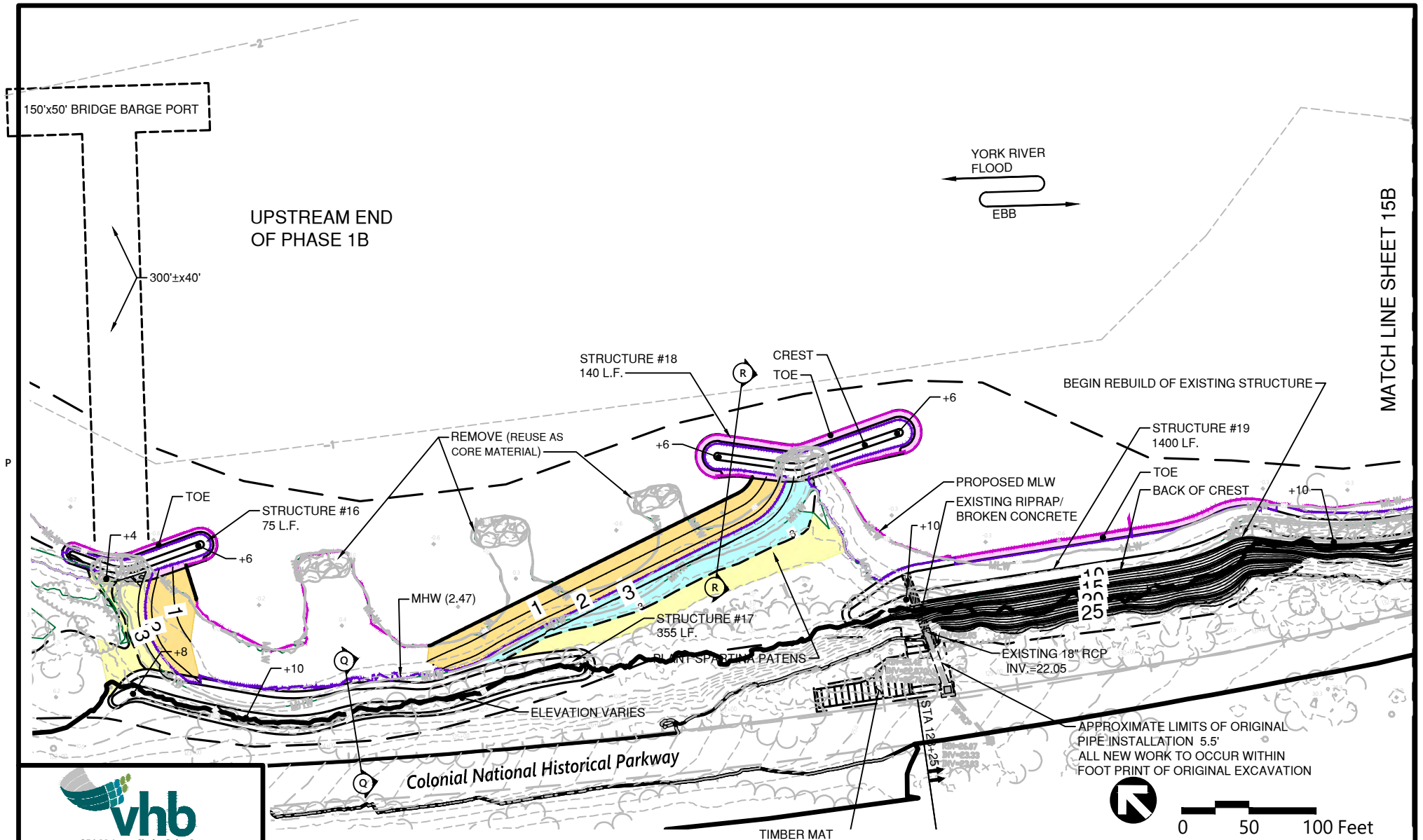


MARINE CONTRACTORS
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Gloucester, Virginia 23061 (804) 693-4158

ADJACENT PROPERTY OWNERS:	
1. YORKTOWN NAVAL WEAPONS STATION	
DATUM:	MEAN LOW WATER

COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B LAYOUT, IMPACT AREAS	
AT: YORK RIVER	PURPOSE: SHORELINE STABILIZATION and REHABILITATION
IN: YORK COUNTY, VIRGINIA	

APPLICATION BY: NATIONAL PARK SERVICE
REVISED: DATE: AUGUST 23, 2020
SHEET 14A



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ADJACENT PROPERTY OWNERS:

1. YORKTOWN NAVAL WEAPONS STATION

DATUM:
 MEAN LOW WATER

**COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B
 HABITAT AREAS**

AT: YORK RIVER

IN: YORK COUNTY, VIRGINIA

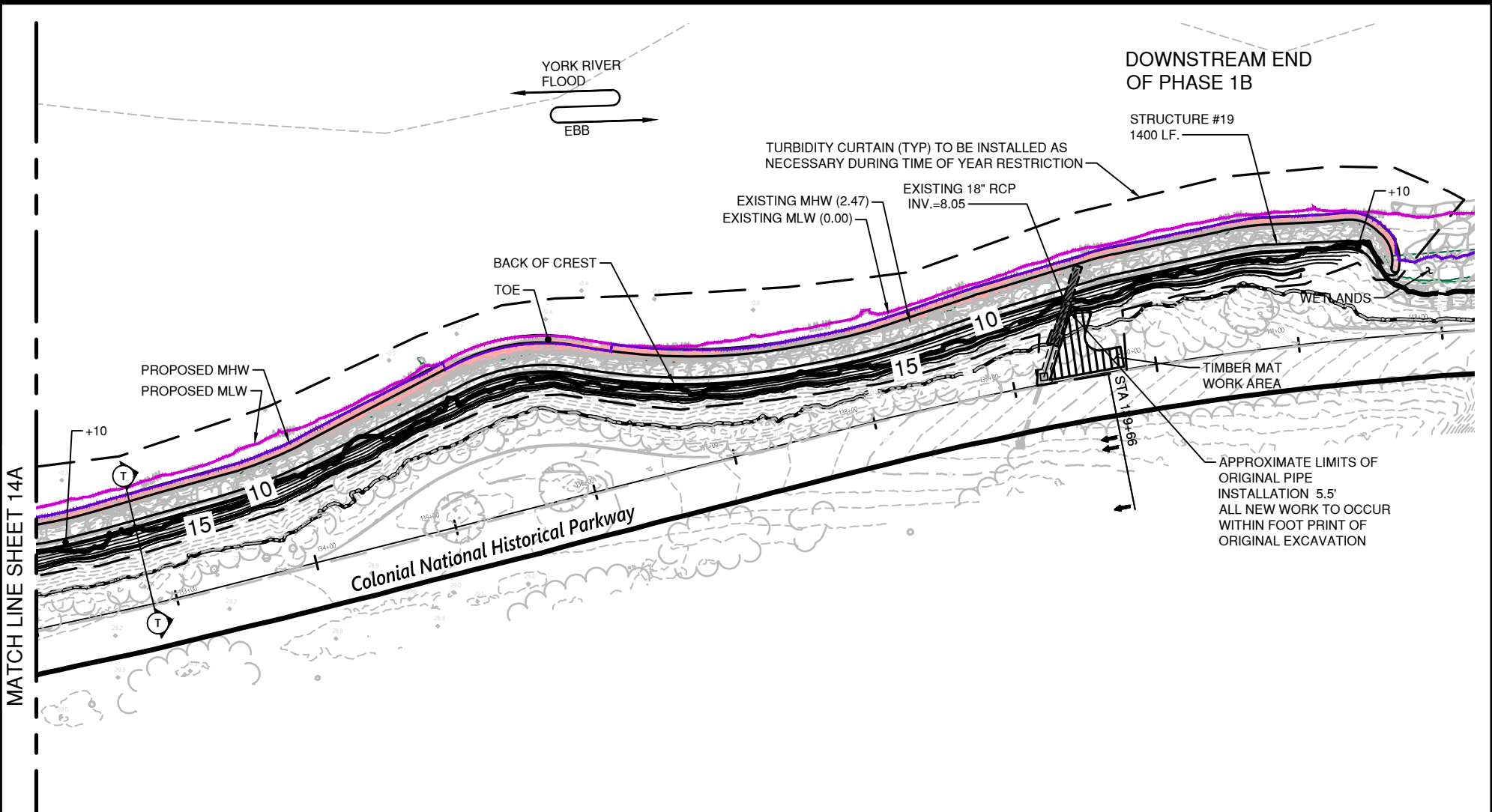
PURPOSE:

SHORELINE STABILIZATION and REHABILITATION

APPLICATION BY:
 NATIONAL PARK SERVICE

REVISED:
 DATE: AUGUST 23, 2020

SHEET 14B



MATCH LINE SHEET 14A

Colonial National Historical Parkway



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ADJACENT PROPERTY OWNERS:

1. YORKTOWN NAVAL WEAPONS STATION

DATUM:
MEAN LOW WATER

COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B LAYOUT, IMPACT AREAS

AT: YORK RIVER

IN: YORK COUNTY, VIRGINIA

PURPOSE:

SHORELINE STABILIZATION and REHABILITATION

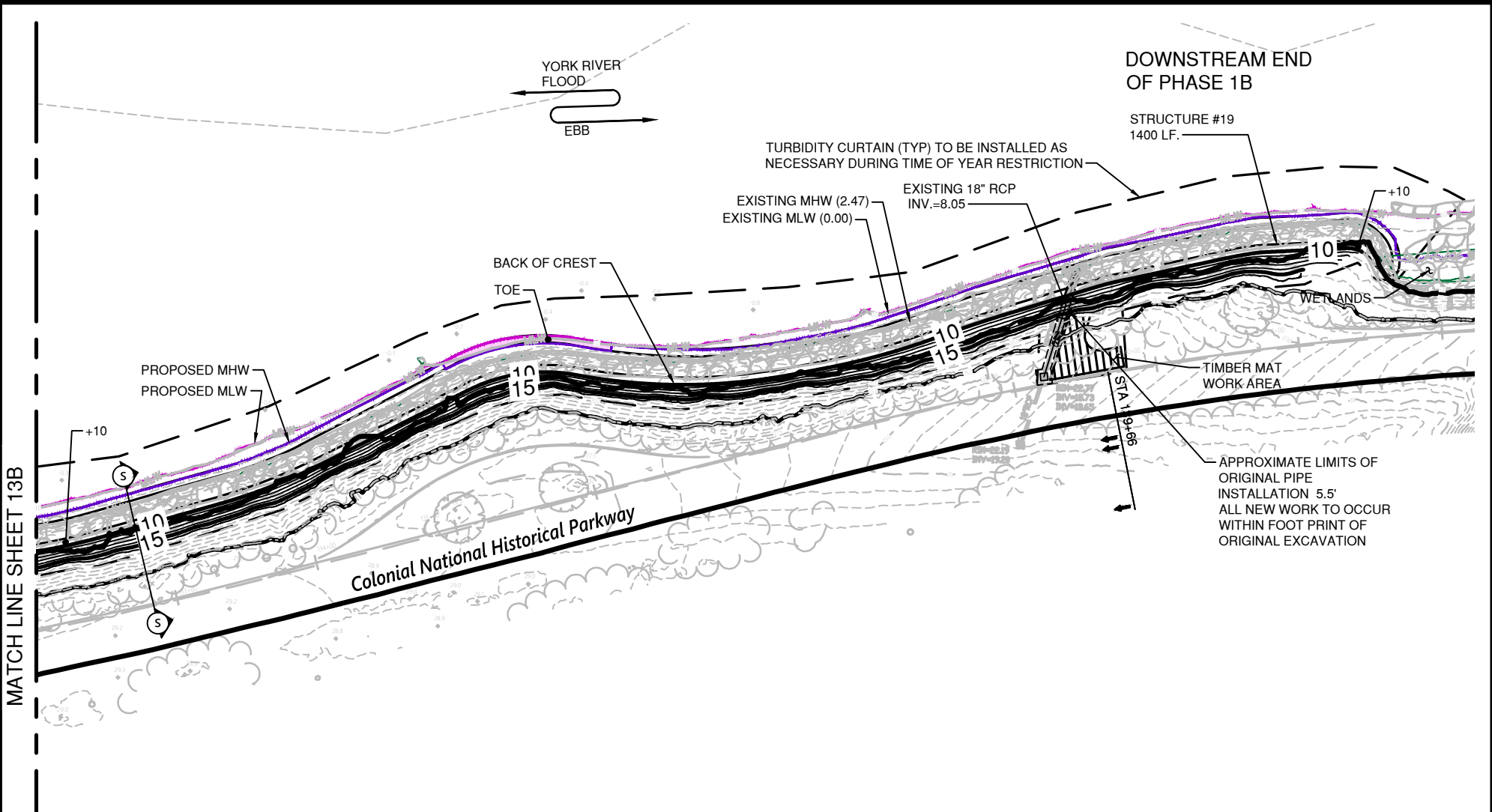
APPLICATION BY:
NATIONAL PARK SERVICE

REVISED:
DATE: AUGUST 23, 2020

SHEET 15A



0 50 100 Feet



MATCH LINE SHEET 13B

Colonial National Historical Parkway

DOWNSTREAM END
OF PHASE 1B

STRUCTURE #19
1400 LF.

TURBIDITY CURTAIN (TYP) TO BE INSTALLED AS
NECESSARY DURING TIME OF YEAR RESTRICTION

EXISTING MHW (2.47)
EXISTING MLW (0.00)

EXISTING 18" RCP
INV.=8.05

BACK OF CREST
TOE

PROPOSED MHW
PROPOSED MLW

WETLANDS

TIMBER MAT
WORK AREA

APPROXIMATE LIMITS OF
ORIGINAL PIPE
INSTALLATION 5.5'
ALL NEW WORK TO OCCUR
WITHIN FOOT PRINT OF
ORIGINAL EXCAVATION

STA 19+66
90+66



0 50 100 Feet



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ADJACENT PROPERTY
OWNERS:

1. YORKTOWN NAVAL
WEAPONS STATION

DATUM:
MEAN LOW WATER

COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B HABITAT AREAS

AT: YORK RIVER

IN: YORK COUNTY, VIRGINIA

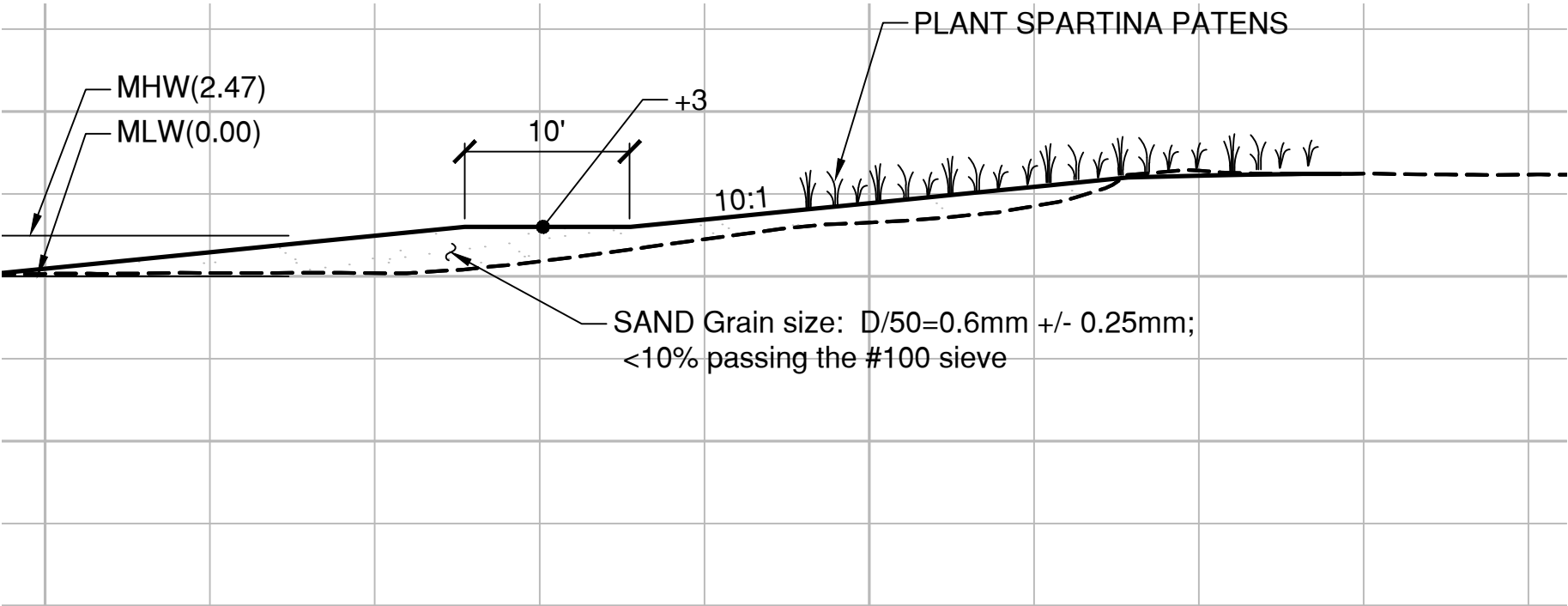
PURPOSE:

SHORELINE STABILIZATION and REHABILITATION

APPLICATION BY:
NATIONAL PARK
SERVICE

REVISED:
DATE: AUGUST 23, 2020

SHEET 15B



Typical Section B-B - Sta 6+80 (Applies From Sta 6+00 to Sta 8+00)

1" = 10'



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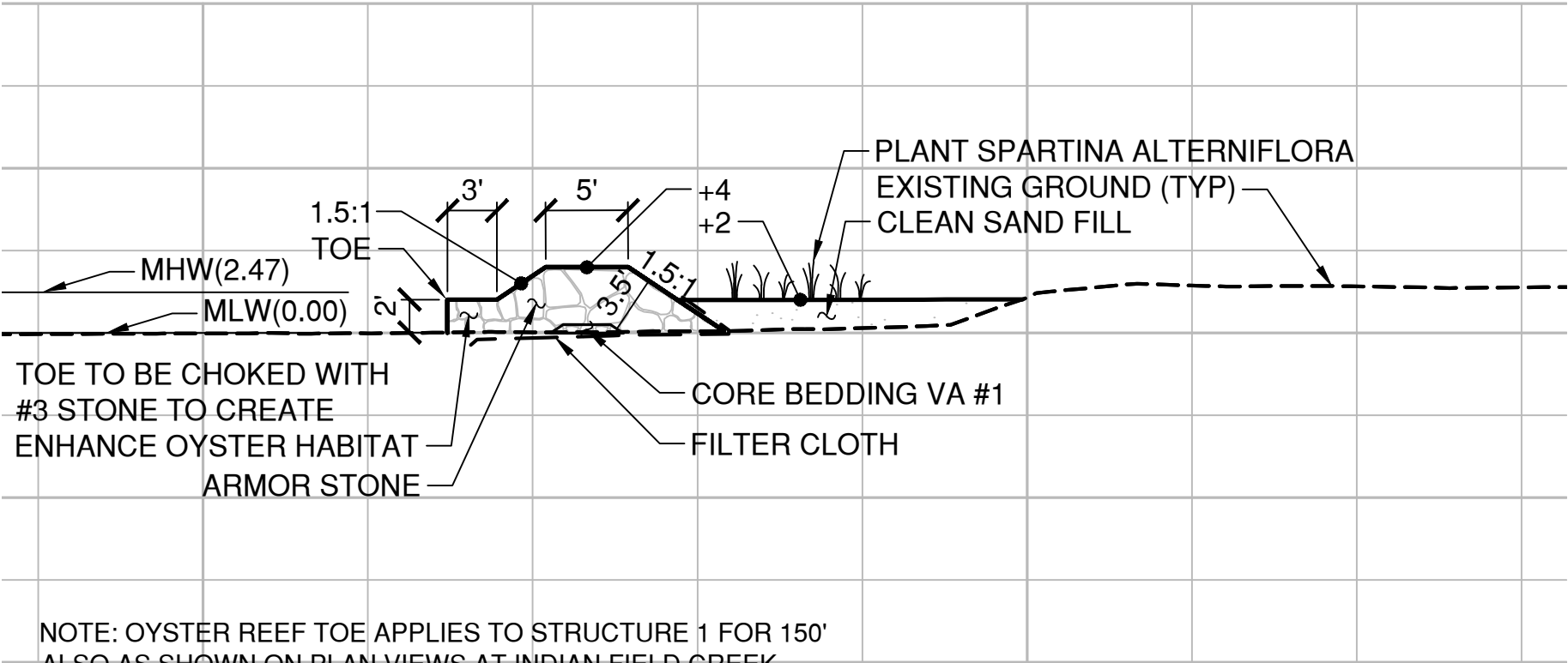


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ADJACENT PROPERTY OWNERS: 1. YORKTOWN NAVAL WEAPONS STATION	COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B Typical Sections / Details		APPLICATION BY: NATIONAL PARK SERVICE
	AT: YORK RIVER	PURPOSE: SHORELINE STABILIZATION and REHABILITATION	REVISED: DATE: AUGUST 23, 2020
DATUM: MEAN LOW WATER	IN: YORK COUNTY, VIRGINIA		SHEET 17



NOTE: OYSTER REEF TOE APPLIES TO STRUCTURE 1 FOR 150'
ALSO AS SHOWN ON PLAN VIEWS AT INDIAN FIELD CREEK
WHERE #3 STONE WILL BE ADDED TO EXISTING REVETMENT
TOE FOR 150' TO ENHANCE OYSTER HABITAT.

Typical Section A-A - Sta 4+35 - Structure 1-5

1" = 10'



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ADJACENT PROPERTY OWNERS:
1. YORKTOWN NAVAL WEAPONS STATION

DATUM:
MEAN LOW WATER

COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B
Typical Sections / Details

AT: YORK RIVER
IN: YORK COUNTY, VIRGINIA

PURPOSE:
SHORELINE STABILIZATION and REHABILITATION

APPLICATION BY:
NATIONAL PARK SERVICE

REVISED:
DATE: AUGUST 23, 2020

SHEET 16



Typical Section C-C - Sta 7+30 - Structure 7

1" = 10'



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ADJACENT PROPERTY OWNERS:
1. YORKTOWN NAVAL WEAPONS STATION

DATUM:
MEAN LOW WATER

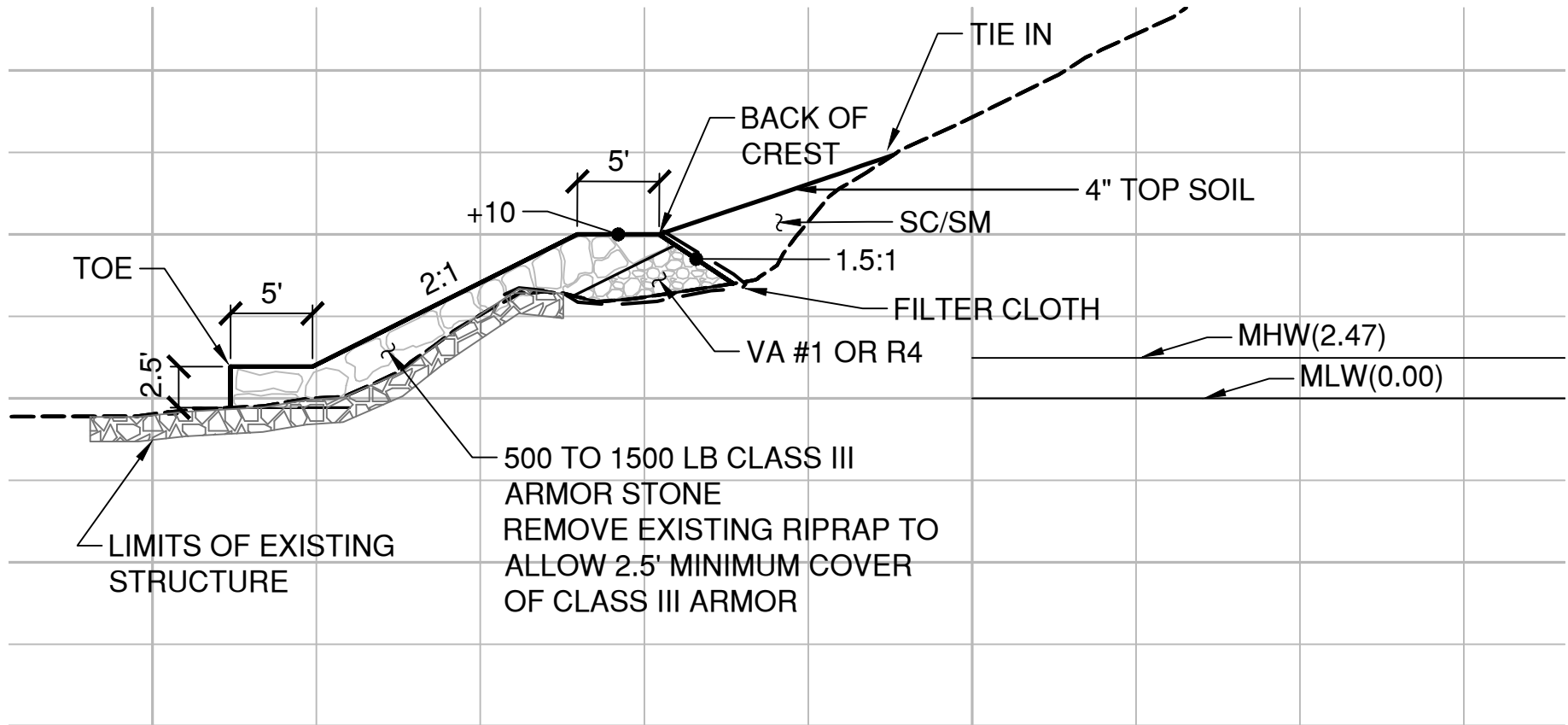
COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B
Typical Sections / Details

AT: YORK RIVER
IN: YORK COUNTY, VIRGINIA

PURPOSE:
SHORELINE STABILIZATION and REHABILITATION

APPLICATION BY:
NATIONAL PARK SERVICE

REVISED:
DATE: AUGUST 23, 2020
SHEET 18



Typical Section D-D - Sta 14+00 - Structure 8

1" = 10'



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ADJACENT PROPERTY OWNERS:

1. YORKTOWN NAVAL WEAPONS STATION

DATUM:
 MEAN LOW WATER

COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B Typical Sections / Details

AT: YORK RIVER

IN: YORK COUNTY, VIRGINIA

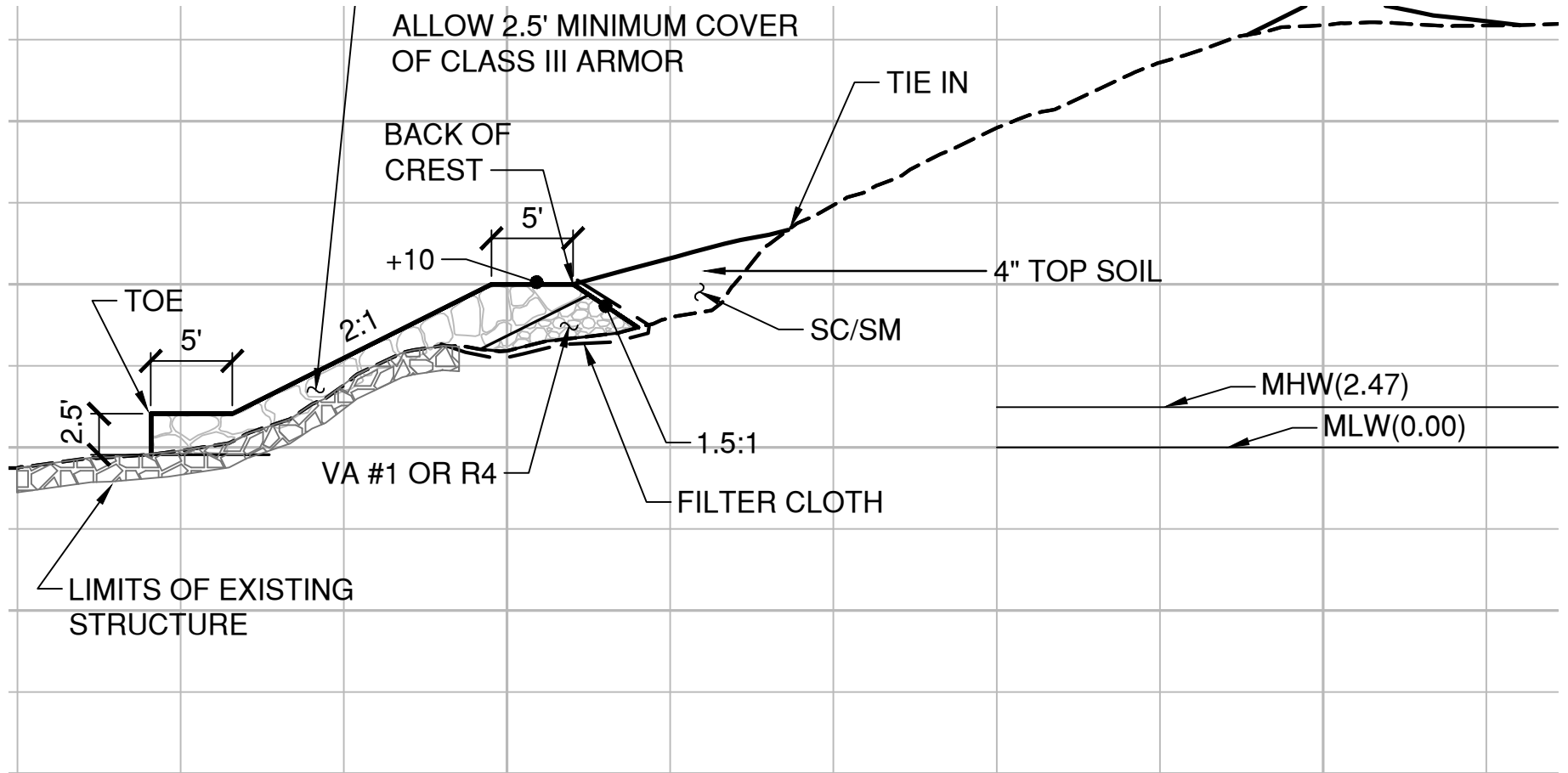
PURPOSE:

SHORELINE STABILIZATION and REHABILITATION

APPLICATION BY:
 NATIONAL PARK SERVICE

REVISED:
 DATE: AUGUST 23, 2020

SHEET 19



Typical Section E-E - Sta 19+00 - Structure 8

1" = 10'



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ADJACENT PROPERTY OWNERS:

1. YORKTOWN NAVAL WEAPONS STATION

DATUM:
 MEAN LOW WATER

COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B Typical Sections / Details

AT: YORK RIVER

IN: YORK COUNTY, VIRGINIA

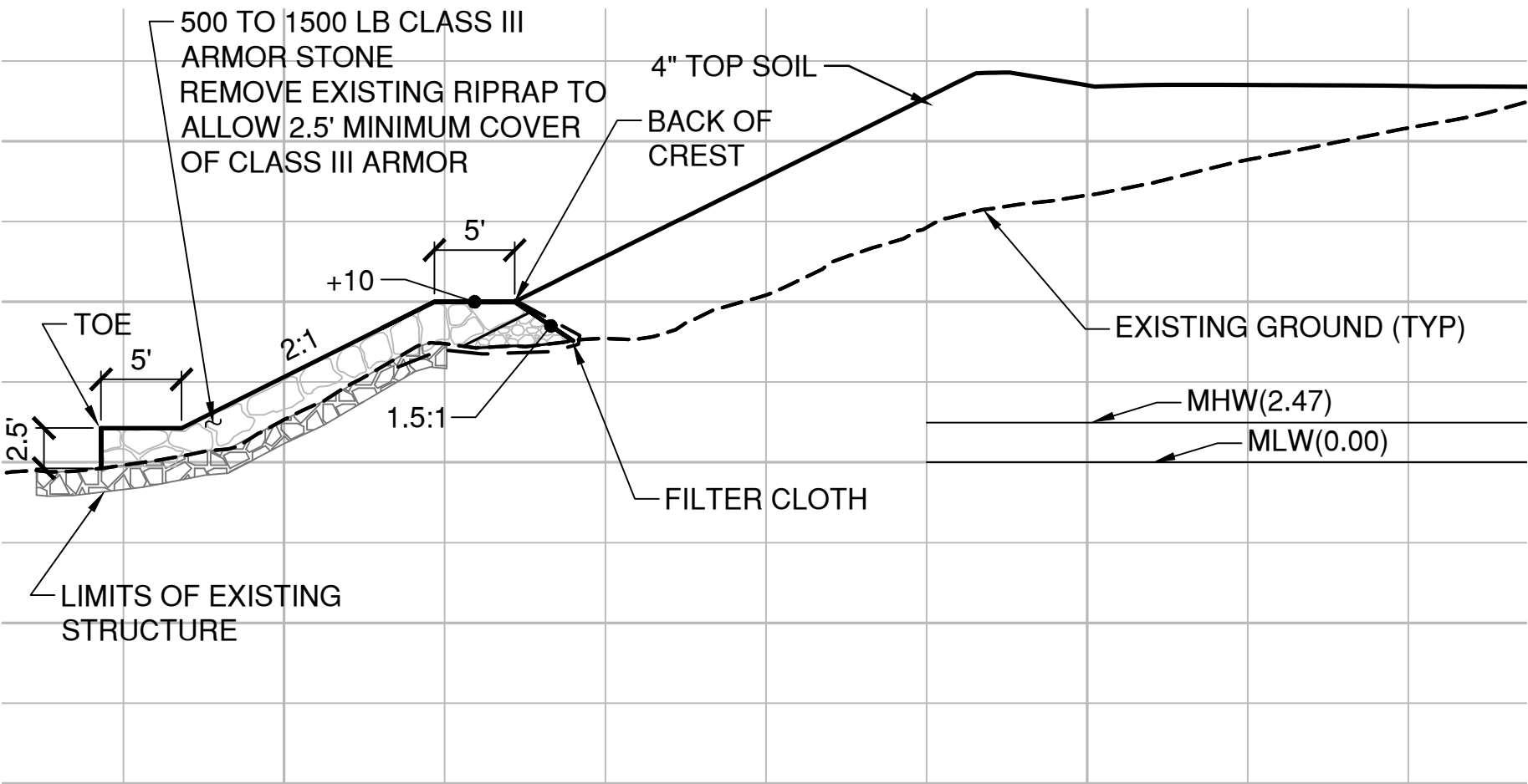
PURPOSE:

SHORELINE STABILIZATION and REHABILITATION

APPLICATION BY:
 NATIONAL PARK SERVICE

REVISED:
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SHEET 20



Typical Section F-F - Sta 32+50 - Structure 8

1" = 10'



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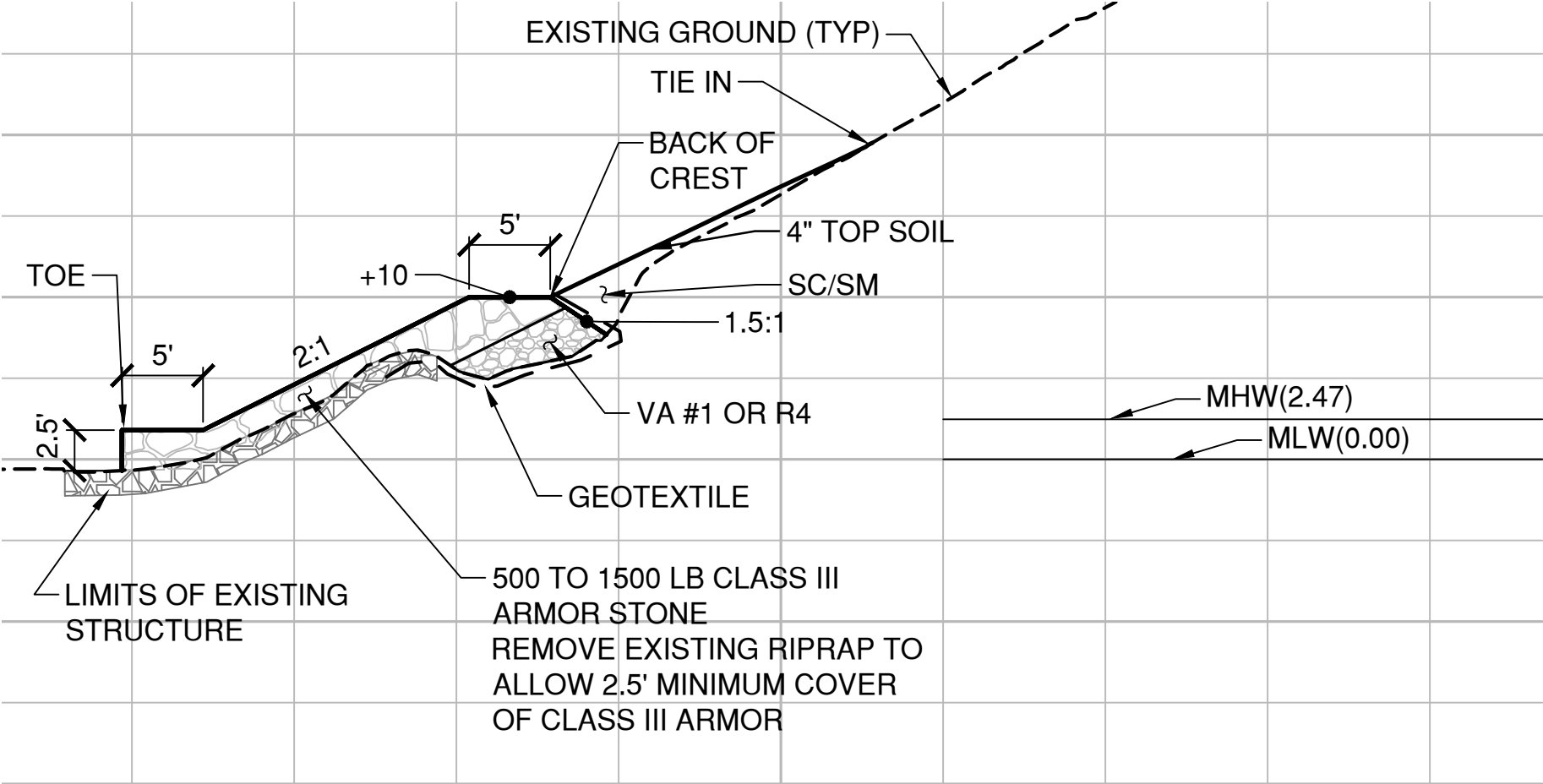


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ADJACENT PROPERTY OWNERS: 1. YORKTOWN NAVAL WEAPONS STATION	COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B Typical Sections / Details	APPLICATION BY: NATIONAL PARK SERVICE
DATUM: MEAN LOW WATER	AT: YORK RIVER	PURPOSE: SHORELINE STABILIZATION and REHABILITATION
IN: YORK COUNTY, VIRGINIA	REVISED: DATE: AUGUST 23, 2020	SHEET 21



Typical Section G-G - Sta 66+00 - Structure 8



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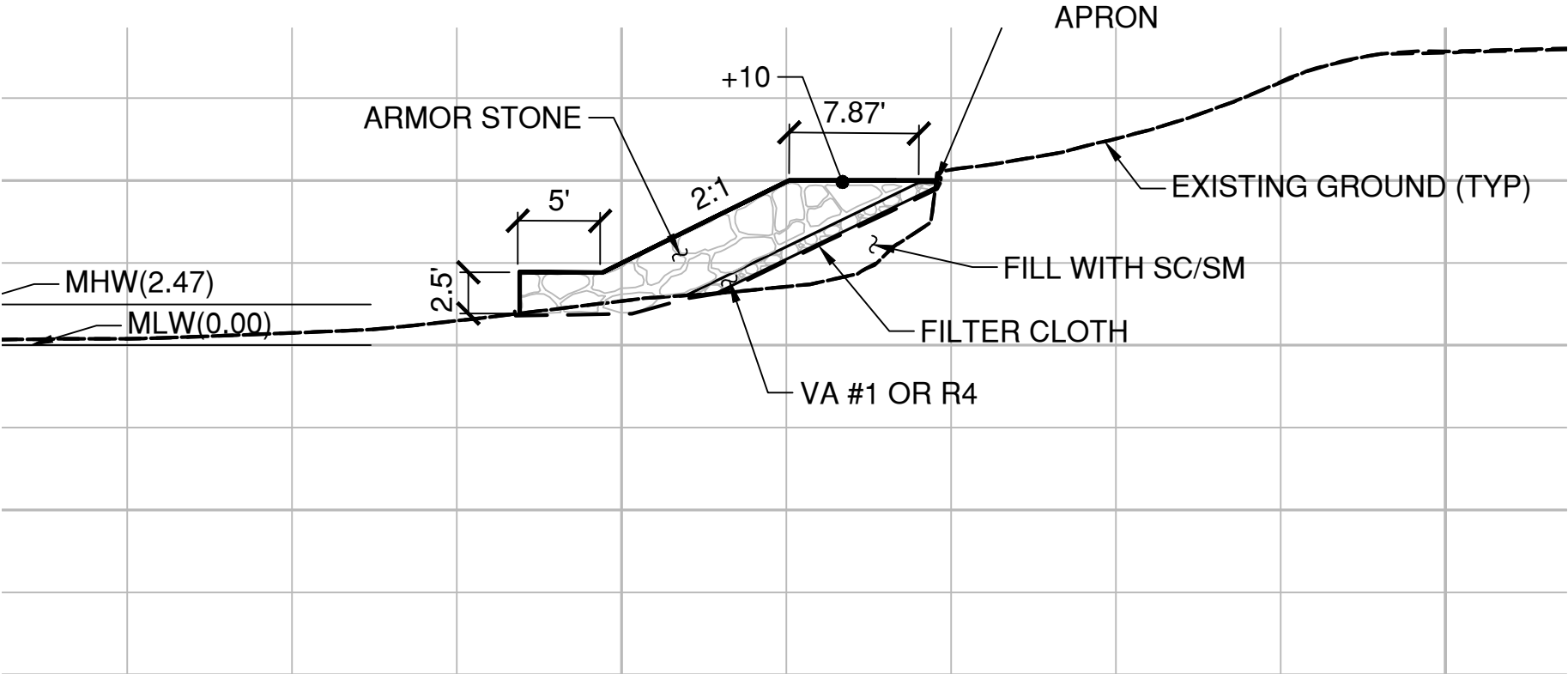


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ADJACENT PROPERTY OWNERS:
1. YORKTOWN NAVAL WEAPONS STATION
DATUM:
MEAN LOW WATER

COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B Typical Sections / Details	
AT: YORK RIVER	PURPOSE:
IN: YORK COUNTY, VIRGINIA	SHORELINE STABILIZATION and REHABILITATION

APPLICATION BY:
NATIONAL PARK SERVICE
REVISED:
DATE: AUGUST 23, 2020
SHEET 22



Typical Section Q-Q - Sta 124+00 - Structure 17

1" = 10'



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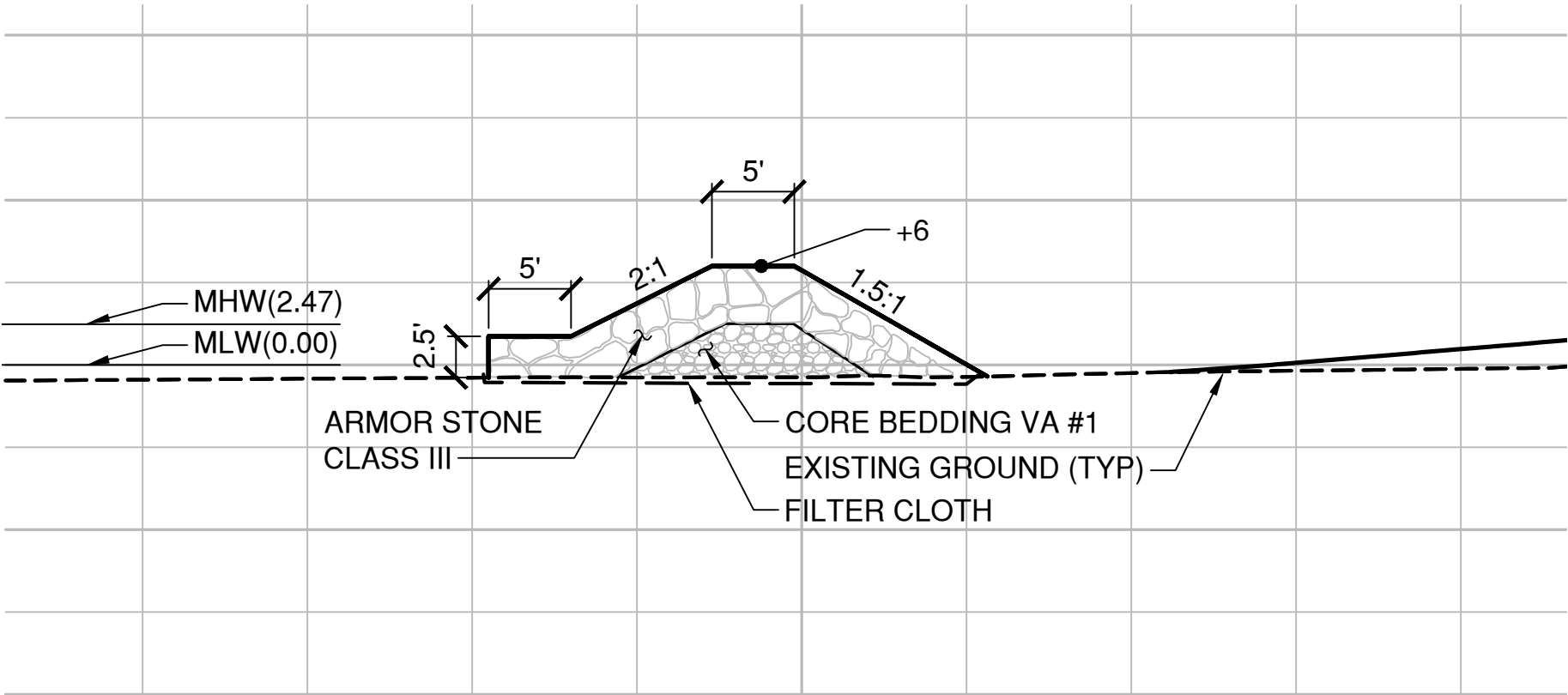


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ADJACENT PROPERTY OWNERS: 1. YORKTOWN NAVAL WEAPONS STATION	COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B Typical Sections / Details	APPLICATION BY: NATIONAL PARK SERVICE
DATUM: MEAN LOW WATER	AT: YORK RIVER	PURPOSE: SHORELINE STABILIZATION and REHABILITATION
IN: YORK COUNTY, VIRGINIA	REVISED: DATE: AUGUST 23, 2020	SHEET 23



Typical Section R-R - Sta 127+00 Structure 18

1" = 10'



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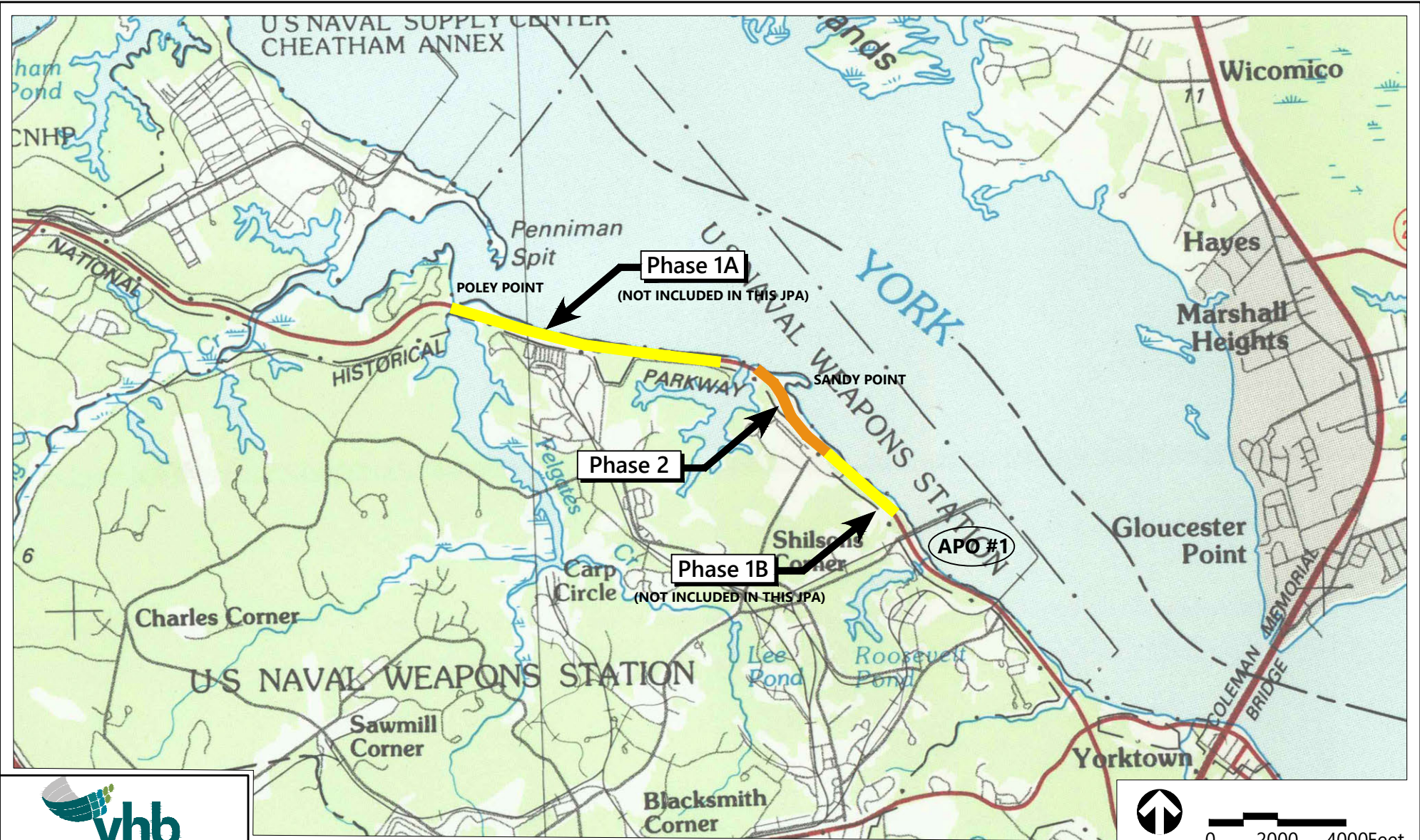


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ADJACENT PROPERTY OWNERS: 1. YORKTOWN NAVAL WEAPONS STATION	COLONIAL NATIONAL HISTORICAL PARK PHASE 1A & 1B Typical Sections / Details		APPLICATION BY: NATIONAL PARK SERVICE
	AT: YORK RIVER	PURPOSE: SHORELINE STABILIZATION and REHABILITATION	REVISED: DATE: AUGUST 23, 2020
DATUM: MEAN LOW WATER	IN: YORK COUNTY, VIRGINIA		SHEET 24

COLO York River Shoreline Stabilization

Phase 2 Drawings





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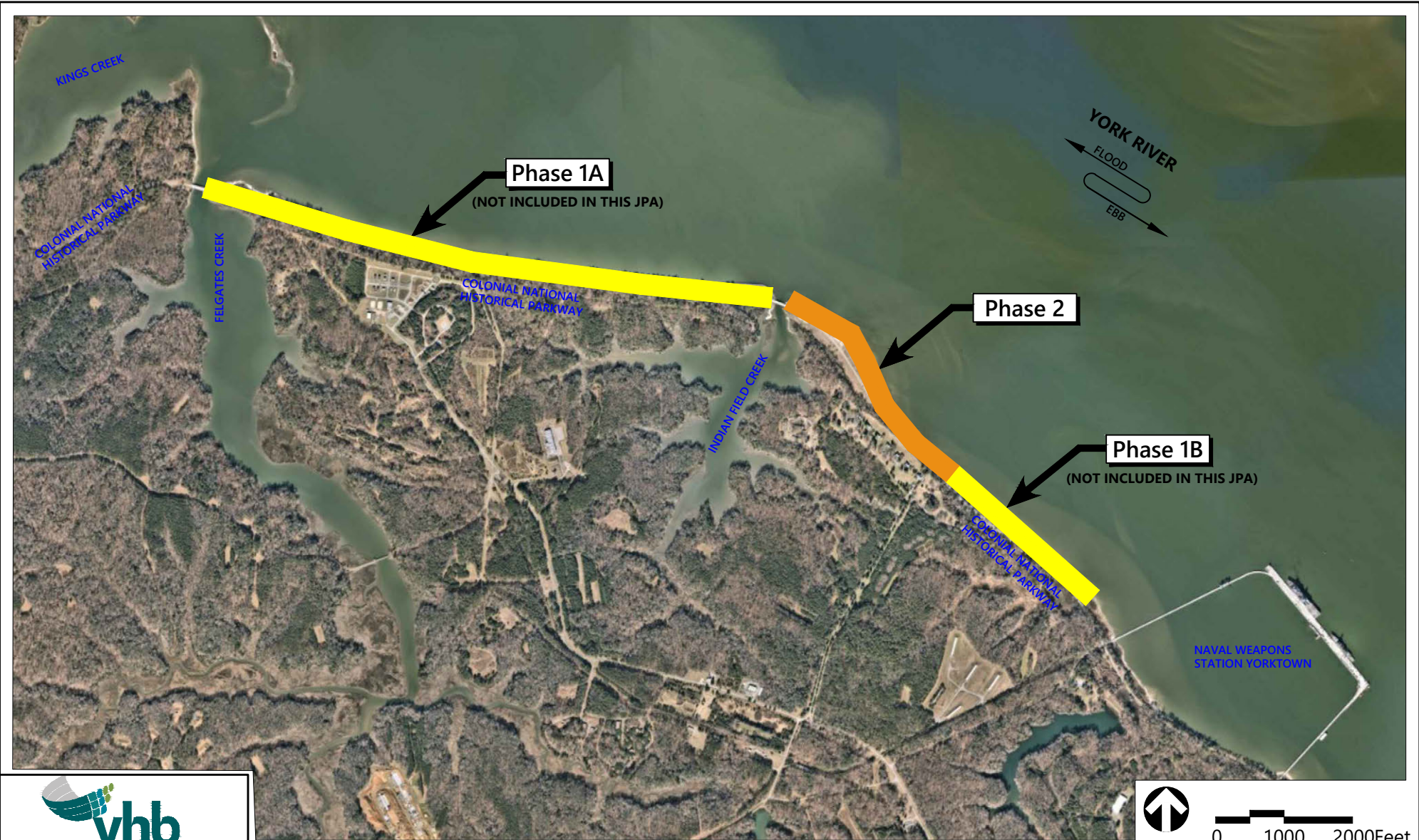
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ADJACENT PROPERTY OWNERS:	
1. YORKTOWN NAVAL WEAPONS STATION	
DATUM:	MEAN LOW WATER

COLONIAL NATIONAL HISTORICAL PARK PHASE 2 LOCATION MAP	
AT: YORK RIVER	PURPOSE:
IN: YORK COUNTY, VIRGINIA	SHORELINE STABILIZATION and REHABILITATION

APPLICATION BY: NATIONAL PARK SERVICE
REVISED: DATE: AUGUST 23, 2022
SHEET 1





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ADJACENT PROPERTY OWNERS:
1. YORKTOWN NAVAL WEAPONS STATION

DATUM:
MEAN LOW WATER

COLONIAL NATIONAL HISTORICAL PARK PHASE 2 AERIAL	
AT: YORK RIVER	PURPOSE: SHORELINE STABILIZATION and REHABILITATION
IN: YORK COUNTY, VIRGINIA	

APPLICATION BY: NATIONAL PARK SERVICE
REVISED: DATE: AUGUST 23, 2022
SHEET 2

Total Impact Areas

6,869 SF	SAND FILL, SUBAQUEOUS
1,809 SF	SAND FILL, VEGETATED ESTUARINE
36,461 SF	SAND FILL, NON-VEGETATED ESTUARINE
225 SF	SAND FILL, PALUSTRINE
20,046 SF	STONE FILL, SUBAQUEOUS
1,873 SF	STONE FILL, VEGETATED ESTUARINE
24,073 SF	STONE FILL, NON-VEGETATED ESTUARINE
70 SF	STONE FILL, PALUSTRINE
155 SF	TEMP IMPACT, SUBAQUEOUS
27,544 SF	TEMP IMPACT, VEGETATED ESTUARINE
1,928 SF	TEMP IMPACT, NON-VEGETATED ESTUARINE
680 SF	TEMP IMPACT, PALUSTRINE

Total Resulting Habitat Areas

15,587 SF	NV SANDY INTERTIDAL
27,721 SF	S PATENS BACKSHORE
6,577 SF	S ALTERNIFLORA INTERTIDAL
18,187 SF	NV SANDY BACKSHORE
16,791 SF	ROCKY INTERTIDAL

Notes

General

1.

WETLAND DELINEATION WAS COMPLETED BY VHB BETWEEN MAY 31 AND JUNE 2, 2022
2.

THE EXISTING CONDITIONS SHOWN ON THIS PLAN ARE COMPILED BY PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHY DATED 2-28-2022 BY NV5 AND MINIMAL ON-THE-GROUND-SURVEY PERFORMED BY VHB DURING JULY 2022.
3.

THE EXISTING TOPOGRAPHY SHOWN ON THIS PLAN IS COMPILED BY PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHY DATED 2-28-2022 BY NV5.
4.

MERIDIAN SOURCE:
HORIZONTAL: VIRGINIA STATE PLANE COORDINATE SYSTEM SOUTH ZONE NAD83.

VERTICAL: MLW.
5.

THIS PROPERTY SHOWN HEREON LIES WITHIN FLOOD ZONE X (AREAS OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) , ZONE AE AND ZONE VE AS INDICATED ON THE FLOOD INSURANCE RATE MAP (FIRM) FOR YORK COUNTY VIRGINIA ON COMMUNITY PANEL NUMBER 5119C0068D AND 51199C0064D, MAP REVISED JANUARY 16, 2015.



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ADJACENT PROPERTY OWNERS:

1. YORKTOWN NAVAL WEAPONS STATION

DATUM:
MEAN LOW WATER

COLONIAL NATIONAL HISTORICAL PARK PHASE 2 LEGEND AND GENERAL NOTES

AT: YORK RIVER

IN: YORK COUNTY, VIRGINIA

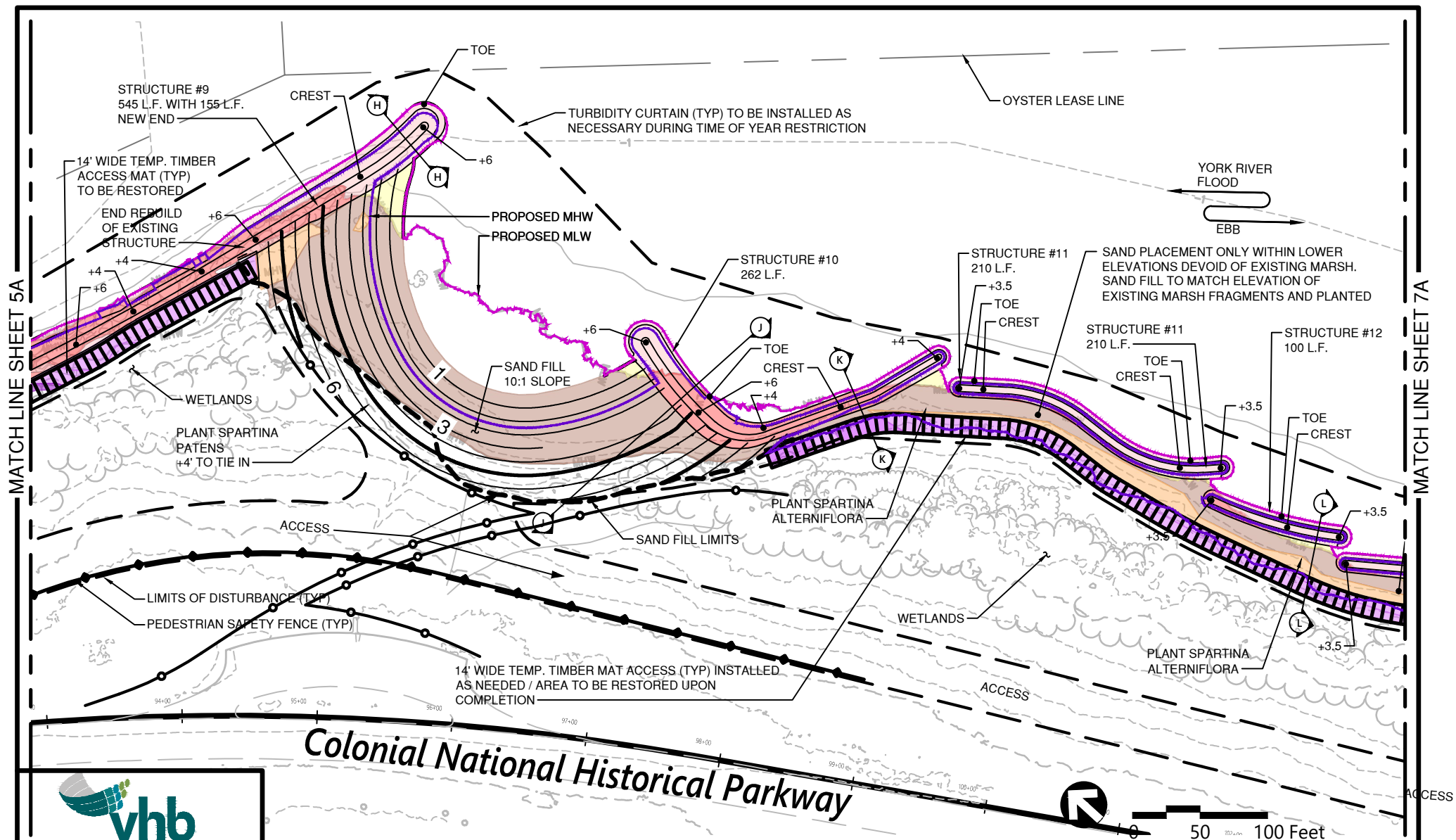
PURPOSE:

SHORELINE STABILIZATION and REHABILITATION

APPLICATION BY:
NATIONAL PARK SERVICE

REVISED: October 12, 2022
DATE: August 23, 2022

SHEET 4



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ADJACENT PROPERTY OWNERS:

1. YORKTOWN NAVAL WEAPONS STATION

DATUM:
MEAN LOW WATER

COLONIAL NATIONAL HISTORICAL PARK PHASE 2 LAYOUT, IMPACT AREAS

AT: YORK RIVER

IN: YORK COUNTY, VIRGINIA

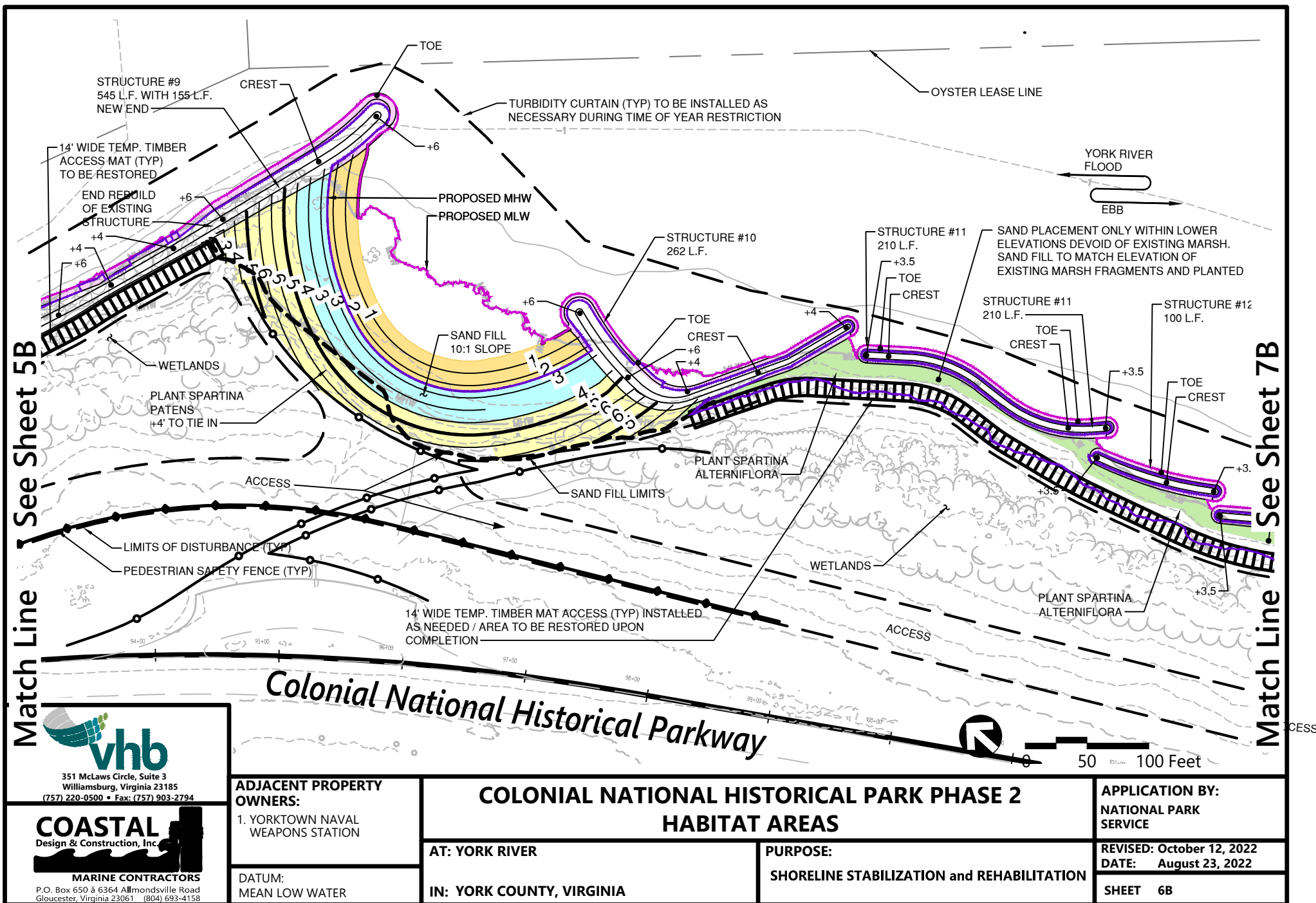
PURPOSE:

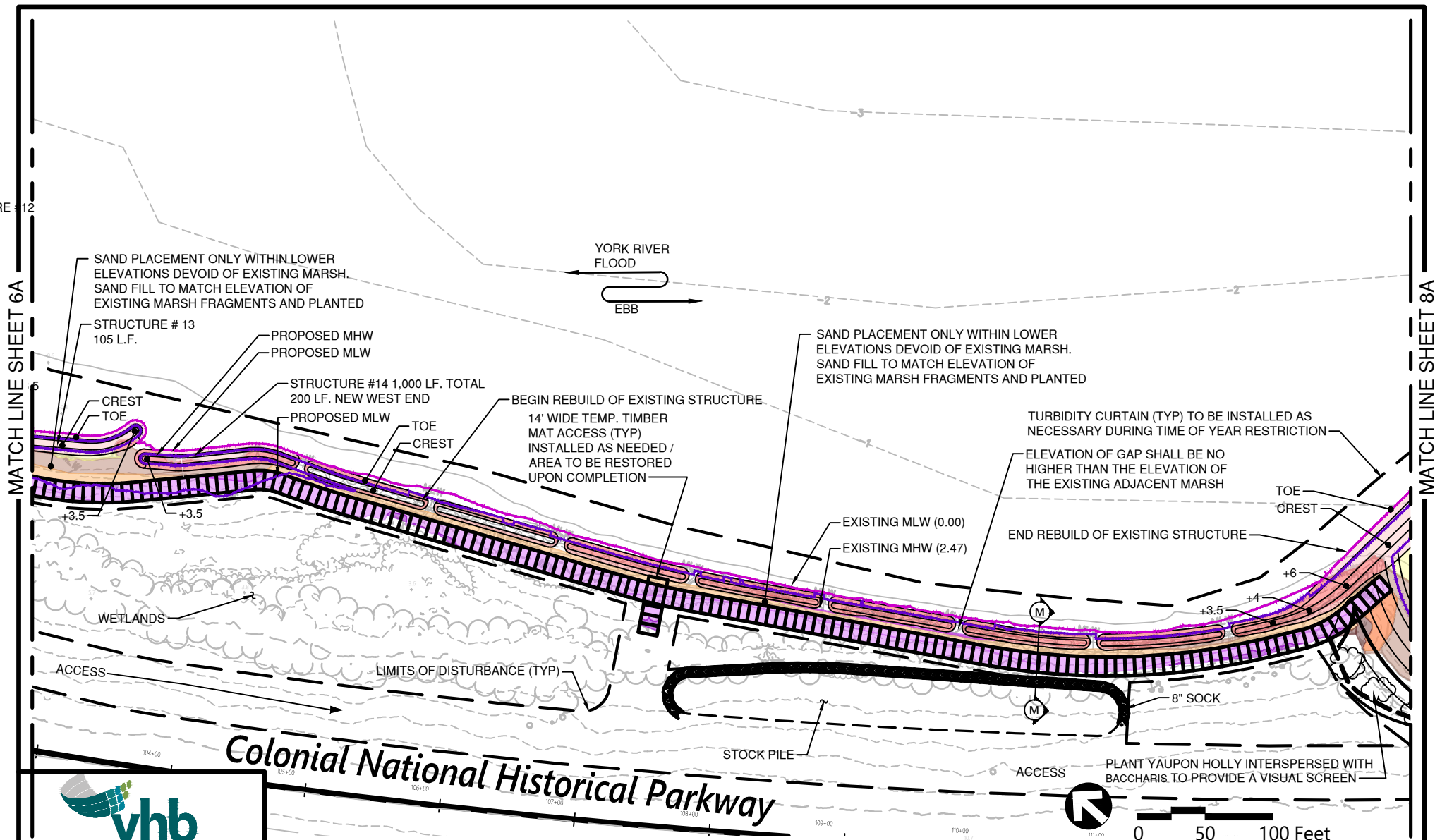
SHORELINE STABILIZATION and REHABILITATION

APPLICATION BY:
NATIONAL PARK
SERVICE

REVISED: October 12, 2022
DATE: August 23, 2022

SHEET 6A





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ADJACENT PROPERTY OWNERS:

1. YORKTOWN NAVAL WEAPONS STATION

DATUM:
 MEAN LOW WATER

COLONIAL NATIONAL HISTORICAL PARK PHASE 2 LAYOUT, IMPACT AREAS

AT: YORK RIVER

IN: YORK COUNTY, VIRGINIA

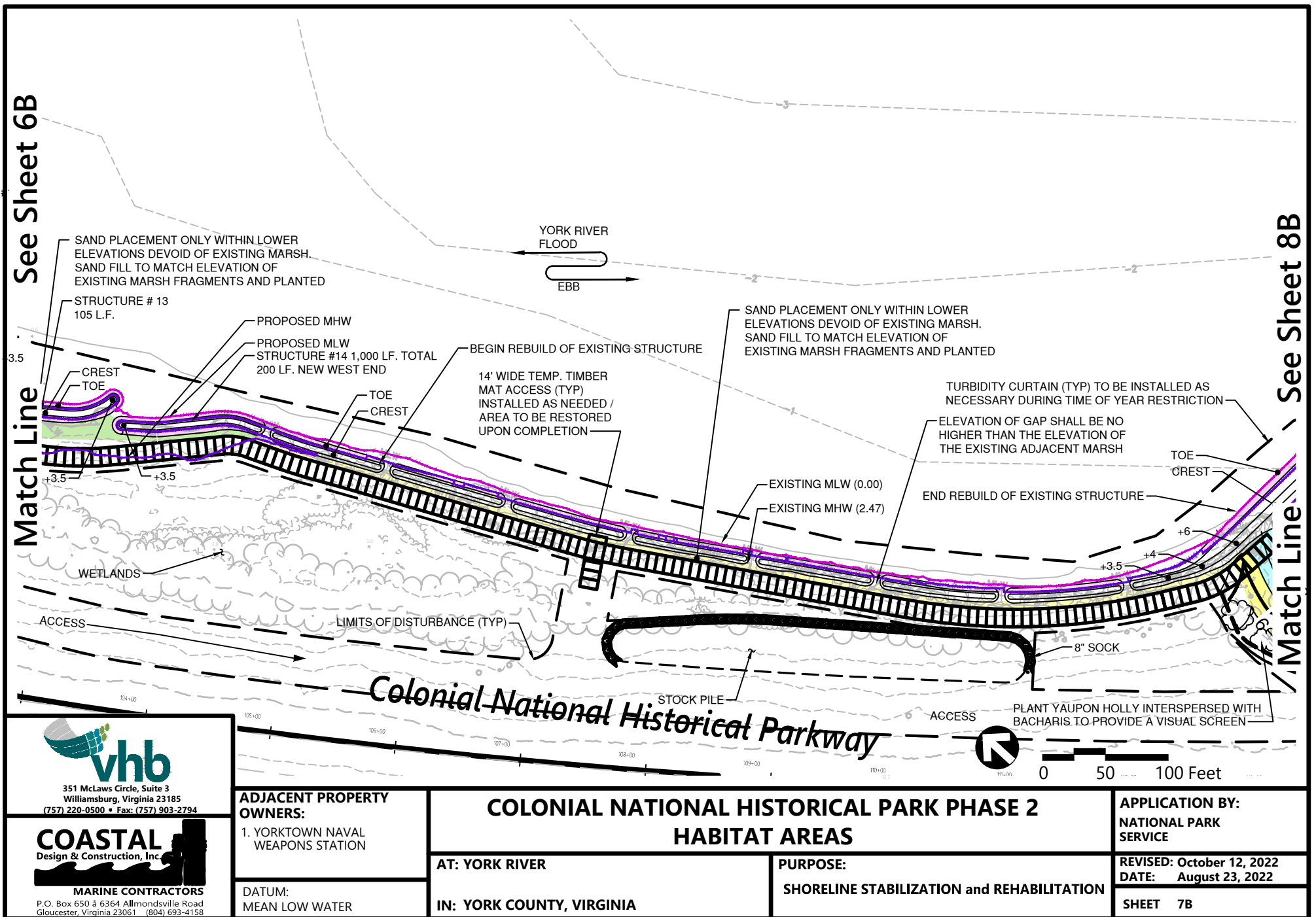
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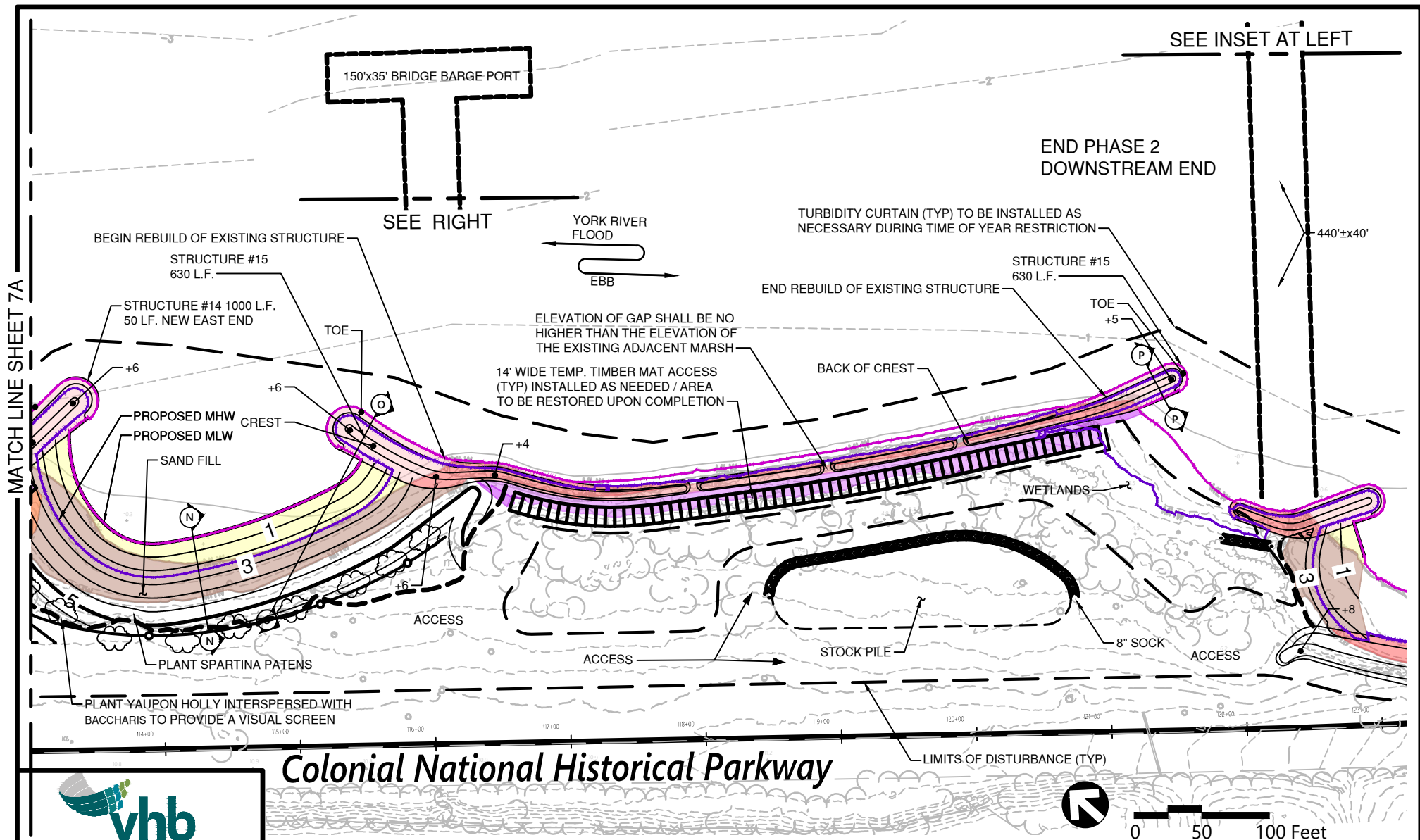
SHORELINE STABILIZATION and REHABILITATION

APPLICATION BY:
 NATIONAL PARK SERVICE

REVISED: October 12, 2022
DATE: August 23, 2022

SHEET 7A





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ADJACENT PROPERTY OWNERS:

1. YORKTOWN NAVAL WEAPONS STATION

DATUM:
 MEAN LOW WATER

COLONIAL NATIONAL HISTORICAL PARKWAY PHASE 2 LAYOUT, IMPACT AREAS

AT: YORK RIVER

IN: YORK COUNTY, VIRGINIA

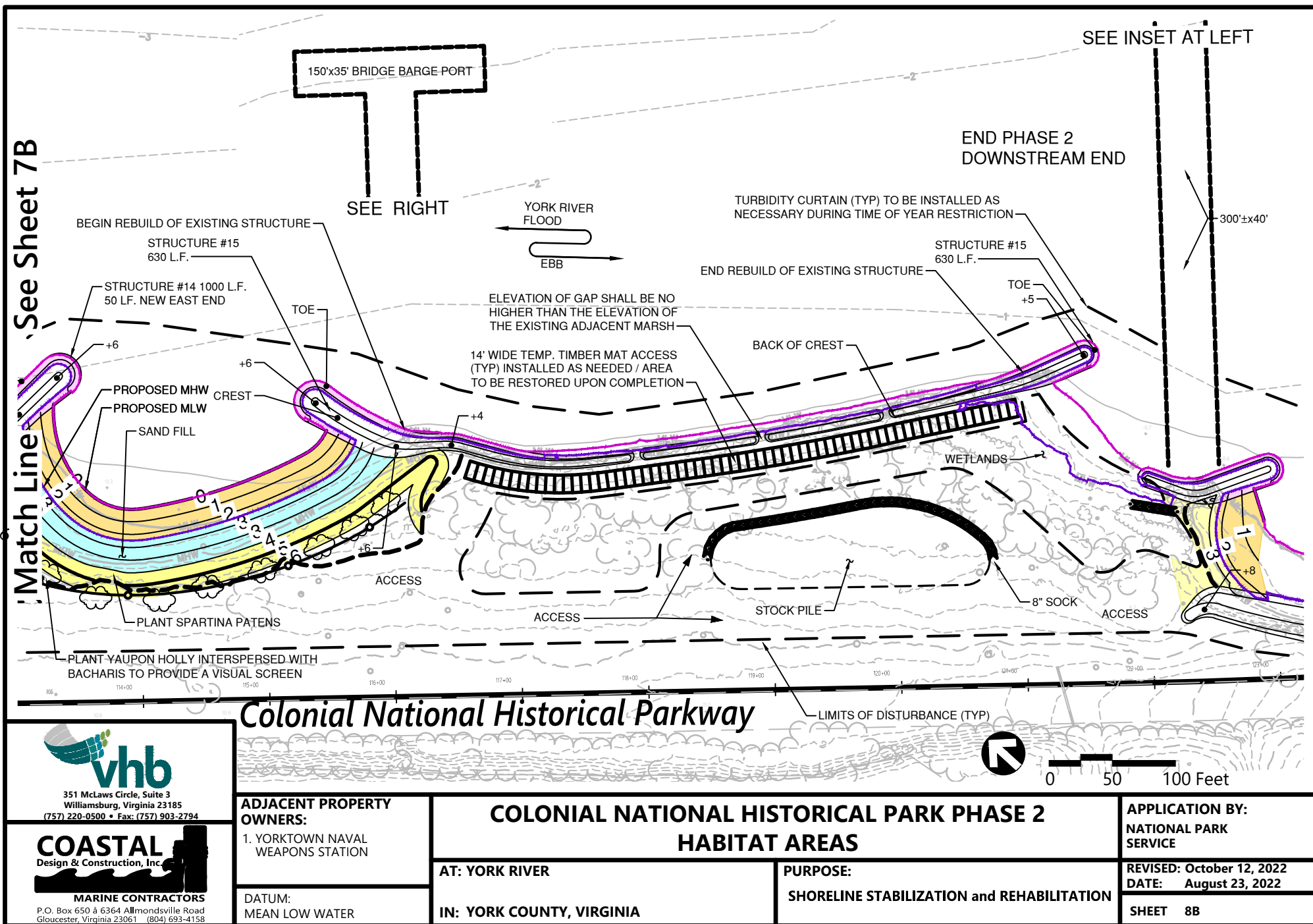
PURPOSE:

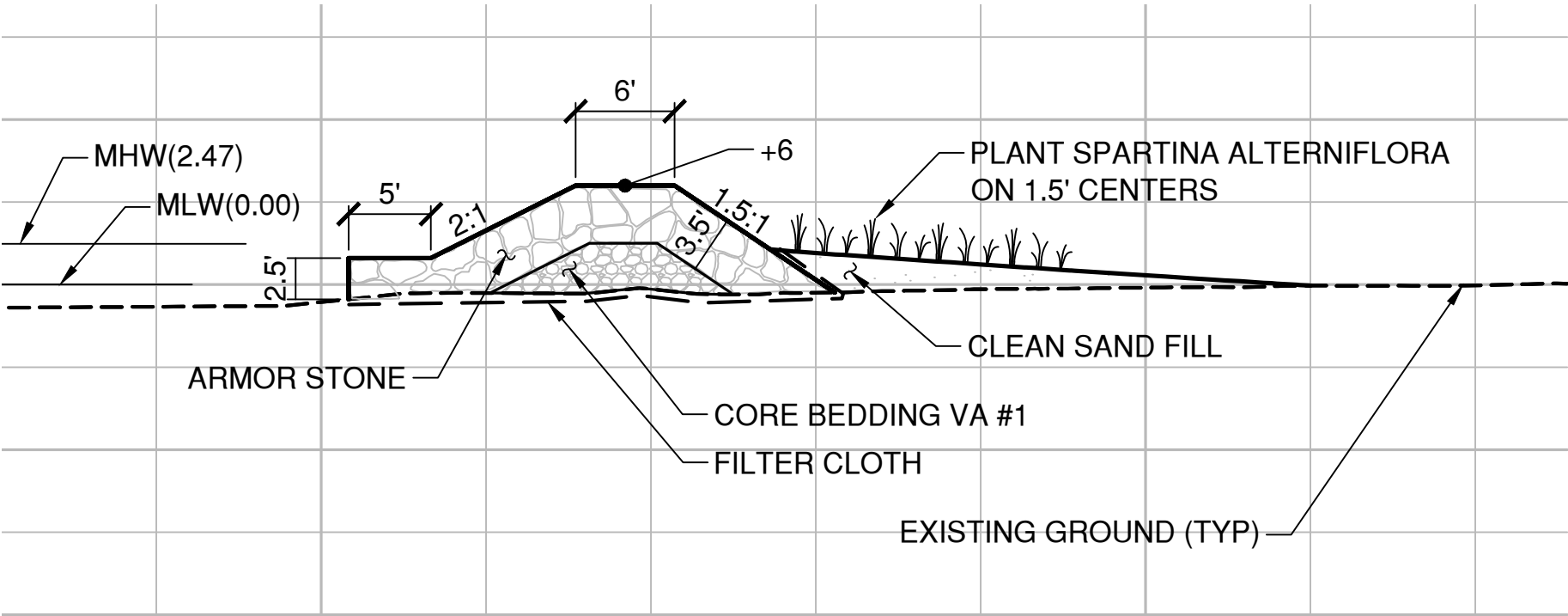
SHORELINE STABILIZATION and REHABILITATION

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REVISED: October 12, 2022
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SHEET 8A





Typical Section H-H - Sta 95+00 - Structure 9

1" = 10'



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ADJACENT PROPERTY OWNERS:

1. YORKTOWN NAVAL WEAPONS STATION

DATUM:
MEAN LOW WATER

COLONIAL NATIONAL HISTORICAL PARK PHASE 2 Details

AT: YORK RIVER

IN: YORK COUNTY, VIRGINIA

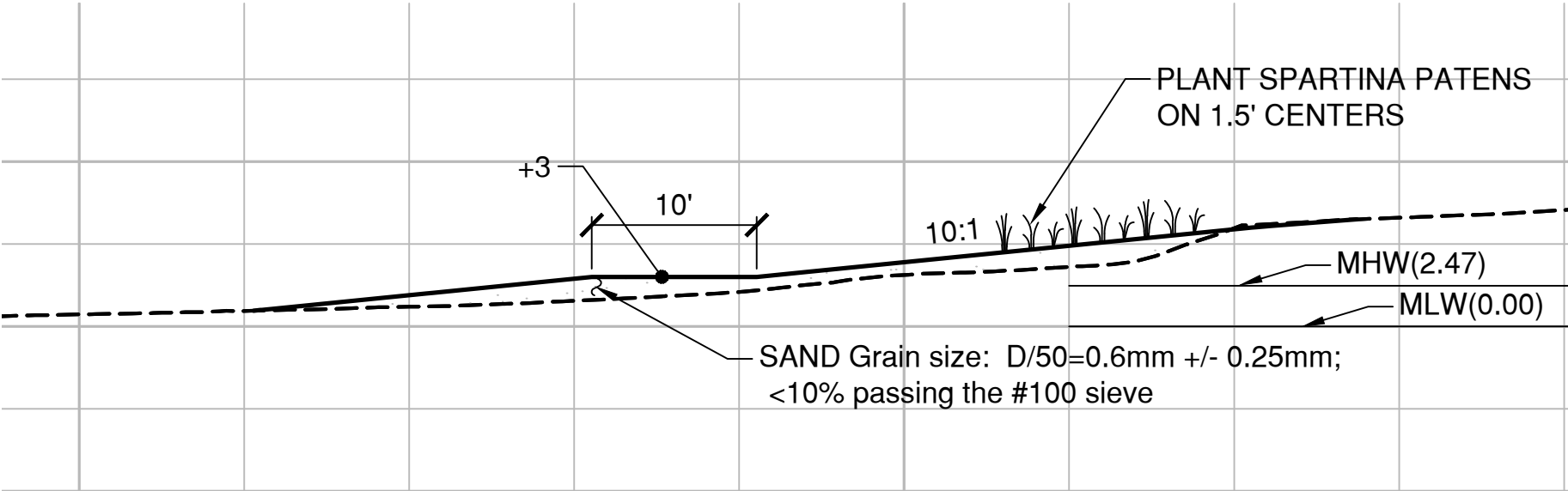
PURPOSE:

SHORELINE STABILIZATION and REHABILITATION

APPLICATION BY:
NATIONAL PARK SERVICE

REVISED:
DATE: AUGUST 23, 2022

SHEET 9



Typical Section I-I - Sta 96+00 (Applies From Sta 95+00 to Sta 97+50)

1" = 10'



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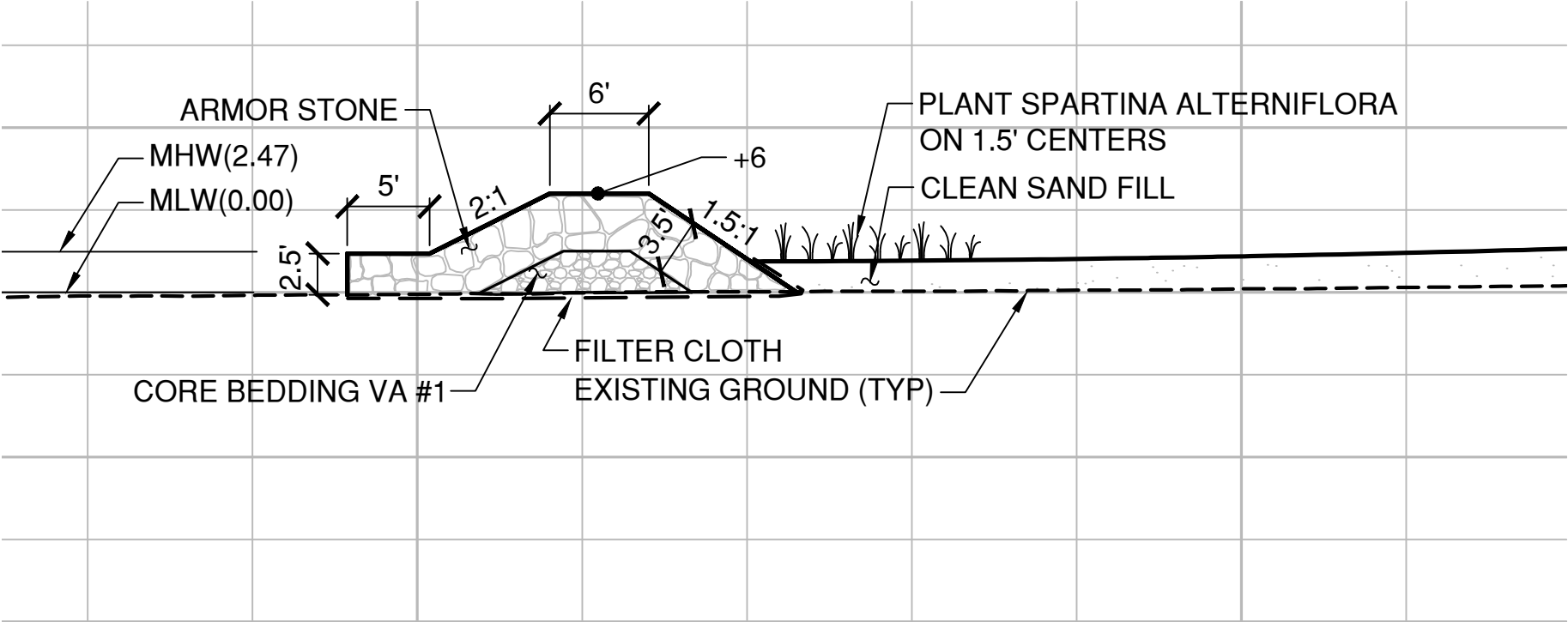


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ADJACENT PROPERTY OWNERS: 1. YORKTOWN NAVAL WEAPONS STATION	COLONIAL NATIONAL HISTORICAL PARK PHASE 2 Details		APPLICATION BY: NATIONAL PARK SERVICE
DATUM: MEAN LOW WATER	AT: YORK RIVER	PURPOSE: SHORELINE STABILIZATION and REHABILITATION	REVISED: DATE: AUGUST 23, 2022
	IN: YORK COUNTY, VIRGINIA		SHEET 10



Typical Section J-J - Sta 97+20 - Structure 10

1" = 10'



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ADJACENT PROPERTY OWNERS:
1. YORKTOWN NAVAL WEAPONS STATION

DATUM:
MEAN LOW WATER

COLONIAL NATIONAL HISTORICAL PARK PHASE 2

Details

AT: YORK RIVER

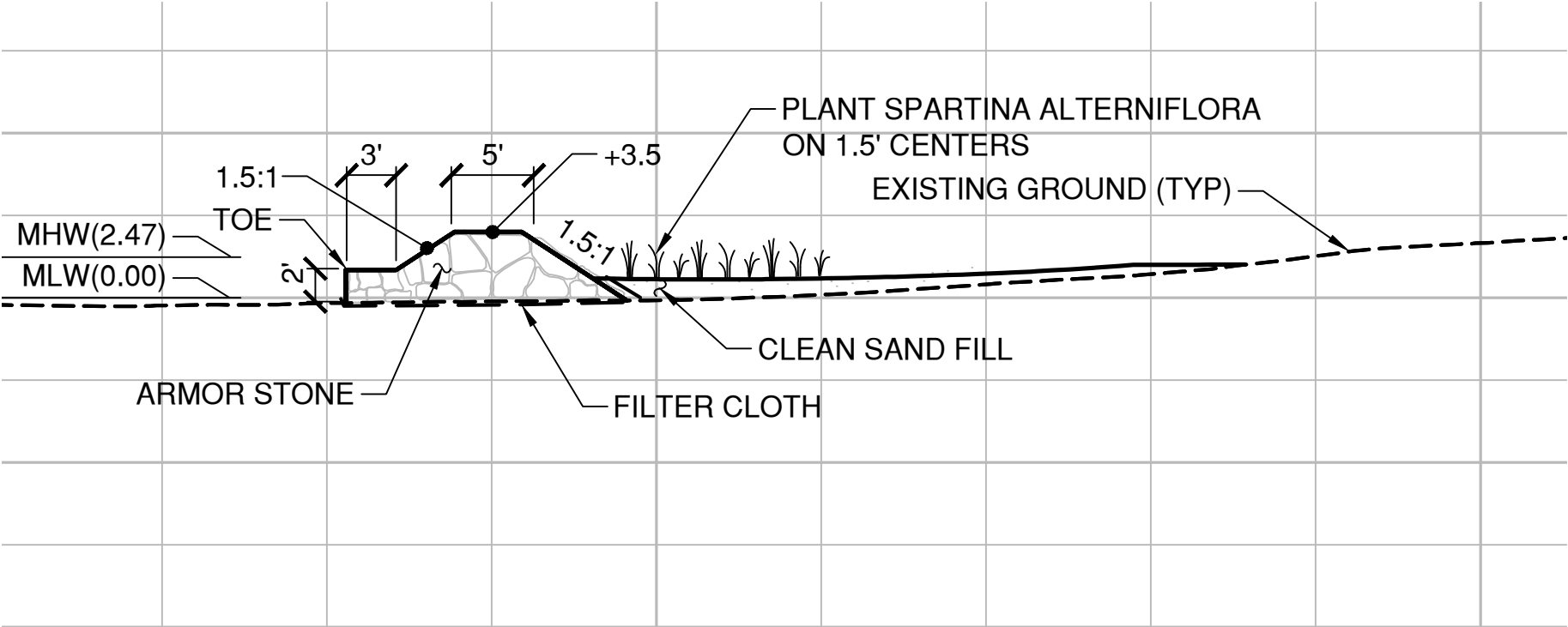
IN: YORK COUNTY, VIRGINIA

PURPOSE:
SHORELINE STABILIZATION and REHABILITATION

APPLICATION BY:
NATIONAL PARK SERVICE

REVISED:
DATE: AUGUST 23, 2022

SHEET 11



Typical Section K-K - Sta 99+00 - Structure 10

1" = 10'



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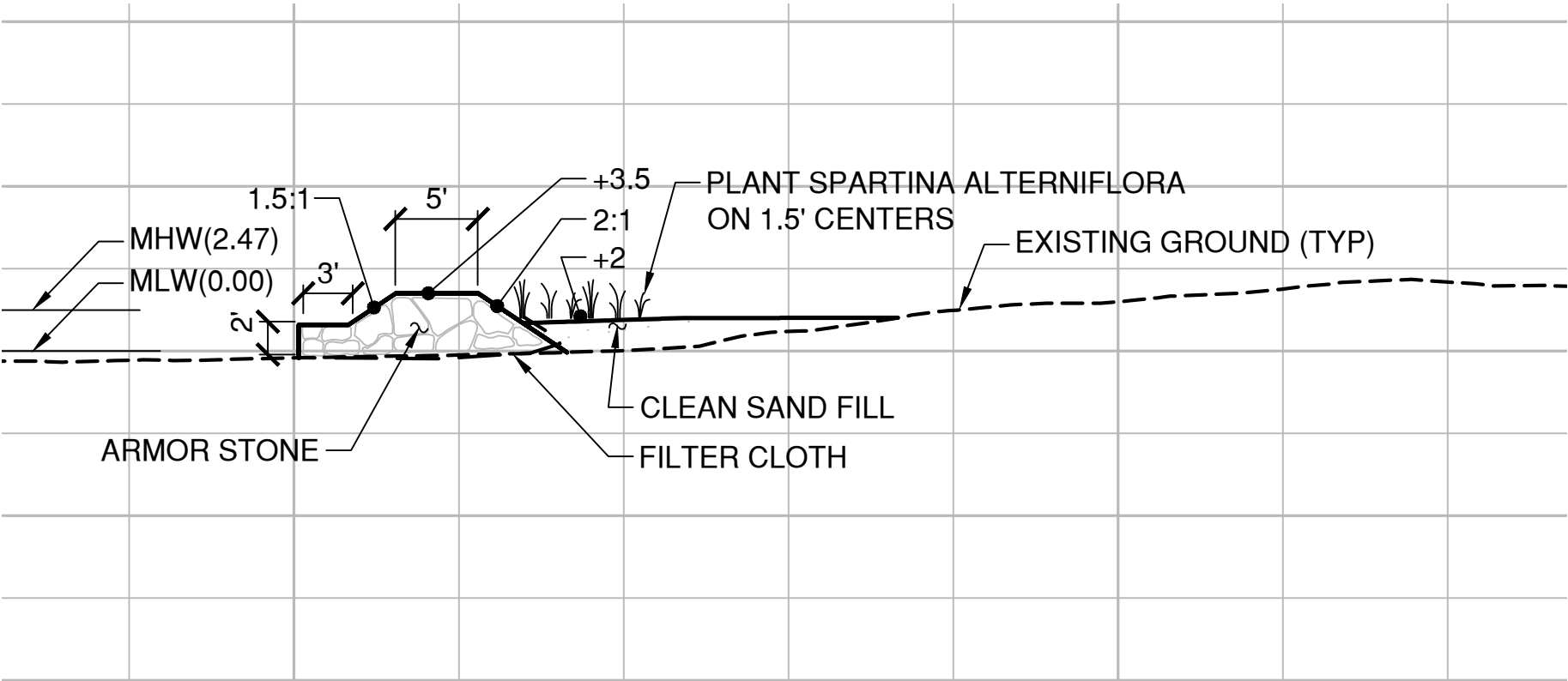


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Design & Construction, Inc.



MARINE CONTRACTORS
P.O. Box 650 • 6364 Allmondsville Road
Gloucester, Virginia 23061 (804) 693-4158

ADJACENT PROPERTY OWNERS: 1. YORKTOWN NAVAL WEAPONS STATION	COLONIAL NATIONAL HISTORICAL PARK PHASE 2 Details		APPLICATION BY: NATIONAL PARK SERVICE
DATUM: MEAN LOW WATER	AT: YORK RIVER	PURPOSE: SHORELINE STABILIZATION and REHABILITATION	REVISED: DATE: AUGUST 23, 2022
	IN: YORK COUNTY, VIRGINIA		SHEET 12



Typical Section L-L - Structures 11, 12, 13, & 14, (W)End

1" = 10'



351 McLaws Circle, Suite 3
Williamsburg, Virginia 23185
(757) 220-0500 • Fax: (757) 903-2794



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1. YORKTOWN NAVAL WEAPONS STATION

DATUM:
MEAN LOW WATER

COLONIAL NATIONAL HISTORICAL PARK PHASE 2
Details

AT: YORK RIVER

IN: YORK COUNTY, VIRGINIA

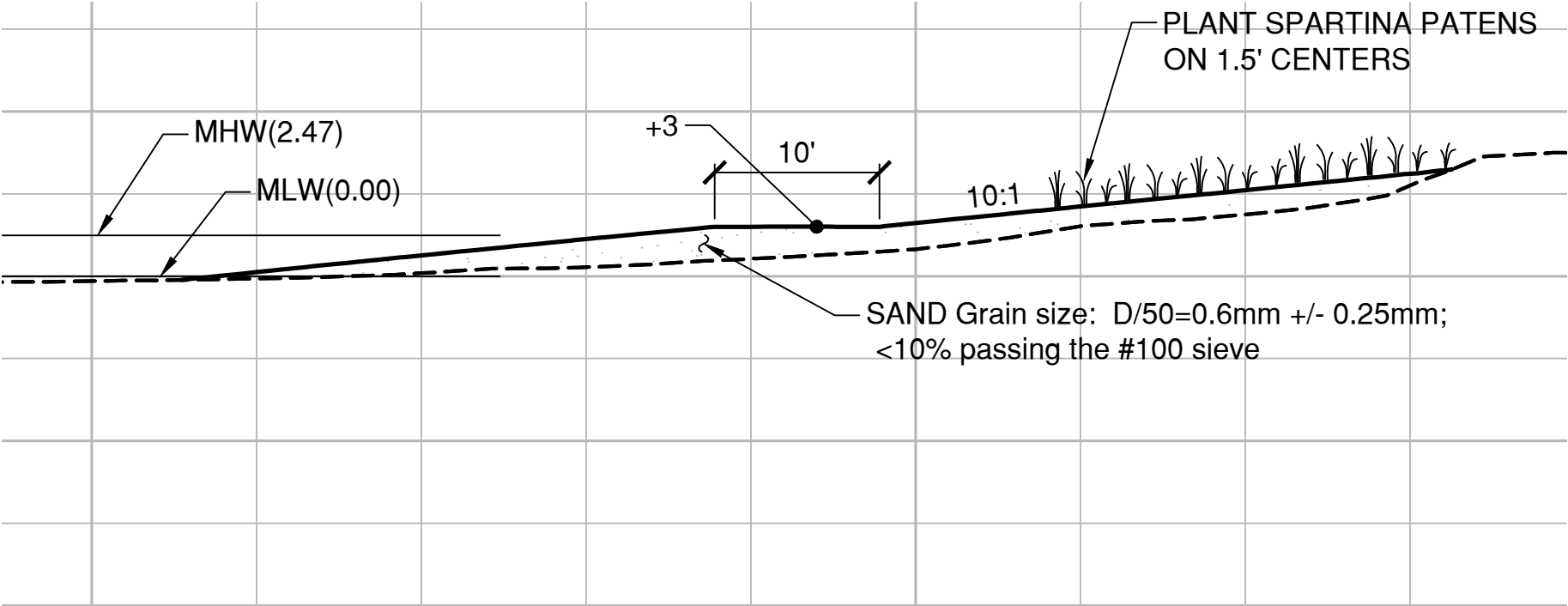
PURPOSE:

SHORELINE STABILIZATION and REHABILITATION

APPLICATION BY:
NATIONAL PARK SERVICE



REVISED:
DATE: AUGUST 23, 2022

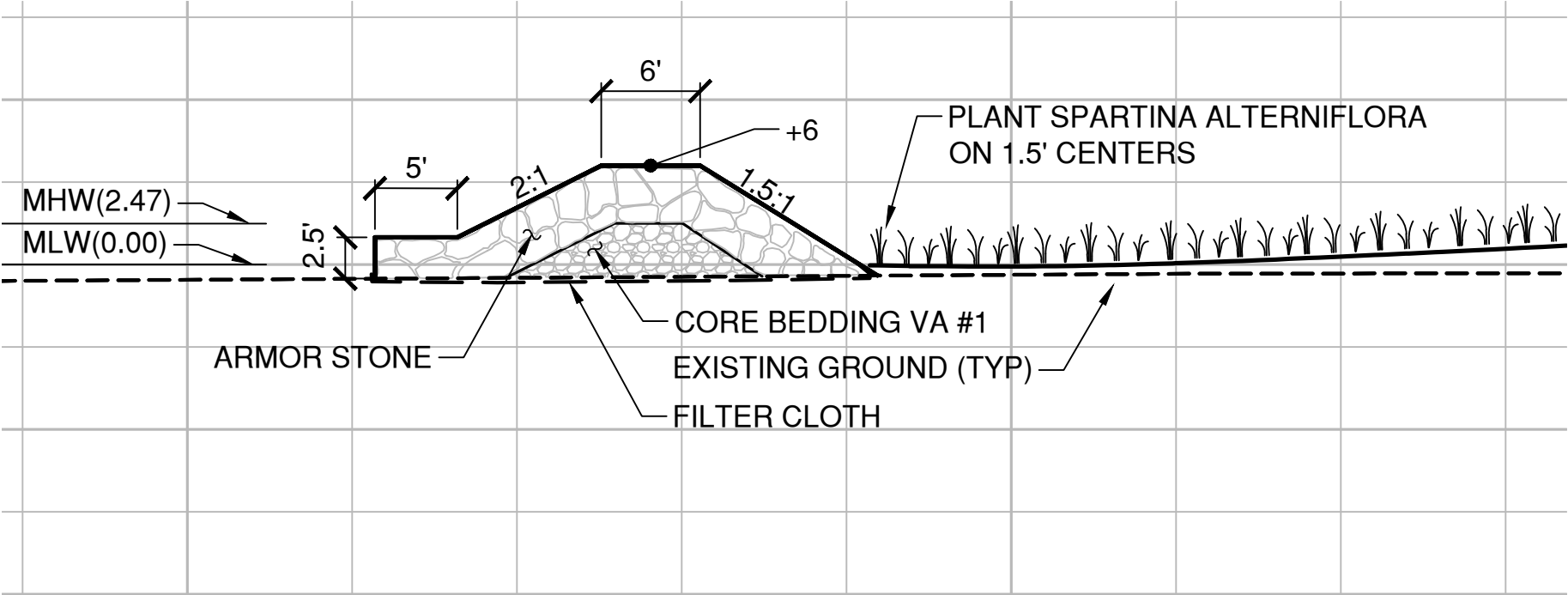
SHEET 13



Typical Section N-N - Sta 114+50 (Applies From Sta 113 to Sta 116)

1" = 10'

<div><p>351 McLaws Circle, Suite 3 Williamsburg, Virginia 23185 (757) 220-0500 • Fax: (757) 903-2794</p></div> <div><p>COASTAL Design & Construction, Inc.</p><p>MARINE CONTRACTORS P.O. Box 650 • 6364 Allmondsville Road Gloucester, Virginia 23061 (804) 693-4158</p></div>	<div>ADJACENT PROPERTY OWNERS: 1. YORKTOWN NAVAL WEAPONS STATION</div> <div>DATUM: MEAN LOW WATER</div>	<div>COLONIAL NATIONAL HISTORICAL PARK PHASE 2 Details</div> <div>AT: YORK RIVER IN: YORK COUNTY, VIRGINIA</div>		<div>APPLICATION BY: NATIONAL PARK SERVICE</div> <div>REVISED: DATE: AUGUST 23, 2022</div> <div>SHEET 15</div>
		<div>PURPOSE: SHORELINE STABILIZATION and REHABILITATION</div>		



Typical Section O-O - Sta 115+50 - Structure 15 and 14 Head, (E)End
1" = 10'



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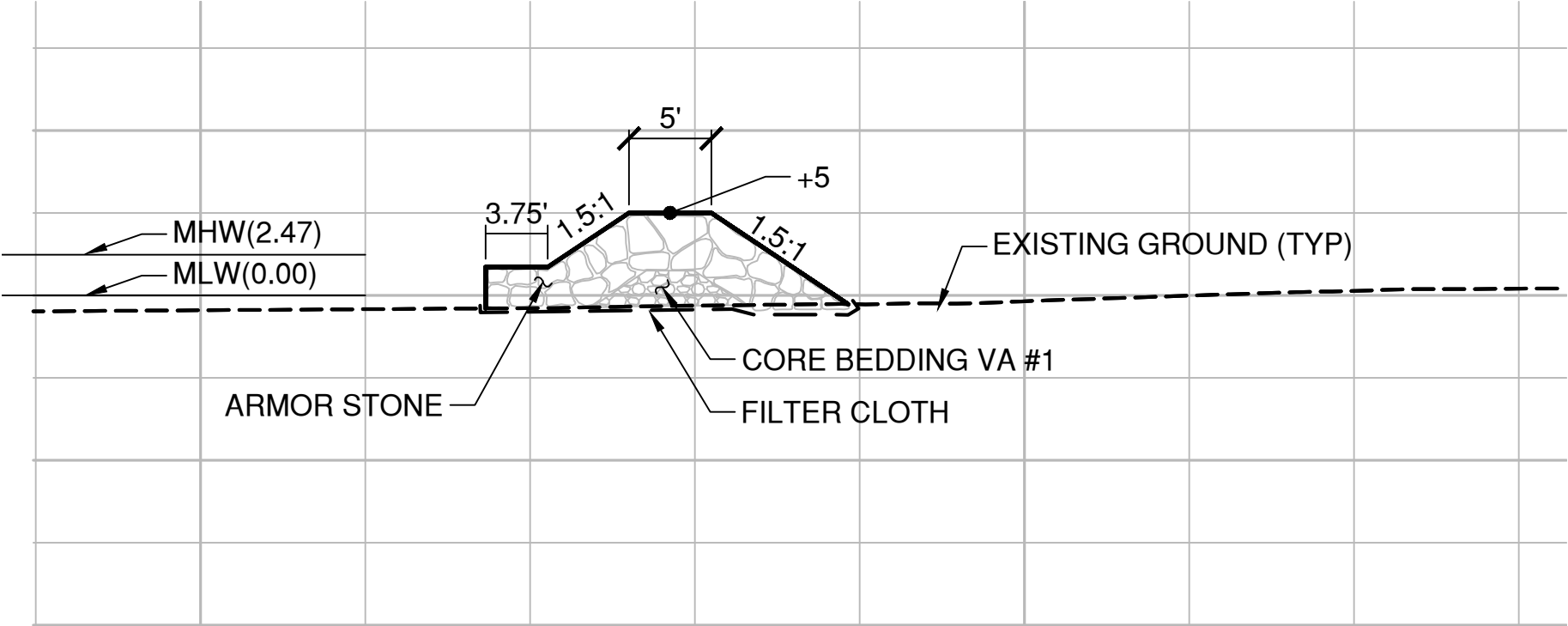


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ADJACENT PROPERTY OWNERS: 1. YORKTOWN NAVAL WEAPONS STATION
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COLONIAL NATIONAL HISTORICAL PARK PHASE 2 Details	
AT: YORK RIVER	PURPOSE: SHORELINE STABILIZATION and REHABILITATION
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SHEET 16



Typical Section P-P - Sta 121+50 - Structure 15

1" = 10'



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REVISED: DATE: AUGUST 23, 2022
SHEET 17