MIDDLE BRANCH RESILIENCY INITIATIVE

PATAPSCO DELTA EAST SITE (PDP-EAST)

CONSTRUCTION COMPLETION REPORT

SUBMITTED BY:
GREENVEST, LLC
921 EAST FORT AVENUE, SUITE 325
BALTIMORE, MD 21230

PREPARED FOR:
SOUTH BALTIMORE GATEWAY PARTNERSHIP
101 W. DICKMAN STREET, SUITE 1000
BALTIMORE, MD 21230

SUBMITTED TO:

Maryland Department of the Environment
Wetland and Waterways Program
Mitigation and Technical Assistance Section
1800 Washington Blvd., Suite 430
Baltimore, MD 21230-1708

US Army Corps of Engineers
Baltimore District Operations Division
Regulatory Branch
2 Hopkins Plaza
Baltimore, MD 21201

FEBRUARY 2026

Table of Contents

Table of Contents ii
1.0 INTRODUCTION 1
2.0 PROJECT DESCRIPTION 2
3.0 STABILIZATION APPROACH 4
3.1. Gravel Stone Sill w/Woody Vent Structures 4
3.2. Aquatic Marsh System w/Habitat Features 5
3.3. Planting 5
4.0 CONSTRUCTION SUMMARY 6
5.0 MAINTENANCE AND MONITORING PLAN 7
5.1. Marsh Maintenance Plan 7
5.2. MBRI Habitat Monitoring Plan 8
6.0 CONCLUSION 8

TABLES

Table 1: Construction Timeline 6

FIGURES

Figure 1: Site Location Map
Figure 2: Site Design Plan View
Figure 3: Site Design Cross Sections
Figure 4: Site Planting Plan

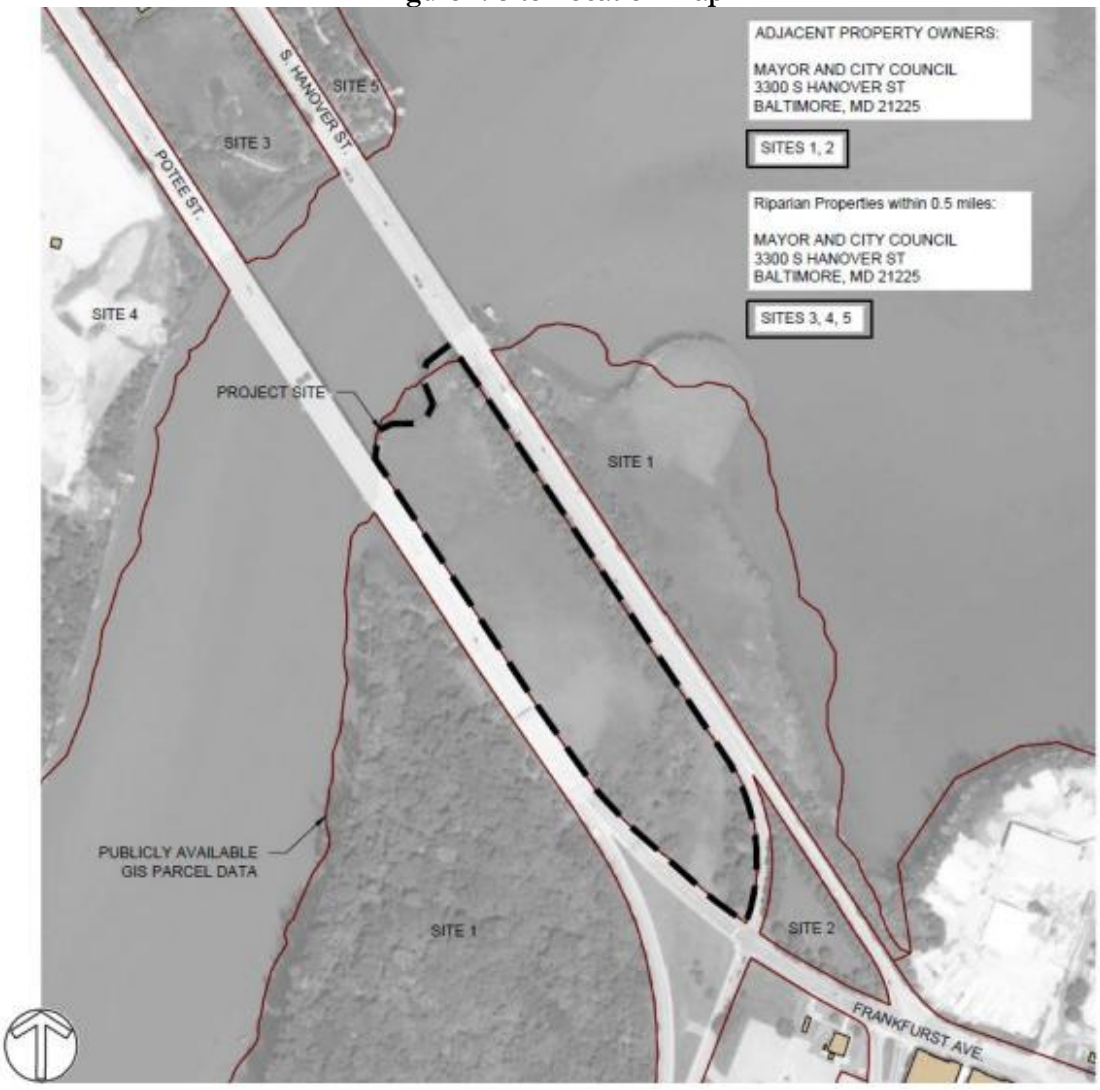
APPENDICES

APPENDIX A – SELECT CONSTRUCTION PERMITS & AUTHORIZATIONS
APPENDIX B – APPROVED 100% FINAL DESIGN PLANS
APPENDIX C – SITE PHOTOGRAPHS
APPENDIX D – AS-BUILT SURVEY
APPENDIX E – MONITORING PLAN

1.0 INTRODUCTION

The Middle Branch Resiliency Initiative (MBRI) is a comprehensive shoreline restoration strategy for Reimagine Middle Branch (RMB). MBRI uses nature-based infrastructure to enhance community resilience (including mitigating flood risk to energy, transportation, and other lifeline infrastructure), restore aquatic habitat complexity, improve water quality, and re-establish public waterfront access around the Middle Branch of the Patapsco River. This construction completion report covers the MBRI Patapsco Delta Project - East (also referred to as PDP-East, EB-1, or Project), which is located in MBRI South. South Baltimore Gateway Partnership secured funding from the National Oceanic and Atmospheric Administration (NOAA) Transformational Habitat Restoration and Coastal Resilience Grant to design, permit, and implement the Project. The Project provides valuable co-benefits such as water quality improvements, as well as enhanced structure and function to impaired terrestrial, aquatic, and riparian habitats. The Project is located on the Middle Branch of the Patapsco River in the Brooklyn neighborhood of the City of Baltimore, Maryland (Figure 1). This project is located on the Baltimore City Department of Recreation and Parks managed east side of the South Branch of the Patapsco River, between South Hanover Street and Potee Street.

Figure 1: Site Location Map



The Project was authorized and constructed under the following permits and approvals:

- USACE Nationwide Permit NAB-2024-60545-P05
- MDE General Permit for Stormwater Associated with Construction Activity 20CPD09DZ/MDRCD09DZ
- MDE Water and Science Administration Water Quality Certification Letter of Authorization No. 24-WQC-0033
- MDE Private Tidal Wetlands Permit 24-WP-0387
- Baltimore City Building Permit No. BCCM-25-000721
- Application of Herbicides/Pesticides NPDES Permit NO. MDG870375 – Registration Number 17PE0375A

Cover sheets for these permits are included in Appendix A.

This Construction Completion Report (CCR) summarizes completed construction activities per the approved design plans. Approved site development grading plans are included as Appendix B.

2.0 PROJECT DESCRIPTION

The MBRI Patapsco Delta Project - East proposed to enhance an approximate 5.0-acres of existing marsh located to the east of Reed Bird Island and the Potee Street causeway and to the west of the Hanover Street causeway in Brooklyn. This is a habitat-focused, shoreline stabilization, water quality improvement, and aquatic habitat restoration project in the Patapsco River Delta, where the non-tidal Lower North Branch Patapsco River meets the tidal Middle Branch.

The previously existing marsh consisted of approximately 4.9-acres of invasive Common Reed (*Phragmites australis*) and 0.1-acre of mixed native/non-native vegetation marsh. The Project included removing the existing non-native marsh vegetation via herbicide treatment, mechanically grading channels, and re-using excavated materials on site to create high and low marsh. The site includes the restoration and creation of tidal channels, low marsh, high marsh, supratidal zones, and upland planting. Design features include a sand/gravel beach and woody debris structures for habitat and stabilization. The Project improves habitat for both aquatic and terrestrial species while enhancing water quality by improving tidal flushing and capturing/treating stormwater before it enters the Patapsco River, a main tributary to the Chesapeake Bay.

• Shallow Open Water: Shallow water represents a permanently inundated condition and offers nearshore habitat for aquatic organisms. When the conditions allow (depth, light penetration, wave energy), submerged aquatic vegetation (SAV) has the potential to develop, which would enhance the foraging and refugia for both juvenile and mature organisms. The shallow open water features at PDP-East are in the form of tidal channels excavated for better connection to the Patapsco River.

• Mudflats: Mudflats are flat or gently sloped substrate that occupy the intertidal zone between Mean Lower Low Water (MLLW) and Mean Low Water (MLW). Due to their depth, mudflats do not support vegetation across the bottom; however, their role in nutrient cycling, habitat for a range of species (invertebrate, bacterial, etc.), and rich foraging grounds for migratory birds make them a beneficial addition.

• High and Low Marsh: Marsh comprises the intertidal zone and is the flat or gently sloping wetland bottom that extends from the edge of the tidal guts to the tidal fringe and is inundated twice daily. The marsh can be

subdivided into high marsh and low marsh based on the depth and duration of inundation during a typical tidal cycle. Microtopographic variation within the marsh plain provides increased habitat complexity.

• Supra-Tidal Marsh: The supra-tidal areas are the high marsh transition zones where high marsh elevations transition to upland elevations. These areas are within high marsh elevations and planted with the same species. This is designed for predicted wave heights at the shoreline, which will be attenuated by the exterior berm and shallow marsh areas. Supra-tidal elevations have been set to be resilient in the face of projected sea level rise.

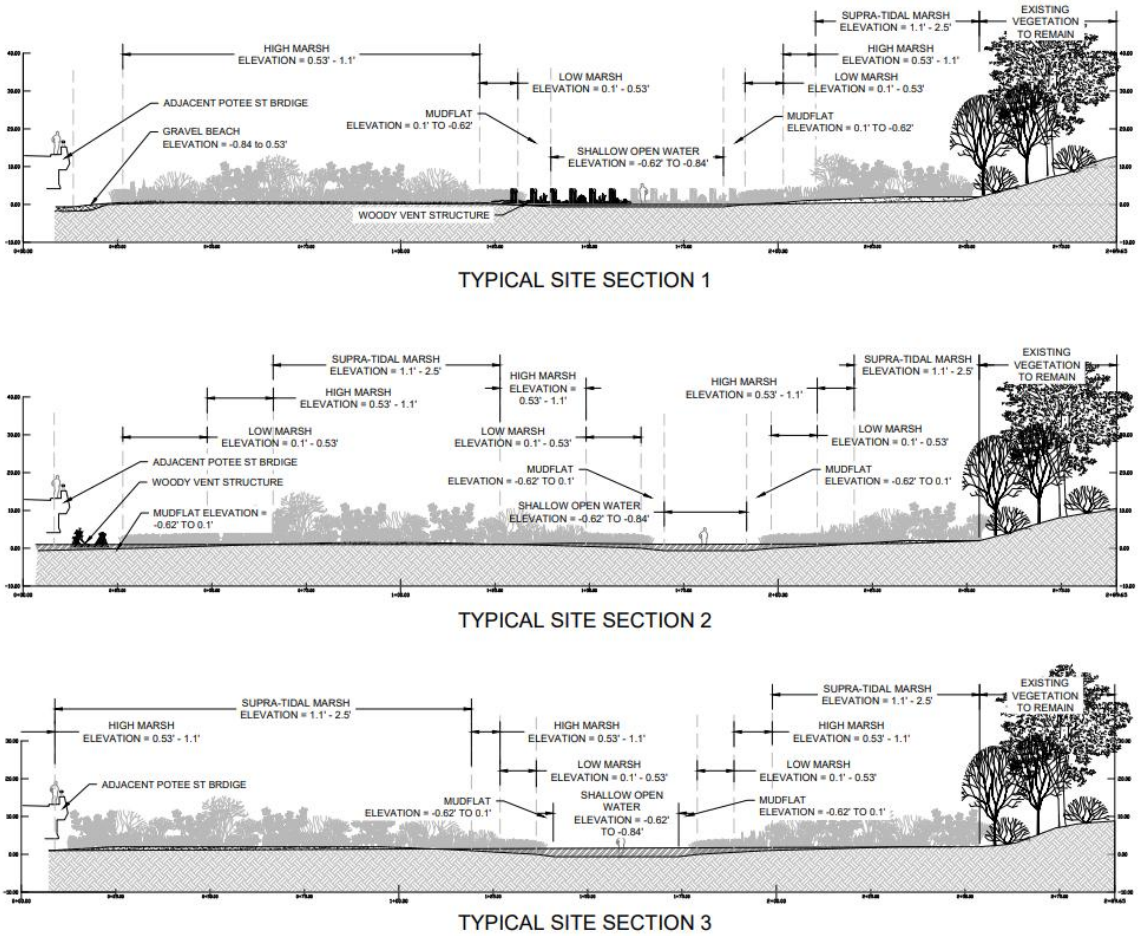
• Riparian Buffer Zone: The Riparian Buffer Zones are upland areas that are designed to be resilient in the face of projected sea level rise through grading and native vegetation establishment – including native tree species. These areas provide habitat for wildlife and create the natural transition between wetland/marsh areas to uplands. The Riparian Buffer Zone also provides stabilization of the existing embankment along the South Hanover Street shoreline.

The Project entailed first approximately 570 linear feet of low-profile sill, effectively creating 0.10-acres of mixed gravel and sand beach. This feature stabilized the project at the interface with the Patapsco River. Then, habitat diversity was achieved by grading the *Phragmites* marsh to achieve approximately 0.36-acres of shallow open water (channels), 0.31-acres of mudflat, 0.55-acres of low marsh, 0.86-acres of high marsh, and 2.93-acres of supra-tidal marsh. Work did not extend channel ward of the existing marsh. The constructed marsh includes various woody debris features for both stability and habitat located within the marsh and at the newly constructed channel mouths to the Patapsco River. Low, high, and supra-tidal marsh were planted with native species. Additionally, a small upland riparian buffer zone (0.27-acres) was enhanced with native plantings.

Figure 2: Design Plan View



Figure 3: Design Cross-Sections



3.0 STABILIZATION APPROACH

PDP-East is a habitat-focused, shoreline stabilization, water quality improvement, and aquatic habitat restoration project in the Patapsco River Delta, where the non-tidal Lower North Branch Patapsco River meets the tidal Middle Branch. The site includes the restoration and creation of tidal channels, low marsh, high marsh, supratidal zones, and upland planting. Design features include a low profile sill to create a native gravel beach condition, as well as woody debris structures for habitat and stabilization. The Project also restored extensive aquatic habitat structure by installing innovative subtidal habitat structures, stabilizing the shoreline, and restoring native wetland habitat along this lower reach of the Patapsco.

3.1. Gravel and Sand Low Profile Sill w/Woody Vent Structures

570 linear feet of gravel/sandsill/beach was installed along the northeast perimeter of the project at the interface with the Patapsco River and where the newly constructed tidal channels confluence with the River. The low profile sill consisted of Class 0 cobble and sand mixture overtop a geotextile underlayment. At both ends of the sill, two (2) woody vent structures were installed with logs in a vertical and horizontal matrix. Waterside of the woody vent structure on the northern edge along the Patapsco River, one (1) group of eight

(8) rootwads was installed. These structures provide habitat and wave resiliency while maintaining tidal flushing as well as wildlife movement in and out of the marsh system.

3.2. Aquatic Marsh System w/Habitat Features

Landside of the gravel stone sill, 5.00 acres of aquatic habitat was created with new and restored tidal marsh system. Removal of the existing non-native marsh vegetation was achieved via herbicide and mechanical removal. Tidal channels were graded within the existing marsh to reestablish connection between the marsh and Patapsco River. The material removed to create the channels was replaced on-site to create a complex ecosystem of low, high and supratidal marsh. Low Marsh grading elevations consisted of 0.1'-0.53' and High Marsh grading elevations consisted of 0.53'-1.1'. Supra-Tidal Marsh grading elevations consisted of 1.1'-2.5'. Woody features such as standing snags (19 each), basking logs (13 each) and brush piles (13 each) were installed at locations shown on the approved plans within the Low Marsh, High Marsh and Supra-Tidal zones. To create a smooth and natural transition from marsh/wetlands to uplands, supra-tidal marsh grading elevations of 2.5' – 3.0' were also established along the outer edges of the marsh.

3.3. Planting

An initial upland invasive species clearing occurred during the site preparation, as well as the erosion and sediment control installation phase. The treatment was largely concentrated in the construction ingress and egress locations to the site . The wood generated from this clearing was reused on site for woody habitat structures, when the material met specifications. The remaining unsuitable material was removed and disposed of off-site. These upland construction access points to the marsh were replanted with native tree species.

Once the existing *Phragmites* was effectively treated and removed, and elevations for the Low Marsh, High Marsh, and Supra-Tidal zones were constructed, these areas were planted with 47,264 plugs, 951 shrubs, 21 trees, and 50 pounds of native seed mix, per the approved planting plan. Nearly 800 linear feet of temporary perimeter goose fencing was installed to prevent herbivory and promote permanent establishment.

Figure 4: Planting Plan



4.0 CONSTRUCTION SUMMARY

The following provides a summary of the construction activities completed for the MBRI PDP-East. The construction timeline, including key milestones and dates, is summarized in Table 1. Site photographs taken during pre-construction, construction, and post-construction are included in Appendix C.

Table 1: Construction Timeline

Task	Date
Pre-Construction Meeting	June 3, 2024
Initial Invasive Treatment	October 2024
Mowing of Treated Invasives within the Marsh	February 2025
Mobilization	May 2025
Erosion and Sediment Control Installation	May 2025
Construction Access Clearing & Grubbing	May 2025
Gravel and Sand Low Profile Sill	June – July 2025
Marsh Grading / Open Water Channel Grading, and Habitat Features	June – July 2025
Seeding	June – July 2025
Supplemental Herbicide Treatment	September 2025
Planting	October 2025
Goose Exclusion Fence Installation	October 2025

De-mobilization	November 2025
As-Built Survey	November – December 2025

Construction of the Project was initiated on June 3, 2024, with the pre-construction meeting. In early October 2024 treatment of the *Phragmites* in the existing marsh using imazapyr was applied with a Marsh Master machine. The subsequent mowing of the existing marsh occurred on February 19, 2025.

Contractor mobilized the Project on May 7, 2025 and started delineating the limits of disturbance with temporary orange construction fencing. Installation of Erosion and Sediment Controls, including the turbidity curtain, two stabilized construction entrances (one on Potee Street and one on South Hanover Street), and the temporary stockpile area continued through May 2025. *Phragmites* re-growth was sprayed May 28, 2025 and again in September 2025 prior to planting.

Installation of the 570 linear feet of gravel/sand sill, and two woody vents totaling 100 linear feet was completed in early June. Grading of the marsh and installation of the woody habitat features occurred from June through July 2025. All woody features, including the standing snags (19 each), basking logs (13 each) and brush piles (13 each), were installed at the locations shown on the approved plans. Native seeding occurred concurrently with grading operations.

The Marsh planting consisting of 47,264 plugs and 951 shrubs occurred in early November 2025, as well as the 21 trees in the riparian buffer zone. Demobilization by the Contractor was completed by the end of November 2025 and as-built surveys were completed by early December 2025. No permits have been closed to date due to regulatory monitoring requirements.

5.0 MAINTENANCE AND MONITORING PLAN

GreenVest (GV) will conduct regulatory monitoring and required site maintenance during the regulatory maintenance and monitoring (MM) period, at minimum, to be the first five years following construction. The regulatory MM period will conclude upon receiving regulatory sign off (MDE and USACE) that the Project has been successfully completed and success criteria met. At that point, the project will enter the long-term management (LTM) phase with the selected long-term steward.

Performance monitoring for the Project is required in accordance with the site's USACE and MDE permits. The monitoring requirements and parameters are described below, and within the permits included in Appendix A. Also, as part of the monitoring requirements, as-built drawings are provided in Appendix D.

5.1. Marsh Maintenance Plan

An individual marsh maintenance plan was developed for MBRI PDP-East in accordance with the USACE Individual permit and the Maryland Tidal Wetland license. GV will monitor and maintain the Project for a minimum period of five (5) years, with a potential to extend the monitoring period up to three (3) additional years depending on site conditions and monitoring results. Monitoring reports will be submitted to regulators annually, starting at the end of construction, for a minimum of five (5) years, and will include inspection dates, project status, percent (%) complete plant coverage (native vs. non-native), limiting factors, corrective actions, and photos. The Marsh Maintenance Plan provides details on methodologies and success criteria (Appendix A).

5.2. MBRI Habitat Monitoring Plan

The MBRI Habitat Monitoring Plan is a program-wide monitoring plan implemented across five (5) locations within the Middle Branch of the Patapsco River, including PDP-East. Baseline data was collected in 2024 and will continue at approved locations and intervals across a period of 10 years. Though not specific to PDP-East, the MBRI Habitat Monitoring Plan will collect valuable site data for the following six items of interest: habitat assessment, fish monitoring, benthic macroinvertebrate monitoring, sediment sampling, porewater sampling and project stability. The Habitat Monitoring Plan provides details on methodologies, however, no success criteria is tied to this monitoring (Appendix E).

6.0 CONCLUSION

Construction of the MBRI PDP-East resulted in the successful restoration of 5.00 acres of marsh habitat. The primary goal of the project was to improve and diversify the aquatic habitat, which was significantly improved via incorporating an array of marsh zones, coarse woody debris, habitat features, and vegetative community types. Distinct aquatic habitat zones were established where the depth and durations of tidal inundation were set to achieve the target hydroperiod and ecology. Construction of the project was initiated on June 3, 2024, and Project completion—including planting, clean-up, and demobilization was achieved November 7, 2025. Punchlist items were completed November 26, 2025. As-built drawings were completed in December 2025. The Maintenance and Monitoring period will commence in Spring 2026, which is the next growing season following construction completion. The MBRI Habitat Monitoring Plan which already started in 2024, will continue until 2034.

GreenVest
VISION • PERFORMANCE • RESULTS

Appendix A: Construction Permits and Authorizations

4201 Northview Dr. Suite 202
Bowie, MD 20716
410-987-5500

3175 Route 10, Suite 100
Denville, NJ 07834
732-902-6644

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DEPARTMENT OF THE ARMY
U. S. ARMY CORPS OF ENGINEERS,
STATE COLLEGE FIELD OFFICE
1631 SOUTH ATHERTON STREET, SUITE 101
STATE COLLEGE, PENNSYLVANIA 16801-6260

January 15, 2025

Operations Division

GreenVest, Limited Liability Corporation
Mr. Brian Cramer, Vice President
4201 Northview Drive, Suite 202
Bowie, MD 20716

Dear Mr. Cramer:

This is in reference to your application, NAB-2024-60545-P05 (GreenVest, LLC - Habitat Re-Establishment) wherein you requested a Department of the Army (DA) authorization to enhance an approximate 5.0-acres of existing marsh located on the west side of Reed Bird Island, west of the Hanover Street Bridge, east of the Potee Street Bridge, at the site identified as Patapsco River East Bank. The existing marsh consists of approximately 4.9-acres of phragmites and 0.1-acre of mixed native/non-native vegetation marsh. The proposed marsh project at Patapsco River East Bank consists of the following work: removal of the existing non-native marsh vegetation by mechanically grading and removing 2,858-cubic-yards of material and re-using the resulting material on-site to create high and low marsh; to construct approximately 570 linear feet, 0.10-acres/4,471 square feet of segmented gravel stone sill with 148 cubic yards of gravel; enhance the graded phragmites marsh with approximately 1.21-acres/52,832 square feet of native low marsh vegetation and approximately 3.79-acres/165,121 square feet of native high marsh vegetation. Work will not extend channelward of the existing marsh. The proposed marsh includes various woody debris features for both stability and habitat located within the marsh and at the sill vents in the unplanted sand and cobble sections to facilitate fish passage. The proposed project site (identified as EB-1) is located in the Patapsco River between the South Hanover Street and Potee Street Bridges, in Baltimore, Maryland.

Our evaluation has determined that the proposed work, if accomplished in accordance with the project plans, titled “MIDDLE BRANCH RESILIENCY INITIATIVE PATAPSCO RIVER EAST BANK (EB) TIDAL MARSH RESTORATION” (100 % Final Plans) dated December 9, 2024, Sheets 1 through 19 of 19, is authorized by Nationwide Permit (NWP) for purposes of Section 10 of the River and Harbors Act of 1899 and/or Section 404 of the Clean Water Act as published in the January 13, 2021 Federal Register, Final Notice of Issuance, Reissuance, and Modification of NWPs (86 FR 2744) and/or the December 27, 2021 Federal Register, Final Notice of Issuance, Reissuance, and Modification of NWPs (86 FR 73522), NWP number 27, provided all state

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authorizations are granted. If any of the information contained in the application and/or plan(s) is later found to be in error, this authorization may be subject to modification, suspension, or revocation.

Please note that you must comply with the general conditions and activity-specific impact limits and requirements for NWP 27 including Water Quality Certification conditions, if appropriate, at the following link: https://www.nab.usace.army.mil/Missions/Regulatory/NWP/. If you are not able to access the conditions, please contact the project manager for a hard copy.

In addition, we have determined that the project-specific special conditions below must also be followed in performing the work to ensure that the project impacts to the aquatic environment are minimal:

1. All work is to be completed in accordance with the project plans, titled “MIDDLE BRANCH RESILIENCY INITIATIVE PATAPSCO RIVER EAST BANK (EB) TIDAL MARSH RESTORATION” (100 % Final Plans) dated December 9, 2024, Sheets 1 through 19 of 19.

2. The authorized work shall result in the creation of 15,691 square feet of shallow open water, 13,297 square feet of mudflat, 23,882 square feet of low marsh vegetation, 38,050 square feet of high marsh vegetation, and 127,072 square feet of supratidal marsh vegetation.

3. There shall be no deviation to the authorized work without prior approval of the United States Army Corps of Engineers (Corps). Revised project plans and a description of any additional work in waters of the United States other than that shown on the approved project plans must be submitted to the Corps for review and approval two weeks prior to commencing work.

4. The permittee shall contact this office via email to nab-regulatory@usace.army.mil two weeks prior to commencing construction of the authorized work, as well as within two weeks after the authorized work has been completed.

5. A copy of this DA permit must be provided to the contractor performing the work and be posted on site during construction.

6. The permittee shall allow representatives of the Corps to enter the project area to inspect the ongoing or completed work.

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7. Best management practices must be employed to minimize impacts to waterways. The permittee must employ measures during construction to prevent spills of fuels or lubricants, etc. If a spill occurs, it must immediately be controlled to prevent its entry into the waterway and the United States Coast Guard (USCG) notified.

8. A turbidity curtain must be installed and maintained, where operationally feasible, around the channelward limit of the project area prior to and during the construction to contain suspended sediments and minimize turbidity.

9. Within 30 days of completion of construction, the permittee must provide as built plans, to include the latitude and longitude coordinates of the channelward most points of each structure, to the Corps and must notify the Corps to coordinate a compliance site visit via email to nab-regulatory@usace.army.mil.

10. The permittee shall monitor the project area for ten (10) years following construction completion in accordance with the Middle Branch Resiliency Initiative–Habitat Monitoring Plan. During this 10-year timeframe, the permittee must submit, to the Corps, an annual monitoring report via email to nab-regulatory@usace.army.mil by December 31 of the monitoring or completion year. If the remedial measures are needed, the permittee must coordinate with the Corps and the Maryland Department of the Environment for approval.

11. The United States Code of Federal Regulations, Title 33, Subpart 64 states that all structures erected in navigable waters require obstruction lights unless the applicant is advised to the contrary by the Coast Guard District Commander. Because the structures authorized by this permit are to be built in navigable waters, you must contact the Commander (oan), Fifth Coast Guard District, 431 Crawford Street, Room 100, Portsmouth, Virginia, 23704, to ascertain the need for obstruction lights.

12. A minimum of 21 days prior to commencing work, the permittee, or the permittee's contractor, shall request, in writing, from the USCG, that a Broadcast and Local Notice to Mariners be issued regarding the authorized work. The written request shall include the location of work, description of activities to include the presence of submerged and/or floating dredge pipelines, the type of construction equipment to be used, and the expected duration of the work on the waterway.

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The written request should be addressed to the following:

Commander (dpw)
Fifth Coast Guard District
431 Crawford Street
Room 100
Portsmouth, Virginia 23704-5004
LNM e-mail address: CGD5Waterways@uscg.mil
CC: Ryan.P.Doody2@uscg.mil

a. No authorized work may commence until this required USCG LNM has been issued by the USCG, identifying the location and schedule for commencement of the approved work.

b. No authorized work may commence until the permittee informs the Corps in writing, with the date that the USCG publishes the LNM for the approved work.

13. The location of work, description of activities, the type of construction equipment to be used, the expected duration of the work on the waterway and final as built plans must be furnished to the National Oceanic Survey at the following address so the information is charted on the appropriate nautical chart:

NOAA, National Ocean Survey
Marine Chart Division
Nautical Data Branch (N/CS26)
Station 7350
1315 West-West Highway
Silver Spring, Maryland 20910-3282
Attn: Chief, Nautical Data Branch
Telephone Number: (301) 713-2737 ext. 123
Fax Number: (301) 713-4516

14. The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration; of the structures or work herein authorized, or if, in the opinion of the Secretary of the Army or his Authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permlttee will be required, upon due notice from the Corps, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

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15. All conditions of the state issued Water Quality Certification are hereby made part of this permit.

Please note that as of the date of this authorization, your project is in compliance with Section 7 of the Endangered Species Act. However, new species may be listed, or additional populations found. Therefore, it is your responsibility to ensure that construction of the authorized work does not adversely affect any existing or newly listed federally endangered or threatened species.

Information on threatened and endangered species and their critical habitat can be obtained from the offices of the United States Fish and Wildlife Service and National Marine Fisheries Service or their web pages at: https://ecos.fws.gov/ipac and https://www.greateratlantic.fisheries.noaa.gov/protected/section7/guidance/maps/index.html respectively.

Please note that you are required to submit a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. An example of the information that is required is posted on the Baltimore District webpage at: https://www.nab.usace.army.mil/Portals/63/NAB-xxxx-xxxxx_XXXX_Universal_CompCert_Final.pdf. The signed certification should be emailed to the Regulatory Branch email at nab-regulatory@usace.army.mil within 60 days with NAB-2024-60545-P05 (GreenVest, LLC - Habitat Re- Establishment) in the subject line following completion of the authorized work and any required mitigation. Your signature on the certification verifies your understanding that the work was completed in accordance with the terms and conditions associated with your DA permit.

This verification is valid until the NWP is modified, reissued, or revoked. The NWPs issued in the January 13, 2021, Federal Register, Final Notice of Issuance, Reissuance, and Modification of NWPs (86 FR 2744) and/or the December 27, 2021, Federal Register, Final Notice of Issuance, Reissuance, and Modification of NWPs (86 FR 73522) expire on March 14, 2026. It is incumbent upon you to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant NWP is modified or revoked, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this NWP.

After you have obtained all required federal, state, and/or local authorizations, you may proceed with the authorized work.

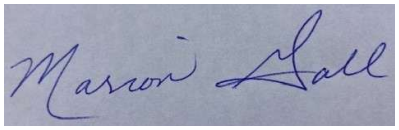
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When the structures or work authorized by this NWP are still in existence at the time the property is transferred, the terms and conditions of this NWP, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this NWP and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below. A copy of this NWP verification signed by the transferee must be submitted to the Baltimore District to validate the transfer.

A copy of this letter is being provided to the Maryland Department of the Environment for informational purpose.

If you have any questions concerning this matter, please call or email me at (814) 235-1761 or marion.gall@usace.army.mil.

Sincerely,



Marion Gall
Biologist – Pennsylvania Section
Regulatory Branch

Docusign Envelope ID: 7724DE17-DCA9-4032-8083-5F1AE9ED176A

Transfer Form

NAB-2024-60545-P05 (GreenVest, LLC - Habitat Re- Establishment)

Signed by:
Brian Cramer
2B55C983776D4DB...

TRANSFEREE SIGNATURE	DATE	TELEPHONE NO.
	1/16/2025	410-987-5500

Brian Cramer

PRINTED NAME

4201 Northview Drive, Suite 202, Bowie MD, 20716

ADDRESS

Return to Regulatory by email at:
nab-regulatory@usace.army.mil with NAB-2024-60545-P05 in the subject line.

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201-2930

COMPLIANCE SELF-CERTIFICATION

AUTHORIZATION NUMBER: NAB- 2024-60545-P05

Corps Project Manager: Marion Gall

Upon completion of the authorized work, sign this certification and return it to the address above or the following electronic mail address: nab-regulatory@usace.army.mil. Please include the following text in the email subject line: Compliance Certification Form.

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with this permit, you are subject to permit suspension, modification, or revocation.

Please complete the following information:

1. Date authorized work commenced: MAY 1, 2025
2. Date authorized work completed: DECEMBER 23, 2025

3. Was all work completed in accordance with your authorization, including all general and/or specific conditions?
YES ☑ NO ☐

4. Explain in detail any deviations to the authorized work and/or compliance with conditions:
(use additional sheets if necessary)

N/A

5. If compensatory mitigation is required, please provide a status below:

N/A

6. Attach labeled photographs showing completed work.

RSG I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said authorization.
____I hereby certify that the work is NOT in compliance with the above referenced authorization as detailed in #4 above and would like to discuss this project with a project manager.
I can be reached at: ( ) ____-_____.

RYAN SCOTT GIBSON - Q.P.

Signature of Permittee

FEBRUARY 13, 2026
Date

RYAN GIBSON
SENIOR PROJECT MANAGER
GREENVEST, LLC

3/28/2025
GREENVEST, LLC

4201 NORTHVIEW DRIVE
SUITE 202
BOWIE, Maryland 20716

RE: Authorization of Application Number: **20CPD09DZ/MDRCD09DZ**

Dear **Mr. Ryan Gibson,**
This letter confirms, that as of **3/28/2025** , your authorization for coverage under the General Permit for Stormwater Associated with Construction Activity (MDRC/20-CP) was granted for discharges into:

Use II: Patapsco River L N Br (02130906)

In signing the Notice of Intent (NOI) you have certified that the Operator named here:

GREENVEST, LLC

intends to abide by the terms of the MDRC/20-CP permit for:

Middle Branch Resiliency Initiative Patapsco River East Bank (EB-1) Tidal Marsh Restoration

for a total disturbed area of: **6.43 acres**

at a property located at:

Baltimore, Maryland 21225

in:

Baltimore City

This coverage will continue under the terms of the General Permit until the permit is renewed by MDE (see 20CP Part I.F). You must print the full permit text to be kept on file and onsite with this letter. The permit text can be printed from: https://mde.maryland.gov/programs/Water/wwp/Pages/gp_construction.aspx. Staff on-site must be thoroughly familiar with the content of the permit and where a copy is available on-site. A summary of the permit requirements and provision are provided below.

The stormwater discharges associated with construction and associated support activity are authorized under this authorization provided that appropriate stormwater controls are designed, installed, and maintained (see 20CP Parts III.A and III.B). In addition to stormwater associated with construction activity (see 20CP Part I.C.2) of the permit specifies the allowable non-stormwater discharges under this authorization. Any discharges not authorized by the General Permit may require additional permit coverage (see 20CP Part I.E).

If the current E&SC plan approval covers only part of the entire site, be advised that this registration does not authorize discharges from the other portions for the site until the appropriate E&SC approval authority approves the E&SC plan for those portions.

Discharges must be controlled as necessary to meet applicable water quality standards (see 20CP Part III.B). The narrative surface water quality criteria in Maryland's water quality standards include floating debris, oil, grease, scum, sludge, and other floating materials in amounts sufficient to cause the receiving water(s) to be unsightly; change the existing color to produce objectionable color for aesthetic purposes, or interfere directly or indirectly with designated uses; or elevate temperature which interfere directly or indirectly with designated uses.

In addition to the Technology-Based and Water Quality-Based Limits, the permit requirements include:

• "Site Inspection, Monitoring and Records", categorized as Person(s) Responsible for Inspecting Site (see 20CP Part III.C.1), Frequency of Inspections (see 20CP Part III.C.2), Increase in Inspection Frequency for Sites Discharging to Sensitive Waters (see 20CP Part III.C.3), Reductions in Inspection Frequency (see 20CP Part III.C.4), Areas That Must Be Inspected (see 20CP Part III.C.5), Requirements for Inspections (see 20CP Part III.C.6), Inspection Report (see 20CP Part III.C.7) and Records On-site (see 20CP Part III.C.8).

• "Corrective Actions", categorized as Conditions Triggering Corrective Action (see 20CP Part III.D.1), Corrective Action Deadlines (see 20CP Part III.D.2), and Corrective Action Report (see 20CP Part III.D.3).

• "Staff Training Requirements", categorized as Prior to the commencement of construction activities (see 20CP Part III.E.1), Regarding subcontractors or outside service providers (see 20CP Part III.E.2), Specific training related to scope of jobs (see 20CP Part III.E.3), and Easy access to documents (see 20CP Part III.E.4).

• "Stormwater Pollution Prevention Plan (SWPPP)", categorized as when a SWPPP is required (see 20CP Part III.F.1), the onsite availability of your SWPPP (see 20CP Part III.F.3) and when your SWPPP must be updated (see 20CP Part III.F.4).

You are required to submit any Modifications to this coverage, Transfers of Authorization, or Notices of Termination via the ePermits portal found at https://egov.maryland.gov/mde/npdes/Account/Login. If your contact information changes, update it through the ePermits portal. If you have any questions, please call the administrative team for the General Permit at (410) 537-3019.

Lastly, please remember to contact the compliance program to schedule a preconstruction meeting two (2) weeks prior to starting construction. If the compliance program contact name isn't on your approved E&SC plan, refer to the regional office Compliance Program Contacts listed on the following web page: https://mde.maryland.gov/programs/water/Compliance/Pages/index.aspx.

Sincerely,



Matthew Perry
Industrial Stormwater Permits Division
Wastewater Pollution Prevention & Reclamation Program

General Permit for Stormwater Associated with Construction Activity Addendum

You indicated that the permit may involve rare, threatened, or endangered species that may be impacted by your construction project. You must have indicated these identified sensitive areas in your E&SC or in your SWPPP (Part III.F.3.i), to highlight where protections must take place based on consultation with DNR.

The Department has imposed additional controls that are necessary for your discharges to meet water quality standards and be consistent with any available wasteload allocation. See (Part III.B) Water Quality-Based Limits. All additional controls imposed by the Department must be documented in your SWPPP.

Cause(s) of the impairment: Bacteria, Biological, Nutrients, Sediments.

November 15, 2024

Baltimore City, Dept. of
Recreation and Parks
C/o GreenVest, LLC
Attn: Andrew Forbes, PE
4201 Northview Dr, Ste 202
Bowie, Maryland 20716

Via email: andrew@greenvestus.com

Re: Agency Interest Number: 181301
Tracking Number: 202460545
Tidal Authorization Number: 24-WQC-0033

Dear Baltimore City, Dept. of Recreation and Parks and Medstar Hospital:

Your project did not qualify for approval under the Maryland State Programmatic General Permit (MDSPGP); therefore a separate review and issuance of the federal permit will be required by the U.S. Army Corps of Engineers. The federal permit is not attached.

Additionally, your project required a Wetlands License to be approved and issued by the Maryland Board of Public Works (BPW). The Wetlands License will be sent to you by BPW's Wetlands Administrator.

A project that does not qualify for approval under the MDSPGP requires an individual Water Quality Certification (WQC) to be issued by the Maryland Department of the Environment, which is attached. Please take a moment to read and review your WQC to ensure that you understand the limits of the authorized work and all of the general and special conditions.

You should not begin any work until you have obtained all necessary State, local, and federal authorizations. Please contact Matthew Wallach at matthew.wallach@maryland.gov or 410-207-0893 with any questions.

Sincerely,

Jonathan Stewart, Acting Chief
Tidal Wetlands Division

STATE OF MARYLAND
DEPARTMENT OF THE ENVIRONMENT
WATER AND SCIENCE ADMINISTRATION
WATER QUALITY CERTIFICATION

24-WQC-0033

EFFECTIVE DATE:	**November 15, 2024**
CERTIFICATION HOLDERS:	**Baltimore City Dept. of Recreation and Parks**
ADDRESS:	**3001 East Drive** **Baltimore, MD 20716**
PROJECT LOCATION:	**Between the S. Hanover St embankment and Potee St. bridge, Brooklyn, MD 21215**

UNDER AUTHORITY OF SECTION 401 OF THE FEDERAL WATER POLLUTION CONTROL ACT AND ITS AMENDMENTS AND IN ACCORDANCE WITH § 9-313 THROUGH § 9-323, INCLUSIVE, OF THE ENVIRONMENT ARTICLE, ANNOTATED CODE OF MARYLAND, THE MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER AND SCIENCE ADMINISTRATION HAS DETERMINED THAT THE REGULATED ACTIVITIES DESCRIBED IN THE REQUEST FOR CERTIFICATION FOR THE PROPOSED MARSH CREATION AND AS DESCRIBED IN THE ATTACHED PLAN SHEETS DATED AUGUST 2, 2024 AND ANY SUBSEQUENT MODIFICATIONS APPROVED BY THE DEPARTMENT WILL NOT VIOLATE MARYLAND'S WATER QUALITY STANDARDS, IF CONDUCTED IN ACCORDANCE WITH THE CONDITIONS OF THIS CERTIFICATION.

THIS CERTIFICATION DOES NOT RELIEVE THE APPLICANT OF RESPONSIBILITY FOR OBTAINING ANY OTHER APPROVALS, LICENSES, OR PERMITS IN ACCORDANCE WITH FEDERAL, STATE, OR LOCAL REQUIREMENTS AND DOES NOT AUTHORIZE COMMENCEMENT OF THE PROPOSED PROJECT. A COPY OF THIS REQUIRED CERTIFICATION HAS BEEN SENT TO THE CORPS OF ENGINEERS. THE CERTIFICATION HOLDER SHALL COMPLY WITH THE CONDITIONS LISTED BELOW.

The Maryland Department of Environment satisfied the statutory and regulatory public notice requirements by placing the WQC on Public Notice from August 15, 2024 to September 15, 2024 on Maryland Department of the Environment's Public Notice webpage and advertising in the Baltimore Sun on August 16, 2024.

PROJECT DESCRIPTION

1. Remove all existing phragmites.
2. Construct a 4,471-square foot sand/gravel stone sill and regrade entire site to create 15,691 square feet of shallow open water, 13,297 square feet of mudflat, 23,882 square feet of low marsh vegetation, 38,050 square feet of high marsh vegetation, and 127,072 square feet of supratidal marsh vegetation.

GENERAL CONDITIONS

1. All water quality-related performance standards and conditions required by the Department in any state issued authorization for activities in tidal wetlands, nontidal wetlands, their 100-year floodplains, nontidal wetlands buffers, or nontidal wetland expanded buffers to ensure that any discharges will not result in a failure to comply with water quality standards in COMAR 26.08.02 or any other water quality requirements of state law or regulation shall be met.

2. This Certification does not obviate the need to obtain required authorizations or approvals from other State, federal or local agencies as required by law.

3. All additional authorizations or approvals, including self-certifying General Permits issued by the Department, shall be obtained and all conditions shall be completed in compliance with such authorizations.

4. The proposed project shall be constructed in accordance with the approved final plan by the Department, or, if Department approval is not required, the plan approved by the U.S. Army Corps of Engineers, and its approved revisions.

5. All fill and construction materials not used in the project shall be removed and disposed of in a manner which will prevent their entry into waters of this State.

6. This Certification does not authorize any injury to private property, any invasion of rights, or any infringement of federal, state, or local laws or regulations.

7. Authorized representatives of the Department shall be provided access to the site of authorized activities during normal business hours to conduct inspections and evaluations of the operations and records necessary to assure compliance with this Certification.

8. No stockpiles of any material shall be placed in Waters of the U.S. or state or private tidal wetlands.

9. Temporary construction trailers or structures, staging areas and stockpiles shall not be located within tidal wetlands, nontidal wetlands, nontidal wetlands buffers, or the 100-year floodplain unless specifically included on the Approved Plan.

10. This Certification is valid for the project identified herein and the associated U.S. Army Corps of Engineers NAB-2024-60545, until such time as that federal approval expires or is not administratively extended.

SPECIAL CONDITIONS

1. All Critical Area requirements shall be followed and all necessary authorizations from the Critical Area Commission ("Commission") shall be obtained. This Certificate does not constitute authorization for disturbance in the 100-foot Critical Area Buffer. "Disturbance" in the Buffer means clearing, grading, construction activities, or removal of any size of tree or vegetation. Any anticipated Buffer disturbance requires prior written approval, before commencement of land disturbing activity, from local jurisdiction in the form of a Buffer Management Plan.

2. All work performed under this Water Quality Certificate shall be conducted by a marine contractor licensed by the Marine Contractors Licensing Board (MCLB) in accordance with Title 17 of the Environment Article of Annotated Code of Maryland. Licensing by MCLB shall occur prior to the beginning of construction activities. A list of licensed marine contractors may be obtained by contacting the MCLB at 410-537- 3249, by e-mail at MDE.MCLB@maryland.gov or by accessing the Maryland Department of the Environment, Environmental Boards webpage.

3. The issuance of this Certificate is not a validation or authorization by the Department for any of the existing structures depicted on the plan sheets on the subject property that is not part of the authorized work description, nor does it relieve the Certificate Holder of the obligation to resolve any existing noncompliant structures and activities within tidal wetlands.

4. The Certificate Holder shall construct the marsh establishment area in accordance with the following conditions:

    1. The Certificate Holder shall use clean substrate fill material, no more than 10% of which shall pass through a standard number 100 sieve.
    2. The marsh establishment area shall be planted within one year following completion of the filling operation.
    3. The marsh establishment project shall be maintained as a wetland, with non-nuisance species' aerial coverage of at least 85% for three consecutive years. If 85% coverage is not attained, the reasons for failure shall be determined, corrective measures shall be taken, and the area shall be replanted.
    4. Certificate Holder shall use a turbidity curtain around the perimeter of the instream work.
    5. If the existing bank is to be cleared or graded:
        a. The Certificate Holder shall perform all work under and in accordance with an approved Soil Erosion and Sediment Control Plan from the applicable sediment and erosion control agency; and
        b. The Certificate Holder shall perform all work under and in accordance with the Critical Area requirements of the local jurisdiction in the form of an approved Buffer Management Plan.

5. The Certificate Holder shall follow the requirements of the marsh maintenance plan as required by Wetlands License 24-WP-0387 and any subsequent modifications.

6. The Certificate Holder shall deploy and maintain a turbidity curtain tightly around and channelward of the project area prior to any excavation and backfilling along the shoreline through completion of any excavation and backfilling along the shoreline.

7. The Certificate Holder shall monitor the entire middle branch as outlined in the attached habitat monitoring plan dated June 5, 2023.

8. The Certificate Holder shall obtain a General Permit for Discharges from the Application of Pesticides from MDE by contacting the Industrial Discharge Permits Division at 410-537-3323 prior to the application of any herbicide to eradicate *Phragmites*. Toxic materials use permits are required for any homeowner, farmer, local government or other person who wants to control aquatic life in ponds, ditches or waterways by the deliberate use of chemical products.

9. The Certificate Holder shall plant the existing *Phragmites* area with the high marsh, supratidal, and maritime shrub species as depicted on page 10 of the existing plans, dated August 2, 2024.

10. The Certificate Holder shall not stockpile any material in State or private tidal wetlands.

CITATIONS AND STATEMENTS OF NECESSITY

1. Statement of Necessity for General Conditions 1, 2, 3, 4, and Special Conditions 1, 3: These conditions are necessary to ensure that water quality standards are met, and designated uses are maintained.

   Citations: Federal and state laws which authorize this condition include but are not limited to: 33 U.S.C. § 1341(a), (b), & (d); 33 U.S.C. § 1251(b); 33 U.S.C. § 1370; Md. Ann. Code, Env. Article, Title 1, Subtitles 3 and 4; Md. Ann. Code, Env. Article, Title 5, Subtitles 5 and 9; Md. Ann. Code, Env. Article, Title 9, Subtitle 3; Md. Ann. Code, Env. Article, Title 16; COMAR 26.08; COMAR 26.08.02.10G(3); COMAR 26.23.02.06; COMAR 26.17.01;COMAR 26.23; COMAR 26.24

2. Statement of Necessity for General Conditions 5, 8, 9: Fill or construction material within or adjacent to regulated resources may cause discharges resulting in turbidity in excess of water quality standards and interfere with designated uses of growth and propagation of fish, other aquatic life, wildlife; and other designated uses; and fail to meet general water quality criteria that waters not be polluted by substances in amounts sufficient to be unsightly or create a nuisance.

   Citation: 26.08.02.03B(l)-B(2); COMAR 26.23; COMAR 26.24; COMAR 26.17.04

3. Statement of Necessity for General Condition 6: This condition is necessary to clarify the scope of this certification to ensure compliance with water quality regulations, without limiting restrictions through other requirements.

   Citation: Federal and state laws which authorize this condition include but are not limited to: 33 U.S.C. § 134l(a), (b), & (d); 33 U.S.C. § 125l(b); 33 U.S.C. § 1370; Md. Ann. Code, Env. Article, Title 1, Subtitles 3 and 4; Md. Ann. Code, Env. Article, Title 5, Subtitles 5 and 9; Md. Ann. Code, Env. Article, Title 9, Subtitle 3; Md. Ann. Code, Env. Article, Title 16; COMAR 26.08, COMAR 26.08.02.l0E; COMAR 26.23.02.06; COMAR 26.17.04; COMAR26.23; COMAR 26.24

4. Statement of Necessity for General Condition 7: Conditions of certification involve precise actions to comply with water quality standards. Site inspection may be necessary to ensure that limits, methods, and other requirements are met to ensure that water quality standards are met and designated uses are maintained. These conditions are necessary to ensure that the activity was conducted, and project completed according to terms of the authorization/certification, while allowing for review of in-field modifications which may have resulted in discharges to ensure that water quality standards were met. Designated uses include support of estuarine and marine aquatic life and shellfish harvesting and for growth and propagation of fish, other aquatic life, and wildlife.

   Citation: Federal and state laws that authorize this condition include but are not limited to: 33 U.S.C. § 1341(a), (b), & (d); 33 U.S.C. § 1251(b); 33 U.S.C. § 1370; Md. Ann. Code, Env.Article, Title 1, Subtitles 3 and 4; Md. Ann. Code, Env. Article, Title 5, Subtitles 5 and 9; Md. Ann. Code, Env. Article, Title 9, Subtitle 3; Md. Ann. Code, Env. Article, Title 16; COMAR 26.08; COMAR 26.08.02.03B(l)(b); COMAR 26.08.02.03B(2); COMAR 26.23.02.06; COMAR 26.23; COMAR 26.24; COMAR 26.17.04

5. Statement of Necessity for General Condition 10: This condition is necessary to qualify the period of applicability of the terms and conditions of this Certification to be protective of Maryland water quality standards.

   Citations: Federal and state laws which authorize this condition include but are not limited to: 33 U.S.C. § 1341(a), (b), & (d); 33 U.S.C. § 1251(b); 33 U.S.C. § 1370; 40 C.F.R. 121, 15 C.F.R. 930, Md. Ann. Code, Env. Article, Title 1, Subtitles 3 and 4; Md. Ann. Code, Env. Article, Title 5, Subtitles 5 and 9; Md. Ann. Code, Env. Article, Title 9, Subtitle 3; Md. Ann. Code, Env. Article, Title 16; COMAR 26.08; COMAR 26.17.04; COMAR 26.23; COMAR 26.24

6. Statement of Necessity for Special Condition 2: Expertise for conducting certain activities is required to ensure that there is no violation of water quality standards nor interference with designated uses. This condition is necessary to ensure that discharges will be conducted in a manner which does not violate water quality criteria nor interfere with designated uses.

   Citation: COMAR 26.08.02.02B(2)- B(4); COMAR 26.08 02.03B(2)(d)-(e); COMAR 26.08.02.03B(l)(b); 26.08.02.03B(2); COMAR 23.02.04.04

7. Statement of Necessity for Special Conditions 4, 5: Stabilization of the site with vegetation is required to ensure that waters continue to meet designated uses. Loss of substrate fill material may result in discharges which reduce water quality and interfere with designated uses, including the support of estuarine and marine aquatic life, and the protection of shellfish harvesting, shallow water submerged aquatic vegetation, and migratory fish spawning and nurseries in tidal wetlands. Loss limits will maintain the designated use.

   Citation: 1) COMAR 26.08.02.02.B.(3) 2) COMAR 26.08.02.03-3.C.(2)d.(5); 33 U.S.C. § 1341(a), (b), & (d); 33 U.S.C. § 1251(b); 33 U.S.C. § 1370; Md. Ann. Code, Env. Article, Title 1, Subtitles 3 and 4; Md. Ann. Code, Env. Article, Title 9, Subtitle 3; Md. Ann. Code, Env. Article, Title 16; COMAR 26.08; COMAR 26.24

8. Statement of Necessity for Special Condition 6: The discharge and deposition of material within or adjacent to regulated resources may result in discharges that result in impacts to water quality and designated uses.

   Citations: 1) 26.08.02.02.B.(3) 2) 26.08.02.03-3.C.(2)d.(5)

9. Statement of Necessity for Special Condition 7: Activities which discharge in regulated waters must be conducted according to certain procedures to maintain water quality. Monitoring the quality, characteristics, effects, and compensatory offsets may be necessary to ensure that water quality standards are met.

   Citations: COMAR 26.08.02.10B(1)(f) COMAR 26.08.02.10B(1)(g) COMAR 26.24 COMAR 26.23 COMAR 26.17.04

10. Statement of Necessity for Special Condition 8: Issuance of water quality certification does not relieve the applicant of their responsibility to comply at all times with federal and State law. Discharges of toxic materials in toxic amounts violate water quality standards.

    Citations: Title 16; Env. Article, Title 4, Subtitle 1 2) COMAR 26.08.02.02.B.(3) 3) COMAR 26.08.02.03-3.C.(2)d.(5) 4) COMAR 26.08.02.03.A.(1)(b) 5) COMAR 26.08.02.03.B.(1)-(5) 6) COMAR 26.08.02.10.E.(2) 7) COMAR 26.17.01

11. Statement of Necessity for Special Condition 9: Tidal wetlands provide essential habitat, store nutrients and sediment, maintain the health of coastal systems, control shoreline stabilization, and improve water quality. Aquatic life and wildlife often require specific habitats. A tidal plant community dominated by non-native vegetation may reduce the benefits associated with tidal wetlands and result in discharges that interfere with the designated use, including the support of estuarine and marine aquatic life, and the protection of shellfish harvesting, shallow water submerged aquatic vegetation, and migratory fish spawning and nurseries in tidal wetlands.

    Citations: 1) Title 16; Env. Article, Title 4, Subtitle 1 2) COMAR 26.08.02.02.B.(3) 3) COMAR 26.08.02.03-3.C.(2)d.(5) 4) COMAR 26.08.02.03.A.(1)(b) 5) COMAR 26.08.02.03.B.(1)-(5) 6) COMAR 26.08.02.10.E.(2) 7) COMAR 26.17.01

12. Statement of Necessity for Specials Condition 10: This condition is necessary to ensure discharges related to the stockpiling of material does not result in additional discharges which may result in violations of water quality due to turbidity and other alterations which interfere with designated uses as well as designated use class for support of estuarine and marine aquatic life, and support of designated uses for growth and propagation of fish, shallow water submerged vegetation, other aquatic life and wildlife. Loss limits will maintain the designation use.

    Citation: Md. Ann. Code, Env. Article, Title 1, Subtitles 3 and 4; Md. Ann. Code, Env. Article, Title 5, Subtitles 5 and 9; Md. Ann. Code, Env. Article, Title 9, Subtitle 3; Md. Ann. Code, Env. Article, Title 16; COMAR 26.24; COMAR 26.08; COMAR 26.08.02.10G(3); COMAR 26.08.02.06; COMAR 26.17.04; COMAR 26.23; COMAR 26.23.02.06; 33 U.S.C. § 1341(a), (b), & (d); 33 U.S.C. § 1251(b); 33 U.S.C. § 1370; Md. Ann. Code, Env. Article, Title 1, Subtitles 3 and 4; Md. Ann. Code, Env. Article, Title 9, Subtitle 3; Md. Ann. Code, Env. Article, Title 16; COMAR 26.08; COMAR 26.24

CERTIFICATION APPROVED

Matthew C. Rowe
Matthew C. Rowe (Nov 20, 2024 13:19 EST)

D. Lee Currey, Director
Water and Science Administration

Nov 20, 2024
Date

Tracking Number: 202460545
Agency Interest Number: 181301

Effective Date: November 15, 2024

Enclosure: Plan Sheets dated August 2, 2024

cc: WSA Inspection & Compliance Program
Army Corps of Engineers

Middle Branch EB-1_24-WQC-0033

Final Audit Report 2024-11-20

Created:	2024-11-19
By:	Jonathan Stewart (jon.stewart@maryland.gov)
Status:	Signed
Transaction ID:	CBJCHBCAABAAPatnVaeo_KSZ7_hc_4wzw4-BPJEpJXP3

"Middle Branch EB-1_24-WQC-0033" History

Document created by Jonathan Stewart (jon.stewart@maryland.gov)
2024-11-19 - 5:41:48 PM GMT

Document emailed to mde.wsaepermits@maryland.gov for signature
2024-11-19 - 5:45:03 PM GMT

Email viewed by mde.wsaepermits@maryland.gov
2024-11-20 - 6:07:40 PM GMT

Signer mde.wsaepermits@maryland.gov entered name at signing as Matthew C. Rowe
2024-11-20 - 6:18:59 PM GMT

Document e-signed by Matthew C. Rowe (mde.wsaepermits@maryland.gov)
Signature Date: 2024-11-20 - 6:19:01 PM GMT - Time Source: server

Agreement completed.
2024-11-20 - 6:19:01 PM GMT

Adobe Acrobat Sign

November 15, 2024

Baltimore City, Dept. of Recreation and Parks
C/o GreenVest, LLC
Attn: Andrew Forbes, PE
4201 Northview Dr, Ste 202
Bowie, Maryland 20716

Via email: andrew@greenvestus.com

Re: Agency Interest Number: 181301
Tracking Number: 202460545
Tidal Authorization Number: 24-WP-0387

Dear GreenVest, LLC:

Your application to alter tidal wetlands has been evaluated by the Tidal Wetlands Division. Your State wetlands license or permit authorizing work in tidal wetlands is attached. Please take a moment to read and review your authorization to ensure that you understand the limits of the authorized work and all of the general and special conditions.

Your project does not qualify for federal approval under the Maryland State Programmatic General Permit (MDSPGP). A separate review by the U.S. Army Corps of Engineers and issuance of the required federal permit is necessary. The federal permit is not attached. You should not begin any work until you have obtained all necessary State, local, and federal authorizations.

This State authorization is a final agency decision; there is no further opportunity for administrative review. Any person with standing, who is either the applicant or who participated in the public participation process through the submission of written or oral comments, may petition for judicial review in the circuit court in the county where the authorized activity will occur. The petition for judicial review must be filed with the court within 30 days of receipt of this decision. Please contact Matthew F Wallach at matthew.wallach@maryland.gov or 410-537-3527 with any questions.

Sincerely,

Heather Hepburn, Chief
Western Region
Tidal Wetlands Division

STATE OF MARYLAND
DEPARTMENT OF THE ENVIRONMENT
WATER AND SCIENCE ADMINISTRATION
PRIVATE WETLANDS PERMIT

PERMIT NUMBER: **24-WP-0387**
EFFECTIVE DATE: **November 15, 2024**
EXPIRATION DATE: **November 14, 2027**
PERMITTEE: **Baltimore City Dept. of Recreation and Parks**
ADDRESS: **3001 East Drive**
Baltimore, MD 21217
PROJECT LOCATION: **Btwn S Hanover St and Potee St bridges**
SE Side of the Patapsco River
39.246080 / -76.611352
Baltimore City, MD 21225
Patapsco River in Baltimore City County

PURSUANT TO TITLE 16 OF THE ENVIRONMENT ARTICLE, ANNOTATED CODE OF MARYLAND, AND CODE OF MARYLAND REGULATIONS 26.24, **GreenVest, LLC** ("PERMITTEE") IS AUTHORIZED BY THE WATER AND SCIENCE ADMINISTRATION ("ADMINISTRATION") TO CONDUCT THE FOLLOWING REGULATED ACTIVITY IN PRIVATE WETLANDS, IN ACCORDANCE WITH THE CONDITIONS OF THIS PERMIT AND THE ATTACHED PLANS APPROVED BY THE ADMINISTRATION'S TIDAL WETLANDS DIVISION ON **November 09, 2024**, AND PREPARED BY **GreenVest, LLC,** AND INCORPORATED HEREIN:

Remove all existing phragmites, place a 4,471-square foot sand/gravel stone sill, and regrade entire site to create 15,691 square feet of shallow open water, 13,297 square feet of mudflat, 23,882 square feet of low marsh vegetation, 38,050 square feet of high marsh vegetation, and 127,072 square feet of supratidal marsh vegetation. The proposed marsh includes woody features at the vents for both stability and habitat.

SPECIAL CONDITIONS

A. The Permittee shall construct the marsh establishment area in accordance with the following conditions:

1. The Permittee shall use clean substrate fill material, no more than 10% of which shall pass through a standard number 100 sieve.
2. The marsh establishment area shall be planted within one year following completion of the filling and grading operation.
3. The marsh establishment project shall be maintained as a wetland, with non-nuisance species' aerial coverage of at least 85% for three consecutive years. If 85% coverage is not attained, the reasons for failure shall be determined, corrective measures shall be taken, and the area shall be replanted.
4. The Permittee shall use a turbidity curtain around the perimeter of the project.

5. If the existing bank is to be cleared or graded:
    a. The Permittee shall perform all work under and in accordance with an approved Soil Erosion and Sediment Control Plan from the applicable sediment and erosion control agency; and
    b. The Permittee shall perform all work under and in accordance with the Critical Area requirements of the local jurisdiction in the form of an approved Buffer Management Plan.

B. The Permittee shall accept the terms of the attached marsh maintenance plan by signing and returning the standard plan to the Water and Science Administration, Tidal Wetlands Division prior to commencement of any work authorized under this Permit. If the Permittee wishes to propose an alternative marsh maintenance plan, the alternative plan must be submitted to and approved by the Tidal Wetlands Division, Water and Science Administration, prior to commencement of any work authorized under this Permit. Any alternative plan must provide assurances of success that are at least equivalent to those of the standard plan, in terms of the extent of native marsh plant coverage, elimination of invasive species and timeframe for plant establishment.

C. The Permittee shall deploy and maintain a turbidity curtain tightly around and channelward of the project area prior to any excavation, backfilling or grading along the shoreline through completion of any excavation, backfilling or grading along the shoreline.

D. The Permittee shall monitor the entire middle branch as outlined in the attached habitat monitoring plan dated June 5, 2023.

E. The Permittee shall obtain a General Permit for Discharges from the Application of Pesticides from MDE by contacting the Industrial Discharge Permits Division at 410-537-3323 prior to the application of any herbicide to eradicate *Phragmites*. Toxic materials use permits are required for any homeowner, farmer, local government or other person who wants to control aquatic life in ponds, ditches or waterways by the deliberate use of chemical products.

F. The Permittee shall plant the existing *Phragmites* area with the high marsh, supratidal, and maritime shrub species as depicted on page 10 of the existing plans, dated August 2, 2024

G. The Permittee shall not stockpile any material in State or private tidal wetlands.

GENERAL CONDITIONS

A. The Maryland Department of the Environment has determined that the proposed activities comply with, and will be conducted in a manner consistent with the State's Coastal Zone Management Program, as required by Section 307 of the Federal Coastal Zone Management Act of 1972, as amended.

B. The Permittee shall comply with all Critical Area requirements and obtain all necessary authorizations from local jurisdiction. This Permit does not constitute authorization for disturbance in the 100-foot Critical Area Buffer. "Disturbance" in the Buffer means clearing, grading, construction activities, or removal of any size of tree or vegetation. Any anticipated Buffer disturbance requires prior written approval, before commencement of land disturbing activity, from local jurisdiction in the form of a Buffer Management Plan.

C. If the authorized work is not performed by the property owner or is not otherwise exempt from the licensing requirement, all work performed under this Tidal Wetlands Permit shall be conducted by a marine contractor licensed by the Marine Contractors Licensing Board (MCLB) in accordance with Title 17 of the Environment Article of Annotated Code of Maryland and COMAR 26.30. The licensed marine contractor shall be authorized for the appropriate license category to perform or solicit to perform the activities within this authorization, if applicable. A list of licensed marine contractors and their license category may be obtained by contacting the MCLB at 410-537- 3249, by e-mail at MDE.MCLB@maryland.gov, or by accessing the Maryland Department of the Environment, Environmental Boards webpage at https://mde.maryland.gov/programs/water/WetlandsandWaterways/Pages/LicensedMarineContractors.aspx.

D. The Permittee certifies real property interest in the contiguous upland.

E. The issuance of this Permit is not a validation or authorization by the Department for any of the existing structures depicted on the plan sheets on the subject property that is not part of the authorized work description, nor does it relieve the Permittee of the obligation to resolve any existing noncompliant structures and activities within tidal wetlands.

F. The Permittee shall obtain an approved sediment and erosion control plan from the local soil conservation district when the area disturbed is greater than 5000 square feet or 100 cubic yards of fill.

G. The Permittee shall ensure that a copy of this Permit, including the approved plans, is available at the site until the authorized work is complete.

H. The Permittee shall make every reasonable effort to design and construct the structure or perform the activity authorized in this permit in a manner which minimizes adverse impacts on natural resource values, including water quality, plants, wildlife, plant and wildlife habitat, and on historic property values.

I. The Secretary of the Environment may suspend or revoke a permit if the Secretary finds that the Permittee has not complied with any condition or limitation in the permit or has exceeded the scope of the authorized activities.

J. The Permittee shall indemnify, defend and hold harmless the State of Maryland, its officials, officers, and employees from and against any and all liability, suits, claims and actions of whatever kind, caused by or arising from the work authorized by the Permit.

K. This Permit is valid only for use by the Permittee. Permission for transfer of the Permit shall be obtained from the Water and Science Administration, Tidal Wetland Division. The terms and conditions of this Permit shall be binding on any assignee or successor in interest of the Permit.

L. The Permittee shall allow representatives of the Maryland Department of the Environment to inspect the authorized activities.

M. The Permittee shall notify the Maryland Department of the Environment, Water and Science Administration, Compliance Program at least 10 days before starting the authorized activities at (410) 537-3510.

N. Upon completion of the authorized activities, the Permittee shall notify the Maryland Department of the Environment, Water and Science Administration, Compliance Program at (410) 537-3510.

By authority of the Secretary of the Environment:

Heather L. Nelson, Program Manager
Wetlands and Waterways Protection Program

11/21/2024
Date

Tidal Wetland Reviewer: *MW*

Supervisor Concurrence:

Tracking Number: 202460545
Agency Interest Number: 181301

Enclosure: Plans dated **August 2, 2024**
cc: WSA Inspection & Compliance Program

MARSH MAINTENANCE PLAN

Agency Interest Number: 181301
Tidal Wetlands License Number: 24 - WP - 0387
Licensee Name: City of Baltimore, Dept. of Recreation and Parks
License Effective Date: November 15, 2024
Address: 3001 East Drive
Baltimore, MD 20716

Please sign and date this Marsh Maintenance Plan and return to the address below no later than** January 15, 2025**.

Preparation: All areas that are to be planted shall be cleaned of rough grass, weeds, and debris and the ground surface filled and graded to the elevations specified on the plans.

Planting: The living shoreline will be planted during the planting season for wetland sprigging which is between April 1 and June 30 or between September 1 and October 30. The mean high water (MHW) lines will be marked on the ground and the plantings shall be made in rows parallel to the MHW line extending to the limits on the construction plans. Rows shall be 18 inches apart and plants 18 inches apart. Plantings shall be made by hand with dibble, spade or shovel by opening a hole at the planting site, placing the fertilizer and then the plant in the hole, closing the hole and firming the soil around the plant so that the surface soil level is .5 to 1 inch above the top of the planting pot root mass. If the soil at the planting site is not wet or damp, the plants shall be sufficiently watered within 4 hours after planting.

Protection: Immediately upon completion of the planting operation, the planting area shall be protected against wildlife and human traffic by erecting goose exclusion fencing and Blaze Orange Fence (BOF) at the top of the slope and along the sides of the planted area.

Plant Establishment: A healthy stand of wetland vegetation is defined as 85% aerial coverage of the original planted area by native wetland vegetation (e.g., planted species and volunteer native species). A healthy stand of wetland vegetation shall be established within 1 year of planting and shall be maintained for at least 3 consecutive years thereafter. The licensee is responsible for making sure the planted area is maintained by eradicating non-native nuisance species (e.g., Phragmites), and protecting areas from human traffic and wildlife predators. If a healthy stand of wetland vegetation is not established within one year after planting, the limiting factors will be identified and addressed and the area will be replanted as necessary.

Trash Maintenance: Blaze Orange Fence will be installed along the toe of the slope and waterward limits of the living shoreline. Trash and debris will be removed from the living shoreline site eat least very two months. The Blaze Orange Fence shall be inspected and repaired as needed. Blaze Orange Fencing shall remain for at least one full growing season or until wetland vegetation becomes established.

Marsh Monitoring Reports: Brief, annual Marsh Monitoring Reports will be submitted to the address below for 5 years by the dates below, *regardless of the whether or not the project is completed or a healthy stand of wetland vegetation is obtained*. The Marsh Monitoring Report may be brief and should include the following information, at a minimum:

- State Agency Interest number, Tidal Wetlands License number, and site address (listed above)
- Date of inspections
- Project completion date. If the project has not yet been completed, please indicate the current status of the project and disregard the remaining requirements.
- Estimation of percent plant coverage by the dominant species.
  This should show the percent coverage of native and non-native wetland plant species. If 85% coverage by native species is not obtained, please indicate the limiting factors to plant growth, and what steps will be taken to meet the 85% coverage requirement.
- Identification of factors limiting establishment or maintenance of a healthy stand of wetland vegetation and identify the maintenance activities necessary to mitigate the resulting stress. *For example, if non-native, invasive species (such as Phragmites) have emerged and begun to crowd out the planted or volunteer native species, the invasive species should be physically removed or chemically controlled. If geese are predating the plants, goose exclusion fence should be erected.*
- Photographs showing the current condition of the project

This 5-year monitoring period may be extended at MDE's discretion in the event replacement plantings are required.

The annual Marsh Monitoring Report should be submitted to the address below on or before the following dates:

1-Year Report: Nov 15, 2025
2-Year Report: Nov 15, 2026
3-Year Report: Nov 15, 2026
4-Year Report: Nov 15, 2028
5-Year Report: Nov 18, 2029

ACCEPTANCE OF MARSH MAINTENANCE PLAN

The applicant acknowledges that he/she has read and understands this Marsh Maintenance Plan and agrees to submit annual Marsh Monitoring Reports on or before the above due dates.

Signature of Licensee **Date**

PLEASE SIGN, DATE AND RETURN THIS COPY OF THE MARSH MAINTENANCE PLAN TO:

MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER AND SCIENCE ADMINISTRATION
WETLANDS AND WATERWAYS PROGRAM
TIDAL WETLANDS DIVISION
(Signed Marsh Maintenance Plan) C/O Matt Wallach
(Annual Marsh Monitoring Reports) C/O Tidal Wetlands Division
1800 WASHINGTON BLVD.
BALTIMORE, MD 21230-1708
(or via e-mail to TidalMMP.mde@maryland.gov)

24-WP-0387 Permit_Plans_MMP

Final Audit Report 2024-11-21

Created:	2024-11-18
By:	Matt Wallach (matthew.wallach@maryland.gov)
Status:	Signed
Transaction ID:	CBJCHBCAABAA2bIsCbDB3C9rJ0Wb5DwBHUE8jFpH3nQp

"24-WP-0387 Permit_Plans_MMP" History

Document created by Matt Wallach (matthew.wallach@maryland.gov)
2024-11-18 - 3:28:40 PM GMT

Document emailed to twdwestpermit.mde@maryland.gov for signature
2024-11-18 - 3:37:32 PM GMT

Email viewed by twdwestpermit.mde@maryland.gov
2024-11-18 - 5:40:13 PM GMT

Signer twdwestpermit.mde@maryland.gov entered name at signing as HH
2024-11-18 - 5:41:43 PM GMT

Document e-signed by HH (twdwestpermit.mde@maryland.gov)
Signature Date: 2024-11-18 - 5:41:45 PM GMT - Time Source: server

Document emailed to wwppepermits.mde@maryland.gov for signature
2024-11-18 - 5:41:49 PM GMT

Email viewed by wwppepermits.mde@maryland.gov
2024-11-21 - 8:28:24 PM GMT

Signer wwppepermits.mde@maryland.gov entered name at signing as Heather L. Nelson
2024-11-21 - 8:29:19 PM GMT

Document e-signed by Heather L. Nelson (wwppepermits.mde@maryland.gov)
Signature Date: 2024-11-21 - 8:29:21 PM GMT - Time Source: server

Agreement completed.
2024-11-21 - 8:29:21 PM GMT

Adobe Acrobat Sign

Department of Housing And Community Development
Division of Construction And Building Inspection

Permit No. BCCM-25-000721

THIS WRITTEN INSTRUMENT, WHEN PROPERLY VALIDATED, CONSTITUTES AUTHORITY FOR DOING OR RECEIVING THE THINGS INDICATED BY THE FEES OR CHARGES SHOWN IN THE APPROPRIATE SPACES BELOW. ANY AND ALL THINGS TO BE DONE OR RECEIVED UNDER THIS WRITTEN INSTRUMENT SHALL BE DONE OR RECEIVED IN STRICT COMPLIANCE WITH THE APPLICATION HERETOFORE FILED IN THIS DEPARTMENT FOR THE AUTHORITY CONTAINED HEREIN, INCLUDING ANY AND ALL APPROVED DRAWINGS AND OTHER DATA OR INFORMATION ATTACHED THERETO, AND SUBJECT TO ANY AND ALL LAWS, ORDINANCES, RULES AND REGULATIONS IN EFFECT IN THE CITY OF BALTIMORE AND THE STATE OF MARYLAND. WARNING: IT IS UNLAWFUL TO WORK BETWEEN THE HOURS OF 7:00 PM AND 7:00 AM WITHIN 300 FEET OF A DWELLING.

WARNING: IT IS UNLAWFUL TO CONCEAL ANY WORK UNTIL INSPECTED AND APPROVED BY THIS DEPARTMENT.

WARD	SEC.	BLOCK	LOT	ISSUE DATE	EXP. DATE	DISTRICT	MINOR PRIVILEGE	DRAWINGS ATTACHED	PLANS NO.
25	6	7612M	001	4/9/2025	10/6/2025	902	Y	Y	

PROPERTY ADDRESS: 3100 S HANOVER ST

APPLICANT: GREENVEST	ADDR.:	4201 NORTHVIEW DRIVE, SUITE 202, BOWIE, MD 20716	PHONE: 443-465-6254
APPLICANT: GREENVEST	ADDR.:	4201 NORTHVIEW DRIVE, SUITE 202, BOWIE, MD 20716	PHONE: 410-984-3684
PROPERTY OWNER: ADAM BOARMAN	ADDR.:	, ,	PHONE: 410-396-7948
REGISTERED DESIGN PROFESSIONAL: BIOHABITATS	ADDR.:	2081 CLIPPER PARK ROAD, BALTIMORE, MD 21211	PHONE: 443-414-2647
REGISTERED DESIGN PROFESSIONAL: BIOHABITATS	ADDR.:	2081 CLIPPER PARK ROAD, BALTIMORE, MD 21211	PHONE: 757-409-2076

WORK COST:		UNDERPINNING: N	INTERIOR DEMOLITION: N

********SDAT LEGAL DESCRIPTION (E & WS HANOVER ST 525 FT S OF HAN)******** ALL WORK FOOTPRINT IS COMPLETELY WITHIN ONE LOT (BLOCK: 7612M/LOT #: 001). AKA REED BIRD ISLAND : WARD 25, SECTION 6, BLOCK 7612M, LOT1SCOPE OF WORK: ------- GRADING, RIP RAP STONE PLACEMENT ALONG WATERFRONT, REMOVAL OF UNWANTED VEGETATION AND PLANTING OF DESIRED VEGETATION. AS PER PLANS AND AS PER CODE.PROJECT IS BEING COMPLETED FOR THE CITY OF BALTIMORE ON A WATERFRONT PARCEL OWNED BY THE CITY OF BALTIMORE. NO EXISTING BUILDINGS ARE ON THE PARCEL AND NONE ARE PROPOSED IN THE WORK. THIS IS PART OF THE REIMAGINE MIDDLE BRANCH AND MIDDLE BRANCH RESILIENCY INITIATIVE. WORK CONSISTS OF ONLY GRADING, RIP RAP STONE PLACEMENT ALONG WATERFRONT, REMOVAL OF UNWANTED VEGETATION AND PLANTING OF DESIRED VEGETATION.The Middle Branch Resiliency Initiative (MBRI) is a core large-scale implementation component of the Reimagine Middle Branch master plan (RMB) that includes projects which that will enhance community resilience, restore aquatic habitat, improve water quality, and achieve environmental justice (EJ) in underserved communities surrounding the Middle Branch of the Patapsco River in South Baltimore. The Patapsco Delta East project includes the stabilization of approximately 591 linear feet of shoreline and the restoration 5.10 acres of phragmites dominated tidal wetlands along the Patapsco River. Restoration activities include removal and control of non-native invasive species, restoration of tidal flow and inundation, establishing native wetlands plant communities. The site includes the restoration and creation of tidal channels, low marsh, high marsh, supratidal zones and upland planting. Design features include a gravel beach, and woody debris structures for habitat and stabilization. The project will improve habitat for both aquatic and terrestrial species and improve water quality by improving tidal flushing and capturing/treating storm water before it enters the Patapsco R . . .

Property site must be kept clean of trash & debris & maintained secured as per code for the duration of the construction project.
A building permit DOES NOT constitute approval by or compliance with any deed restrictions, covenants, easements, or funding sources.

FEES

FEE DESCRIPTION	QUANTITY	UNIT	FEE AMOUNT	BALANCE DUE
Application Fee - Standard - Other Occupancies	1.00	Each	$50.00	$0.00
Erosion and Sedimentation Fee	3361.08	Dollar Amt	$3,361.00	$0.00
Building - Alterations - Exterior, Interior Doors Only, Tenant Demising and Shell	91375.00	Value	$1,104.00	$0.00
Building - Accessory Structures Max 100 Sq Ft	1.00	Each	$25.00	$0.00
Exterior - Grading, Excavation, and Fill	3656.00	Cubic Yard	$35.00	$0.00
Building Code Permit Tax	1.00		$59.00	$0.00
		TOTAL:	$4,634.00	$0.00

THE AUTHORITY CONTAINED HEREIN MAY NOT BE VALIDLY EXERCISED UNTIL AND AFTER ALL OF THE FEES APPEARING HERE HAVE BEEN PAID.

DEPARTMENT OF HOUSING & COMMUNITY DEVELOPMENT

PLEASE BE ADVISED THAT THERE IS A PRESUMPTION OF LEAD-BASED PAINT IN PROPERTIES CONSTRUCTED PRIOR TO 1979. PROTECT WORKERS AND TENANTS BY USING THE LEAD-SAFE WORK PRACTICES FOUND IN THE CODE OF MARYLAND REGULATIONS SECTION 26.02.07.

THE AUTHORITY CONTAINED HEREIN DOES NOT AUTHORIZE THE PERFORMANCE OF ANY WORK IN, ON, UNDER OR OVER ANY STREET, HIGHWAY, ALLEY, SIDEWALK OR ANY OTHER PUBLIC WAY, UNLESS PERMISSION TO DO SO HAS BEEN FIRST SECURED FROM THE PROPER AUTHORITY. FOR MORE INFORMATION ABOUT RIGHT-OF-WAY PERMITS, TO ACQUIRE ONE, OR TO REPORT AN EMERGENCY EXCAVATION CALL 410-396-2889, EMAIL STREETCUTS@BALTIMORECITY.GOV, OR VISIT 200 N. HOLLIDAY STREET – LOBBY COUNTER 4.

INSPECTION GUIDELINES AND OTHER PERMIT INFORMATION
ALL PERMITS REQUIRE INSPECTIONS

A Certificate of Occupancy requires the following inspections **prior to issuance**.
All work permits must have a final inspection before a Certificate of Occupancy can be issued.

Use Type*		Required Inspection
Restaurant Carry Out Deli Day Care Swimming Pools Grocery Store Tavern/Bar Schools	Animal Care Facilities Old Age/Infirm Care Facilities Convalescent Home Rest/Nursing Home Tattoo Parlor Large Day Care (inside of building) Kitchens	Health Department Fire Department (Institutional) Building Inspection
Offices Retail/Wholesale Stores Most Businesses	Beauty Salons Barber Shops	Fire Department Building Inspection
Multi-Family Dwelling ***Note: Baltimore City considers 3 or more dwelling units as a Multi-Family Dwelling***		**Step #1 Fire Department Inspection** (4 or more dwelling units) **Step #2 <u>BUILDING INSPECTION</u>** **<u>After</u> your Housing Inspection is <u>complete</u>, schedule your Building Inspection online via E-Permits**
Single Family Dwelling with more than 4 unrelated persons Single Family Dwelling (use unchanged) Home Office	Trailers	Building Inspection

All Electrical, Mechanical, Plumbing and H.V.A.C.& R. permits require a rough-in and a final inspections.

Required Building Inspections

Decks	Footing; final
New Bldg/Addition	Footing; foundation; slab; framing; insulation; final
Alterations	Framing; insulation; final
Fencing/Temporaries/Signs	Footing (as needed); final
Razing	On-site consultation before permit is issued; **<u>MUST</u>** schedule inspector presence at start of demolition; slab removal; footing (if required); backfill; final

- Inspection shall be made on concrete slab and under-floor before any concrete is placed or floor sheathing installed, including sub-floor.
- Framing inspections shall be made after the roof deck or sheathing, all framing, fire blocking and bracing are in place and pipes, chimneys and vents to be concealed are complete and the rough electrical, plumbing, heating wires, pipes and ducts are approved.

For more information contact the Inspection Offices

Building Inspections	410-396-3470		Fire Department	410-396-5752 or 5753
Electrical Inspections	410-396-3470		Health Department	410-396-4544 or 4424
Mechanical/Plumbing Inspections	410-396-3470			

Schedule inspections in your E-Permits account.
The cut off time for scheduling an inspection is 2:30 P.M. the day prior to the date requested.
MISS UTILITY: 48 hours prior to work call 1-800-257-7777 or www.missutility.net
For additional permit information visit our website at https://dhcd.baltimorecity.gov/pi/permits

<u>Property Registration: 410-396-3575</u>

Every owner of a **non-owner-occupied** dwelling unit or vacant structure in Baltimore City must file a Property Registration Statement with the Housing Commissioner. For more information on property registration requirements please visit our website at https://dhcd.baltimorecity.gov/pi/alarmproperty-registration.

Permit Information

- ✓ The building permit or copy shall be kept on the site of work until the completion of the project
- ✓ When issued a permit that required plans you must keep an approved set of the plans at the job site during construction
- ✓ The issuance of a permit does not prevent the Building Official from later requiring the correction of errors in any plans, drawing, work or operations
- ✓ Construction or work for which a permit is required shall be subject to inspection by the Building Official and such construction of work shall remain accessible and exposed for inspection purposes until approved
- ✓ Footing or foundation inspections shall be made after excavation for footings are complete and any required reinforcing steel is in place
- ✓ Inspection shall be made on concrete slab and under-floor before any concrete is placed or floor sheathing installed, including sub-floor
- ✓ Framing inspections shall be made after the roof deck or sheathing, all framing, fire blocking and bracing are in place and pipes, chimneys and vents to be concealed are complete and the rough electrical, plumbing, heating wires, pipes and ducts are approved
- ✓ The final inspection shall be made after all work required by the building permit is completed

Miss Utility

Before you dig. Every dig. It's the law

48 hours prior to work call 1-800-257-7777

www.missutility.net

For more information contact the Inspection Offices

Building Inspections
410-396-3470

Electrical Inspections
410-396-3470

Mechanical/Plumbing Inspections
410-396-3470

Fire Department
311
443-263-2220

Health Department
410-396-4544
410-396-4424

*Items listed are not all-inclusive

REV 09/2025

August 28, 2024

Brett Birkley
GreenVest LLC
4201 Northview Drive Suite 202
Bowie, MD 20716

RE: General Discharge Permit 17PE: Discharges from the Application of Pesticides
NPDES Permit NO. MDG870375- Registration Number 17PE0375A

Dear Brett Birkley:

The Maryland Department of the Environment has received your notice of intent (NOI) for coverage under the general permit for discharges from the application of pesticides. This letter will serve as your receipt and notification that your NOI has been accepted.

In signing the NOI, you have certified your company's agreement to comply with the terms of this permit for its operations located at Reed Bird Island, Block 7612M, Lot 001 and Liber 5577 Folio 400 as identified on the site map submitted with your NOI. This authorization adds the area of Marsh Restoration Project site EB-1 to site 5A, under the original authorization for Reed Bird Island having been issued last September. Authorization for this facility's discharge, under Registration Number 17PE0375A, becomes effective as of August 28, 2024 and extends until **March 31, 2025**.

Covered Discharges

The permit provides a complete list of the covered discharges (see Eligible Discharges, **Permit Part I.B.1**). The permit also includes a list of ineligible discharges (**Part I.B.2)** that you should be aware of.

This permit covers discharges to Waters of this State from the application of biological pesticides or chemical pesticides that leave a residue (hereinafter collectively "pesticides"), or colorants, when the application of pesticides or colorants is for one of the four pesticide use patterns. Your registration covers the following pesticide use pattern(s):

- Weed and Algae Control

Decision-maker Requirements

The permit includes a list of Decision-maker specific responsibilities dependent on the pesticide use pattern (**Part III.A.2**). To meet the effluent limitations of this permit, prior to pesticide application, any Decision-maker who is or will be required to submit an NOI as required in Part II.B, must also implement **Parts III.A.2.a - III.A.2.d** to minimize the discharge of pesticides to Waters of this State from the application of pesticides, through the use of Pest Management Measures, as defined in Appendix A. However, these requirements do not apply to Decision-makers at smaller properties (less than an acres) that will need to submit an NOI solely because they discharge to Waters of this State containing Desirable Species and that also comply with provisions in Part II.I.

Applicator Coverage

The permit includes a list of Applicator specific responsibilities identified in **Part III.A.1**. This includes, but is not limited to, the requirement that they achieve and maintain the required Pesticide Applicator Certification and Business Licensing Requirements from Maryland Department of Agriculture or be supervised by an employee in your organization who achieves and maintains this same Certification and Licensing. Information is available on the following webpage: http://mda.maryland.gov/plants-pests/Pages/licensing_and_certification.aspx

Water-Quality based Effluent Limitations

If you will be using a copper-based product, you must provide an assurance plan to the Department for approval which will verify that the application of the product will be in compliance with state water quality standards. The application must meet the guidelines specified in **Part III.B.1**. If you are unable to provide this verification, the alternative is to provide a monitoring plan before and after the application (**Part III.B.1.d)**. Monitoring is only required during periods when the pesticide is being used.

Desirable Species Conditions

Your registration is for a discharge from the application of pesticides that will occur to waters of this state containing a desirable species. A consultation with the DNR Environmental Review Program has been completed and in addition to the requirements stated directly in the permit, you are required to abide by any additional requirements laid out in the consultation determination letter received from DNR.

Monitoring, Reporting, and Record Keeping

Your registration requires certain monitoring, reporting, and record keeping requirements (**Permit Part III.F**). These requirements are stated in the permit as indicated in the following table:

17-PE Part	Applicable Type of Operator
F.1	Recordkeeping for All Operators
F.2	Recordkeeping for All Operators who are For-Hire Applicators
F.3	Recordkeeping for Any Decision-maker Required to Submit an NOI and Who is a Small Entity(1)
F.4	Recordkeeping for Any Decision-maker Required to Submit an NOI and Who is a Large Entity(2)
F.5	Retention of Records for All Operators
F.6	Annual Reporting for Any Decision-maker Required to Submit an NOI and Who is a Large Entity(2)
F.7	Annual Reporting for Any Decision-maker with Discharges to waters of the United States containing a Desirable Species, as defined in Appendix A, and Who is a Small Entity(1)

[1]Small Entity – As defined in Appendix A, is any (1) public entity that serves a population of 10,000 or less or (2) private enterprise that does not exceed the Small Business Administration size standard identified at:

https://www.sba.gov/federal-contracting/contracting-guide/size-standards

[2]Large Entity – As defined in Appendix A, is any (1) public entity that serves a population of greater than 10,000 or (2) private enterprise that exceeds the Small Business Administration size standard as identified at:

https://www.sba.gov/federal-contracting/contracting-guide/size-standards

Corrective Action Requirements

In certain situations, you must take specific actions to address problems or triggering conditions (**Permit Part III.E**). If any of the triggering conditions occur, you must review and revise the selection, design, installation, and implementation of your control measures, within deadlines, to ensure that the condition is eliminated and will not be repeated. If you take corrective action, you must also follow the permit reporting requirements.

Modification to Registration

If you would like to make a modification to your registration, you will be required to submit a change of information request consistent with the deadlines found in Table 3 in **Part II.C**.

If you have any questions, please do not hesitate to visit our Pesticide General Permit website, found at https://mde.maryland.gov/programs/Permits/WaterManagementPermits/Pages/GPPesticides.aspx , or call the department at 410-537-3323.

Sincerely,

Tracy Severcool
Natural Resource Planner
Industrial Stormwater Permits Division

cc: Division Chief, MDE WSA Compliance Program
ICIS-NPDES Manager, Enforcement Division

GreenVest
VISION • PERFORMANCE • RESULTS

Appendix B: Approved Design Plans

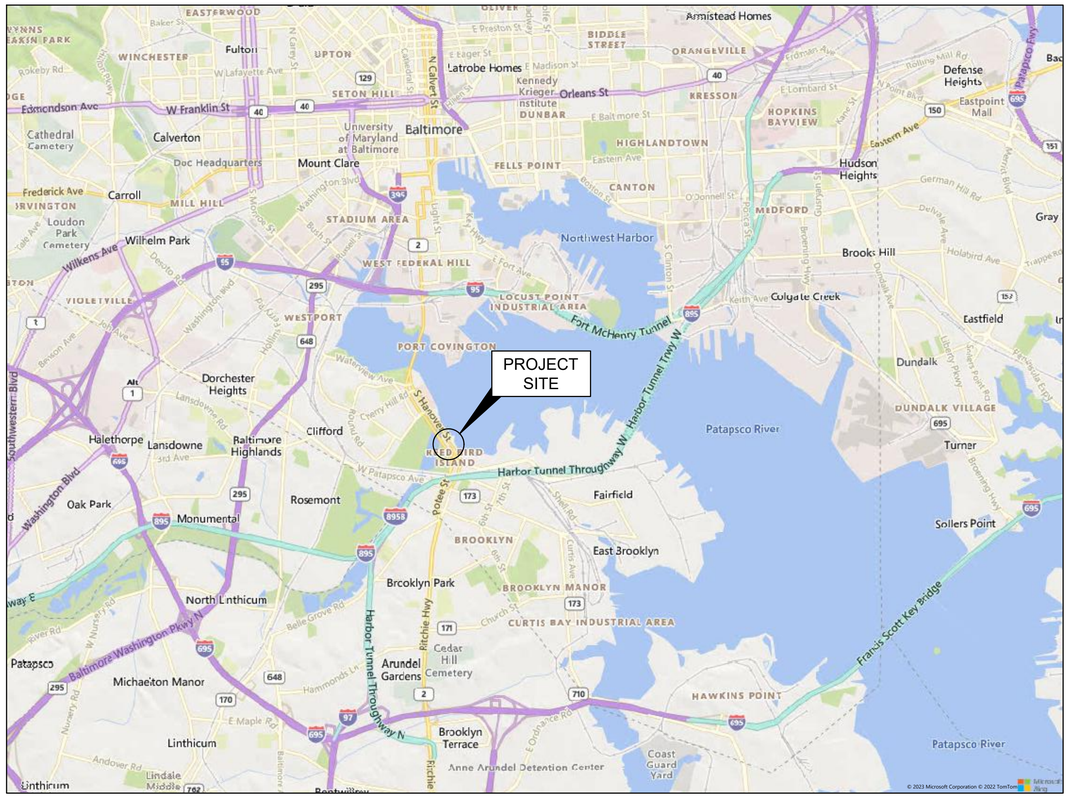
4201 Northview Dr. Suite 202
Bowie, MD 20716
410-987-5500

3175 Route 10, Suite 100
Denville, NJ 07834
732-902-6644

MIDDLE BRANCH RESILIENCY INITIATIVE

PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

100% Final Plans



VICINITY MAP
SCALE 1" = 4,000'

MDE AI# - 181301
BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE
PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

COVER SHEET

OWNER:
SOUTH BALTIMORE GATEWAY PARTNERSHIP
101 WEST DICKMAN STREET, SUITE 1000
BALTIMORE, MD 21230
ph: 410.424.7593 / www.sbgpartnership.org

APPLICANT/DEVELOPER:
GreenVest
VISION • PERFORMANCE • RESULTS
4201 NORTHVIEW DRIVE, SUITE 202
BOWIE, MD 20716
ph: 410.987.5500 / www.greenvestus.com

COASTAL ENGINEERS:
moffatt & nichol
2780 LIGHTHOUSE POINT E.
BALTIMORE, MD 21224
ph: 410.563.7300 / www.moffattnichol.com

RESTORATION ECOLOGISTS:
Biohabitats
The Stables Building 2081 Clipper Park Road
Baltimore, MD 21211 / ph: 410.554.0156
fx: 410.554.0168 / www.biohabitats.com

12/09/24

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 26960 Expiration Date: 02/25/2026

APPROVAL				REVISIONS			
		/ /	NO.	DESCRIPTION	DATE	BY
		/ /	1	SCHEMATIC DESIGN (30%)	04/26/24	JP
		/ /	2	SITE DEVELOPMENT (65%)	08/09/24	JP
		/ /	3	FINAL DESIGN (100%)	12/09/24	JP
		/ /				

SCALE: AS SHOWN
DATE: 1/29/2025
DRAWING NO. CV100
1 OF 20

10/23/2024I:\Projects\22002.04 NOAA\CAD\Plans\EB-1\CV000-COVER SHEET.dwg

SHEET LIST TABLE

Sheet Number	Drawing No.	Sheet Title
1	CV100	COVER SHEET
2	GN100	SHEET LIST & LEGEND
3	GN101	SITE MAP
4	GN102	GENERAL NOTES
5	GN103	SEQUENCE OF CONSTRUCTION
6	GN104	MATERIAL SPECIFICATION NOTES
7	EC100	EXISTING CONDITIONS & NRI PLAN
8	SP100	INITIAL SITE PREPARATION PLAN
9	ES100	EROSION AND SEDIMENT CONTROL PLAN
10	ES101	EROSION AND SEDIMENT CONTROL NOTES
11	ES102	EROSION AND SEDIMENT CONTROL NOTES
12	ES103	EROSION AND SEDIMENT CONTROL NOTES
13	ES104	EROSION AND SEDIMENT CONTROL DETAILS
14	PC100	PROPOSED CONDITIONS PLAN
15	PC101	TYPICAL SECTIONS
16	PC102	HABITAT FEATURES DETAILS
17	PC103	HABITAT FEATURES DETAILS
18	LA100	PLANTING PLAN
19	LA101	PLANTING SCHEDULES
20	LA102	PLANTING DETAILS

LEGEND

EXISTING

- MAJOR CONTOUR
- MINOR CONTOUR
- SURVEYED PROPERTY LINE
- GIS PROPERTY LINE
- STORM DRAIN
- EDGE OF ROADWAY
- BULKHEAD LINE
- CHAIN LINK FENCE
- CRITICAL AREA BOUNDARY
- CRITICAL AREA BUFFER
- SOIL TYPE BOUNDARY
- WETLAND LIMIT
- WETLAND BUFFER
- MEAN HIGHER HIGH WATER (ELEV = 0.82')
- MEAN HIGH WATER (ELEV = 0.53')
- MEAN LOW WATER (ELEV = -0.62')
- FEMA FLOODPLAIN
- NAVIGATION CHANNEL
- APPROXIMATE SHORELINE
- SOIL TYPE BOUNDARY
- TREELINE
- DELINEATED PHRAGMITES WETLAND
- TREE
- TRAVERSE POINT
- POWER POLE
- LIGHT POLE
- GUY WIRE
- UNDERGROUND ELECTRIC
- TELEVISION BOX
- TELEVISION MANHOLE

PROPOSED

- MAJOR CONTOUR
- MINOR CONTOUR
- BASELINE
- WATER SURFACE
- MEAN HIGH WATER
- MEAN LOW WATER
- MEAN LOWER LOW WATER
- LIMIT OF DISTURBANCE
- SUPER SILT FENCE
- BLAZE ORANGE FENCE
- FILTER LOG
- SUPER SILT FENCE
- TURBIDITY CURTAIN
- TREE REMOVAL
- TREE PROTECTION FENCE
- CRITICAL ROOT ZONE
- WOOD CHIPS CONSTRUCTION ACCESS ROADS
- STAGING AND STOCKPILE AREA
- STABILIZED CONSTRUCTION ENTRANCE WITH WASH RACK
- PORTABLE SEDIMENT TANK
- COMBINATION INLET PROTECTION
- AT-GRADE INLET PROTECTION
- MIXED GRAVEL AND SAND LOW PROFILE SILL
- WOODY VENT STRUCTURE
- ROOTWAD STRUCTURE
- CHRISTMAS TREE FASCINE STRUCTURE
- BASKING LOG
- STANDING SNAG
- BRUSH PILE
- TYPICAL SECTION

HABITAT LEGEND

- SHALLOW OPEN WATER
- MUDFLAT ZONE
- LOW MARSH ZONE
- HIGH MARSH ZONE
- SUPRATIDAL ZONE
- RIPARIAN BUFFER ZONE

MARSH SHRUB LEGEND

- MARSH HIBISCUS - Hm (*Hibiscus moscheutos*)
- GROUNDSEL TREE - Bh (*Baccharis halimifolia*)
- MARSH ELDER - If (*Iva frutescens*)
- ELDERBERRY - Sn (*Sambucus nigra ssp. Canadensis*)

*PLAN ELEMENTS CONTAIN COLOR. TO AVOID MISINTERPRETATION, IT IS RECOMMENDED TO PRINT THIS SHEET IN COLOR.

PLANTING LEGEND

- RIPARIAN BUFFER (0.27 ac)
- SUPRA-TIDAL MARSH (2.93 ac)
- HIGH MARSH (0.86 ac)
- LOW MARSH (0.55 ac)

SITE PREPARATION LEGEND

- CLEARING / GRUBBING
- NON-NATIVE/INVASIVE TREATMENT AND FLOATABLE TRASH REMOVAL

OWNER:
SOUTH BALTIMORE GATEWAY PARTNERSHIP
101 WEST DICKMAN STREET, SUITE 1000
BALTIMORE, MD 21230
ph: 410.424.7593 / www.sbgpartnership.org

APPLICANT/DEVELOPER:
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VISION • PERFORMANCE • RESULTS
4201 NORTHVIEW DRIVE, SUITE 202
BOWIE, MD 20716
ph: 410.987.5500 / www.greenvestus.com

COASTAL ENGINEERS:
moffatt & nichol
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BALTIMORE, MD 21224
ph: 410.563.7300 / www.moffattnichol.com

RESTORATION ECOLOGISTS:
Biohabitats
The Stables Building 2081 Clipper Park Road
Baltimore, MD 21211 / ph: 410.554.0156
fx: 410.554.0168 / www.biohabitats.com

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APPROVAL				REVISIONS			
		/ /	NO.	DESCRIPTION	DATE	BY
		/ /	1	SCHEMATIC DESIGN (30%)	04/26/24	JP
		/ /	2	SITE DEVELOPMENT (65%)	08/09/24	JP
		/ /	3	FINAL DESIGN (100%)	12/09/24	JP
		/ /				

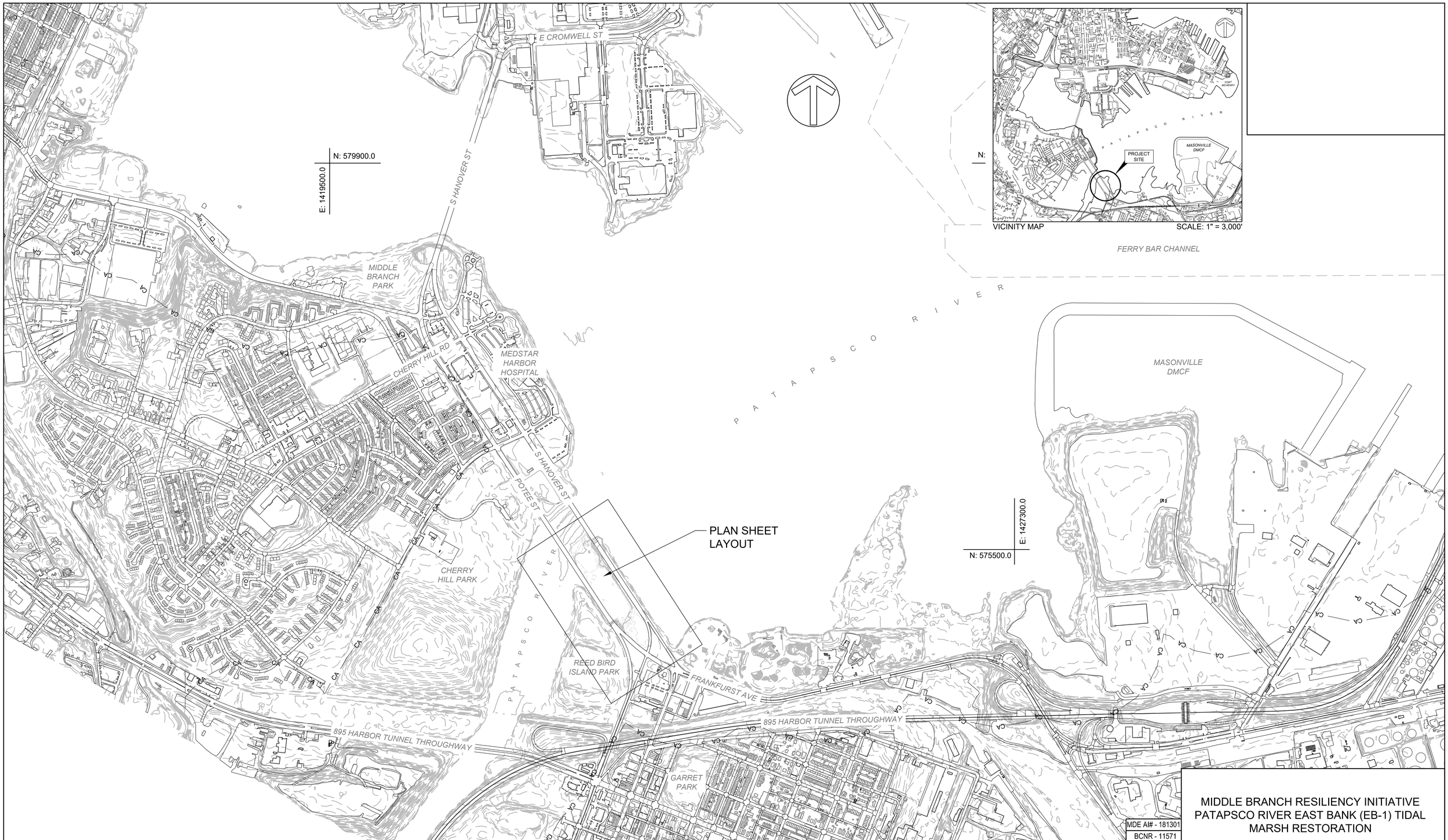
MDE AI# - 181301
BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE
PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

SHEET LIST & LEGEND

SCALE: NA
DATE: 1/29/2025
DRAWING NO. GN100
2 OF 20

10/23/2024I:\Projects\22002.04 NOAA\CAD\Plans\EB-1\GN001-SHEET LIST & LEGEND.dwg



MDE AI# - 181301

BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

SITE MAP

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101 WEST DICKMAN STREET, SUITE 1000
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		/ /				

SCALE: 1" = 500'

DATE: 1/29/2025

DRAWING NO. GN101

3 OF 20

10/23/2024I:\Projects\22002.04 NOAA\CAD\Plans\EB-1\EC000-SITE MAP.dwg

GENERAL NOTES

1. THE FOLLOWING DATA ARE PROVIDED REGARDING TIDAL INFORMATION. TIDAL INFORMATION WAS OBTAINED FROM THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA), NATIONAL OCEAN SERVICE (NOS) BENCHMARK 8574680 (BALTIMORE, MARYLAND). ELEVATIONS ARE REFERENCED ON THE 1983-2001 EPOCH.

- HIGHEST RECORDED TIDE (09/19/2003) = +7.32 FEET
- HIGHEST ASTRONOMICAL TIDE (HAT) = +1.38 FEET
- MEAN HIGHER HIGH WATER (MHHW) = +0.82 FEET
- MEAN HIGH WATER (MHW) = +0.53 FEET
- NORTH AMERICAN VERTICAL DATUM (NAVD88) = +0.00 FEET
- MEAN SEA LEVEL (MSL) = -0.03 FEET
- MEAN TIDE LEVEL (MTL) = -0.05 FEET
- MEAN LOW WATER (MLW) = -0.62 FEET
- MEAN LOWER LOW WATER (MLLW) = -0.84 FEET
- LOWEST RECORDED TIDE (01/24/1908) = -5.93 FEET

2. SCOPE OF PROJECT INCLUDES CREATING TIDAL CHANNELS TO IMPROVE HYDROLOGY AND CONNECTION FOR AQUATIC COMMUNITY, STRUCTURES AND RESTORATION OF NATIVE VEGETATION TO MARSH PLANE ARE INTENDED TO ENHANCE HABITAT.

3. HORIZONTAL COORDINATE SYSTEM IS BASED ON THE MARYLAND STATE PLANE COORDINATE SYSTEM (NAD83). ALL DISTANCES SHOWN HEREIN ARE IN US SURVEY FEET, UNLESS OTHERWISE NOTED.ELEVATIONS SHOWN HEREIN ARE RELATIVE TO NAVD88 AND IN FEET, UNLESS OTHERWISE NOTED.

4. A TOPOGRAPHIC/HYDROGRAPHIC SURVEY CONDUCTED BY MERCADO CONSULTANTS, INC. IN NOVEMBER 2023 OF THE PROJECT SITE IS USED TO DEVELOP EXISTING SITE CONDITIONS.

5. THE CONTRACTOR SHALL ABIDE BY ALL APPLICABLE ENVIRONMENTAL PROTECTION STANDARDS, MDE WETLAND LICENSE PERMIT, USACE PERMITS, LAWS AND REGULATIONS. DISPOSAL OF TRASH AND DEBRIS MATERIALS IN BALTIMORE HARBOR IS NOT PERMITTED.

6. ALL SAFETY REGULATIONS ARE TO BE STRICTLY FOLLOWED.

7. THE CONTRACTOR SHALL NOTIFY MDE COMPLIANCE INSPECTOR AT 410-537-3510 AT LEAST 14 BUSINESS DAYS BEFORE COMMENCING WORK.

8. THE CONTRACTOR SHALL CALL MISS UTILITY AT 1-800-277-7777 A MINIMUM OF 48 HOURS BEFORE STARTING CONSTRUCTION. ALL EXISTING UTILITIES MUST BE MARKED IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES THAT MAY OCCUR AS A RESULT OF THE CONSTRUCTION. DAMAGED UTILITIES ARE TO BE IMMEDIATELY REPORTED TO BOTH THE UTILITY OWNER AND PROJECT ENGINEER/DESIGNATED SPECIALIST. ANY DAMAGE TO EXISTING STRUCTURES, INCLUDING SEWER PIPES/MANHOLES AND STORM DRAIN PIPES/STRUCTURES, SHALL BE REPAIRED TO THE UTILITY OWNER'S SATISFACTION BY THE CONTRACTOR AT HIS/HER OWN EXPENSE.

9. CONTRACTOR SHALL TAKE ALL NECESSARY STEPS AND ACTIONS REQUIRED UNDER THE APPLICABLE SAFETY PRACTICES OF THE FOLLOWING REGULATORY AGENCIES INCLUDING, BUT NOT LIMITED TO: MARYLAND OCCUPATIONAL SAFETY AND HEALTH (MOSH), OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), AND NATIONAL INSTITUTE OF OCCUPATIONAL SAFETY AND HEALTH (NIOSH).

10. CONTRACTOR SHALL REPAIR, AT HIS OWN EXPENSE, ANY DAMAGE TO THE EXISTING INFRASTRUCTURE AND SITE FEATURES (ROAD, TREES, ETC.)

11. THE CONTRACTOR SHALL CONDUCT AN ON-SITE PRE-CONSTRUCTION MEETING WITH THE BALTIMORE CITY EROSION AND SEDIMENT CONTROL INSPECTOR TO REVIEW THE LIMITS OF DISTURBANCE, EROSION AND SEDIMENT CONTROL REQUIREMENTS, AND THE SEQUENCE OF CONSTRUCTION.

12. THE CONTRACTOR SHALL NOTIFY BALTIMORE GAS & ELECTRIC CO. (BGE) AT 1-800-685-0123 AT LEAST 72 HOURS BEFORE COMMENCING WORK IN COMPLIANCE WITH THE MARYLAND HIGH VOLTAGE LINE ACT (HVLA). THE CONTRACTOR SHALL ADHERE TO THE MARYLAND HVLA FOR ANY OVERHEAD FACILITIES IN THE AREA MAINTAINING A MINIMUM 10-FEET CLEARANCE AT ALL TIMES.

13. CONSTRUCTION ACTIVITIES, INCLUDING THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES, SHALL NOT BEGIN UNTIL ALL REQUIRED EASEMENTS AND RIGHT-OF-WAYS HAVE BEEN OBTAINED. CONSTRUCTION SHALL NOT BEGIN UNTIL ALL EROSION AND SEDIMENT CONTROL MEASURES HAVE BEEN INSTALLED AND APPROVED BY THE PROJECT ENGINEER/ DESIGNATED SPECIALIST AND THE BALTIMORE CITY EROSION AND SEDIMENT CONTROL INSPECTOR.

14. THE PROJECT ENGINEER/ DESIGNATED SPECIALIST WILL BE NOTIFIED UPON THE START OF EACH PHASE OF CONSTRUCTION. UPON APPROVAL OF THE BALTIMORE CITY EROSION AND SEDIMENT CONTROL INSPECTOR, THE CONTRACTOR MAY BEGIN CONSTRUCTION ACTIVITIES. CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH THE APPROVED SEQUENCE OF CONSTRUCTION AND PROPOSED CONDITIONS, PROJECT SPECIFICATIONS, AND EROSION AND SEDIMENT CONTROL STANDARD DETAILS AND NOTES.

15. THE LIMITS OF DISTURBANCE (LOD) SHOWN ON THE PLANS ENCOMPASSES ALL DISTURBANCE ACTIVITIES RELATED TO CONSTRUCTION ACCESS AND SHORELINE IMPROVEMENTS. PLANTING ACTIVITIES ARE DELIMITED BY THE LIMITS OF PLANTING (LOP); NO LAND DISTURBANCE IS PROPOSED WITHIN THE LOP.

16. AS REQUIRED, WITH BALTIMORE CITY EROSION AND SEDIMENT CONTROL INSPECTOR'S APPROVAL, CONTRACTOR SHALL FILE A NOTICE OF TERMINATION (NOT) TO MDE AND CLOSE ANY APPLICABLE PERMITS.

OWNER: SOUTH BALTIMORE GATEWAY PARTNERSHIP
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		/ /				

MDE AI# - 181301
BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE
PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

GENERAL NOTES

SCALE: NA DATE: 1/29/2025

DRAWING NO. GN102 4 OF 20

10/22/2024I:\Projects\22002.04 NOAA\CAD\Plans\EB-1\GN002-GENERAL NOTES.dwg

SEQUENCE OF CONSTRUCTION:

I INITIAL SITE PREPARATION:

1. SUBMIT A WRITTEN NOTIFICATION TO:
   THE DEPARTMENT OF PUBLIC WORKS,
   OFFICE OF RESEARCH AND ENVIRONMENTAL PROTECTION,
   3001 DRUID PARK DRIVE, ROOM 228, BALTIMORE, MD 21215,
   PHONE NUMBER: 410-396-0732, DPW.ESCINSPECTIONS@BALTIMORECITY.GOV,
2. AT LEAST 72 HOURS PRIOR TO START OF CONSTRUCTION STARTING:
   A. A REQUEST FOR A PRECONSTRUCTION MEETING,
   B. WHEN CONTRACTOR INTENDS TO BEGIN CONSTRUCTION,
   C. LOCATION OF DISPOSAL AREA OF SITE MATERIAL,
   D. CONTRACTOR'S TENTATIVE CLOSING DATE.
3. IMPLEMENT INVASIVE SPECIES MANAGEMENT TREATMENTS PRIOR TO SOIL DISTURBANCE TO MITIGATE SPREADING SEED AND RHIZOMES. SEE SHEET IS100 - NON-NATIVE INVASIVE SPECIES TREATMENT SPECIFICATIONS FOR MORE DETAIL.
4. CLEAR SITE OF TRAPPED PLASTIC AND SMALL INORGANIC DEBRIS NOT REQUIRING EQUIPMENT.
5. MDE & DPW WILL BE ALLOWED RIGHT OF ENTRY FOR PERIODIC ONSITE EVALUATION.

II EROSION AND SEDIMENT CONTROL:

1. OBTAIN ALL NECESSARY PERMITS.
2. EXISTING UTILITIES AND OBSTRUCTIONS SHOWN ARE FOR THE CONVENIENCE OF THE CONTRACTOR AND ARE NOT WARRANTED OR GUARANTEED BY THE CITY OR THE ENGINEER TO BE COMPLETE OR CORRECT. THE CONTRACTOR SHALL VERIFY ALL INFORMATION TO HIS OWN SATISFACTION.
3. THE RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE, BEFORE THE PROJECT BEGINS, A CERTIFICATE OF TRAINING FROM AN MDE-APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT.
4. THE CONTRACTOR SHALL STAKE OUT THE NECESSARY LOD.
5. ANY CLEARING, GRADING, OR DEVELOPMENT WILL BE DONE PURSUANT TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
6. CLEAR/REMOVE MINIMUM AMOUNT OF LITTER AND VEGETATION NECESSARY TO INSTALL STABILIZED CONSTRUCTION ENTRANCE, BLAZE ORANGE SAFETY FENCING, ACCESS ROAD, MULCH AND SAND CONSTRUCTION ACCESS PATHS, AND EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING TURBIDITY CURTAIN AND SUPER SILT FENCE.
7. ONCE SEDIMENT CONTROLS HAVE BEEN INSTALLED, CONTACT THE INSPECTOR FOR WRITTEN APPROVAL OF SEDIMENT CONTROL INSTALLATION PRIOR TO COMMENCING WORK. INSPECTIONS AND PERMITS MAY REQUIRE THAT AN INSPECTION AND CERTIFICATION OF THE INSTALLATION OF SEDIMENT CONTROL ALSO BE PERFORMED BY A DESIGN PROFESSIONAL PRIOR TO CONSTRUCTION COMMENCING.

III GRAVEL SHORELINE

1. ENSURE EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING TURBIDITY CURTAIN, ARE FUNCTIONING AS INTENDED.
2. REMOVE REMAINING INVASIVE SPECIES, CONCRETE RUBBLE, TRASH, AND DEBRIS FROM PROJECT SITE.
3. THE CONTRACTOR SHALL REVIEW STAKE OUT OF STRUCTURE LOCATIONS.
4. GEOTEXTILE TO BE PLACED PRIOR TO GRAVEL AS NEEDED, WITH DIRECTION FROM THE PROJECT ENGINEER.
5. THE GRAVEL SHORELINE SHALL BE CONSTRUCTED TO THE DIMENSIONS AND ELEVATIONS SHOWN ON THE CONTRACT DRAWINGS (SEE SHEETS PC100).
6. CONTRACTOR SHALL BE RESPONSIBLE FOR CARE AND MAINTENANCE OF THE GRAVEL SHORELINE UNTIL FINAL ACCEPTANCE BY THE ENGINEER. DAMAGE TO ROCK WORK DUE TO ANY CAUSE PRIOR TO ACCEPTANCE SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE

IV MARSH PLANE GRADING

1. CONTRACTOR SHALL MANAGE ACCESS AND GRADING OPERATION TO MINIMIZE TRACKING AND SEDIMENT EXPOSURE. BREACHING RIVER ACCESS TO SITE INTERIOR SHALL BE FINAL STEP IN TIDAL CHANNEL EXCAVATION PROCESS.
2. EXCAVATED MATERIALS TO BE PLACED WITHIN MARSH ZONE ONLY AND TO DESIGN ELEVATIONS (SEE SHEET PC100). ALTHOUGH SETTLEMENT IS POSSIBLE, THE IMPORT OF ADDITIONAL MATERIAL WILL NOT BE NECESSARY. TO ACHIEVE A CUT/FILL BALANCE ON THE SITE, THERE SHALL BE NO IMPORT OR EXPORT.
3. INSTALLATION OF CERTAIN INDIVIDUAL HABITAT FEATURES (WOOD VENT STRUCTURES, CHRISTMAS TREE FASCINES, BASKING LOGS, BRUSH PILES, STANDING SNAGS, WATERWARD ROOTWADS), DETERMINED BY THE PROJECT ECOLOGIST, WILL COMMENCE AFTER COMPLETION OF TIDAL CHANNEL.

V POST-FILL HABITAT FEATURES

1. INSTALLATION OF CERTAIN INDIVIDUAL HABITAT FEATURES (WOOD VENT STRUCTURES, CHRISTMAS TREE FASCINES, BASKING LOGS, BRUSH PILES, STANDING SNAGS, WATERWARD ROOTWADS), DETERMINED BY THE PROJECT ECOLOGIST, WILL COMMENCE AFTER COMPLETION OF PLACEMENT AND ROUGH GRADING OF MARSH FILL MATERIAL.

VI PLANTING

1. LANDSCAPE PLANTING OF HABITAT AREAS TO COMMENCE ONCE ALL SETTLING, FINAL GRADING AND INSTALLATION OF REMAINING HABITAT FEATURES HAS BEEN ACHIEVED.
2. UPON FINAL STABILIZATION, AND WITH WRITTEN PERMISSION OF THE BALTIMORE CITY ESC INSPECTOR, REMOVE REMAINING SEDIMENT CONTROLS AND PERMANATELY STABILIZE ANY AREA DISTURBED BY SUCH REMOVAL

VII CLOSEOUT

1. AS REQUIRED, WITH INSPECTOR'S WRITTEN APPROVAL, CONTRTACTOR TO FILE NOTICE OF TERMINATION (NOT) TO MDE AND CLOSE ANY APPLICABLE PERMITS.

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MIDDLE BRANCH RESILIENCY INITIATIVE
PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

SEQUENCE OF CONSTRUCTION

SCALE: NA
DATE: 1/29/2025
DRAWING NO. GN103
5 OF 20

MATERIAL SPECIFICATIONS

REFERENCES

1. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
   - A. ASTM C 88 (2013) SOUNDNESS OF AGGREGATES BY USE OF SODIUM SULFATE OR MAGNESIUM SULFATE
   - B. ASTM C 97 (2015) ABSORPTION AND BULK SPECIFIC GRAVITY OF DIMENSION STONE
   - C. ASTM C 127 (2015) RELATIVE DENSITY (SPECIFIC GRAVITY) AND ABSORPTION OF COARSE AGGREGATE
   - D. ASTM C 295 (2012) PETROGRAPHIC EXAMINATION OF AGGREGATES FOR CONCRETE
   - E. ASTM C 535 (2012) RESISTANCE TO DEGRADATION OF LARGE SIZE COARSE AGGREGATE BY ABRASION AND IMPACT IN THE LOS ANGELES MACHINE
   - F. ASTM D 3786 (2009) STANDARD TEST METHOD FOR BURSTING STRENGTH TEXTILE FABRICS - DIAPHRAGM BURSTING STRENGTH TESTER METHOD
   - G. ASTM D 4354 (2009) STANDARD PRACTICE FOR SAMPLING OF GEOSYNTHETICS FOR TESTING
   - H. ASTM D 4355 (2007) STANDARD TEST METHOD FOR DETERIORATION OF GEOTEXTILES BY EXPOSURE TO LIGHT, MOISTURE AND HEAT IN A XENON ARC TYPE APPARATUS
   - I. ASTM D 4491 (2009) STANDARD TEST METHODS FOR WATER PERMEABILITY OF GEOTEXTILES BY PERMITTIVITY
   - J. ASTM D 4533 (2009) STANDARD TEST METHOD FOR TRAPEZOID TEARING STRENGTH OF GEOTEXTILES
   - K. ASTM D 4595 (2009) STANDARD TEST METHOD FOR TENSILE PROPERTIES OF GEOTEXTILES BY WIDE-WIDTH STRIP METHOD
   - L. ASTM D 4632 (2008) STANDARD TEST METHOD FOR GRAB BREAKING LOAD AND ELONGATION OF GEOTEXTILES
   - M. ASTM D 4751 (2004) STANDARD TEST METHOD FOR DETERMINING THE APPARENT OPENING SIZE OF GEOTEXTILE
   - N. ASTM D 4595 (2009) STANDARD TEST METHOD FOR TENSILE PROPERTIES OF GEOTEXTILES BY WIDE-WIDTH STRIP METHOD
   - O. ASTM D 4833 (2007) STANDARD TEST METHOD FOR INDEX PUNCTURE RESISTANCE OF GEOMEMBRANES AND RELATED PRODUCTS
   - P. ASTM D 4873 (2009) STANDARD GUIDE FOR IDENTIFICATION, STORAGE, AND HANDLING OF GEOSYNTHETIC ROLLS AND SAMPLES
   - Q. ASTM D 5261 (2010) STANDARD TEST METHOD FOR MEASURING MASS PER UNIT AREA OF GEOTEXTILES
2. U.S. ARMY CORPS OF ENGINEERS (USACE)
   - A. CRD-C 144-73 METHOD OF TESTING STONE FOR RESISTANCE TO FREEZING AND THAWING
   - B. USACE, 1986, GEOTEXTILES USED AS FILTERS, CIVIL WORKS CONSTRUCTION GUIDE SPECIFICATION, CW-02215
3. AMERICAN ASSOCIATION OF STATE HIGHWAY TRANSPORTATION OFFICIALS (AASHTO)
   - A. AASHTO M288 (2006) STANDARD SPECIFICATION FOR GEOTEXTILE SPECIFICATION FOR HIGHWAY APPLICATIONS
   - B. AASHTO T11 (2005) MATERIALS FINER THAN 75 MM SIEVE IN MINERAL AGGREGATES BY WASHING
   - C. AASHTO T27 (2006) SIEVE ANALYSIS OF FINE AND COARSE AGGREGATES
   - D. AASHTO T90 (2004) PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS
   - F. AASHTO T180 (2004) MOISTURE DENSITY RELATIONS OF SOILS USING A 10-POUND RAMMER AND AN 18-INCH DROP
4. MARYLAND DEPARTMENT OF TRANSPORTATION (MDOT), STATE HIGHWAY ADMINISTRATION (MSHA), STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, 2018
5. MARYLAND DEPARTMENT OF TRANSPORTATION (MDOT), STATE HIGHWAY ADMINISTRATION (MSHA), MARYLAND STANDARD METHOD OF TEST, 2018

STONE MATERIAL

1. GRAVEL BEACH STONE SHALL BE 1.5" - 3" CRUSHED STONE, CRUSHER RUN, OR APPROVED SUBSTITUTE.
2. ROCK SHALL BE FURNISHED IN BLOCKY AND ANGULAR SHAPES, WITH ITS GREATEST DIMENSION NOT GREATER THAN THREE TIMES ITS LEAST DIMENSION. FLAT STONES, SLABS, BOULDERS, AND PARTS OF BOULDERS WILL BE REJECTED. NOT MORE THAN 5% BY WEIGHT OF CLEAN SPALLS RESULTING FROM LOADING AND SHIPMENT WILL BE ALLOWED IN ANY ONE DELIVERY.
3. ROCK SHALL MEET THE FOLLOWING TEST CRITERIA:

PROPERTY	TEST METHOD	TEST VALUE
SPECIFIC GRAVITY	ASTM C 97	2.65 MINIMUM
ABSORPTION	ASTM C 127	LESS THAN 2%
ABRASION	ASTM C 535	LESS THAN 20% LOSS FOR 500 REVOLUTIONS
SULFATE SOUNDNESS	ASTM C 88	LESS THAN 18% LOSS FOR 5 CYCLES
FREEZING AND THAWING	CRD-C 144-73	LESS THAN 10% LOSS FOR 12 CYCLES

4. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION THAT ROCK FROM THESE SOURCES MEETS THE REQUIREMENTS OF THESE SPECIFICATIONS. GREENVEST, LLC RESERVES THE RIGHT TO REJECT STONE FROM SOURCES THAT DOES NOT MEET THESE SPECIFICATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THAT SOURCES CAN PRODUCE THE SPECIFIED QUANTITY AND GRADATION OF RIPRAP.

TURBIDITY CURTAIN

1. THE TURBIDITY CURTAIN SHALL BE INSTALLED AND MAINTAINED FOR THE DURATION OF ALL SHORELINE DISTURBANCES. THE CONTRACTOR MAY INSTALL TURBIDITY CURTAIN FOR ENTIRE LENGTH OF THE PROJECT AT ONE TIME, OR FOR SMALLER WORK AREAS WITH APPROVAL OF SEDIMENT CONTROL INSPECTOR. TURBIDITY CURTAIN MAY ONLY BE REMOVED WITH PERMISSION OF THE SEDIMENT CONTROL INSPECTOR AND AFTER ADJACENT SHORELINE WORK IS COMPLETE AND STABILIZED.
2. PRIOR TO DELIVERY OF TURBIDITY CURTAIN TO THE JOB SITE, THE CONTRACTOR SHALL SUBMIT THE FOLLOWING TO THE ENGINEER FOR APPROVAL:
   - 2A. TURBIDITY CURTAIN MANUFACTURER'S DATA.
   - 2B. DETAILED PLAN IDENTIFYING THE MATERIALS, METHODOLOGY, SCHEDULE AND SEQUENCE OF THE DEPLOYMENT OF TURBIDITY CURTAIN.
   - 2C. PROVISIONS FOR MARKING THE CURTAIN IN ACCORDANCE WITH USCG REQUIREMENTS FOR MARKER BUOYS, LIGHTS AND NOTICES TO MARINERS.
   - 2D. REPRESENTATIVE SAMPLE OF EACH TYPE OF THE TURBIDITY CURTAIN SHOWING THE NAME OF THE MANUFACTURER, BRAND NAME, AND TYPE OF CURTAIN MATERIAL.
3. THE CONTRACTOR SHALL EXAMINE ALL THE CURTAIN ROLLS FOR DAMAGE AND DEFECT PRIOR TO INSTALLATION. ANY ROLL FOUND TO BE DAMAGED AND/OR DEFECTIVE SHALL BE REMOVED FROM THE SITE AND SHALL BE REPLACED BY AN ACCEPTABLE ROLL. GREENVEST LLC WILL EXAMINE THE ROLLS FOR DAMAGE.
4. ALL MATERIALS SPECIFIED SHALL BE APPLIED AS PER THE MANUFACTURER'S PRINTED INSTRUCTIONS AND RECOMMENDATIONS OR AS DIRECTED BY THE ENGINEER. NO WORK SHALL BE PERFORMED USING UNAPPROVED MATERIALS.
5. THE TURBIDITY CURTAIN SHALL BE A COMMERCIALLY AVAILABLE, PREASSEMBLED SYSTEM, INCLUDING A GEOTEXTILE, FLOATATION SYSTEM, BOTTOM WEIGHT AND ANCHORING AND SECURING MECHANISM. IF ASSEMBLED IN PANELS, IT SHALL INCLUDE A SECURE MECHANISM FOR JOINING THE PANELS TOGETHER WITHOUT GAPS AT THE SEAMS OR LEAKAGE OF TURBIDITY. TURBIDITY CURTAIN FABRIC SHALL BE VINYL LAMINATED FABRIC (OR EQUIVALENT) WITH A MINIMUM TENSILE STRENGTH OF 500 LBS/IN.; A MINIMUM FABRIC WEIGHT OF 22 OZ/SQ. YD. AND A TEAR STRENGTH OF 300 LBS.
6. THE TURBIDITY CURTAIN SHALL BE PLACED IN ACCORDANCE WITH DEPLOYMENT GEOMETRY AS SHOWN ON THE PLANS AND MANUFACTURERS RECOMMENDATIONS, OR AS DIRECTED BY GREENVEST, LLC. THE TURBIDITY CURTAIN SHALL BE CONFIGURED AND PLACED SUCH THAT IT WILL EFFECTIVELY DIRECT ANY TURBIDITY PLUME TOWARDS THE SEABED BOTTOM AND MAXIMIZE CONTAINMENT OF THE PLUME THROUGHOUT THE WATER COLUMN SUCH THAT THE IMPACT OF ANY TURBIDITY GENERATED IS MINIMIZED. THE TURBIDITY CURTAIN SHALL BE ANCHORED FROM THE SECTION JOINTS VERY 50 FEET AND ON BOTH SIDES IF THE CURTAIN IS EXPOSED TO REVERSING TIDAL CURRENTS.

OWNER: SOUTH BALTIMORE GATEWAY PARTNERSHIP
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ph: 410.424.7593 / www.sbgpartnership.org

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12/09/24

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 26960 Expiration Date: 02/25/2026

APPROVAL				REVISIONS			
		/ /	NO.	DESCRIPTION	DATE	BY
		/ /	1	SCHEMATIC DESIGN (30%)	04/26/24	JP
		/ /	2	SITE DEVELOPMENT (65%)	08/09/24	JP
		/ /	3	FINAL DESIGN (100%)	12/09/24	JP
		/ /				

MDE A# - 181301
BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE
PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

MATERIAL SPECIFICATION NOTES

SCALE: NA
DATE: 1/29/2025
DRAWING NO. GN104
6 OF 20

TREE TABLE

TAG #	*Scientific Name*	Common Name	DBH	Condition
1234*	*Robinia pseudoacacia*	Black locust	22.9	Poor
1235	*Robinia pseudoacacia*	Black locust	20.0	Poor
1236	*Robinia pseudoacacia*	Black locust	16.5	Poor
1237*	*Robinia pseudoacacia*	Black locust	19.4	Poor
1238	*Prunus sp.*	Ornamental cherry	7.0	Poor
1239	*Morus alba*	White mulberry	11.5	Poor
1240	*Morus alba*	White mulberry	25.5	Poor
1241*	*Morus alba*	White mulberry	25.8	Poor
1242	*Morus alba*	White mulberry	14.5	Poor
1243	*Celtis occidentalis*	Hackberry	8.7	Fair
1244*	*Robinia pseudoacacia*	Black locust	27.2	Fair-poor
1245*	*Robinia pseudoacacia*	Black locust	32.2	Poor
1246	*Prunus sp.*	Ornamental cherry	7.7	Good
1247	*Prunus sp.*	Ornamental cherry	8.5	Good
1248*	*Prunus serotina*	Black cherry	22.6	Poor
1249*	*Morus alba*	White mulberry	28.4	Poor
1250	*Robinia pseudoacacia*	Black locust	22.0	Fair
1251	*Robinia pseudoacacia*	Black locust	26.7	Poor
1252	*Morus alba*	White mulberry	6.5	Poor
1253	*Robinia pseudoacacia*	Black locust	24.5	Fair
1254	*Prunus sp.*	Ornamental cherry	6.0	Good
1255	*Prunus sp.*	Ornamental cherry	6.0	Good
1256	*Prunus sp.*	Ornamental cherry	9.5	Good
1257*	*Morus alba*	White mulberry	42.1	Fair
1258	*Quercus palustris*	Pin oak	13.0	Good
1259	*Platanus occidentalis*	Sycamore	10.5	Good
1260	*Liquidambar styraciflua*	Sweetgum	9.2	Good
1261	*Liquidambar styraciflua 'Rotundiloba'*	Roundleaf sweetgum	9.5	Good
1262*	*Morus alba*	White mulberry	30.8	Fair
1263	*Pyrus calleryana*	Callery pear	8.0	Good
1264	*Morus alba*	White mulberry	29.0	Fair-poor
1265	*Robinia pseudoacacia*	Black locust	11.5	Good
1266	*Ailanthus altissima*	Tree of heaven	6.0	Poor
1267	*Prunus serotina*	Black cherry	6.0	Good
1268	*Ulmus pumila*	Siberian elm	11.5	Fair
1269	*Robinia pseudoacacia*	Black locust	9.0	Good
1270	*Prunus serotina*	Black cherry	7.7	Poor
1271	*Robinia pseudoacacia*	Black locust	18.0	Poor
1272	*Ulmus americana*	American elm	8.0	Good
1273*	*Morus alba*	White mulberry	18.5	Poor
1274*	*Morus alba*	White mulberry	20.1	Fair
1275	*Morus alba*	White mulberry	21.5	Poor
1276	*Pyrus calleryana*	Callery pear	6.0	Good
1277	*Morus alba*	White mulberry	26.0	Good
1278	*Ulmus americana*	American elm	10.5	Good
1279	*Ailanthus altissima*	Tree of heaven	8.0	Poor
1280	*Gleditsia triacanthos*	Honey locust	9.0	Good
1281	*Quercus palustris*	Pin oak	10.0	Good
1282	*Quercus palustris*	Pin oak	9.2	Good
1283	*Quercus palustris*	Pin oak	10.0	Good
1284	*Quercus palustris*	Pin oak	8.0	Good
1285	*Morus alba*	White mulberry	22.0	Poor
1286*	*Morus alba*	White mulberry	30.7	Poor
1287	*Quercus palustris*	Pin oak	9.7	Good
1288	*Robinia pseudoacacia*	Black locust	10.0	Good
1289	*Ailanthus altissima*	Tree of heaven	10.0	Poor
1290	*Ailanthus altissima*	Tree of heaven	6.7	Poor
1291	*Morus alba*	White mulberry	32.0	Poor
1292	*Ailanthus altissima*	Tree of heaven	7.0	Poor
1293	*Celtis occidentalis*	Hackberry	8.5	Poor
1294*	*Celtis occidentalis*	Hackberry	24.4	Good
1295	*Morus alba*	White mulberry	22.0	Good
1296	*Prunus serotina*	Black cherry	11.0	Fair
1297	*Celtis occidentalis*	Hackberry	10.0	Fair
1298	*Ailanthus altissima*	Tree of heaven	10.5	Poor
1299	*Morus alba*	White mulberry	18.0	Fair
1300	*Celtis occidentalis*	Hackberry	10.0	Fair
1301	*Ailanthus altissima*	Tree of heaven	7.0	Good
1302	*Ailanthus altissima*	Tree of heaven	6.6	Good
1303	*Ailanthus altissima*	Tree of heaven	9.0	Poor
1304	*Robinia pseudoacacia*	Black locust	6.0	Good
1305	*Morus alba*	White mulberry	11.5	Fair
1306	*Celtis occidentalis*	Hackberry	8.0	Good
1307	*Acer negundo*	Box elder	14.5	Poor
1308	*Ailanthus altissima*	Tree of heaven	7.0	Good
1309	*Morus alba*	White mulberry	11.0	Poor
1310	*Ailanthus altissima*	Tree of heaven	7.0	Good
1311	*Celtis occidentalis*	Hackberry	10.0	Good
1312	*Ailanthus altissima*	Tree of heaven	6.0	Good
1313	*Morus alba*	White mulberry	13.0	Fair
1314	*Celtis occidentalis*	Hackberry	6.5	Good
1315	*Robinia pseudoacacia*	Black locust	7.5	Good
1316	*Robinia pseudoacacia*	Black locust	8.5	Good
1317	*Robinia pseudoacacia*	Black locust	8.5	Good
1318	*Robinia pseudoacacia*	Black locust	9.5	Poor
1319	*Ailanthus altissima*	Tree of heaven	7.5	Good
1320	*Robinia pseudoacacia*	Black locust	9.0	Poor
1321	*Celtis occidentalis*	Hackberry	23.0	Good
1322	*Morus alba*	White mulberry	8.5	Good
1323	*Robinia pseudoacacia*	Black locust	11.0	Good
1324	*Celtis occidentalis*	Hackberry	8.0	Good
1325	*Celtis occidentalis*	Hackberry	6.0	Good
1326	*Ailanthus altissima*	Tree of heaven	6.5	Good
1327	*Morus alba*	White mulberry	10.0	Good
1328*	*Morus alba*	White mulberry	9.4	Poor
1329*	*Morus alba*	White mulberry	34.4	Fair
1330	*Morus alba*	White mulberry	13.0	Fair
1331	*Gymnocladus dioicus*	Kentucky coffee tree	10.0	Good
1332	*Gymnocladus dioicus*	Kentucky coffee tree	6.0	Good
1333	*Morus alba*	White mulberry	8.0	Good
1334	*Pyrus calleryana*	Callery pear	8.0	Good
1335	*Morus alba*	White mulberry	17.0	Poor
1336	*Morus alba*	White mulberry	30.0	Poor
1337*	*Gymnocladus dioicus*	Kentucky coffee tree	10.3	Good
1338	*Gymnocladus dioicus*	Kentucky coffee tree	6.0	Fair
1339*	*Gymnocladus dioicus*	Kentucky coffee tree	7.9	Fair
1340	*Gymnocladus dioicus*	Kentucky coffee tree	6.0	Poor
1341	*Gymnocladus dioicus*	Kentucky coffee tree	8.0	Good
1342	*Gymnocladus dioicus*	Kentucky coffee tree	6.5	Poor
1343*	*Gymnocladus dioicus*	Kentucky coffee tree	10.5	Fair
1344	*Gymnocladus dioicus*	Kentucky coffee tree	8.8	Poor
1345	*Gymnocladus dioicus*	Kentucky coffee tree	7.8	Fair
1346	*Gymnocladus dioicus*	Kentucky coffee tree	16.0	Good
1347	*Morus alba*	White mulberry	6.0	Good
1348	*Morus alba*	White mulberry	14.0	Fair
1349	*Ailanthus altissima*	Tree of heaven	11.0	Fair
1350	*Prunus serotina*	Black cherry	6.0	Poor
1351*	*Ailanthus altissima*	Tree of heaven	16.9	Poor
1352	*Ailanthus altissima*	Tree of heaven	11.0	Poor
1353	*Ailanthus altissima*	Tree of heaven	7.0	Poor
1354	*Ulmus americana*	American elm	12.5	Good
1355	*Ailanthus altissima*	Tree of heaven	8.5	Poor
1356	*Ailanthus altissima*	Tree of heaven	6.0	Fair
1357	*Ailanthus altissima*	Tree of heaven	7.0	Poor
1358*	*Ailanthus altissima*	Tree of heaven	11.9	Fair
1359	*Ailanthus altissima*	Tree of heaven	6.0	Fair
1360	*Celtis occidentalis*	Hackberry	6.0	Poor
1361	*Acer negundo*	Box elder	6.0	Good
1362	*Acer negundo*	Box elder	6.5	Fair
1363*	*Ailanthus altissima*	Tree of heaven	13.4	Fair
1364	*Ulmus americana*	American elm	12.0	Fair
1365	*Morus alba*	White mulberry	20.0	Poor
1366	*Ulmus americana*	American elm	9.5	Fair
1367*	*Morus alba*	White mulberry	12.4	Poor
1368	*Ailanthus altissima*	Tree of heaven	9.0	Poor
1369*	*Acer negundo*	Box elder	8.3	Poor
1370	*Prunus serotina*	Black cherry	6.0	Good
1371	*Acer negundo*	Box elder	17.0	Fair
1372	*Acer negundo*	Box elder	6.0	Fair
1373*	*Acer negundo*	Box elder	9.2	Poor
1374*	*Acer negundo*	Box elder	17.0	Poor
1375	*Pyrus calleryana*	Bradford pear	7.5	Good
1376	*Morus alba*	White mulberry	12.0	Poor
1377	*Ulmus americana*	American elm	12.0	Fair
1378	*Robinia pseudoacacia*	Black locust	16.0	Good
1379	*Pyrus calleryana*	Bradford pear	18.0	Good
1380	*Ulmus americana*	American elm	11.0	Fair

*Multistem tree: Aggregated DBH is calculated using the Square Root of Sum of Squared DBH's calculation. DBH = √ d1²+d2²+d3²+d4²...etc.

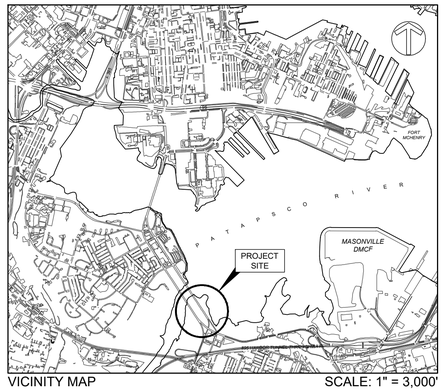
Natural Resources Inventory

Federal Regulated			State Regulated			Local Regulated		
Present? (Y/N)	Feature	Legend Symbology	Present? (Y/N)	Feature	Legend Symbology	Present? (Y/N)	Feature	Legend Symbology
Y	Wetlands	NWI	Y	Tidal and Nontidal Wetlands	Wetland Limit	N	Steep Slopes	NA
Y	Major Waterways	(PATAPSCO RIVER) Edge of Water	N	Wetlands of Special State Concern	NA	N	Highly Erodible Soils	*See Soils Table*
Y	Floodplains	FEMA Floodplain	Y	Wetland Buffers	Wetland Buffer	N	Enhanced Stream Buffers	NA
			N	Stream Buffers	NA	Y	Topography / Slopes	Major/Minor Contours
			N	Perennial Streams	NA	N	Springs	NA
			Y	Floodplains	FEMA Floodplain	N	Seeps	NA
			N	Forests	NA	N	Intermittent Streams	NA
			N	Forest Buffers	NA	Y	Vegetative Cover	Treeline
			Y	Critical Areas	Critical Area Buffer	Y	Soils	*See Soils Table* Soil Type Boundary
						N	Bedrock/Geology	NA
						N	Existing Drainage Area	NA
						N	Existing SWM Facilities	NA

Updated 4/19/2024

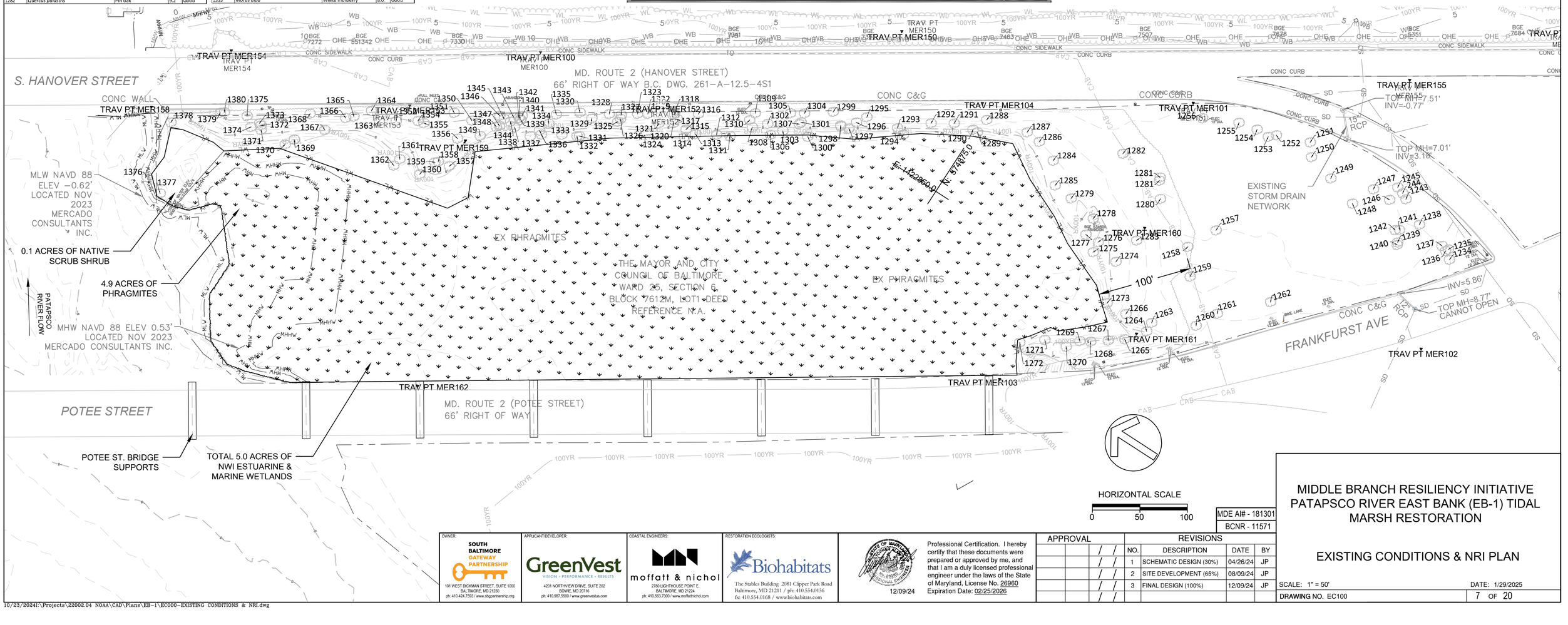
Soils Data Table

Symbol	Soil Series	Slope	Hydric	Highly Erodible? (K)	Hydrologic Classification
42E	Udorthents	0-35%	No	No	C
37	Sulfaquepts	0-35%	Yes	No	B/D



VICINITY MAP SCALE: 1" = 3,000'

EXISTING PHRAG MARSH WATERWARD OF MHHW	EXISTING PHRAG MARSH LANDWARD OF MHHW	EXISTING SHALLOW WATER HABITAT (FROM MLW)
25,564 sq ft	188,243 sq ft	5,793 sq ft



OWNER:	APPLICANT/DEVELOPER:	COASTAL ENGINEERS:	RESTORATION ECOLOGISTS:
SOUTH BALTIMORE GATEWAY PARTNERSHIP 101 WEST DICKMAN STREET, SUITE 1000 BALTIMORE, MD 21230 ph: 410.424.7593 / www.sbgpartnership.org	GreenVest VISION • PERFORMANCE • RESULTS 4201 NORTHVIEW DRIVE, SUITE 202 BOWIE, MD 20716 ph: 410.987.5500 / www.greenvestus.com	moffatt & nichol 2780 LIGHTHOUSE POINT E, BALTIMORE, MD 21224 ph: 410.563.7300 / www.moffattnichol.com	Biohabitats The Stables Building 2081 Clipper Park Road Baltimore, MD 21211 / ph: 410.554.0156 fx: 410.554.0168 / www.biohabitats.com

12/09/24

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APPROVAL			REVISIONS			
			NO.	DESCRIPTION	DATE	BY
			1	SCHEMATIC DESIGN (30%)	04/26/24	JP
			2	SITE DEVELOPMENT (65%)	08/09/24	JP
			3	FINAL DESIGN (100%)	12/09/24	JP

MDE A#- 181301
BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

EXISTING CONDITIONS & NRI PLAN

SCALE: 1" = 50' DATE: 1/29/2025

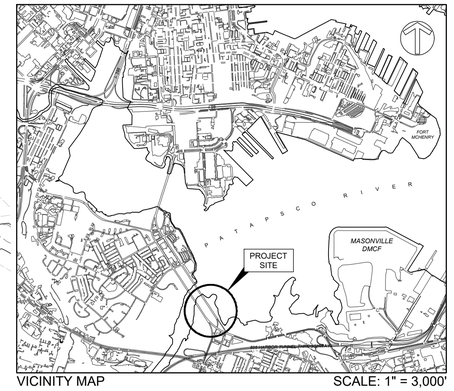
DRAWING NO. EC100 7 OF 20

10/23/2024:\Projects\22002.04 NOAA\CAD\Plans\EB-1\EC000-EXISTING CONDITIONS & NRI.dwg

SITE PREPARATION LEGEND

CLEARING / GRUBBING

NON-NATIVE/INVASIVE TREATMENT AND FLOATABLE TRASH REMOVAL



VICINITY MAP SCALE: 1" = 3,000'

S. HANOVER STREET

POTEE STREET

FRANKFURST AVE

PATAPSCO RIVER FLOW

TRAV PT MER154

TRAV PT MER158

TRAV PT MER153

TRAV PT MER159

TRAV PT MER152

TRAV PT MER100

TRAV PT MER150

TRAV PT MER104

TRAV PT MER101

TRAV PT MER155

TOP MH=7.51'
INV=-0.77'

15" RCP

TOP MH=7.01'
INV=3.18'

TRAV PT MER160

INV=5.86'

TOP MH=8.77'
CANNOT OPEN

CONC C&G

12" RCP

TRAV PT MER161

TRAV PT MER102

TRAV PT MER162

TRAV PT MER103

UNDERSTORY CLEARING AND GRUBBING ACTIVITIES

ROADSIDE EMBANKMENT VEGETATION TO REMAIN.

0.17 TOTAL ACRES. UNDERSTORY CLEARING AND GRUBBING ACTIVITIES AND REPLACED WITH NATIVE VEGETATION. SEE EROSION AND SEDIMENT CONTROL PLAN FOR TREE REMOVAL (ALL OF WHICH WILL BE INVASIVE SPECIES). 4,015 SF OF TREE CLEARING IS ANTICIPATED WITHIN THE CRITICAL AREA BUFFER.

4.9 AC OF PHRAGMITES. PRIOR TO MOWING AT GROUND PLANE, REMOVE FLOATABLE INORGANIC DEBRIS THROUGHOUT SITE. THE CONTRACTOR SHALL PROPOSE PREFERRED APPROACH AND ATTAIN AUTHORIZATION FROM ENGINEER PRIOR TO REMOVAL.

ROADSIDE EMBANKMENT VEGETATION TO REMAIN.

HORIZONTAL SCALE

0 50 100

NOTES:

1. CLEARING AND GRUBBING ACTIVITIES SHALL FOLLOW TREATMENT OF INVASIVE SPECIES AND REMOVAL OF FLOATABLE DEBRIS. ANY ONSITE TREES REMOVED SHALL BE USED IN PROPOSED STRUCTURES. CONTRACTOR SHALL ENSURE FELLED TREES ROOTWADS AND LENGTHS MEET SPECIFICATIONS OF HABITATS STRUCTURES.
2. EXISTING UTILITIES AND OBSTRUCTIONS SHOWN ARE FOR THE CONVENIENCE OF THE CONTRACTOR AND ARE NOT WARRANTED OR GUARANTEED BY THE CITY OR THE ENGINEER TO BE COMPLETE OR CORRECT. THE CONTRACTOR SHALL VERIFY ALL INFORMATION TO THEIR OWN SATISFACTION.

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12/09/24

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MDE A# - 181301
BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

INITIAL SITE PREPARATION PLAN

SCALE: 1" = 50' DATE: 1/29/2025

DRAWING NO. SP100 8 OF 20

11/12/2024 I:\Projects\22002.04 NOAA\CAD\Plans\EB-1\SP100-INITIAL SITE PREPARATION.dwg

EROSION AND SEDIMENT CONTROL LEGEND

LOD	LIMIT OF DISTURBANCE
SSF	SUPER SILT FENCE
FL-18	FILTER LOG
TC	TURBIDITY CURTAIN
BOF	BLAZE ORANGE FENCE
SCE	STABILIZED CONSTRUCTION ENTRANCE WITH WASH RACK
PST	PORTABLE SEDIMENT TANK
	WOOD CHIPS CONSTRUCTION ACCESS ROADS
	STAGING AND STOCKPILING
	TREE REMOVAL
TP	TREE PROTECTION FENCE
CRZ	CRITICAL ROOT ZONE
COIP	COMBINATION INLET PROTECTION
AGIP	AT-GRADE INLET PROTECTION

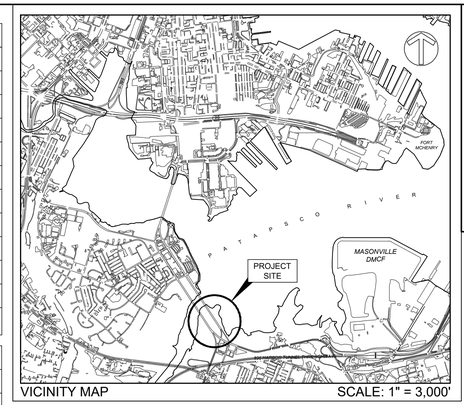
STABILIZATION SCHEDULE

AREA	SQ.FT.	TYPE OF STABILIZATION	SEQUENCE
A STABILIZED CONSTRUCTION ENTRANCES	1,723	STONE BED (temporary)	ESC - 6
		PERMANENT SEED (permanent)	PLANT -1
B CONSTRUCTION ACCESS, WOOD CHIPS	5,851	WOOD CHIP ROAD ACCESS (permanent)	ESC - 6
C PERVIOUS AREAS	241,118	TEMPORARY SEEDING (temporary)	PLANT -1
		SEED/LANDSCAPING (permanent)	PLANT -1
D SEDIMENT CONTROLS	31,398	SEEDING (temporary)	PLANT -1
		PERMANENT SEED (permanent)	PLANT -1

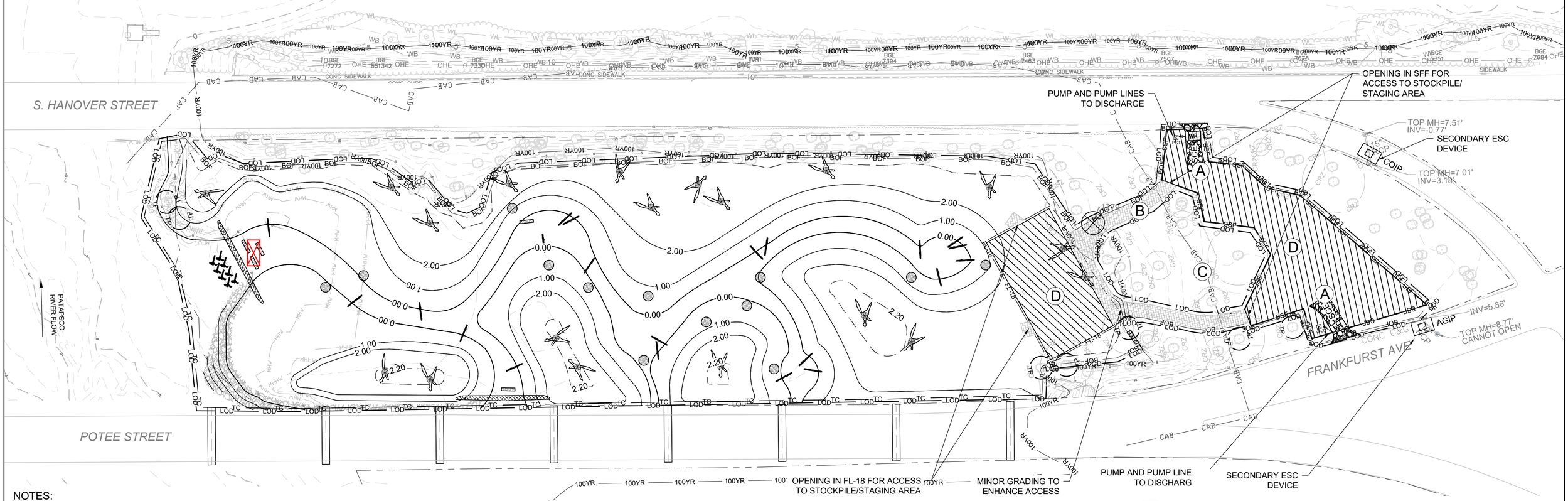
AREAS ARE TO BE VEGETATIVELY STABILIZED TO SATISFY THE 3/7 DAY REQUIREMENT AS PER THE BALTIMORE CITY STANDARD EROSION AND SEDIMENT CONTROL NOTES.

SITE DATA

SITE AREA	8.5	AC	371,764	SF
LOD	6.43	AC	280,090	SF
CUT	3494	CY		
FILL	3656	CY		



VICINITY MAP SCALE: 1" = 3,000'



NOTES:

1. CRITICAL AREA BUFFER WILL BE FLAGGED IN THE FIELD DURING CONSTRUCTION.
2. SEE SHEETS ES101 AND ES102 FOR EROSION AND SEDIMENT CONTROL SPECIFICATIONS. SEE SHEET ES104 FOR EROSION AND SEDIMENT CONTROL DETAILS.
3. CONTRACTOR SHALL ACCESS THE SHORELINE AS NECESSARY THROUGH THE ORANGE SAFETY FENCE WHILE MAINTAINING PROPER EROSION AND SEDIMENT CONTROL DEVICES AND PROCEDURES.
4. THE SITE IS WITHIN THE 100-YEAR FLOODPLAIN.
5. SEE SHEETS GN101, GN102, and GN103 FOR GENERAL NOTES AND LEGEND.
6. ALL STONE OR SEDIMENT SPILLED, DROPPED, OR TRACKED OUTSIDE OF THE PROJECT LOD SHALL BE REMOVED IMMEDIATELY BY VACUUMING, SCRAPING, AND/OR SWEEPING.
7. LIMIT OF DISTURBANCE (LOD) IS 280,090 SF, 6.43 AC.
8. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN.
   - 8.1. THREE CALENDAR DAYS FOR THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN THREE HORIZONTAL TO ONE VERTICAL (3:1).
   - 8.2. SEVEN DAYS FOR ALL OTHER DISTURBED OR GRADED AREAS ON PROJECT SITE.
9. STOCKPILED MATERIALS SHALL BE AT A SLOPE NO STEEPER THAN 2:1 AND NO HIGHER THAN 20 FT.

HORIZONTAL SCALE
0 50 100

MDE AI# - 181301
BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

EROSION AND SEDIMENT CONTROL PLAN

SCALE: 1" = 50' DATE: 1/29/2025

DRAWING NO. ES100 9 OF 20

OWNER: SOUTH BALTIMORE GATEWAY PARTNERSHIP
101 WEST DICKMAN STREET, SUITE 1000
BALTIMORE, MD 21230
ph: 410.424.7593 / www.sbgpartnership.org

APPLICANT/DEVELOPER: GreenVest VISION - PERFORMANCE - RESULTS
4201 NORTHVIEW DRIVE, SUITE 202
BOWIE, MD 20716
ph: 410.987.5500 / www.greenvestus.com

COASTAL ENGINEERS: moffatt & nichol
2780 LIGHTHOUSE POINT E.
BALTIMORE, MD 21224
ph: 410.563.7300 / www.moffattnichol.com

RESTORATION ECOLOGISTS: Biohabitats
The Stables Building 2081 Clipper Park Road
Baltimore, MD 21211 / ph: 410.554.0156
fx: 410.554.0168 / www.biohabitats.com

12/09/24

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 26960 Expiration Date: 02/25/2026

APPROVAL				REVISIONS			
				NO.	DESCRIPTION	DATE	BY
				1	SCHEMATIC DESIGN (30%)	04/26/24	JP
				2	SITE DEVELOPMENT (65%)	08/09/24	JP
				3	FINAL DESIGN (100%)	12/09/24	JP

12/2/2024 I:\Projects\220002.04 NOAA\CAD\Plans\EB-1\ES100-ESC PLAN.dwg

EROSION AND SEDIMENT CONTROL - STANDARD SPECIFICATIONS FOR BALTIMORE CITY PART 1 OF 2

SHEET REVISION DATE: November 15, 2022

B-4 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

DEFINITION
USING VEGETATION AS COVER TO PROTECT EXPOSED SOIL FROM EROSION.

PURPOSE
TO PROMOTE THE ESTABLISHMENT OF VEGETATION ON EXPOSED SOIL.

CONDITIONS WHERE PRACTICE APPLIES
ON ALL DISTURBED AREAS NOT STABILIZED BY OTHER METHODS. THIS SPECIFICATION IS DIVIDED INTO SECTIONS ON INCREMENTAL STABILIZATION; SOIL PREPARATION, SOIL AMENDMENTS AND TOPSOILING; SEEDING AND MULCHING; TEMPORARY STABILIZATION; AND PERMANENT STABILIZATION.

EFFECTS ON WATER QUALITY AND QUANTITY
STABILIZATION PRACTICES ARE USED TO PROMOTE THE ESTABLISHMENT OF VEGETATION ON EXPOSED SOIL. WHEN SOIL IS STABILIZED WITH VEGETATION, THE SOIL IS LESS LIKELY TO ERODE AND MORE LIKELY TO ALLOW INFILTRATION OF RAINFALL, THEREBY REDUCING SEDIMENT LOADS AND RUNOFF TO DOWNSTREAM AREAS. PLANTING VEGETATION IN DISTURBED AREAS WILL HAVE AN EFFECT ON THE WATER BUDGET, ESPECIALLY ON VOLUMES AND RATES OF RUNOFF, INFILTRATION, EVAPORATION, TRANSPIRATION, PERCOLATION, AND GROUNDWATER RECHARGE. OVER TIME, VEGETATION WILL INCREASE ORGANIC MATTER CONTENT AND IMPROVE THE WATER HOLDING CAPACITY OF THE SOIL AND SUBSEQUENT PLANT GROWTH. VEGETATION WILL HELP REDUCE THE MOVEMENT OF SEDIMENT, NUTRIENTS, AND OTHER CHEMICALS CARRIED BY RUNOFF TO RECEIVING WATERS. PLANTS WILL ALSO HELP PROTECT GROUNDWATER SUPPLIES BY ASSIMILATING THOSE SUBSTANCES PRESENT WITHIN THE ROOT ZONE. SEDIMENT CONTROL PRACTICES MUST REMAIN IN PLACE DURING GRADING, SEEDBED PREPARATION, SEEDING, MULCHING, AND VEGETATIVE ESTABLISHMENT.

ADEQUATE VEGETATIVE ESTABLISHMENT
INSPECT SEEDED AREAS FOR VEGETATIVE ESTABLISHMENT AND MAKE NECESSARY REPAIRS, REPLACEMENTS, AND RESEEDINGS WITHIN THE PLANTING SEASON.

1. ADEQUATE VEGETATIVE STABILIZATION REQUIRES 95 PERCENT GROUNDCOVER.
2. IF AN AREA HAS LESS THAN 40 PERCENT GROUNDCOVER, RESTABILIZE FOLLOWING THE ORIGINAL RECOMMENDATIONS FOR LIME, FERTILIZER, SEEDBED PREPARATION, AND SEEDING.
3. IF AN AREA HAS BETWEEN 40 AND 94 PERCENT GROUNDCOVER, OVER-SEED AND FERTILIZE USING HALF OF THE RATES ORIGINALLY SPECIFIED.
4. MAINTENANCE FERTILIZER RATES FOR PERMANENT SEEDING ARE SHOWN IN TABLE B.6.

B-4-1 STANDARDS AND SPECIFICATIONS FOR INCREMENTAL STABILIZATION

DEFINITION
ESTABLISHMENT OF VEGETATIVE COVER ON CUT AND FILL SLOPES.

PURPOSE
TO PROVIDE TIMELY VEGETATIVE COVER ON CUT AND FILL SLOPES AS WORK PROGRESSES.

CONDITIONS WHERE PRACTICE APPLIES
ANY CUT OR FILL SLOPE GREATER THAN 15 FEET IN HEIGHT. THIS PRACTICE ALSO APPLIES TO STOCKPILES.

CRITERIA

A. INCREMENTAL STABILIZATION - CUT SLOPES
1. EXCAVATE AND STABILIZE CUT SLOPES IN INCREMENTS NOT TO EXCEED 15 FEET IN HEIGHT. PREPARE SEEDBED AND APPLY SEED AND MULCH ON ALL CUT SLOPES AS THE WORK PROGRESSES.
2. CONSTRUCTION SEQUENCE EXAMPLE (REFER TO FIGURE B.1):
   a. CONSTRUCT AND STABILIZE ALL TEMPORARY SWALES OR DIKES THAT WILL BE USED TO CONVEY RUNOFF AROUND THE EXCAVATION.
   b. PERFORM PHASE 1 EXCAVATION, PREPARE SEEDBED, AND STABILIZE.
   c. PERFORM PHASE 2 EXCAVATION, PREPARE SEEDBED, AND STABILIZE. OVERSEED PHASE 1 AREAS AS NECESSARY.
   d. PERFORM FINAL PHASE EXCAVATION, PREPARE SEEDBED, AND STABILIZE. OVERSEED PREVIOUSLY SEEDED AREAS AS NECESSARY.

NOTE: ONCE EXCAVATION HAS BEGUN THE OPERATION SHOULD BE CONTINUOUS FROM GRUBBING THROUGH THE COMPLETION OF GRADING AND PLACEMENT OF TOPSOIL (IF REQUIRED) AND PERMANENT SEED AND MULCH. ANY INTERRUPTIONS IN THE OPERATION OR COMPLETING THE OPERATION OUT OF THE SEEDING SEASON WILL NECESSITATE THE APPLICATION OF TEMPORARY STABILIZATION.

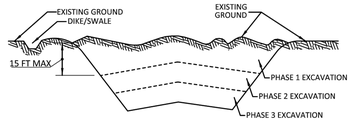


FIGURE B.1: INCREMENTAL STABILIZATION - CUT

B. INCREMENTAL STABILIZATION - FILL SLOPES
1. CONSTRUCT AND STABILIZE FILL SLOPES IN INCREMENTS NOT TO EXCEED 15 FEET IN HEIGHT. PREPARE SEEDBED AND APPLY SEED AND MULCH ON ALL SLOPES AS THE WORK PROGRESSES.
2. STABILIZE SLOPES IMMEDIATELY WHEN THE VERTICAL HEIGHT OF A LIFT REACHES 15 FEET, OR WHEN THE GRADING OPERATION CEASES AS PRESCRIBED IN THE PLANS.
3. AT THE END OF EACH DAY, INSTALL TEMPORARY WATER CONVEYANCE PRACTICE(S), AS NECESSARY, TO INTERCEPT SURFACE RUNOFF AND CONVEY IT DOWN THE SLOPE IN A NON-EROSIVE MANNER.
4. CONSTRUCTION SEQUENCE EXAMPLE (REFER TO FIGURE B.2):
   a. CONSTRUCT AND STABILIZE ALL TEMPORARY SWALES OR DIKES THAT WILL BE USED TO DIVERT RUNOFF AROUND THE FILL. CONSTRUCT SILT FENCE ON LOW SIDE OF FILL UNLESS OTHER METHODS SHOWN ON THE PLANS ADDRESS THIS AREA.
   b. AT THE END OF EACH DAY, INSTALL TEMPORARY WATER CONVEYANCE PRACTICE(S), AS NECESSARY, TO INTERCEPT SURFACE RUNOFF AND CONVEY IT DOWN THE SLOPE IN A NON-EROSIVE MANNER.
   c. PLACE PHASE 1 FILL, PREPARE SEEDBED, AND STABILIZE.
   d. PLACE PHASE 2 FILL, PREPARE SEEDBED, AND STABILIZE.
   e. PLACE FINAL PHASE FILL, PREPARE SEEDBED, AND STABILIZE. OVERSEED PREVIOUSLY SEEDED AREAS AS NECESSARY.

B-4-1 (CONTINUED)

NOTE: ONCE THE PLACEMENT OF FILL HAS BEGUN THE OPERATION SHOULD BE CONTINUOUS FROM GRUBBING THROUGH THE COMPLETION OF GRADING AND PLACEMENT OF TOPSOIL (IF REQUIRED) AND PERMANENT SEED AND MULCH. ANY INTERRUPTIONS IN THE OPERATION OR COMPLETING THE OPERATION OUT OF THE SEEDING SEASON WILL NECESSITATE THE APPLICATION OF TEMPORARY STABILIZATION B (INCREMENTAL STABILIZATION - FILL SLOPES).

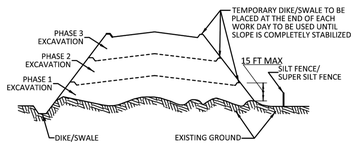


FIGURE B.2: INCREMENTAL STABILIZATION - FILL

B-4-2 STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

DEFINITION
THE PROCESS OF PREPARING THE SOILS TO SUSTAIN ADEQUATE VEGETATIVE STABILIZATION.

PURPOSE
TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH.

CONDITIONS WHERE PRACTICE APPLIES
WHERE VEGETATIVE STABILIZATION IS TO BE ESTABLISHED.

CRITERIA
A. SOIL PREPARATION
1. TEMPORARY STABILIZATION
   a. SEEDBED PREPARATION CONSISTS OF LOOSENING SOIL TO A DEPTH OF 3 TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT, SUCH AS DISC HARROWS OR CHISEL PLOWS OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT. AFTER THE SOIL IS LOOSENED, IT MUST NOT BE ROLLED OR DRAGGED SMOOTH BUT LEFT IN THE ROUGHENED CONDITION. SLOPES 3:1 OR FLATTER ARE TO BE TRACKED WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE.
   b. APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE PLANS.
   c. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
2. PERMANENT STABILIZATION
   a. A SOIL TEST IS REQUIRED FOR ANY EARTH DISTURBANCE OF 5 ACRES OR MORE. THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT ARE:
      i. SOIL PH BETWEEN 6.0 AND 7.0.
      ii SOLUBLE SALTS LESS THAN 500 PARTS PER MILLION (PPM).
      iii. SOIL CONTAINS LESS THAN 40 PERCENT CLAY BUT ENOUGH FINE GRAINED MATERIAL (GREATER THAN 30 PERCENT SILT PLUS CLAY)TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE. AN EXCEPTION: IF LOVEGRASS WILL BE PLANTED, THEN A SANDY SOIL (LESS THAN 30 PERCENT SILT PLUS CLAY) WOULD BE ACCEPTABLE.
      iv. SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT.
      v. SOIL CONTAINS SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
   b. APPLICATION OF AMENDMENTS OR TOPSOIL IS REQUIRED IF ON-SITE SOILS DO NOT MEET THE ABOVE CONDITIONS.
   c. GRADED AREAS MUST BE MAINTAINED IN A TRUE AND EVEN GRADE AS SPECIFIED ON THE APPROVED PLAN, THEN SCARIFIED OR OTHERWISE LOOSENED TO A DEPTH OF 3 TO 5 INCHES.
   d. APPLY SOIL AMENDMENTS AS SPECIFIED ON THE APPROVED PLAN OR AS INDICATED BY THE RESULTS OF A SOIL TEST.
   e. MIX SOIL AMENDMENTS INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS. RAKE LAWN AREAS TO SMOOTH THE SURFACE, REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES, AND READY THE AREA FOR SEED APPLICATION. LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE WHERE SITE CONDITIONS WILL NOT PERMIT NORMAL SEEDBED PREPARATION. TRACK SLOPES 3:1 OR FLATTER WITH TRACKED EQUIPMENT LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. LEAVE THE TOP 1 TO 3 INCHES OF SOIL LOOSE AND FRIABLE. SEEDBED LOOSENING MAY BE UNNECESSARY ON NEWLY DISTURBED AREAS.

B. TOPSOILING
1. TOPSOIL IS PLACED OVER PREPARED SUBSOIL PRIOR TO ESTABLISHMENT OF PERMANENT VEGETATION. THE PURPOSE IS TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH. SOILS OF CONCERN HAVE LOW MOISTURE CONTENT, LOW NUTRIENT LEVELS, LOW PH, MATERIALS TOXIC TO PLANTS, AND/OR UNACCEPTABLE SOIL GRADATION.
2. TOPSOIL SALVAGED FROM AN EXISTING SITE MAY BE USED PROVIDED IT MEETS THE STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SOIL TYPE CAN BE FOUND IN THE REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA-NRCS.
3. TOPSOILING IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:
   a. THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.
   b. THE SOIL MATERIAL IS SO SHALLOW THAT THE ROOTING ZONE IS NOT DEEP ENOUGH TO SUPPORT PLANTS OR FURNISH CONTINUING SUPPLIES OF MOISTURE AND PLANT NUTRIENTS.
   c. THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH.
   d. THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.
4. AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN.
5. TOPSOIL SPECIFICATIONS: SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING CRITERIA:
   a. TOPSOIL MUST BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, OR LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. TOPSOIL MUST NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND MUST CONTAIN LESS THAN 5 PERCENT BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1.5 INCHES IN DIAMETER.
   b. TOPSOIL MUST BE FREE OF NOXIOUS PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, NUT SEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.
   c. TOPSOIL SUBSTITUTES OR AMENDMENTS, AS RECOMMENDED BY A QUALIFIED AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY, MAY BE USED IN LIEU OF NATURAL TOPSOIL.
6. TOPSOIL APPLICATION
   a. EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED WHEN APPLYING TOPSOIL.
   b. UNIFORMLY DISTRIBUTE TOPSOIL IN A 5 TO 8 INCH LAYER AND LIGHTLY COMPACT TO A MINIMUM THICKNESS OF 4 INCHES. SPREADING IS TO BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS MUST BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.
   c. TOPSOIL MUST NOT BE PLACED IF THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.

B-4-2 (CONTINUED)

C. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)
1. SOIL TESTS MUST BE PERFORMED TO DETERMINE THE EXACT RATIOS AND APPLICATION RATES FOR BOTH LIME AND FERTILIZER ON SITES HAVING DISTURBED AREAS OF 5 ACRES OR MORE. SOIL ANALYSIS MAY BE PERFORMED BY A RECOGNIZED PRIVATE OR COMMERCIAL LABORATORY. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES MAY ALSO BE USED FOR CHEMICAL ANALYSES.
2. FERTILIZERS MUST BE UNIFORM IN COMPOSITION, FREE FLOWING AND SUITABLE FOR ACCURATE APPLICATION BY APPROPRIATE EQUIPMENT. MANURE MAY BE SUBSTITUTED FOR FERTILIZER WITH PRIOR APPROVAL FROM THE APPROPRIATE APPROVAL AUTHORITY. FERTILIZERS MUST ALL BE DELIVERED TO THE SITE FULLY LABELED ACCORDING TO THE APPLICABLE LAWS AND MUST BEAR THE NAME, TRADE NAME OR TRADEMARK AND WARRANTY OF THE PRODUCER.
3. LIME MATERIALS MUST BE GROUND LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED EXCEPT WHEN HYDROSEEDING) WHICH CONTAINS AT LEAST 50 PERCENT TOTAL OXIDES (CALCIUM OXIDE PLUS MAGNESIUM OXIDE). LIMESTONE MUST BE GROUND TO SUCH FINENESS THAT AT LEAST 50 PERCENT WILL PASS THROUGH A #100 MESH SIEVE AND 98 TO 100 PERCENT WILL PASS THROUGH A #20 MESH SIEVE.
4. LIME AND FERTILIZER ARE TO BE EVENLY DISTRIBUTED AND INCORPORATED INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
5. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, SPREAD GROUND LIMESTONE AT THE RATE OF 4 TO 8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL.

B-4-3 STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING

DEFINITION
THE APPLICATION OF SEED AND MULCH TO ESTABLISH VEGETATIVE COVER.

PURPOSE
TO PROTECT DISTURBED SOILS FROM EROSION DURING AND AT THE END OF CONSTRUCTION.

CONDITIONS WHERE PRACTICE APPLIES
TO THE SURFACE OF ALL PERIMETER CONTROLS, SLOPES, AND ANY DISTURBED AREA NOT UNDER ACTIVE GRADING.

CRITERIA
A. SEEDING
1. SPECIFICATIONS
   a. ALL SEED MUST MEET THE REQUIREMENTS OF THE MARYLAND STATE SEED LAW. ALL SEED MUST BE SUBJECT TO RE-TESTING BY A RECOGNIZED SEED LABORATORY. ALL SEED USED MUST HAVE BEEN TESTED WITHIN THE 6 MONTHS IMMEDIATELY PRECEDING THE DATE OF SOWING SUCH MATERIAL ON ANY PROJECT. REFER TO TABLE B.4 REGARDING THE QUALITY OF SEED. SEED TAGS MUST BE AVAILABLE UPON REQUEST TO THE INSPECTOR TO VERIFY TYPE OF SEED AND SEEDING RATE.
   b. MULCH ALONE MAY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES ONLY IF THE GROUND IS FROZEN. THE APPROPRIATE SEEDING MIXTURE MUST BE APPLIED WHEN THE GROUND THAWS.
   c. INOCULANTS: THE INOCULANT FOR TREATING LEGUME SEED IN THE SEED MIXTURES MUST BE A PURE CULTURE OF NITROGEN FIXING BACTERIA PREPARED SPECIFICALLY FOR THE SPECIES. INOCULANTS MUST NOT BE USED LATER THAN THE DATE INDICATED ON THE CONTAINER. ADD FRESH INOCULANTS AS DIRECTED ON THE PACKAGE. USE FOUR TIMES THE RECOMMENDED RATE WHEN HYDROSEEDING. NOTE: IT IS VERY IMPORTANT TO KEEP INOCULANT AS COOL AS POSSIBLE UNTIL USED. TEMPERATURES ABOVE 75 TO 80 DEGREES FAHRENHEIT CAN WEAKEN BACTERIA AND MAKE THE INOCULANT LESS EFFECTIVE.
   d. SOD OR SEED MUST NOT BE PLACED ON SOIL WHICH HAS BEEN TREATED WITH SOIL STERILANTS OR CHEMICALS USED FOR WEED CONTROL UNTIL SUFFICIENT TIME HAS ELAPSED (14 DAYS MIN.) TO PERMIT DISSIPATION OF PHYTO-TOXIC MATERIALS.
2. APPLICATION
   a. DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.
      i. INCORPORATE SEED INTO THE SUBSOIL AT THE RATES PRESCRIBED ON TEMPORARY SEEDING TABLE B.1, PERMANENT SEEDING TABLE B.3, OR SITE-SPECIFIC SEEDING SUMMARIES.
      ii. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION. ROLL THE SEEDED AREA WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED TO SOIL CONTACT.
   b. DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.
      i. CULTIPACKING SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A FASHION AS TO PROVIDE AT LEAST 1/4 INCH OF SOIL COVERING. SEEDBED MUST BE FIRM AFTER PLANTING.
      ii. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.
   c. HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLUDES SEED AND FERTILIZER).
      i. IF FERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLICATION RATES SHOULD NOT EXCEED THE FOLLOWING: NITROGEN, 100 POUNDS PER ACRE TOTAL OF SOLUBLE NITROGEN; P_2O_5 (PHOSPHOROUS), 200 POUNDS PER ACRE; K_2O (POTASSIUM), 200 POUNDS PER ACRE.
      ii. LIME: USE ONLY GROUND AGRICULTURAL LIMESTONE (UP TO 3 TONS PER ACRE MAY BE APPLIED BY HYDROSEEDING). NORMALLY, NOT MORE THAN 2 TONS ARE APPLIED BY HYDROSEEDING AT ANY ONE TIME. DO NOT USE BURNT OR HYDRATED LIME WHEN HYDROSEEDING.
      iii. MIX SEED AND FERTILIZER ON SITE AND SEED IMMEDIATELY AND WITHOUT INTERRUPTION.
      iv. WHEN HYDROSEEDING DO NOT INCORPORATE SEED INTO THE SOIL.

B. MULCHING
1. MULCH MATERIALS (IN ORDER OF PREFERENCE)
   a. STRAW CONSISTING OF THOROUGHLY THRESHED WHEAT, RYE, OAT, OR BARLEY AND REASONABLY BRIGHT IN COLOR. STRAW IS TO BE FREE OF NOXIOUS WEED SEEDS AS SPECIFIED IN THE MARYLAND SEED LAW AND NOT MUSTY, MOLDY, CAKED, DECAYED, OR EXCESSIVELY DUSTY. NOTE: USE ONLY STERILE STRAW MULCH IN AREAS WHERE ONE SPECIES OF GRASS IS DESIRED.
   b. WOOD CELLULOSE FIBER MULCH (WCFM) CONSISTING OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBROUS PHYSICAL STATE.
      i. WCFM IS TO BE DYED GREEN OR CONTAIN A GREEN DYE IN THE PACKAGE THAT WILL PROVIDE AN APPROPRIATE COLOR TO FACILITATE VISUAL INSPECTION OF THE UNIFORMLY SPREAD SLURRY.
      ii. WCFM, INCLUDING DYE, MUST CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.
      iii. WCFM MATERIALS ARE TO BE MANUFACTURED AND PROCESSED IN SUCH A MANNER THAT THE WOOD CELLULOSE FIBER MULCH WILL REMAIN IN UNIFORM SUSPENSION IN WATER UNDER AGITATION AND WILL BLEND WITH SEED, FERTILIZER AND OTHER ADDITIVES TO FORM A HOMOGENEOUS SLURRY. THE MULCH MATERIAL MUST FORM A BLOTTER-LIKE GROUND COVER, ON APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND MUST COVER AND HOLD GRASS SEED IN CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDLINGS.
      iv. WCFM MATERIAL MUST NOT CONTAIN ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTO-TOXIC.
      v. WCFM MUST CONFORM TO THE FOLLOWING PHYSICAL REQUIREMENTS: FIBER LENGTH OF APPROXIMATELY 10 MILLIMETERS, DIAMETER APPROXIMATELY 1 MILLIMETER, PH RANGE OF 4.0 TO 8.5, ASH CONTENT OF 1.6 PERCENT MAXIMUM AND WATER HOLDING CAPACITY OF 90 PERCENT MINIMUM.
2. APPLICATION
   a. APPLY MULCH TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.
   b. WHEN STRAW MULCH IS USED, SPREAD IT OVER ALL SEEDED AREAS AT THE RATE OF 2 TONS PER ACRE TO A UNIFORM LOOSE DEPTH OF 1 TO 2 INCHES. APPLY MULCH TO ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. WHEN USING A MULCH ANCHORING TOOL, INCREASE THE APPLICATION RATE TO 2.5 TONS PER ACRE.
   c. WOOD CELLULOSE FIBER USED AS MULCH MUST BE APPLIED AT A NET DRY WEIGHT OF 1500 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER TO ATTAIN A MIXTURE WITH A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.

B-4-3 (CONTINUED)

3. ANCHORING
   a. PERFORM MULCH ANCHORING IMMEDIATELY FOLLOWING APPLICATION OF MULCH TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), DEPENDING UPON THE SIZE OF THE AREA AND EROSION HAZARD:
      i. A MULCH ANCHORING TOOL IS A TRACTOR DRAWN IMPLEMENT DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE A MINIMUM OF 2 INCHES. THIS PRACTICE IS MOST EFFECTIVE ON LARGE AREAS, BUT IS LIMITED TO FLATTER SLOPES WHERE EQUIPMENT CAN OPERATE SAFELY. IF USED ON SLOPING LAND, THIS PRACTICE SHOULD FOLLOW THE CONTOUR.
      ii. WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. APPLY THE FIBER BINDER AT A NET DRY WEIGHT OF 750 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER AT A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
      iii. SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRO-TACK), DCA-70, PETROSET, TERRA TAX II, TERRA TACK AR OR OTHER APPROVED EQUAL MAY BE USED. FOLLOW APPLICATION RATES AS SPECIFIED BY THE MANUFACTURER. APPLICATION OF LIQUID BINDERS NEEDS TO BE HEAVIER AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. USE OF ASPHALT BINDERS IS STRICTLY PROHIBITED.
      iv. LIGHTWEIGHT PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER RECOMMENDATIONS. NETTING IS USUALLY AVAILABLE IN ROLLS 4 TO 15 FEET WIDE AND 300 TO 3,000 FEET LONG.

B-4-4 STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABILIZATION

DEFINITION
TO STABILIZE DISTURBED SOILS WITH VEGETATION FOR UP TO 6 MONTHS.

PURPOSE
TO USE FAST GROWING VEGETATION THAT PROVIDES COVER ON DISTURBED SOILS.

CONDITIONS WHERE PRACTICE APPLIES
EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR A PERIOD OF 6 MONTHS OR LESS. FOR LONGER DURATION OF TIME, PERMANENT STABILIZATION PRACTICES ARE REQUIRED.

CRITERIA

1. SELECT ONE OR MORE OF THE SPECIES OR SEED MIXTURES LISTED IN TABLE B.1 FOR THE APPROPRIATE PLANT HARDINESS ZONE (FROM FIGURE B.3), AND ENTER THEM IN THE TEMPORARY SEEDING SUMMARY BELOW ALONG WITH APPLICATION RATES, SEEDING DATES AND SEEDING DEPTHS. IF THIS SUMMARY IS NOT PUT ON THE PLAN AND COMPLETED, THEN TABLE B.1 PLUS FERTILIZER AND LIME RATES MUST BE PUT ON THE PLAN.

2. FOR SITES HAVING SOIL TESTS PERFORMED, USE AND SHOW THE RECOMMENDED RATES BY THE TESTING AGENCY. SOIL TESTS ARE NOT REQUIRED FOR TEMPORARY SEEDING.

3. WHEN STABILIZATION IS REQUIRED OUTSIDE OF A SEEDING SEASON, APPLY SEED AND MULCH OR STRAW MULCH ALONE AS PRESCRIBED IN SECTION B-4-3.A.1.B AND MAINTAIN UNTIL THE NEXT SEEDING SEASON.

TEMPORARY SEEDING SUMMARY

HARDINESS ZONE (FROM FIGURE B.3): 7A SEED MIXTURE (FROM TABLE B.1): SEE BELOW					FERTILIZER RATE (10-20-20)	LIME RATE
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS		
N/A	ANNUAL RYEGRASS	40	2/15-4/30 8/15-11/30	½IN.	436 LB/AC (10 LB/1000 SF)	2 TONS/AC (90 LB/1000 SF)
N/A	FOXTAIL MILLET (WARM SEASON)	30	5/1-8/14	½IN.		
N/A	PEARL MILLET (WARM SEASON)	20	5/1-8/14	½IN.		

MDE Al# - 181301
BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE
PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

EROSION AND SEDIMENT CONTROL NOTES

OWNER: SOUTH BALTIMORE GATEWAY PARTNERSHIP
101 WEST DICKMAN STREET, SUITE 1000
BALTIMORE, MD 21230
ph: 410.424.7593 / www.sbgpartnership.org

APPLICANT/DEVELOPER: GreenVest VISION - PERFORMANCE - RESULTS
4201 NORTHVIEW DRIVE, SUITE 202
BOWIE, MD 20716
ph: 410.987.5500 / www.greenvestus.com

COASTAL ENGINEERS: moffatt & nichol
2780 LIGHTHOUSE POINT E.
BALTIMORE, MD 21224
ph: 410.563.7300 / www.moffattnichol.com

RESTORATION ECOLOGISTS: Biohabitats
The Stables Building 2081 Clipper Park Road
Baltimore, MD 21211 / ph: 410.554.0156
fx: 410.554.0168 / www.biohabitats.com

12/09/24

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 26960 Expiration Date: 02/25/2026

APPROVAL			REVISIONS			
			NO.	DESCRIPTION	DATE	BY
			1	SCHEMATIC DESIGN (30%)	04/26/24	JP
			2	SITE DEVELOPMENT (65%)	08/09/24	JP
			3	FINAL DESIGN (100%)	12/09/24	JP

SCALE: NA
DATE: 1/29/2025
DRAWING NO. ES101
10 OF 20

10/22/2024:\Projects\22002.04 NOAA\CAD\Plans\EB-1\GN002-GENERAL NOTES.dwg

EROSION AND SEDIMENT CONTROL - STANDARD SPECIFICATIONS FOR BALTIMORE CITY PART 2 OF 2

SHEET REVISION DATE: NOVEMBER 15, 2022

B-4-5 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION

DEFINITION
TO STABILIZE DISTURBED SOILS WITH PERMANENT VEGETATION.

PURPOSE
TO USE LONG-LIVED PERENNIAL GRASSES AND LEGUMES TO ESTABLISH PERMANENT GROUND COVER ON DISTURBED SOILS.

CONDITIONS WHERE PRACTICE APPLIES
EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR 6 MONTHS OR MORE.

CRITERIA
A. SEED MIXTURES
1. GENERAL USE
a. SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED IN TABLE B.3 FOR THE APPROPRIATE PLANT HARDINESS ZONE(FROM FIGURE B.3) AND BASED ON THE SITE CONDITION OR PURPOSE FOUND ON TABLE B.2. ENTER SELECTED MIXTURE(S), APPLICATION RATES, AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN.
b. ADDITIONAL PLANTING SPECIFICATIONS FOR EXCEPTIONAL SITES SUCH AS SHORELINES, STREAM BANKS, OR DUNES OR FOR SPECIAL PURPOSES SUCH AS WILDLIFE OR AESTHETIC TREATMENT MAY BE FOUND IN USDA-NRCS TECHNICAL FIELD OFFICE GUIDE, SECTION 342 - CRITICAL AREA PLANTING.
c. FOR SITES HAVING DISTURBED AREA OVER 5 ACRES, USE AND SHOW THE RATES RECOMMENDED BY THE SOIL TESTING AGENCY.
d. FOR AREAS RECEIVING LOW MAINTENANCE, APPLY UREA FORM FERTILIZER (46-0-0) AT 3.5 POUNDS PER 1000 SQUARE FEET (150 POUNDS PER ACRE) AT THE TIME OF SEEDING IN ADDITION TO THE SOIL AMENDMENTS SHOWN IN THE PERMANENT SEEDING SUMMARY.
2. TURFGRASS MIXTURES
a. AREAS WHERE TURFGRASS MAY BE DESIRED INCLUDE LAWNS, PARKS, PLAYGROUNDS, AND COMMERCIAL SITES WHICH WILL RECEIVE A MEDIUM TO HIGH LEVEL OF MAINTENANCE.
b. SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED BELOW BASED ON THE SITE CONDITIONS OR PURPOSE. ENTER SELECTED MIXTURE(S), APPLICATION RATES, AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN.
i. KENTUCKY BLUEGRASS: FULL SUN MIXTURE: FOR USE IN AREAS THAT RECEIVE INTENSIVE MANAGEMENT. IRRIGATION REQUIRED IN THE AREAS OF CENTRAL MARYLAND AND EASTERN SHORE. RECOMMENDED CERTIFIED KENTUCKY BLUEGRASS CULTIVARS SEEDING RATE: 1.5 TO 2.0 POUNDS PER 1000 SQUARE FEET. CHOOSE A MINIMUM OF THREE KENTUCKY BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35 PERCENT OF THE TOTAL MIXTURE BY WEIGHT.
ii. KENTUCKY BLUEGRASS/PERENNIAL RYE: FULL SUN MIXTURE: FOR USE IN FULL SUN AREAS WHERE RAPID ESTABLISHMENT IS NECESSARY AND WHEN TURF WILL RECEIVE MEDIUM TO INTENSIVE MANAGEMENT. CERTIFIED PERENNIAL RYEGRASS CULTIVARS/CERTIFIED KENTUCKY BLUEGRASS SEEDING RATE: 2 POUNDS MIXTURE PER 1000 SQUARE FEET. CHOOSE A MINIMUM OF THREE KENTUCKY BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35 PERCENT OF THE TOTAL MIXTURE BY WEIGHT.
iii. TALL FESCUE/KENTUCKY BLUEGRASS: FULL SUN MIXTURE: FOR USE IN DROUGHT PRONE AREAS AND/OR FOR AREAS RECEIVING LOW TO MEDIUM MANAGEMENT IN FULL SUN TO MEDIUM SHADE. RECOMMENDED MIXTURE INCLUDES; CERTIFIED TALL FESCUE CULTIVARS 95 TO 100 PERCENT, CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 0 TO 5 PERCENT. SEEDING RATE: 5 TO 8 POUNDS PER 1000 SQUARE FEET. ONE OR MORE CULTIVARS MAY BE BLENDED.
iv. KENTUCKY BLUEGRASS/FINE FESCUE: SHADE MIXTURE: FOR USE IN AREAS WITH SHADE IN BLUEGRASS LAWNS. FOR ESTABLISHMENT IN HIGH QUALITY, INTENSIVELY MANAGED TURF AREA. MIXTURE INCLUDES; CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 30 TO 40 PERCENT AND CERTIFIED FINE FESCUE AND 60 TO 70 PERCENT. SEEDING RATE: 1.5 TO 3 POUNDS PER 1000 SQUARE FEET. NOTES: SELECT TURFGRASS VARIETIES FROM THOSE LISTED IN THE MOST CURRENT UNIVERSITY OF MARYLAND PUBLICATION, AGRONOMY MEMO #77, "TURFGRASS CULTIVAR RECOMMENDATIONS FOR MARYLAND" CHOOSE CERTIFIED MATERIAL. CERTIFIED MATERIAL IS THE BEST GUARANTEE OF CULTIVAR PURITY. THE CERTIFICATION PROGRAM OF THE MARYLAND DEPARTMENT OF AGRICULTURE, TURF AND SEED SECTION, PROVIDES A RELIABLE MEANS OF CONSUMER PROTECTION AND ASSURES A PURE GENETIC LINE.
c. IDEAL TIMES OF SEEDING FOR TURF GRASS MIXTURES
- WESTERN MD:
MARCH 15 TO JUNE 1, AUGUST 1 TO OCTOBER 1 (HARDINESS ZONES: 5B, 6A)
- CENTRAL MD:
MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONE: 6B)
- SOUTHERN MD, EASTERN SHORE:
MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONES: 7A, 7B)
d. TILL AREAS TO RECEIVE SEED BY DISKING OR OTHER APPROVED METHODS TO A DEPTH OF 2 TO 4 INCHES, LEVEL AND RAKE THE AREAS TO PREPARE A PROPER SEEDBED. REMOVE STONES AND DEBRIS OVER 1.5 INCHES IN DIAMETER. THE RESULTING SEEDBED MUST BE IN SUCH CONDITION THAT FUTURE MOWING OF GRASSES WILL POSE NO DIFFICULTY.
e. IF SOIL MOISTURE IS DEFICIENT, SUPPLY NEW SEEDINGS WITH ADEQUATE WATER FOR PLANT GROWTH 0.5 TO 1 INCH EVERY 3 TO 4 DAYS DEPENDING ON SOIL TEXTURE) UNTIL THEY ARE FIRMLY ESTABLISHED. THIS IS ESPECIALLY TRUE WHEN SEEDINGS ARE MADE LATE IN THE PLANTING SEASON, IN ABNORMALLY DRY OR HOT SEASONS, OR ON ADVERSE SITES.

B. SOD: TO PROVIDE QUICK COVER ON DISTURBED AREAS (2:1 GRADE OR FLATTER).
1. GENERAL SPECIFICATIONS
a. CLASS OF TURFGRASS SOD MUST BE MARYLAND STATE CERTIFIED. SOD LABELS MUST BE MADE AVAILABLE TO THE JOB FOREMAN AND INSPECTOR.
b. SOD MUST BE MACHINE CUT AT A UNIFORM SOIL THICKNESS OF 0.75 INCH, PLUS OR MINUS 0.25 INCH, AT THE TIME OF CUTTING. MEASUREMENT FOR THICKNESS MUST EXCLUDE TOP GROWTH AND THATCH. BROKEN PADS AND TORN OR UNEVEN ENDS WILL NOT BE ACCEPTABLE.
c. STANDARD SIZE SECTIONS OF SOD MUST BE STRONG ENOUGH TO SUPPORT THEIR OWN WEIGHT AND RETAIN THEIR SIZE AND SHAPE WHEN SUSPENDED VERTICALLY WITH A FIRM GRASP ON THE UPPER 10 PERCENT OF THE SECTION.
d. SOD MUST NOT BE HARVESTED OR TRANSPLANTED WHEN MOISTURE CONTENT (EXCESSIVELY DRY OR WET) MAY ADVERSELY AFFECT ITS SURVIVAL.
e. SOD MUST BE HARVESTED, DELIVERED, AND INSTALLED WITHIN A PERIOD OF 36 HOURS. SOD NOT TRANSPLANTED WITHIN THIS PERIOD MUST BE APPROVED BY AN AGRONOMIST OR SOIL SCIENTIST PRIOR TO ITS INSTALLATION.
2. SOD INSTALLATION
a. DURING PERIODS OF EXCESSIVELY HIGH TEMPERATURE OR IN AREAS HAVING DRY SUBSOIL, LIGHTLY IRRIGATE THE SUBSOIL IMMEDIATELY PRIOR TO LAYING THE SOD.
b. LAY THE FIRST ROW OF SOD IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLEL TO IT AND TIGHTLY WEDGED AGAINST EACH OTHER. STAGGER LATERAL JOINTS TO PROMOTE MORE UNIFORM GROWTH AND STRENGTH. ENSURE THAT SOD IS NOT STRETCHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED TIGHT IN ORDER TO PREVENT VOIDS WHICH WOULD CAUSE AIR DRYING OF THE ROOTS.
c. WHEREVER POSSIBLE, LAY SOD WITH THE LONG EDGES PARALLEL TO THE CONTOUR AND WITH STAGGERING JOINTS. ROLL AND TAMP, PEG OR OTHERWISE SECURE THE SOD TO PREVENT SLIPPAGE ON SLOPES. ENSURE SOLID CONTACT EXISTS BETWEEN SOD ROOTS AND THE UNDERLYING SOIL SURFACE.
d. WATER THE SOD IMMEDIATELY FOLLOWING ROLLING AND TAMPING UNTIL THE UNDERSIDE OF THE NEW SOD PAD AND SOIL SURFACE BELOW THE SOD ARE THOROUGHLY WET. COMPLETE THE OPERATIONS OF LAYING, TAMPING AND IRRIGATING FOR ANY PIECE OF SOD WITHIN EIGHT HOURS.
3. SOD MAINTENANCE
a. IN THE ABSENCE OF ADEQUATE RAINFALL, WATER DAILY DURING THE FIRST WEEK OR AS OFTEN AND SUFFICIENTLY AS NECESSARY TO MAINTAIN MOIST SOIL TO A DEPTH OF 4 INCHES. WATER SOD DURING THE HEAT OF THE DAY TO PREVENT WILTING.
b. AFTER THE FIRST WEEK, SOD WATERING IS REQUIRED AS NECESSARY TO MAINTAIN ADEQUATE MOISTURE CONTENT.
c. DO NOT MOW UNTIL THE SOD IS FIRMLY ROOTED. NO MORE THAN ONE THIRD OF THE GRASS LEAF MUST BE REMOVED BY THE INITIAL CUTTING OR SUBSEQUENT CUTTINGS. MAINTAIN A GRASS HEIGHT OF AT LEAST 3 INCHES UNLESS OTHERWISE SPECIFIED.

PERMANENT SEEDING SUMMARY

HARDINESS ZONE (FROM FIGURE B.3): 7A SEED MIXTURE (FROM TABLE B.3): SEE BELOW					FERTILIZER RATE (10-20-20)			LIME RATE
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	N	P_2O_5	K_2O	
	TALL FESCUE	60	2/15-4/30 8/15-10/31	¼-½ IN.	45 POUNDS PER ACRE (1.0 LB/ 1000 SF)	90 POUNDS PER ACRE (2 LB/ 1000 SF)	90 POUNDS PER ACRE (2 LB/ 1000 SF)	2 TONS/AC (90 LB/ 1000 SF)
	PERENNIAL RYEGRASS	20		¼-½ IN.				
	KENTUCKY BLUEGRASS	40		¼-½ IN.				

PERMANENT SEEDING NOTES
1. THE SEEDING DATES LISTED ARE AVERAGES FOR THE IDENTIFIED HARDINESS ZONE. WHEN SEEDING TOWARD THE END OF THE LISTED PLANTING DATES, OR WHEN CONDITIONS ARE EXPECTED TO BE LESS THAN OPTIMAL, SELECT AN APPROPRIATE NURSE CROP FROM THE TEMPORARY SEEDING SUMMARY FOUND ON THE EROSION AND SEDIMENT CONTROL - STANDARD SPECIFICATIONS FOR BALTIMORE CITY PART 1 OF 2, AND PLANT TOGETHER WITH THE PERMANENT SEEDING MIX.

2. SEEDING TOWARD THE END OF PLANTING DATE RANGES MAY REQUIRE SUPPLEMENTAL WATERING TO ENSURE PLANT ESTABLISHMENT.

3. FOR GUIDANCE ON STABILIZATION OUTSIDE OF A SEEDING SEASON, SEE B-4-4 STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABILIZATION FOUND ON EROSION AND SEDIMENT CONTROL PART - STANDARD SPECIFICATIONS FOR BALTIMORE CITY 1 OF 2.

B-4-7 STANDARDS AND SPECIFICATIONS FOR HEAVY USE AREA PROTECTION

DEFINITION
THE STABILIZATION OF AREAS FREQUENTLY AND INTENSIVELY USED BY SURFACING WITH SUITABLE MATERIALS (E.G., MULCH AND AGGREGATE).

PURPOSE
TO PROVIDE A STABLE, NON-ERODING SURFACE FOR AREAS FREQUENTLY USED AND TO IMPROVE WATER QUALITY FROM THE RUNOFF OF THESE AREAS.

CONDITIONS WHERE PRACTICE APPLIES
THIS PRACTICE APPLIES TO INTENSIVELY USED AREAS (E.G., EQUIPMENT AND MATERIAL STORAGE, STAGING AREAS, HEAVILY USED TRAVEL LANES).

CRITERIA

1. A MINIMUM 4-INCH BASE COURSE OF CRUSHED STONE OR OTHER SUITABLE MATERIALS INCLUDING WOOD CHIPS OVER NONWOVEN GEOTEXTILE SHOULD BE PROVIDED AS SPECIFIED IN SECTION H-1 MATERIALS
2. SELECT THE STABILIZING MATERIAL BASED ON THE INTENDED USE, DESIRED MAINTENANCE FREQUENCY, AND RUNOFF CONTROL.
3. THE TRANSPORT OF SEDIMENTS, NUTRIENTS, OILS, CHEMICALS, PARTICULATE MATTER ASSOCIATED WITH VEHICULAR TRAFFIC AND EQUIPMENT, AND MATERIAL STORAGE NEEDS TO BE CONSIDERED IN THE SELECTION OF MATERIAL. ADDITIONAL CONTROL MEASURES MAY BE NECESSARY TO CONTROL SOME OF THESE POTENTIAL POLLUTANTS.
4. SURFACE EROSION CAN BE A PROBLEM ON LARGE HEAVY USE AREAS. IN THESE SITUATIONS, MEASURES TO REDUCE THE FLOW LENGTH OF RUNOFF OR EROSIVE VELOCITIES NEED TO BE CONSIDERED.

MAINTENANCE
THE HEAVY USE AREAS MUST BE MAINTAINED IN A CONDITION THAT MINIMIZES EROSION. THIS MAY REQUIRE ADDING SUITABLE MATERIAL, AS SPECIFIED ON THE APPROVED PLANS, TO MAINTAIN A CLEAN SURFACE.

B-4-8 STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREA

DEFINITION
A MOUND OR PILE OF SOIL PROTECTED BY APPROPRIATELY DESIGNED EROSION AND SEDIMENT CONTROL MEASURES.

PURPOSE
TO PROVIDE A DESIGNATED LOCATION FOR THE TEMPORARY STORAGE OF SOIL THAT CONTROLS THE POTENTIAL FOR EROSION, SEDIMENTATION, AND CHANGES TO DRAINAGE PATTERNS.

CONDITIONS WHERE PRACTICE APPLIES
STOCKPILE AREAS ARE UTILIZED WHEN IT IS NECESSARY TO SALVAGE AND STORE SOIL FOR LATER USE.

CRITERIA

1. THE STOCKPILE LOCATION AND ALL RELATED SEDIMENT CONTROL PRACTICES MUST BE CLEARLY INDICATED ON THE EROSION AND SEDIMENT CONTROL PLAN.

2. THE FOOTPRINT OF THE STOCKPILE MUST BE SIZED TO ACCOMMODATE THE ANTICIPATED VOLUME OF MATERIAL AND BASED ON A SIDE SLOPE RATIO NO STEEPER THAN 2:1. BENCHING MUST BE PROVIDED IN ACCORDANCE WITH SECTION B-3 LAND GRADING.

3. RUNOFF FROM THE STOCKPILE AREA MUST DRAIN TO A SUITABLE SEDIMENT CONTROL PRACTICE.

4. ACCESS THE STOCKPILE AREA FROM THE UPGRADE SIDE.

5. CLEAR WATER RUNOFF INTO THE STOCKPILE AREA MUST BE MINIMIZED BY USE OF A DIVERSION DEVICE SUCH AS AN EARTH DIKE, TEMPORARY SWALE OR DIVERSION FENCE. PROVISIONS MUST BE MADE FOR DISCHARGING CONCENTRATED FLOW IN A NON-EROSIVE MANNER.

6. WHERE RUNOFF CONCENTRATES ALONG THE TOE OF THE STOCKPILE FILL, AN APPROPRIATE EROSION/SEDIMENT CONTROL PRACTICE MUST BE USED TO INTERCEPT THE DISCHARGE.

7. STOCKPILES MUST BE STABILIZED IN ACCORDANCE WITH THE 3/7 DAY STABILIZATION REQUIREMENT AS WELL AS STANDARD B-4-1 INCREMENTAL STABILIZATION AND STANDARD B-4-4 TEMPORARY STABILIZATION.

8. IF THE STOCKPILE IS LOCATED ON AN IMPERVIOUS SURFACE, A LINER SHOULD BE PROVIDED BELOW THE STOCKPILE TO FACILITATE CLEANUP. STOCKPILES CONTAINING CONTAMINATED MATERIAL MUST BE COVERED WITH IMPERMEABLE SHEETING.

MAINTENANCE
THE STOCKPILE AREA MUST CONTINUOUSLY MEET THE REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION. SIDE SLOPES MUST BE MAINTAINED AT NO STEEPER THAN A 2:1 RATIO. THE STOCKPILE AREA MUST BE KEPT FREE OF EROSION. IF THE VERTICAL HEIGHT OF A STOCKPILE EXCEEDS 20 FEET FOR 2:1 SLOPES, 30 FEET FOR 3:1 SLOPES, OR 40 FEET FOR 4:1 SLOPES, BENCHING MUST BE PROVIDED IN ACCORDANCE WITH SECTION B-3 LAND GRADING.

H-5 STANDARDS AND SPECIFICATIONS FOR DUST CONTROL

DEFINITION
CONTROLLING THE SUSPENSION OF DUST PARTICLES FROM CONSTRUCTION ACTIVITIES.

PURPOSE
TO PREVENT BLOWING AND MOVEMENT OF DUST FROM EXPOSED SOIL SURFACE TO REDUCE ON AND OFF-SITE DAMAGE INCLUDING HEALTH AND TRAFFIC HAZARDS.

CONDITIONS WHERE PRACTICE APPLIES
AREAS SUBJECT TO DUST BLOWING AND MOVEMENT WHERE ON AND OFF-SITE DAMAGE IS LIKELY WITHOUT TREATMENT.

SPECIFICATIONS

1. MULCHES: SEE SECTION B-4-2 SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS, SECTION B-4-3 SEEDING AND MULCHING, AND SECTION B-4-4 TEMPORARY STABILIZATION. MULCH MUST BE ANCHORED TO PREVENT BLOWING.

2. VEGETATIVE COVER: SEE SECTION B-4-4 TEMPORARY STABILIZATION.

3. TILLAGE: TILL TO ROUGHEN SURFACE AND BRING CLODS TO THE SURFACE. BEGIN PLOWING ON WINDWARD SIDE OF SITE. CHISEL-TYPE PLOWS SPACED ABOUT 12 INCHES APART, SPRING-TOOTHED HARROWS, AND SIMILAR PLOWS ARE EXAMPLES OF EQUIPMENT THAT MAY PRODUCE THE DESIRED EFFECT.

4. IRRIGATION: SPRINKLE SITE WITH WATER UNTIL THE SURFACE IS MOIST. REPEAT AS NEEDED. THE SITE MUST NOT BE IRRIGATED TO THE POINT THAT RUNOFF OCCURS.

5. BARRIERS: SOLID BOARD FENCES, SILT FENCES, SNOW FENCES, BURLAP FENCES, STRAW BALES, AND SIMILAR MATERIAL CAN BE USED TO CONTROL AIR CURRENTS AND SOIL BLOWING.

6. CHEMICAL TREATMENT: USE OF CHEMICAL TREATMENT REQUIRES APPROVAL BY THE APPROPRIATE PLAN REVIEW AUTHORITY.

SUPPLEMENTAL EROSION AND SEDIMENT CONTROL NOTES

1. FOR UTILITY TRENCHES OUTSIDE THE DRAINAGE AREA LIMITS OF EROSION AND SEDIMENT CONTROL (ESC) CONTROLS, THE CONTRACTOR SHALL OPEN ONLY A SECTION OF TRENCH THAT CAN BE BACKFILLED AND STABILIZED AT THE END OF EACH WORKDAY. NO DISTURBED AREA SHALL BE LEFT UNSTABILIZED OVERNIGHT. ANY EXCESS STOCKPILE MATERIAL SHALL BE REMOVED FROM THE SITE AT THE END OF EACH WORKDAY. FOR PERVIOUS SURFACES, THE USE OF ANY VEHICLE TRAFFIC IS PROHIBITED THE FIRST 24 HOURS AFTER A RAIN EVENT.

2. IF A STOCKPILE AREA IS NOT SHOWN ON THE APPROVED ESC PLAN, NO STOCKPILING SHALL BE ALLOWED. ALL EXCESS MATERIAL SHALL BE REMOVED FROM THE SITE AT THE END OF EACH WORK DAY AND SENT TO A DISPOSAL SITE GOVERNED BY AN APPROVED EROSION AND SEDIMENT CONTROL PLAN.

3. IF A STAGING AREA IS NOT SHOWN ON THE APPROVED ESC PLAN, NO STAGING AREA SHALL BE ALLOWED ON SITE. STAGING AREAS OUTSIDE OF THE LOD MUST BE LOCATED ON AN IMPERVIOUS SURFACE, AND SHALL NOT RESULT IN EARTH DISTURBANCE. STOCKPILES OF ERODIBLE MATERIAL WILL NOT BE PERMITTED AT A STAGING AREA

4. ALL DISTURBED AREAS SHALL BE STABILIZED PER THE STABILIZATION SCHEDULE.

5. THE ESC INSPECTOR HAS AUTHORITY TO REQUIRE ADDITIONAL ESC CONTROLS BEYOND THOSE SHOWN ON THE APPROVED ESC PLAN. ANY ADDITIONAL CONTROLS REQUIRED BY THE INSPECTOR SHALL BE PROVIDED BY THE CONTRACTOR AT THE DIRECTION OF THE INSPECTOR WITH 24 HOURS OF VERBAL NOTIFICATION BY THE ESC INSPECTOR.

6. WHERE NO STABILIZED CONSTRUCTION ENTRANCE (SCE) IS PROVIDED, THE CONTRACTOR SHALL DESIGNATE PIECES OF CONSTRUCTION EQUIPMENT THAT SHALL BE ALLOWED WITHIN THE LOD. THIS EQUIPMENT SHALL BE KEPT WITHIN THE LOD UNTIL THE PROPOSED WORK IS COMPLETE, AND SHALL HAVE TREADS/TIRES CLEANED PRIOR TO LEAVING THE LOD. ALL MATERIAL REMOVAL OR DELIVERY SHALL BE EITHER LIFTED FROM OR INTO THE LOD; AND, ANY SEDIMENT TRACKED OR DROPPED OUTSIDE THE LOD CLEANED IMMEDIATELY. FLUSHING WILL NOT BE PERMITTED.

7. WHERE SAME DAY STABILIZATION IS SPECIFIED ON THE ESC PLAN, IT SHALL BE CONSIDERED THE PRIMARY ESC CONTROL. ANY CONTROLS PROVIDED DOWNSTREAM OF AREAS SPECIFIED FOR SAME DAY STABILIZATION SHALL BE CONSIDERED SECONDARY CONTROLS UNLESS SPECIFIED OTHERWISE. (SECONDARY CONTROLS ARE DEFINED AS CONTROLS PROVIDED AS BACKUP MEASURES TO A PRIMARY CONTROL).

8. SAME DAY STABILIZATION IS DEFINED AS THE COMPLETION OF PROPOSED WORK WITHIN A DEFINED AREA WITH THE STIPULATION OF A NON-ERODIBLE SURFACE AT THE END OF EACH WORK DAY. EXAMPLES OF ACCEPTABLE NON-ERODIBLE SURFACES INCLUDE PAVEMENT, STEEL PLATES, A 2"MINIMUM STONE LAYER, OR STABILIZATION MATTING OVER PERMANENT SEEDING. THIRTY (30) MIL PLASTIC SHEETING WITH ANCHORING MAY BE CONSIDERED ACCEPTABLE IF EITHER SPECIFIED ON AN APPROVED PLAN, OR APPROVED BY THE ESC INSPECTOR. TEMPORARY SEEDING AND MULCH IS NOT CONSIDERED AN ACCEPTABLE SAME DAY STABILIZATION PRACTICE.

STANDARD STABILIZATION NOTE

FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN:

a. THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND

b. SEVEN (7) CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING

MAINTENANCE OF SEDIMENT CONTROL

CONTRACTOR SHALL, WITHOUT EXTRA COST TO THE PROJECT, REPAIR AND MAINTAIN EXISTING SEDIMENT CONTROL DEVICES UNTIL ALL AREAS WITHIN LIMITS OF CONSTRUCTION ARE STABILIZED. ALL SEDIMENT CONTROL MEASURES REFERRED TO ON THESE PLANS SHALL BE IN ACCORDANCE WITH THE PUBLICATION ENTITLED "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL".

ESC CERTIFICATIONS

OWNER'S/DEVELOPER'S CERTIFICATION
I/WE DO HEREBY CERTIFY THAT ANY CLEARING, GRADING , CONSTRUCTION, AND/OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVED PLAN AND ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE CERTIFICATION OF ATTENDANCE AT AN APPROVED MARYLAND DEPARTMENT OF THE ENVIRONMENTAL SEDIMENT AND EROSION CONTROL TRAINING PROGRAM PRIOR TO THE BEGINNING OF WORK. THE CITY'S DPW AND DHCD AND MDE WILL BE ALLOWED RIGHT OF ENTRY FOR PERIODIC ON-SITE EVALUATION.

PRINT NAME | SIGNATURE | DATE

ADDRESS | TELEPHONE NUMBER

ENGINEERS CERTIFICATION
I DO HEREBY CERTIFY THAT THIS PLAN FOR EROSION SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED UPON PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE BALTIMORE CITY OFFICE OF RESEARCH AND ENVIRONMENTAL PROTECTION.

PRINT NAME: Chris Streb | SIGNATURE | DATE: 1/22/2025

ADDRESS: 2081 Clipper Park Road, Baltimore MD, 21211 | TELEPHONE NUMBER: 667.401.8485

EROSION AND SEDIMENT CONTROL NOTES

1. THE CONTRACTOR WILL COMPLY WITH ALL REQUIREMENTS OF SEDIMENT AND EROSION CONTROL AS SET FORTH IN THE MARYLAND SEDIMENT AND EROSION MANUAL AND BALTIMORE CITY CODE ARTICLE 7.

2. SUBMIT A WRITTEN NOTIFICATION TO: THE DEPARTMENT OF PUBLIC WORKS, OFFICE OF RESEARCH AND ENVIRONMENTAL PROTECTION: 3001 DRUID PARK DRIVE, ROOM 228, BALTIMORE, MD 21215, PHONE NUMBER, 410-396-0732, DPW.ESCINSPECTIONS@BALTIMORECITY.GOV, AT LEAST 72 HOURS PRIOR TO START OF CONSTRUCTION STATING:
A. A REQUEST FOR A PRECONSTRUCTION MEETING,
B. WHEN CONTRACTOR INTENDS TO BEGIN CONSTRUCTION,
C. WHEN CONTRACTOR INTENDS TO INSTALL STORMWATER MANAGEMENT FACILITIES,
D. SOURCE OF BORROW MATERIAL,
E. LOCATION OF DISPOSAL AREA OF SITE MATERIAL,
F. CONTRACTOR'S TENTATIVE CLOSING DATE.

3. INITIAL DISTURBANCE WILL BE LIMITED TO THAT NECESSARY TO GAIN ENTRANCE TO THE SITE AND INSTALL NECESSARY SEDIMENT CONTROLS AS PER THE APPROVED PLANS.

4. ALL SEDIMENT CONTROLS AND CRITICAL SLOPES MUST BE STABILIZED WITHIN THREE (3) CALENDAR DAYS. ALL OTHER INACTIVE DISTURBED AREAS ON THE PROJECT SITE MUST BE STABILIZED WITHIN SEVEN (7) CALENDAR DAYS.

5. ALL EXCAVATED MATERIAL SHALL BE PLACED ON THE HIGH SIDE WHENEVER POSSIBLE AND CONFINED TO AN AREA WHERE IT WILL NOT BE OBSTRUCT THE NORMAL COURSE OF DRAINAGE.

6. PUMPING OF SEDIMENT LADEN WATER WILL NOT BE ALLOWED UNLESS IT IS FILTERED BY WAY OF AN APPROVED SEDIMENT TRAPPING DEVICE.

7. CONTINUOUS INSPECTION AND MAINTENANCE OF ALL SEDIMENT CONTROL DEVICES IS MANDATORY.

8. ANY SEDIMENT CONTROL DEVICES DISTURBED DURING UTILITY CONSTRUCTION MUST BE RESTORED IMMEDIATELY.

9. ALL POINTS OF INGRESS AND EGRESS SHALL BE PROTECTED TO MINIMIZE TRACKING OF MUD ON TO PUBLIC RIGHT-OF-WAYS.

10. ANY EARTH, GRAVEL, AND/OR OTHER MATERIAL TRACKED, SPILLED OR WASHED ON TO ADJACENT ROADS MUST BE IMMEDIATELY REMOVED AND DISPOSED OF IN A PROPER MANNER. NO FLUSHING WILL BE PERMITTED. ALL MATERIAL MUST BE REMOVED BY MEANS OF SHOVELING AND SWEEPING.

11. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 5,000 SQ. FT , THE CONTRACTOR SHALL HAVE A BALTIMORE CITY EROSION AND SEDIMENT CONTROL INSPECTOR INSPECT AND APPROVE THE WORK COMPLETED AT THE STAGES OF CONSTRUCTION SPECIFIED BELOW:
A. UPON COMPLETION OF THE INSTALLATION OF THE PERIMETER SEDIMENT CONTROLS;
B. DURING ALL GRADING AND BUILDING OPERATIONS;
C. UPON FINAL STABILIZATION OF THE ENTIRE SITE PRIOR TO REMOVAL OF THE SEDIMENT CONTROLS

12. THE CONTRACTOR SHALL NOT DEVIATE FROM THE APPROVED SEDIMENT AND EROSION CONTROL PLAN WITHOUT FIRST RECEIVING APPROVAL FROM THE OFFICE OF RESEARCH AND ENVIRONMENTAL PROTECTION. VARIATIONS TO THE ORIGINAL PLAN MUST BE SUBMITTED IN WRITING WITH ALL PROPOSED MODIFICATIONS STILL BEING HIGHLIGHTED. SUBSTANTIAL CHANGES WILL NECESSITATE AMENDMENT OF THE GRADING /BUILDING PERMIT.

EROSION AND SEDIMENT CONTROL WILL BE STRICTLY ENFORCED.

OWNER:
SOUTH BALTIMORE GATEWAY PARTNERSHIP
101 WEST DICKMAN STREET, SUITE 1000
BALTIMORE, MD 21230
ph: 410.424.7593 / www.sbgpartnership.org

APPLICANT/DEVELOPER:
GreenVest VISION - PERFORMANCE - RESULTS
4201 NORTHVIEW DRIVE, SUITE 202
BOWIE, MD 20716
ph: 410.987.5500 / www.greenvestus.com

COASTAL ENGINEERS:
moffatt & nichol
2780 LIGHTHOUSE POINT E,
BALTIMORE, MD 21224
ph: 410.563.7300 / www.moffattnichol.com

RESTORATION ECOLOGISTS:
Biohabitats
The Stables Building 2081 Clipper Park Road
Baltimore, MD 21211 / ph: 410.554.0156
fx: 410.554.0168 / www.biohabitats.com

12/09/24

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 26960 Expiration Date: 02/25/2026

APPROVAL				REVISIONS			
		/ /	NO.	DESCRIPTION	DATE	BY
		/ /	1	SCHEMATIC DESIGN (30%)	04/26/24	JP
		/ /	2	SITE DEVELOPMENT (65%)	08/09/24	JP
		/ /	3	FINAL DESIGN (100%)	12/09/24	JP
		/ /				

MDE A!# - 181301
BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE
PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

EROSION AND SEDIMENT CONTROL NOTES

SCALE: NA | DATE: 1/29/2025

DRAWING NO. ES102 | 11 OF 20

10/22/2024:\Projects\22002.04 NOAA\CAD\Plans\EB-1\GN002-GENERAL NOTES.dwg

SWM CERTIFICATIONS

SHEET REVISION DATE: May 18, 2022

OWNER'S/DEVELOPER'S CERTIFICATION

I/WE HEREBY CERTIFY THAT ALL PROPOSED WORK SHOWN IN THESE CONSTRUCTION DRAWING(S) AND APPROVED SEDIMENT CONTROL DRAWING(S) WILL BE ACCOMPLISHED PURSUANT TO THESE PLANS. I/WE ALSO UNDERSTAND THAT IT IS MY/OUR RESPONSIBILITY TO HAVE THE CONSTRUCTION SUPERVISED AND CERTIFIED INCLUDING THE SUBMITTAL OF "AS-BUILT" PLANS WITHIN THIRTY (30) DAYS OF COMPLETION, BY A REGISTERED PROFESSIONAL ENGINEER.

Brian Cramer	Signed by: Brian Cramer 39E6C0B37F6D4D8...	12/10/2024
PRINT NAME	**SIGNATURE**	**DATE**
4201 Northview Dr, Suite 202	908-319-8500	
ADDRESS Bowie, MD 20716	**TELEPHONE NUMBER**	

ENGINEERS CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED BY ME OR UNDER MY SUPERVISION AND MEETS THE MINIMUM STANDARDS OF BALTIMORE CITY DEPARTMENT OF PUBLIC WORKS REQUIREMENTS AND SPECIFICATIONS.

Chris Streb, PE		12/09/24
PRINT NAME	**SIGNATURE**	**DATE**
2081 Clipper Park Rd, Baltimore, MD 21211	667.401.8485	
ADDRESS	**TELEPHONE NUMBER**	

TABLE 1. - SITE IMPERVIOUS AREA REQUIRING TREATMENT (IART)

		SF	AC [2]
A	EX. IMP. AREA TREATED BY EXISTING WATER QUALITY FACILITY IMPACTED BY WORK	0	0
B	EXISTING IMPERVIOUS AREA WITHIN SSA [1]	0	0
C	PROPOSED IMPERVIOUS AREA WITHIN SSA [1]	0	0
D	NEW IMPERVIOUS AREA = (C - B) IF REDEVELOPMENT, ELSE = C	0	0
E	REDEVELOPMENT IMPERVIOUS AREA = {0.5 x (B-A)} IF REDEVELOPMENT, ELSE = 0	0	0
F	TOTAL IMPERVIOUS AREA TO TREAT {A + D + E}	0	0
G	TOTAL IMPERVIOUS AREA TREATED BY SWM	0	0
H	FEE PAID IN LIEU OF OR VARIANCE TREATMENT IMPERVIOUS AREA [3]	-	-
I	TOTAL IMPERVIOUS AREA ACCOUNTED (G+H)	0	0

NOTES
1. SSA = STORMWATER STUDY AREA
2. ROUND ACRES TO NO MORE THAN 2 PLACES AFTER THE DECIMAL POINT.
3. CIRCLE FEE AND/OR VARIANCE AS APPLICABLE.

TABLE 2 - SITE ESDv & Rev REQUIREMENTS

	REQ. (cf)	PRO. (cf)	NOTES
ESDv	1543	0	
Rev	-	-	SEE NOTE

NOTE: CLASSIFIED AS RESTORATION AND IT IS MET BY IMPROVING WATER QUALITY THAT ENTERS BALTIMORE HARBOR AND PATAPSCO RIVER THROUGH THE RESTORATION OF 5.0 AC OF NEW TIDAL WETLANDS

TABLE 3. STORMWATER MANAGMENT DISCHARGE SUMMARY

	REQUIREMENT	EXISTING DISCHARGE (CFS)	PROPOSED DISCHARGE w/SWM (CFS)	NOTES
POI 1	Q_1	-	-	NO CHANGE TO DISCHARGE AT POI 1
	Q_{10}	-	-	NO CHANGE TO DISCHARGE AT POI 1
	Q_{100}	-	-	NO CHANGE TO DISCHARGE AT POI 1
TOTALS [1]	Q_1	-	-	NO CHANGE TO DISCHARGE AT POI 1
	Q_{10}	-	-	NO CHANGE TO DISCHARGE AT POI 1
	Q_{100}	-	-	NO CHANGE TO DISCHARGE AT POI 1

NOTES
1. TOTALS ARE THE ALGEBRAIC SUM OF ALL POI'S FOR EACH EVENT.

TABLE 4. FACILITY DESIGN SUMMARY TABLE

PRACTICE ID	DIMENSIONS [1]	DRAINAGE AREA (ac)	IMPERVIOUS AREA (ac)	ESDv VOLUME REQUIRED, (cf) [2]	STORAGE VOLUME PROVIDED, ESD. (cf) [3]	TREATMENT VOLUME CREDITED, ESD. (cf) [4]	RECHARGE VOLUME PROVIDED (cf) [5]	TARGET PE (in) [6]	PE PROVIDED (in) [7]	IS FACILITY USED FOR 10-&100-YEAR QUANTITY CONTROL? (Y/N)	NOTES
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
	TOTALS	-	-	-	-	-	-				-

NOTES
1. SHOW SURFACE AREA OR L x W, ESDv PONDING DEPTH, FILTER MEDIA THICKNESS OR OTHER RELEVANT DESIGN DATA.
2. DESIGN ESDv FOR THE PRACTICE'S DRAINAGE AREA.
3. STORAGE VOLUME PHYSICALLY PROVIDED IN THE PRACTICE.
4. TREATMENT VOLUME = STORAGE VOLUME FOR MOST PRACTICES. TREATMENT VOLUME =(STORAGE VOLUME PROVIDED / 0.75) FOR MICROBIORETENTION, SUBMERGED GRAVEL WETLANDS, BIOSWALES, WET SWALES, SAND FILTERS, BIORETENTION, AND PROPRIETARY SWM SYSTEMS WITH MDE APPROVAL LETTERS INDICATING TEMPORARY STORAGE EQUAL TO 75% OF ESDv.
5. RECHARGE VOLUME PROVIDED = STONE VOLUME UNDER UNDERDRAIN x 0.4 VOID RATIO
6. TARGET PE = PE FOR PRACTICE'S DRAINAGE AREA'S SOIL GROUP AND % IMPERVIOUS
7. PE PROVIDED = (TREATMENT VOLUME CREDITED x 12) / (RV x PRACTICE'S DRAINAGE AREA)
8. INCLUDE QUANTITY CONTROL ONLY FACILITIES IN TABLE, BUT TALLY IMP. AREA AND TREATMENT AS NOT APPLICABLE - N/A

NOTES:

1. TABLE 3 AND TABLE 4 ARE NOT APPLICABLE TO THIS RESTORATION PROJECT.

MDE AI# - 181301

BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

EROSION AND SEDIMENT CONTROL NOTES

SCALE: NA DATE: 1/29/2025

DRAWING NO. ES103 12 OF 20

OWNER: SOUTH BALTIMORE GATEWAY PARTNERSHIP
101 WEST DICKMAN STREET, SUITE 1000
BALTIMORE, MD 21230
ph: 410.424.7593 / www.sbgpartnership.org

APPLICANT/DEVELOPER: GreenVest VISION - PERFORMANCE - RESULTS
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COASTAL ENGINEERS: moffatt & nichol
2780 LIGHTHOUSE POINT E.
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ph: 410.563.7300 / www.moffattnichol.com

RESTORATION ECOLOGISTS: Biohabitats
The Stables Building 2081 Clipper Park Road
Baltimore, MD 21211 / ph: 410.554.0156
fx: 410.554.0168 / www.biohabitats.com

STATE OF MARYLAND — CHRISTOPHER STREB — No. 26960 — PROFESSIONAL ENGINEER

12/09/24

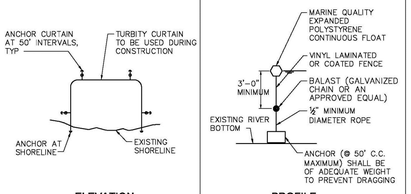
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 26960 Expiration Date: 02/25/2026

APPROVAL				REVISIONS			
		/ /	NO.	DESCRIPTION	DATE	BY
		/ /	1	SCHEMATIC DESIGN (30%)	04/26/24	JP
		/ /	2	SITE DEVELOPMENT (65%)	08/09/24	JP
		/ /	3	FINAL DESIGN (100%)	12/09/24	JP
		/ /				

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TURBIDITY CONTROL CURTAIN

STANDARD SYMBOL: TC



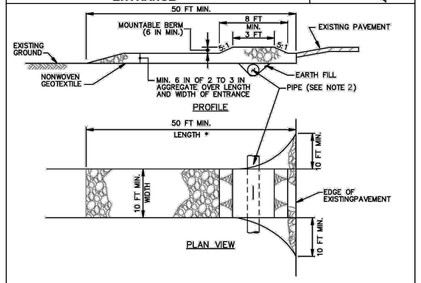
ELEVATION N.T.S. **PROFILE** N.T.S.

STANDARDS AND SPECIFICATIONS FOR TURBIDITY CONTROL CURTAIN

1. THE CONTRACTOR SHALL FURNISH, INSTALL AND MAINTAIN TURBIDITY CONROL CURTAIN, TO ENCLOSE THE WATERWAY. THE PURPOSE OF THE CURTAIN IS TO AVOID ANY DEBRIS FROM GOING INTO THE MAIN WATERS. THE CONTRACTOR HAS THE OPTION TO ENCLOSE THE ENTIRE WATERSIDE OF THE SITE, WITHIN THE LIMITS OF DISTURBANCE, OR TO INSTALL AND MOVE THE CURTAIN IN STAGES. THE CONTRACTOR SHALL MAINTAIN SUCH CURTAINS AT ALL TIMES IN THE AREAS WHERE WORK IS IN PROGRESS. THE TURBIDITY CONTROL CURTAIN SHALL BE NYLON REINFORCED VINYL SUSPENDED FROM FLEXIBLE FLOATS. LOADS SHALL BE TAKEN BY GALVANIZED STEEL CABLES AND THE SKIRT SHALL BE BALLASTED. THE MATERIALS OF THE CURTAIN SHALL MEET OR EXCEED THE FOLLOWING REQUIREMENTS:
   A. FABRIC: 22 OZ. - 500 LB/IN TENSILE STRENGTH VINYL COATED NYLON
   B. FLOATATION: 12" MARINE QUALITY ROLLED MICROFOAM
   C. MAIN LOAD LINES: ¾" VINYL SHEATED GALVANIZED STEEL CABLES (OVER 19,000 LB BREAK STRENGTH)
   D. BALLAST: 1.5 LB/FT. ENCLOSED ¾" GALVANIZED CHAIN
   E. THE GENERAL CONSTRUCTION OF THE CURTAIN SHALL COMPLY WITH THE REQUIREMENTS OF THE DEPARTMENT OF THE DEFENSE SPECIFICATION MIL-B-21617 (YD).
2. A SAMPLE OF THE TURBIDITY CONTROL CURTAIN SHALL BE SUBMITTED AT THE REQUEST OF THE AGENCY INSPECTOR OR THE WMA INSPECTOR FOR APPROVAL.
3. APPROXIMATELY 2,000 LF OF TURBIDITY CURTAIN REQUIRED.
4. THE CURTAIN SHALL BE ANCHORED AT 50 FT INTERVALS. PROVIDE A BUOY AT EACH ANCHOR LOCATION.

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

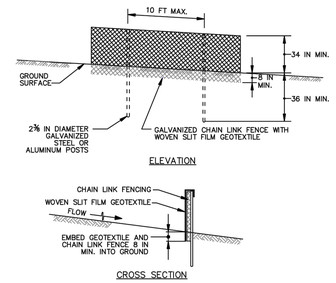
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: SSF



CONSTRUCTION SPECIFICATIONS

1. INSTALL 2¾ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2¾ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HOG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

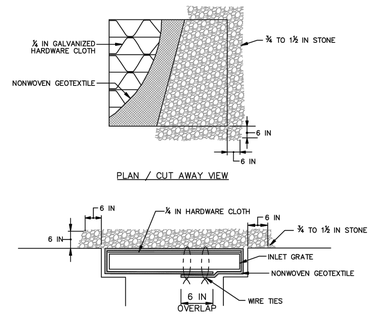
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-2 AT-GRADE INLET PROTECTION

STANDARD SYMBOL: AGIP

MAXIMUM DRAINAGE AREA = 1 ACRE



CONSTRUCTION SPECIFICATIONS

1. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
2. LIFT GRATE AND WRAP WITH NONWOVEN GEOTEXTILE TO COMPLETELY COVER ALL OPENINGS. SECURE WITH WIRE TIES AND SET GRATE BACK IN PLACE.
3. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE 6 INCHES THICK ON THE GRATE.
4. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

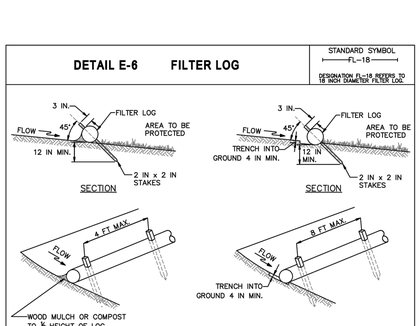
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

E.26

DETAIL E-6 FILTER LOG

STANDARD SYMBOL: FL-18

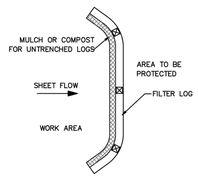
DESIGNATION FL-18 REFERS TO 18 INCH DIAMETER FILTER LOG.



UNTRENCHED INSTALLATION OR ENTRENCHED INSTALLATION*

*THIS APPLICATION MAY NOT BE USED WITH LOGS SMALLER THAN 12 IN.

ISOMETRIC VIEW



PLAN

1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-6 FILTER LOG

STANDARD SYMBOL: FL-18

DESIGNATION FL-18 REFERS TO 18 INCH DIAMETER FILTER LOG.

CONSTRUCTION SPECIFICATIONS

1. PRIOR TO INSTALLATION, CLEAR ALL OBSTRUCTIONS INCLUDING ROCKS, CLODS, AND DEBRIS GREATER THAN ONE INCH THAT MAY INTERFERE WITH PROPER FUNCTION OF FILTER LOG.
2. FILL LOG NETTING UNIFORMLY WITH COMPOST (IN ACCORDANCE WITH SECTION H-1 MATERIALS), OR OTHER APPROVED BIODEGRADABLE MATERIAL TO DESIRED LENGTH SUCH THAT LOGS DO NOT DEFORM.
3. INSTALL FILTER LOGS PERPENDICULAR TO THE FLOW DIRECTION AND PARALLEL TO THE SLOPE WITH THE BEGINNING AND END OF THE INSTALLATION POINTING SLIGHTLY UP THE SLOPE CREATING A "J" SHAPE AT EACH END TO PREVENT BYPASS.
4. FOR UNTRENCHED INSTALLATION BLOW OR HAND PLACE MULCH OR COMPOST ON UPHILL SIDE OF THE SLOPE ALONG LOG.
5. STAKE FILTER LOG EVERY 4 FEET OR CLOSER ALONG ENTIRE LENGTH OF LOG OR TRENCH LOG INTO GROUND A MINIMUM OF 4 INCHES AND STAKE LOG EVERY 8 FEET OR CLOSER.
6. USE STAKES WITH A MINIMUM NOMINAL CROSS SECTION OF 2X2 INCH AND OF SUFFICIENT LENGTH TO ATTAIN A MINIMUM OF 12 INCHES INTO THE GROUND AND 3 INCHES PROTRUDING ABOVE LOG.
7. WHEN MORE THAN ONE LOG IS NEEDED, OVERLAP ENDS 12 INCHES MINIMUM AND STAKE.
8. REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO A DEPTH OF ½ THE EXPOSED HEIGHT OF LOG AND REPLACE MULCH. REPLACE FILTER LOG IF TORN. REINSTALL FILTER LOG IF UNDERMINING OR DISLODGING OCCURS. REPLACE CLOGGED FILTER LOGS. FOR PERMANENT APPLICATIONS, ESTABLISH AND CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

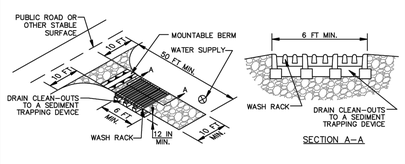
2 OF 2

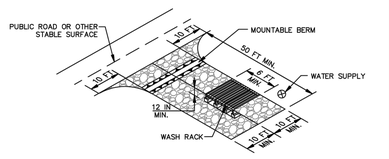
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-2 WASH RACK OPTION

STANDARD SYMBOL: WR





CONSTRUCTION SPECIFICATIONS

1. USE A WASH RACK DESIGNED AND CONSTRUCTED/MANUFACTURED FOR THE ANTICIPATED TRAFFIC LOADS. CONCRETE, STEEL, OR OTHER MATERIALS ARE ACCEPTABLE. PRE-FABRICATED UNITS SUCH AS CATTLE GUARDS ARE ACCEPTABLE. USE MINIMUM DIMENSION OF 6 FEET x 10 FEET. ORIENT DIRECTION OF RIBS AS SHOWN ON THE DETAIL.
2. INSTALL PRIOR TO, ALONG SIDE OF, OR AS PART OF THE SCE.
3. DIRECT WASH WATER TO AN APPROVED SEDIMENT TRAPPING DEVICE.
4. KEEP AREA UNDER WASH RACK FREE OF ACCUMULATED SEDIMENT. IF DAMAGED, REPAIR OR REPLACE WASH RACK.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

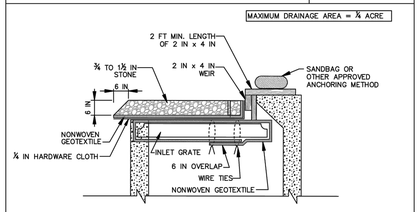
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

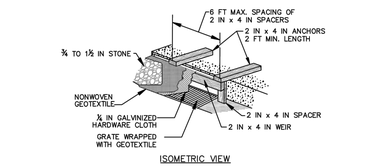
B.4

DETAIL E-9-6 COMBINATION INLET PROTECTION

STANDARD SYMBOL: COIP

MAXIMUM DRAINAGE AREA = ¾ ACRE





1 OF 2

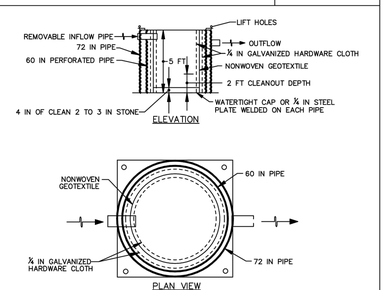
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

E.30

DETAIL F-3 PORTABLE SEDIMENT TANK

STANDARD SYMBOL: PST



CONSTRUCTION SPECIFICATIONS

1. PROVIDE 1 CUBIC FOOT OF STORAGE FOR EACH GALLON PER MINUTE OF PUMP CAPACITY. REQUIRED STORAGE VOLUME MAY BE ATTAINED BY PLACEMENT OF TANKS IN PARALLEL WITH INFLOW EVENLY DISTRIBUTED AMONG TANKS. OVERTOPPING OF TANKS IS NOT PERMITTED.
2. USE 60 INCH CORRUGATED METAL OR PLASTIC PIPE WITH 1 INCH DIAMETER PERFORATIONS, 6 INCHES ON CENTER FOR THE INNER PIPE. LINE PIPE WITH NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, SANDWICHED BETWEEN, AND ATTACHED TO, ¾ INCH HARDWARE CLOTH.
3. OVERLAP GEOTEXTILE 8 INCHES MINIMUM AT VERTICAL SEAM AND AT THE BOTTOM PLATE.
4. ANCHOR GEOTEXTILE AT BOTTOM OF TANK WITH 4 INCHES OF 2 TO 3 INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE.
5. USE 72 INCH CORRUGATED METAL OR PLASTIC OUTER PIPE WITH PERMANENT OUTFLOW PIPE WITH INVERT LOWER THAN INFLOW PIPE
6. INFLOW PIPE MUST DISCHARGE INTO INNER PIPE AND BE REMOVABLE.
7. PLACE TANK ON LEVEL SURFACE AND DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
8. A PORTABLE SEDIMENT TANK REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT FROM INNER PIPE WHEN IT REACHES TWO FEET IN DEPTH. IF SYSTEM CLOGS, PULL OUT INNER PIPE, REMOVE ACCUMULATED SEDIMENT, AND REPLACE GEOTEXTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

F.7

MDE A/# - 181301
BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

EROSION AND SEDIMENT CONTROL DETAILS

SCALE: NOT TO SCALE DATE: 1/29/2025

DRAWING NO. ES104 13 OF 20

OWNER:	APPLICANT/DEVELOPER:	COASTAL ENGINEERS:	RESTORATION ECOLOGISTS:
SOUTH BALTIMORE GATEWAY PARTNERSHIP 101 WEST DICKMAN STREET, SUITE 1000 BALTIMORE, MD 21230 ph: 410.424.7593 / www.sbgpartnership.org	GreenVest VISION - PERFORMANCE - RESULTS 4201 NORTHVIEW DRIVE, SUITE 202 BOWIE, MD 20716 ph: 410.987.5500 / www.greenvestus.com	moffatt & nichol 2780 LIGHTHOUSE POINT E. BALTIMORE, MD 21224 ph: 410.563.7300 / www.moffattnichol.com	Biohabitats The Stables Building 2081 Clipper Park Road Baltimore, MD 21211 / ph: 410.554.0156 fx: 410.554.0168 / www.biohabitats.com

12/09/24

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 25960 Expiration Date: 02/25/2026

APPROVAL			REVISIONS			
			NO.	DESCRIPTION	DATE	BY
			1	SCHEMATIC DESIGN (30%)	04/26/24	JP
			2	SITE DEVELOPMENT (65%)	08/09/24	JP
			3	FINAL DESIGN (100%)	12/09/24	JP

10/22/2024 I:\Projects\22002.04 NOAA\CAD\Plans\EB-1\GN002-GENERAL NOTES.dwg

HABITAT LEGEND

SHALLOW OPEN WATER	TIDAL RANGE: < -0.62'	AREA: 15,691 SF / 0.36 AC
MUDFLAT ZONE	TIDAL RANGE: -0.62' TO 0.05'	AREA: 13,297 SF / 0.31 AC
LOW MARSH ZONE	TIDAL RANGE: 0.05' TO 0.53'	AREA: 23,882 SF / 0.55 AC
HIGH MARSH ZONE	TIDAL RANGE: 0.53' TO 1.1'	AREA: 37,462 SF / 0.86 AC
SUPRATIDAL ZONE	TIDAL RANGE: 1.1' TO 2.5'	AREA: 127,072 SF / 2.93 AC
RIPARIAN BUFFER ZONE	TIDAL RANGE: 2.5' + 3.0'	AREA: 11,560 SF / 0.27 AC

*PLAN ELEMENTS CONTAIN COLOR. TO AVOID MISINTERPRETATION, IT IS RECOMMENDED TO PRINT THIS SHEET IN COLOR.

MIXED GRAVEL AND SAND LOW PROFILE SILL

WOODY VENT STRUCTURE

ROOTWAD STRUCTURE

~~CHRISTMAS TREE FASCINE STRUCTURE~~

BASKING LOG

STANDING SNAG

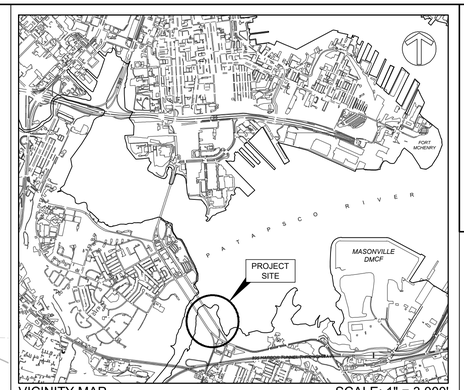
BRUSH PILE

1 / 75100 TYPICAL SECTION

TOTAL AREA OF PROPOSED LOW MARSH	TOTAL AREA OF PROPOSED HIGH MARSH
23,883 SF (0.55 AC)	37,583 SF (0.86 AC)

TOTAL AREA OF PROPOSED LOW MARSH WATERWARD OF EXISTING PHRAG MARSH	TOTAL AREA OF PROPOSED HIGH MARSH WATERWARD OF EXISTING PHRAG MARSH
0 SF (0.0 AC)	0 SF (0.0 AC)

PROPOSED FILL WATERWARD OF MHHW
13,939 SF (0.32 AC)



VICINITY MAP SCALE: 1" = 3,000'

S. HANOVER STREET

POTEE STREET

FRANKFURST AVE

PATAPSCO RIVER FLOW

(13) BASKING LOGS TO BE INSTALLED INTO CHANNEL EDGE

CURVILINEAR TIDAL CHANNEL EXCAVATED THROUGH EXISTING MARSH. CUT MATERIAL TO BE USED ONSITE TO ACHIEVE CUT/FILL BALANCE.

(19) STANDING SNAG HABITAT FEATURES. SNAGS IN THE LOW MARSH

SELECTIVE NATIVE TREE PLANTING IN THE CRITICAL AREA BUFFER ARE INCLUDED IN THE RIPARIAN BUFFER SCHEDULE. SEE LA100 & 101 FOR SPECIES LOCATION.

(5) CHRISTMAS TREE FASCINE STRUCTURES

(1) GROUP OF 8 ROOTWADS

(2) 50' LARGE WOODY VENT STRUCTURES PLACED IN OPENINGS OF GRAVEL BEACH. SEE DETAIL ON DT100.

(13) HABITAT BRUSH PILES LOCATED IN HIGH AND LOW MARSH AREAS.

1 PC101 2 PC101 3 PC101

TOP MH=7.51' INV=-0.77'

TOP MH=7.01' INV=3.18'

INV=5.86'

TOP MH=8.77' CANNOT OPEN

EP: 11+12.61

1+00.00 2+00.00 3+00.00 4+00.00 5+00.00 6+00.00 7+00.00 8+00.00 9+00.00 10+00.00 11+00.00 11+12.61

0+00.00 BP

HORIZONTAL SCALE
0 50 100

MDE AI# - 181301
BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE
PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

PROPOSED CONDITIONS PLAN

OWNER: SOUTH BALTIMORE GATEWAY PARTNERSHIP
101 WEST DICKMAN STREET, SUITE 1000
BALTIMORE, MD 21230
ph: 410.424.7593 / www.sbgpartnership.org

APPLICANT/DEVELOPER: GreenVest VISION · PERFORMANCE · RESULTS
4201 NORTHVIEW DRIVE, SUITE 202
BOWIE, MD 20716
ph: 410.987.5500 / www.greenvestus.com

COASTAL ENGINEERS: moffatt & nichol
2780 LIGHTHOUSE POINT E,
BALTIMORE, MD 21224
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RESTORATION ECOLOGISTS: Biohabitats
The Stables Building 2081 Clipper Park Road
Baltimore, MD 21211 / ph: 410.554.0156
fx: 410.554.0168 / www.biohabitats.com

12/09/24

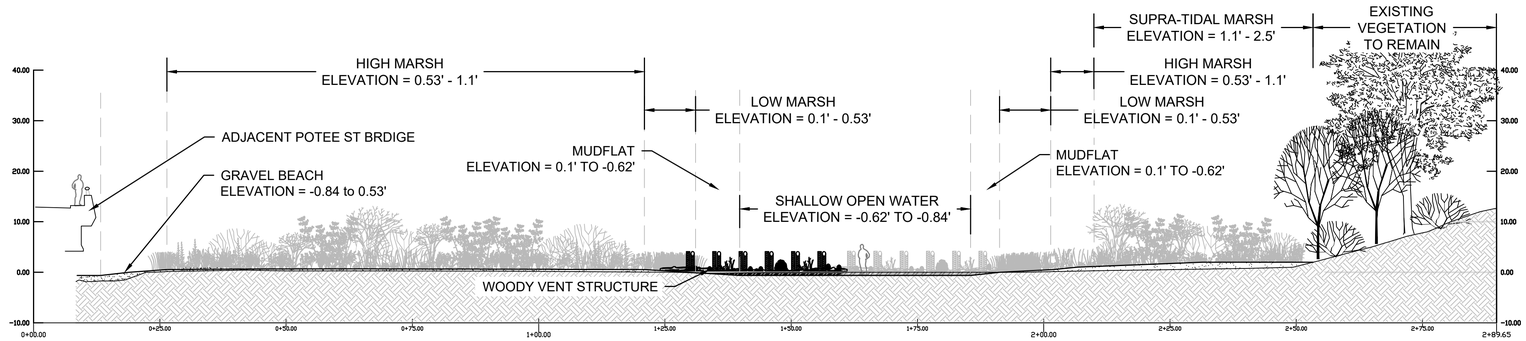
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APPROVAL			REVISIONS			
			NO.	DESCRIPTION	DATE	BY
			1	SCHEMATIC DESIGN (30%)	04/26/24	JP
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			3	FINAL DESIGN (100%)	12/09/24	JP

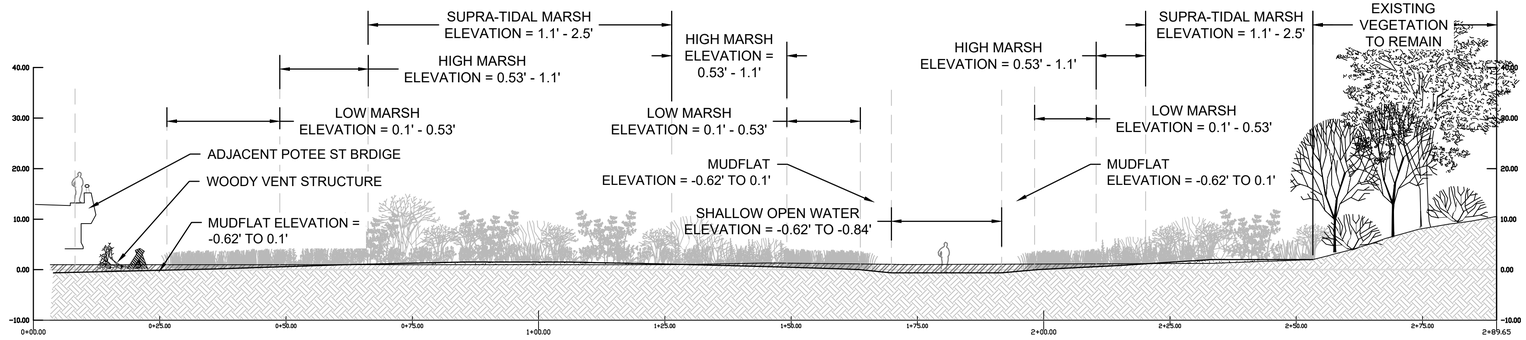
SCALE: 1" = 50' DATE: 1/29/2025

DRAWING NO. PC100 14 OF 20

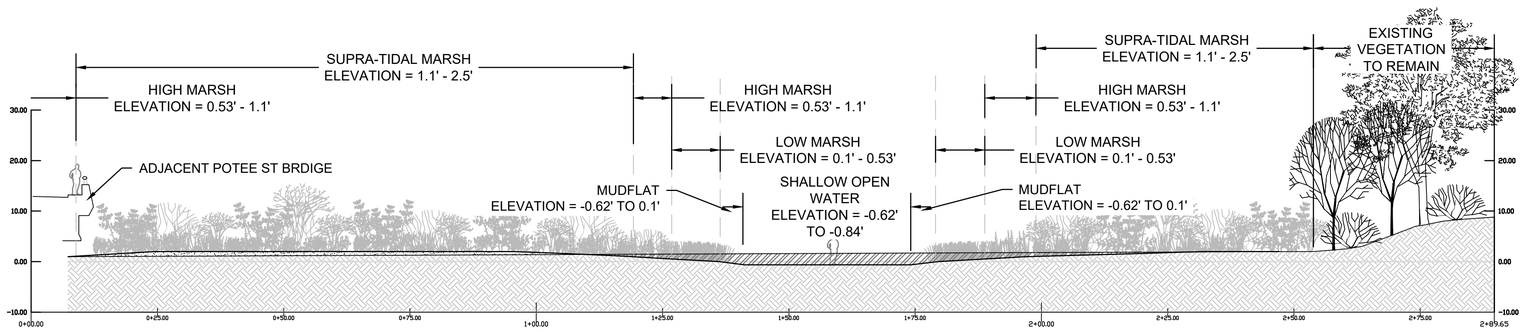
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TYPICAL SITE SECTION 1



TYPICAL SITE SECTION 2



TYPICAL SITE SECTION 3

HORIZONTAL SCALE
0 15 30

VERTICAL SCALE
30
15
0

OWNER:
SOUTH BALTIMORE GATEWAY PARTNERSHIP
101 WEST DICKMAN STREET, SUITE 1000
BALTIMORE, MD 21230
ph: 410.424.7593 / www.sbgpartnership.org

APPLICANT/DEVELOPER:
GreenVest
VISION - PERFORMANCE - RESULTS
4201 NORTHVIEW DRIVE, SUITE 202
BOWIE, MD 20716
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COASTAL ENGINEERS:
moffatt & nichol
2780 LIGHTHOUSE POINT E,
BALTIMORE, MD 21224
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RESTORATION ECOLOGISTS:
Biohabitats
The Stables Building 2081 Clipper Park Road
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12/09/24

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Expiration Date: 02/25/2026

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		/ /	3	FINAL DESIGN (100%)	12/09/24	JP
		/ /				

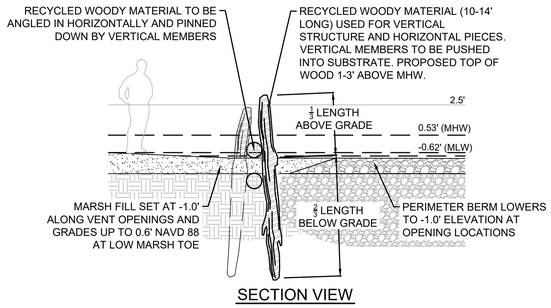
MDE AI# - 181301
BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

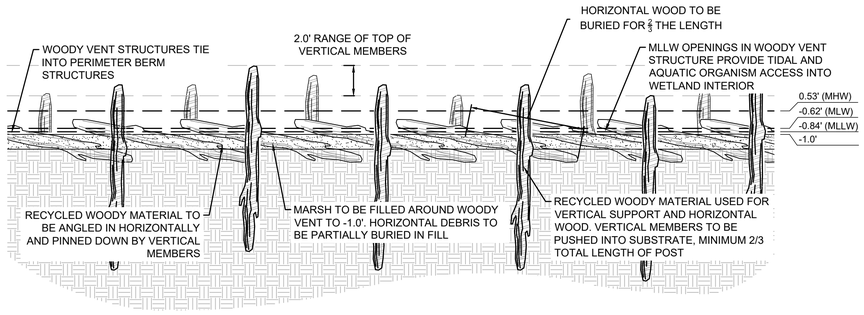
TYPICAL SECTIONS

SCALE: AS SHOWN
DATE: 1/29/2025
DRAWING NO. PC101
15 OF 20

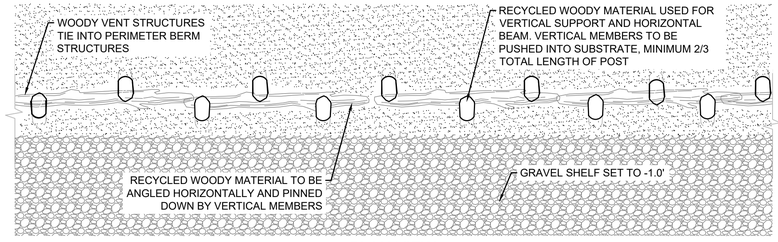
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SECTION VIEW



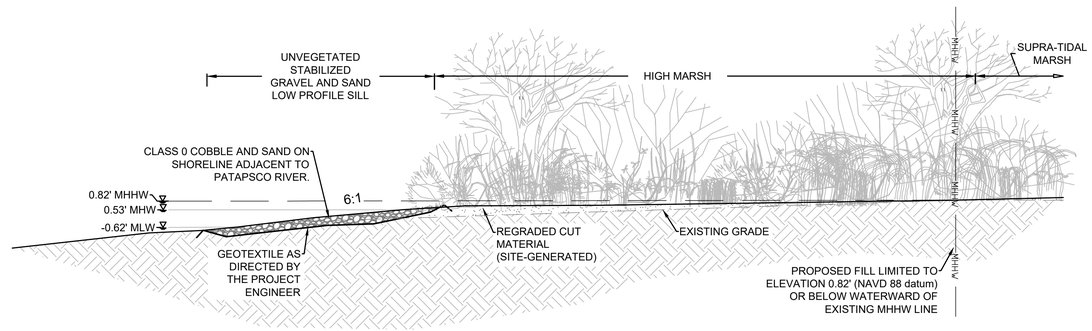
ELEVATION VIEW



PLAN VIEW

LARGE WOODY VENT STRUCTURE

NOT TO SCALE



REPRESENTATIVE 6:1 GRAVEL AND SAND LOW PROFILE SILL

NOT TO SCALE

MDE A# - 181301

BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

HABITAT FEATURES DETAILS

SCALE: NOT TO SCALE

DATE: 1/29/2025

DRAWING NO. PC102

16 OF 20

OWNER:
SOUTH BALTIMORE GATEWAY PARTNERSHIP
101 WEST DICKMAN STREET, SUITE 1000
BALTIMORE, MD 21230
ph: 410.424.7593 / www.sbgpartnership.org

APPLICANT/DEVELOPER:
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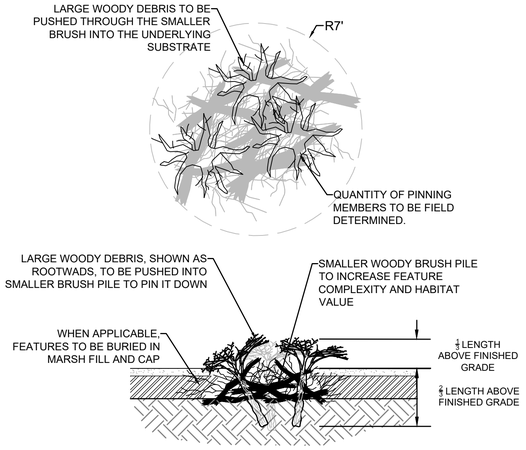
RESTORATION ECOLOGISTS:
Biohabitats
The Stables Building 2081 Clipper Park Road
Baltimore, MD 21211 / ph: 410.554.0156
fx: 410.554.0168 / www.biohabitats.com

STATE OF MARYLAND — JOSEPH PORTER — No. 29955 — PROFESSIONAL ENGINEER

12/09/24

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 26960 Expiration Date: 02/25/2026

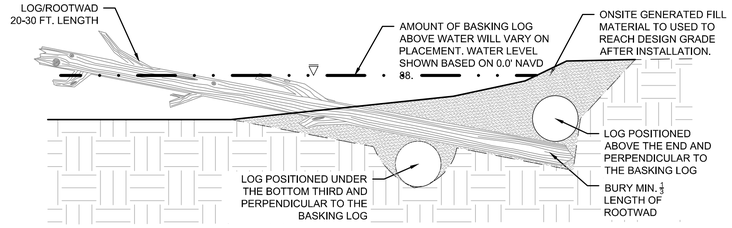
APPROVAL			REVISIONS			
		/ /	NO.	DESCRIPTION	DATE	BY
		/ /	1	SCHEMATIC DESIGN (30%)	04/26/24	JP
		/ /	2	SITE DEVELOPMENT (65%)	08/09/24	JP
		/ /	3	FINAL DESIGN (100%)	12/09/24	JP
		/ /				



NOTE: REUSED LARGE WOODY DEBRIS CAN BE USED IN PLACE OF ROOTWADS. TO PROVIDE ADEQUATE ANCHORING OF THE SMALLER BRUSH MATERIAL, LWD MAY NEED TO BE ANGLED IN AND/OR INSTALL MORE MEMBERS THAN SHOWN HERE. PLEASE CONSULT WITH PROJECT LANDSCAPE ECOLOGIST WHEN SETTING FIRST FEATURE TO DETERMINE STRATEGY.

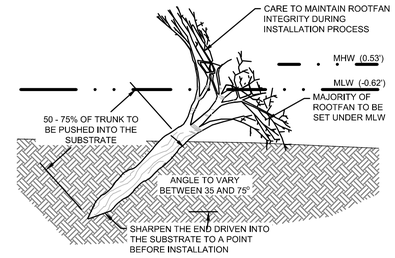
BRUSH PILE

NOT TO SCALE

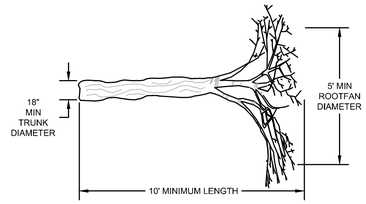


BASKING LOG WITH ANCHOR PARTIALLY BURIED

NOT TO SCALE



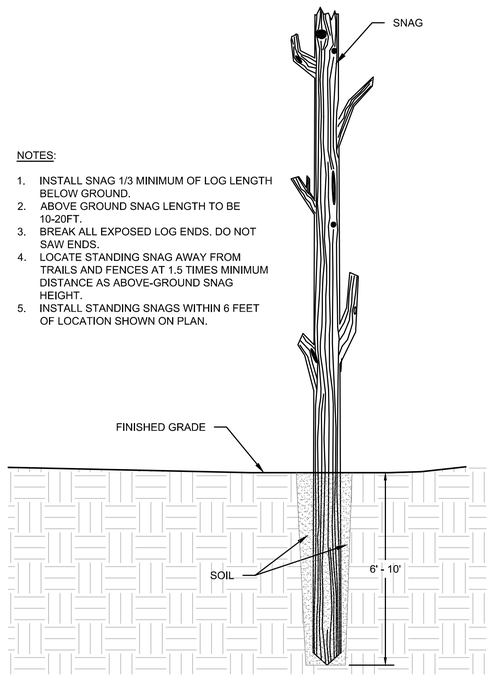
CROSS SECTION



DESCRIPTION

ROOTWAD FEATURE

NOT TO SCALE



NOTES:

1. INSTALL SNAG 1/3 MINIMUM OF LOG LENGTH BELOW GROUND.
2. ABOVE GROUND SNAG LENGTH TO BE 10-20FT.
3. BREAK ALL EXPOSED LOG ENDS. DO NOT SAW ENDS.
4. LOCATE STANDING SNAG AWAY FROM TRAILS AND FENCES AT 1.5 TIMES MINIMUM DISTANCE AS ABOVE-GROUND SNAG HEIGHT.
5. INSTALL STANDING SNAGS WITHIN 6 FEET OF LOCATION SHOWN ON PLAN.

STANDING SNAG

NOT TO SCALE

MDE AI# - 181301

BCNR - 11571

OWNER: SOUTH BALTIMORE GATEWAY PARTNERSHIP
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Baltimore, MD 21211 / ph: 410.544.0156
fx: 410.544.0168 / www.biohabitats.com

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 26960 Expiration Date: 02/25/2026

12/09/24

APPROVAL				REVISIONS			
		/ /	NO.	DESCRIPTION	DATE	BY
		/ /	1	SCHEMATIC DESIGN (30%)	04/26/24	JP
		/ /	2	SITE DEVELOPMENT (65%)	08/09/24	JP
		/ /	3	FINAL DESIGN (100%)	12/09/24	JP
		/ /				

MIDDLE BRANCH RESILIENCY INITIATIVE PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

HABITAT FEATURES DETAILS

SCALE: NOT TO SCALE

DATE: 1/29/2025

DRAWING NO. PC103

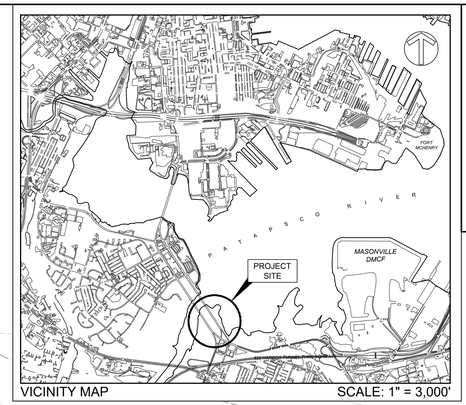
PLANTING LEGEND

- RIPARIAN BUFFER (0.27 ac)
- SUPRA-TIDAL MARSH (2.93 ac)
- HIGH MARSH (0.86 ac)
- LOW MARSH (0.55 ac)

MARSH SHRUB LEGEND

- MARSH HIBISCUS - Hm (*Hibiscus moscheutos*)
- GROUNDSEL TREE - Bh (*Baccharis halimifolia*)
- MARSH ELDER - If (*Iva frutescens*)
- ELDERBERRY - Sn (*Sambucus nigra ssp. Canadensis*)

*PLAN ELEMENTS CONTAIN COLOR. TO AVOID MISINTERPRETATION, IT IS RECOMMENDED TO PRINT THIS SHEET IN COLOR.



VICINITY MAP SCALE: 1" = 3,000'

S. HANOVER STREET

POTEE STREET

FRANKFURST AVE

PATAPSCO RIVER FLOW

42 - Hm
67 - If
31 - Sn
61 - Bh
49 - Sn
3 - AN
4 - PO
3 - QP
2 - AR
22 - Sn
79 - If
32 - Bh
53 - If
9 - Hm
13 - Sn
92 - Hm
13 - Sn
3 - CO
3 - QA
57 - Bh
38 - Hm
44 - Bh
56 - If
86 - Bh
54 - If
13 - Bh
9 - Sn
31 - Hm
3 - NS

HORIZONTAL SCALE
0 50 100

MDE AI# - 181301
BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

PLANTING PLAN

SCALE: 1" = 50' DATE: 1/29/2025

DRAWING NO. LA100 18 OF 20

OWNER: SOUTH BALTIMORE GATEWAY PARTNERSHIP
101 WEST DICKMAN STREET, SUITE 1000
BALTIMORE, MD 21230
ph: 410.424.7593 / www.sbgpartnership.org

APPLICANT/DEVELOPER: GreenVest
VISION • PERFORMANCE • RESULTS
4201 NORTHVIEW DRIVE, SUITE 202
BOWIE, MD 20716
ph: 410.987.5500 / www.greenvestus.com

COASTAL ENGINEERS: moffatt & nichol
2780 LIGHTHOUSE POINT E.
BALTIMORE, MD 21224
ph: 410.563.7300 / www.moffattnichol.com

RESTORATION ECOLOGISTS: Biohabitats
The Stables Building 2081 Clipper Park Road
Baltimore, MD 21211 / ph: 410.544.0156
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Expiration Date: 02/25/2026
12/09/24

APPROVAL				REVISIONS			
		/ /	NO.	DESCRIPTION	DATE	BY
		/ /	1	SCHEMATIC DESIGN (30%)	04/26/24	JP
		/ /	2	SITE DEVELOPMENT (65%)	08/09/24	JP
		/ /	3	FINAL DESIGN (100%)	12/09/24	JP
		/ /				

11/13/2024 I:\Projects\22002.04 NOAA\CAD\Plans\EB-1\LA100-PLANTING PLAN.dwg

PLANT COMPOSITION SCHEDULE

ZONE 1 - LOW MARSH (Elev. 0.1'- 0.53' NAVD88)

Size (acres): 0.55

Plant Spacing (feet off center)	Species Quantity	Vegetation Strata/ Species Name	Common Name	Unit	Spacing Type	Size
2		**HERBACEOUS PLANTS**				
	4180	*Sporobolus alterniflorus*	Smooth cordgrass	CON	RANDOM	PLUGS
	896	*Scirpus validus*	Soft-stemmed bulrush	CON	CLUSTERED 15-17	PLUGS
	896	*Bolboschoenus robustus*	Sturdy bulrush	CON	CLUSTERED 15-17	PLUGS
	5972	**= Total (each)**				

CON = container

PLANT AND COMPOSITION SCHEDULE

ZONE 2 - HIGH MARSH (Elev. 0.53'-1.1' NAVD88)

Size (acres): 0.86

Plant Spacing (feet off center)	Species Quantity	Key	Vegetation Strata/ Species Name	Common Name	Unit	Spacing Type	Size
6			**SHRUBS**				
	109	Bh	*Baccharis halimifolia*	Groundsel tree	CON	SEE PLAN	2 - 3 ft
	59	Hm	*Hibiscus moscheutos*	Marsh hibiscus	CON	SEE PLAN	2 - 3 ft
	103	If	*Iva frutescens*	Marsh elder	CON	SEE PLAN	2 - 3 ft
	271		**= Total (each)**				
2			**HERBACEOUS PLANTS**				
	752		*Bolboschoenus robustus*	Sturdy bulrush	CON	CLUSTERED 5-7	PLUGS
	940		*Distichlis spicata*	Saltgrass	CON	CLUSTERED 5-7	PLUGS
	940		*Schoenoplectus pungens*	Common three-square bulrush	CON	CLUSTERED 5-7	PLUGS
	940		*Sporobouls cynosuroides*	Big Cordgrass	CON	CLUSTERED 5-7	PLUGS
	752		*Amaranthus cannabinus*	Tidalmarsh amaranth	CON	CLUSTERED 5-7	PLUGS
	940		*Schoenoplectus americanus*	Olney's three-square bulrush	CON	CLUSTERED 5-7	PLUGS
	1879		Kosteletzkya pentacarpos	Virginia saltmarsh mallow	CON	CLUSTERED 5-7	PLUGS
	752		*Sporobolus pumilus*	Saltmeadow cordgrass	CON	CLUSTERED 5-7	PLUGS
	752		*Solidago sempervirens*	Seaside Goldenrod	CON	CLUSTERED 5-7	PLUGS
	752		*Symphyotricum undulatum*	Perennial saltmarsh aster	CON	CLUSTERED 5-7	PLUGS
	9399		**= Total (each)**				

CON = Container

PLANT AND COMPOSITION SCHEDULE

ZONE 3 - SUPRA-TIDAL MARSH (Elev. 1.1'-2.5' NAVD88)

Size (acres): 2.93

Plant Spacing (feet off center)	Species Quantity	Key	Vegetation Strata/ Species Name	Common Name	Unit	Spacing Type	Size
6			**SHRUBS**				
	184	Bh	*Baccharis halimifolia*	Groundsel tree	CON	SEE PLAN	2 - 3 ft
	153	Hm	*Hibiscus moscheutos*	Marsh hibiscus	CON	SEE PLAN	2 - 3 ft
	137	Sn	*Sambucus nigra ssp. Canadensis*	Elderberry	CON	SEE PLAN	2 - 3 ft
	206	If	*Iva frutescens*	Marsh elder	CON	SEE PLAN	2 - 3 ft
	680		**= Total (each)**				
2			**HERBACEOUS PLANTS**				
	4784		*Panicum virgatum*	Switchgrass	CON	CLUSTERED 5-7	PLUGS
	4784		*Sporobolus pumilus*	Saltmeadow cordgrass	CON	CLUSTERED 5-7	PLUGS
	3189		*Amaranthus cannabinus*	Tidalmarsh amaranth	CON	CLUSTERED 5-7	PLUGS
	9568		Kosteletzkya pentacarpos	Virginia saltmarsh mallow	CON	CLUSTERED 5-7	PLUGS
	6379		*Solidago sempervirens*	Seaside goldenrod	CON	CLUSTERED 5-7	PLUGS
	3189		*Symphyotricum undulatum*	Perennial saltmarsh aster	CON	CLUSTERED 5-7	PLUGS
	31893		**= Total (each)**				

CON = Container

PLANT AND COMPOSITION SCHEDULE

ZONE 4 - RIPARIAN BUFFER (Elev. 2.5' + NAVD88)

Size (acres): 0.27

Plant Spacing (feet off center)	Species Quantity	Key	Vegetation Strata/ Species Name	Common Name	Unit	Spacing Type	Size
20			**TREES**				
	3	AN	*Acer negundo*	Box Elder	CON	SEE PLAN	2" caliper
	2	AR	*Acer rubrum*	Red Maple	CON	SEE PLAN	2" caliper
	3	CO	*Celtis occidentalis*	Common Hackberry	CON	SEE PLAN	2" caliper
	3	NS	*Nyssa sylvatica*	Black Gum	CON	SEE PLAN	2" caliper
	4	PO	*Platanus occidentalis*	American Sycamore	CON	SEE PLAN	2" caliper
	3	QA	*Quercus alba*	White Oak	CON	SEE PLAN	2" caliper
	3	QP	*Quercus palustris*	Pin Oak	CON	SEE PLAN	2" caliper
	21		**= Total (each)**				
N/A			**NATIVE SEED**				
	5.3		*Partially Shaded Area Roadside Mix*	ERNMX-140	LB of P.L.S. 76 %	SEED	N/A
	8		**Cover Crop Seed Varies*	*Varies	LB of P.L.S. 76 %	SEED	N/A
	13.3		**= Total (lb)**				

P.L.S.= Pure Live Seed; CON = Container

*Cover Crop Seed - Grain Oats (30 lbs/acre Jan 1 - July 31); Grain Rye (30 lbs/acre Aug 1 - Dec 31)

(Cover crop quantity above shows 30 lbs/acre)

OWNER:
SOUTH BALTIMORE GATEWAY PARTNERSHIP
101 WEST DICKMAN STREET, SUITE 1000
BALTIMORE, MD 21230
ph: 410.424.7593 / www.sbgpartnership.org

APPLICANT/DEVELOPER:
GreenVest
VISION • PERFORMANCE • RESULTS
4201 NORTHVIEW DRIVE, SUITE 202
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fx: 410.554.0168 / www.biohabitats.com

12/09/24

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APPROVAL

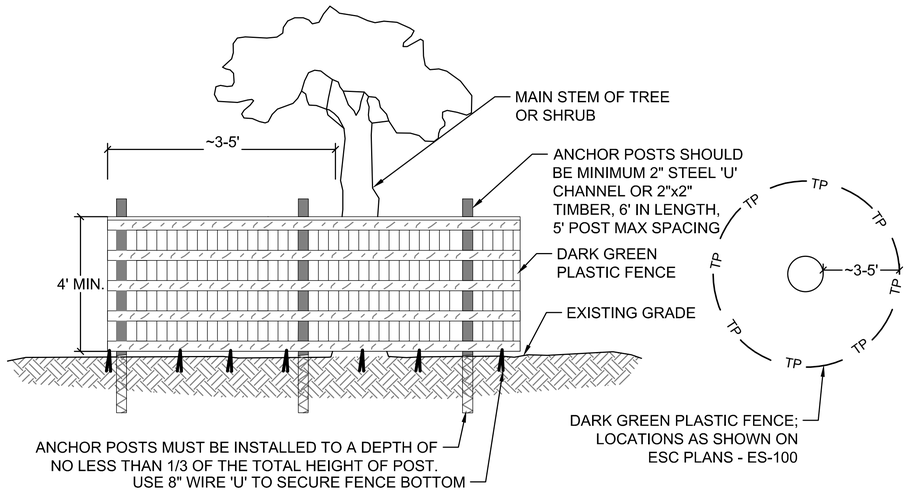
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		/ /	2	SITE DEVELOPMENT (65%)	08/09/24	JP
		/ /	3	FINAL DESIGN (100%)	12/09/24	JP
		/ /				

MDE AI# - 181301
BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

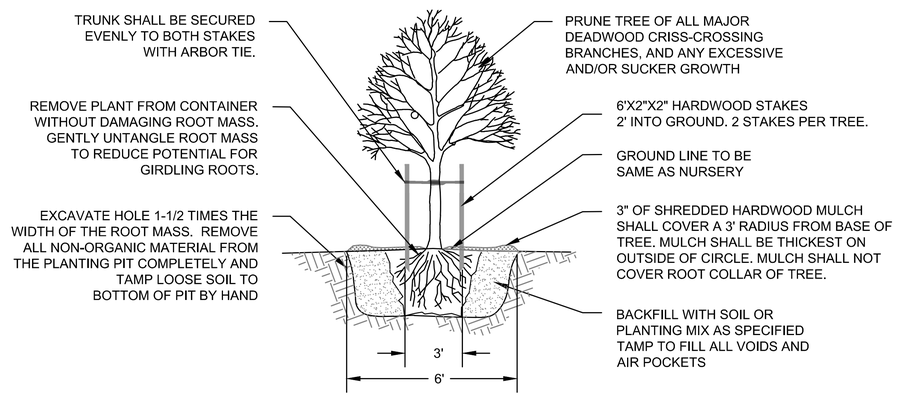
PLANTING SCHEDULES

SCALE: NOT TO SCALE
DATE: 1/29/2025
DRAWING NO. LA101



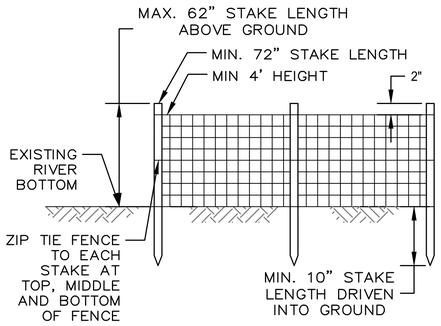
TREE PROTECTION FENCING

NOT TO SCALE

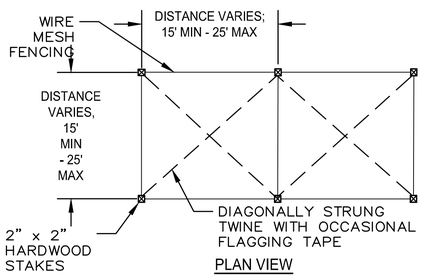


TREE PLANTING

NOT TO SCALE



SECTION VIEW



PLAN VIEW

CONSTRUCTION NOTES:

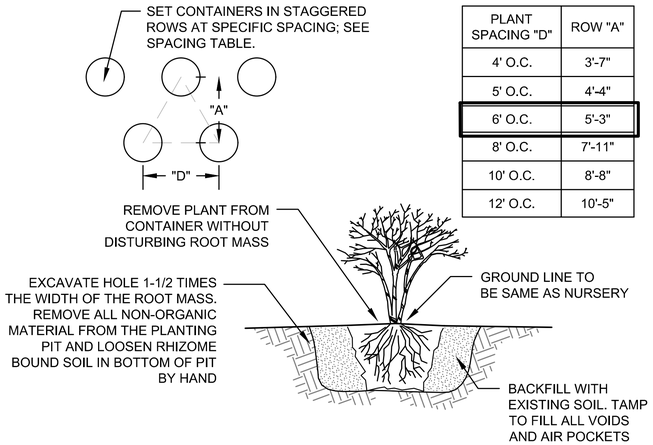
1. EXCLUSION FENCE REQUIRED FOR A PERIOD OF 2 YEARS UNTIL PLANT MATERIAL IS ESTABLISHED.
2. EXCLUSION TO BE REMOVED SEASONALLY TO AVOID DAMAGE FROM ICE.
3. REGULAR MAINTENANCE & REPLACEMENT OF FENCE, TWINE AND STAKES MAY BE NECESSARY DURING THIS TIME.
4. GOOSE FENCING SHALL ENCLOSE THE ENTIRETY OF THE AQUATIC PLANTING AREA.
5. INSTALL WIRE OR TWINE IN A SQUARE GRID ACROSS THE TOP OF THE PLANTING ZONE ON 15' SPACING.
5. SECURE FENCE TO EACH HARDWOOD STAKE WITH 3 ZIP TIES PER STAKE, ONE AT THE TOP, MIDDLE AND BOTTOM OF STAKE.
6. THE ENDS OF THE FENCE SHOULD BE SECURED TOGETHER AT A HARDWOOD STAKE.
7. TWINE TO CONNECT WOOD STAKES ACROSS ENCLOSURE OPENINGS, AS SHOWN. FLAGGING TAPE KNOTTED ON DIAGONAL TWINE AT 15'MAX SPACING.

MATERIALS:

1. STAKES: 2" x 2" x 72" HARDWOOD.
2. FENCE: VINYL COATED WELDED WIRE MESH (14 GAUGE, 2"x2" MESH, 5' HT.)
3. TWINE: HIGH VISIBILITY POLY WIRE OR TWINE.
4. ZIP TIES: 10–12" BLACK NYLON ZIP TIES.
5. FLAGGING TAPE: FLUORESCENT ORANGE FLAGGING TAPE

GOOSE EXCLUSION FENCE

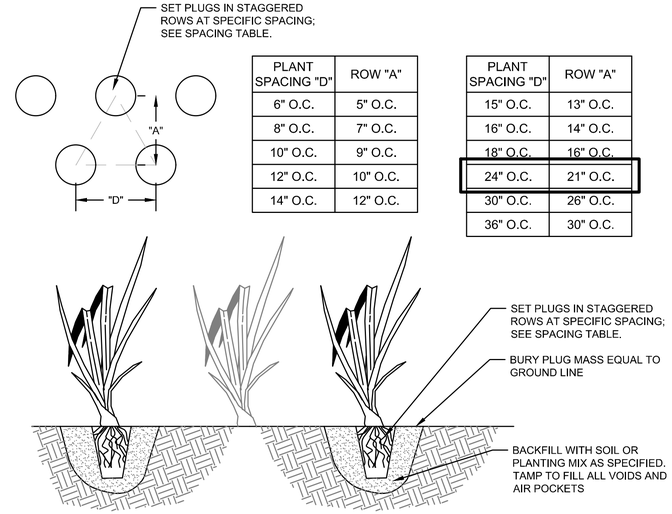
NOT TO SCALE



PLANT SPACING "D"	ROW "A"
4' O.C.	3'-7"
5' O.C.	4'-4"
6' O.C.	5'-3"
8' O.C.	7'-11"
10' O.C.	8'-8"
12' O.C.	10'-5"

CONTAINERIZED PLANTINGS

NOT TO SCALE



PLANT SPACING "D"	ROW "A"
6" O.C.	5" O.C.
8" O.C.	7" O.C.
10" O.C.	9" O.C.
12" O.C.	10" O.C.
14" O.C.	12" O.C.

PLANT SPACING "D"	ROW "A"
15" O.C.	13" O.C.
16" O.C.	14" O.C.
18" O.C.	16" O.C.
24" O.C.	21" O.C.
30" O.C.	26" O.C.
36" O.C.	30" O.C.

EMERGENT HERBACEOUS PLANTING - PLUG

NOT TO SCALE

MDE AI# - 181301
BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE
PATAPSCO RIVER EAST BANK (EB-1) TIDAL MARSH RESTORATION

PLANTING DETAILS

SCALE: AS SHOWN
DATE: 1/29/2025
DRAWING NO. LA102
20 OF 20

OWNER: SOUTH BALTIMORE GATEWAY PARTNERSHIP
101 WEST DICKMAN STREET, SUITE 1000
BALTIMORE, MD 21230
ph: 410.424.7593 / www.sbgpartnership.org

APPLICANT/DEVELOPER: GreenVest VISION - PERFORMANCE - RESULTS
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BOWIE, MD 20716
ph: 410.987.5500 / www.greenvestus.com

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RESTORATION ECOLOGISTS: Biohabitats
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12/09/24

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		/ /	3	FINAL DESIGN (100%)	12/09/24	JP
		/ /				

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Appendix C: Construction Site Photographs

4201 Northview Dr. Suite 202
Bowie, MD 20716
410-987-5500

3175 Route 10, Suite 100
Denville, NJ 07834
732-902-6644

VIEW #1

Pre-Construction Photo Facing East from Potee Street Bridge over towards Hanover Street Bridge



VIEW #2

Pre-Construction Photo Facing South from Potee Street Bridge



GreenVest
VISION • PERFORMANCE • RESULTS

CONSTRUCTION PHOTOGRAPHS & DESCRIPTIONS
MBRI EB-1 Project

PRE- CONSTRUCTION

VIEW #3

Pre-Construction Photo Facing South from Potee Street Bridge



VIEW #4

Pre-Construction Photo Facing East from Potee Street Bridge



GreenVest
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CONSTRUCTION PHOTOGRAPHS & DESCRIPTIONS
MBRI EB-1 Project

PRE- CONSTRUCTION

VIEW #5

Pre-Construction Photo Facing North from Potee Street Bridge



VIEW #6

Pre-Construction Photo Facing West from under the Hanover Street Bridge along the water, looking at the Potee Street Bridge



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CONSTRUCTION PHOTOGRAPHS & DESCRIPTIONS
MBRI EB-1 Project

PRE- CONSTRUCTION

End of PRE-Construction Photos

VIEW #1 Marsh Master mowing Phragmites	
VIEW #2 Installation of Erosion & Sediment Controls	

GreenVest VISION • PERFORMANCE • RESULTS	***CONSTRUCTION PHOTOGRAPHS & DESCRIPTIONS*** ***MBRI EB-1 Project*** **DURING CONSTRUCTION**

VIEW #3

Installation of rootwads and woody vent structure



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CONSTRUCTION PHOTOGRAPHS & DESCRIPTIONS
MBRI EB-1 Project

DURING CONSTRUCTION

VIEW #4 Channel grading and habitat features (brush piles)	
VIEW #5 Channel grading and habitat features (standing snags & brush piles)	

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CONSTRUCTION PHOTOGRAPHS & DESCRIPTIONS
MBRI EB-1 Project

DURING CONSTRUCTION

VIEW #6 Finished woody vents	
VIEW #7 Finish channel grading	

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VIEW #8

Marsh Planting (plugs)



VIEW #9

Marsh Planting



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CONSTRUCTION PHOTOGRAPHS & DESCRIPTIONS
MBRI EB-1 Project

DURING CONSTRUCTION

VIEW #10 Installed goose fence	
VIEW #11 Installed trees in CBA	

GreenVest VISION • PERFORMANCE • RESULTS	***CONSTRUCTION PHOTOGRAPHS & DESCRIPTIONS*** ***MBRI EB-1 Project*** **DURING CONSTRUCTION**

VIEW #20	

End of Construction Photos

VIEW #1

Completed Work; Facing South from Potee Steet Bridge



VIEW #2

Completed Work; Facing South from Potee Steet Bridge



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CONSTRUCTION PHOTOGRAPHS & DESCRIPTIONS
MBRI EB-1 Project

POST- CONSTRUCTION

VIEW #3

Completed Work; Facing North from Potee Steet



VIEW #4

Completed Work; Facing North from East Entrance



GreenVest
VISION • PERFORMANCE • RESULTS

CONSTRUCTION PHOTOGRAPHS & DESCRIPTIONS
MBRI EB-1 Project

POST- CONSTRUCTION

VIEW #5

Completed Work; Facing North from West Entrance



VIEW #6

Critical Buffer Area Planted with Trees



End of POST-Construction Photos

GreenVest
VISION • PERFORMANCE • RESULTS

Appendix D: As-Built Survey

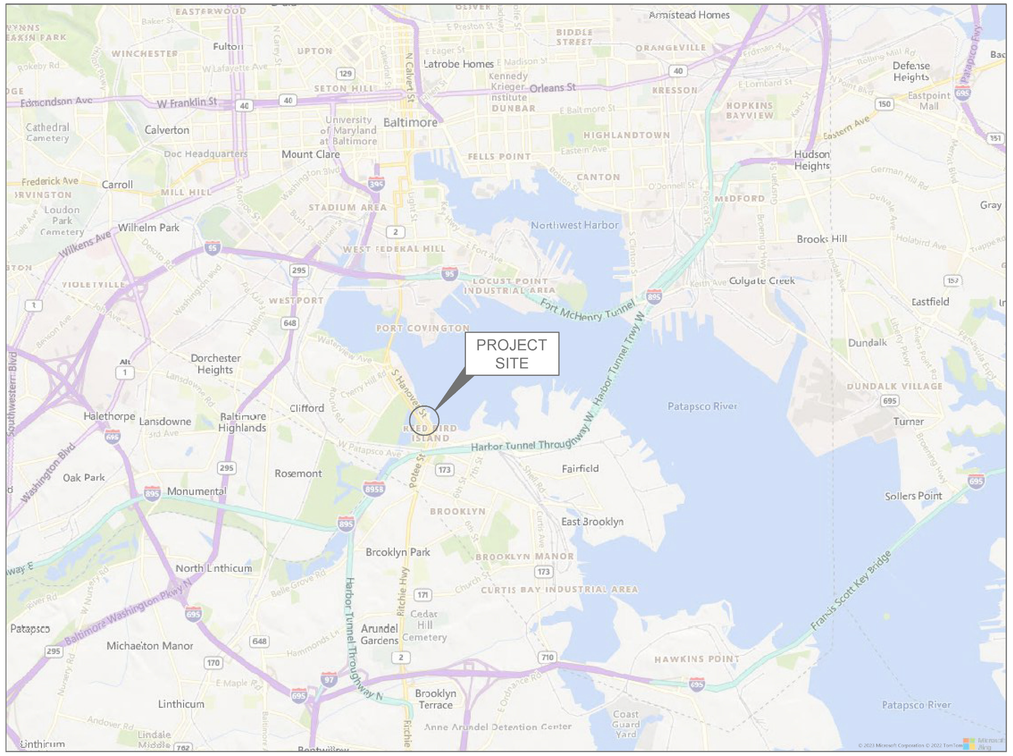
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3175 Route 10, Suite 100
Denville, NJ 07834
732-902-6644

MIDDLE BRANCH RESILIENCY INITIATIVE

PATAPSCO RIVER EAST BANK (EB) TIDAL MARSH RESTORATION

100% Final Plans



VICINITY MAP
SCALE 1" = 4,000'

AS BUILT 1 OF 4

MDE A\# - 181301	
BCNR - 11571	

MIDDLE BRANCH RESILIENCY INITIATIVE
PATAPSCO RIVER EAST BANK (EB) TIDAL MARSH RESTORATION

COVER SHEET

SCALE: AS SHOWN | DATE: 12/9/2024

DRAWING NO. CV100 | 1 OF 19

OWNER:
SOUTH BALTIMORE GATEWAY PARTNERSHIP
101 WEST DICKMAN STREET, SUITE 1000
BALTIMORE, MD 21230
ph: 412.424.7593 / www.sbgpartnership.org

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08/24/23

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		/ /	NO.	DESCRIPTION	DATE	BY
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		/ /	3	FINAL DESIGN (100%)	12/09/24	JP
		/ /				

10/23/2024:\Projects\22002.04 NOAA\CAD\Plans\EB-1\CV000-COVER SHEET.dwg

SHEET LIST TABLE

Sheet Number	Drawing No.	Sheet Title
1	CV100	COVER SHEET AB 1 OF 4
2	GN100	SHEET LIST & LEGEND AB 2 OF 4
~~3~~	~~GN101~~	~~SITE MAP~~
~~4~~	~~GN102~~	~~GENERAL NOTES~~
~~5~~	~~GN103~~	~~SEQUENCE OF CONS~~TRUCTION
~~6~~	~~GN104~~	~~MATERIAL SPEC NOTE~~S
~~7~~	~~EC100~~	~~EXISTING CONDITION~~S & NRI PLAN
~~8~~	~~SP100~~	~~INITIAL SITE PREPARA~~TION PLAN
9	ES100	EROSION AND SEDIMENT CONTROL PLAN AB 3 OF 4
~~10~~	~~EC101~~	~~EROSION AND SEDIM~~ENT CONTROL NOTES
~~11~~	~~ES102~~	~~EROSION AND SEDIM~~ENT CONTROL NOTES
~~12~~	~~ES103~~	~~EROSION AND SEDIM~~ENT CONTROL NOTES
~~13~~	~~ES104~~	~~EROSION AND SEDIM~~ENT CONTROL DETAIL
~~14~~	~~PC100~~	~~PROPOSED CONDITION~~S PLAN
15	PC101	TYPICAL SECTIONS AB 4 OF 4
~~16~~	~~PC102~~	~~HABITAT FEATURES~~ DETAILS
~~17~~	~~PC103~~	~~HABITAT FEATURES~~ DETAILS
~~18~~	~~LA100~~	~~PLANTING PLAN~~
~~19~~	~~LA101~~	~~PLANTING SCHEDULE~~S & DETAILS

LEGEND

EXISTING

- MAJOR CONTOUR
- MINOR CONTOUR
- SURVEYED PROPERTY LINE
- GIS PROPERTY LINE
- SD — STORM DRAIN
- EDGE OF ROADWAY
- BULKHEAD LINE
- CHAIN LINK FENCE
- CA — CRITICAL AREA BOUNDARY
- CAB — CRITICAL AREA BUFFER
- SOIL TYPE BOUNDARY
- WL — WETLAND LIMIT
- WB — WETLAND BUFFER
- MHHW — MEAN HIGHER HIGH WATER (ELEV = 0.82')
- MHW — MEAN HIGH WATER (ELEV = 0.53')
- MLW — MEAN LOW WATER (ELEV = -0.62')
- 100YR — FEMA FLOODPLAIN
- NAVIGATION CHANNEL
- APPROXIMATE SHORELINE
- SOIL TYPE BOUNDARY
- TREELINE
- DELINEATED PHRAGMITES WETLAND
- TREE
- TRAVERSE POINT
- POWER POLE
- LIGHT POLE
- GUY WIRE
- UTIL — UNDERGROUND ELECTRIC
- TV — TELEVISION BOX
- TELEVISION MANHOLE

PROPOSED

- 0 — MAJOR CONTOUR
- 2 — MINOR CONTOUR
- BASELINE
- WATER SURFACE
- MHW — MEAN HIGH WATER
- MLW — MEAN LOW WATER
- MLLW — MEAN LOWER LOW WATER
- LOD — LIMIT OF DISTURBANCE
- SSF — SUPER SILT FENCE
- BOF — BLAZE ORANGE FENCE
- FL-18 — FILTER LOG
- SSF — SUPER SILT FENCE
- TC — TURBIDITY CURTAIN
- TREE REMOVAL
- TP — TREE PROTECTION FENCE
- CRZ — CRITICAL ROOT ZONE
- WOOD CHIPS CONSTRUCTION ACCESS ROADS
- STAGING AND STOCKPILE AREA
- SCE — STABILIZED CONSTRUCTION ENTRANCE WITH WASH RACK
- PST — PORTABLE SEDIMENT TANK
- COIP — COMBINATION INLET PROTECTION
- AGIP — AT-GRADE INLET PROTECTION
- MIXED GRAVEL AND SAND LOW PROFILE SILL
- WOODY VENT STRUCTURE
- ROOTWAD STRUCTURE
- CHRISTMAS TREE FASCINE STRUCTURE
- BASKING LOG
- STANDING SNAG
- BRUSH PILE
- TS100 — TYPICAL SECTION

HABITAT LEGEND

- SHALLOW OPEN WATER
- MUDFLAT ZONE
- LOW MARSH ZONE
- HIGH MARSH ZONE
- SUPRATIDAL ZONE
- RIPARIAN BUFFER ZONE

MARSH SHRUB LEGEND

- MARSH HIBISCUS - Hm (*Hibiscus moscheutos*)
- GROUNDSEL TREE - Bh (*Baccharis halimifolia*)
- MARSH ELDER - If (*Iva frutescens*)
- ELDERBERRY - Sn (*Sambucus nigra ssp. Canadensis*)

*PLAN ELEMENTS CONTAIN COLOR. TO AVOID MISINTERPRETATION, IT IS RECOMMENDED TO PRINT THIS SHEET IN COLOR.

PLANTING LEGEND

- RIPARIAN BUFFER (0.18 ac)
- SUPRA-TIDAL MARSH (2.93 ac)
- HIGH MARSH (0.86 ac)
- LOW MARSH (0.55 ac)

SITE PREPARATION LEGEND

- CLEARING / GRUBBING
- NON-NATIVE/INVASIVE TREATMENT AND FLOATABLE TRASH REMOVAL

AS BUILT 2 OF 4

OWNER: SOUTH BALTIMORE GATEWAY PARTNERSHIP
101 WEST DICKMAN STREET, SUITE 1000
BALTIMORE, MD 21230
ph: 410.424.7553 / www.sbgpartnership.org

APPLICANT/DEVELOPER: GreenVest
VISION • PERFORMANCE • RESULTS
4201 NORTHVIEW DRIVE, SUITE 202
BOWIE, MD 20716
ph: 410.397.5500 / www.greenvestus.com

COASTAL ENGINEERS: moffatt & nichol
2780 LIGHTHOUSE POINT E,
BALTIMORE, MD 21224
ph: 410.563.7300 / www.moffattnichol.com

RESTORATION ECOLOGISTS: Biohabitats
The Stables Building 2081 Clipper Park Road
Baltimore, MD 21211 / ph: 410.554.0156
fx: 410.554.0168 / www.biohabitats.com

08/24/23

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APPROVAL				REVISIONS			
		/ /	NO.	DESCRIPTION	DATE	BY
		/ /	1	SCHEMATIC DESIGN (30%)	04/26/24	JP
		/ /	2	SITE DEVELOPMENT (65%)	08/09/24	JP
		/ /	3	FINAL DESIGN (100%)	12/09/24	JP
		/ /				

MDE AI# - 181301
BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE
PATAPSCO RIVER EAST BANK (EB) TIDAL MARSH RESTORATION

SHEET LIST & LEGEND

SCALE: NA
DATE: 12/9/2024
DRAWING NO. GN100
2 OF 19

10/23/2024I:\Projects\22002.04 NOAA\CAD\Plans\EB-1\GN001-SHEET LIST & LEGEND.dwg

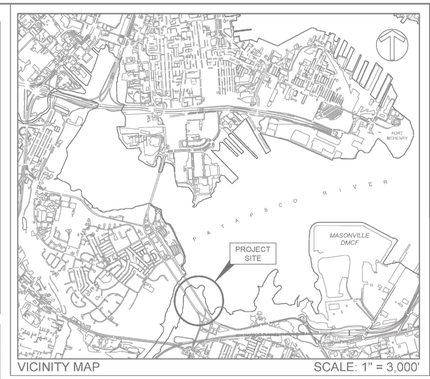
EROSION AND SEDIMENT CONTROL LEGEND

- LOD — LIMIT OF DISTURBANCE
- SSF — SUPER SILT FENCE
- FL-18 — FILTER LOG
- TC — TURBIDITY CURTAIN
- BOF — BLAZE ORANGE FENCE
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- TP — TREE PROTECTION FENCE
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- COIP — COMBINATION INLET PROTECTION
- AGIP — AT-GRADE INLET PROTECTION

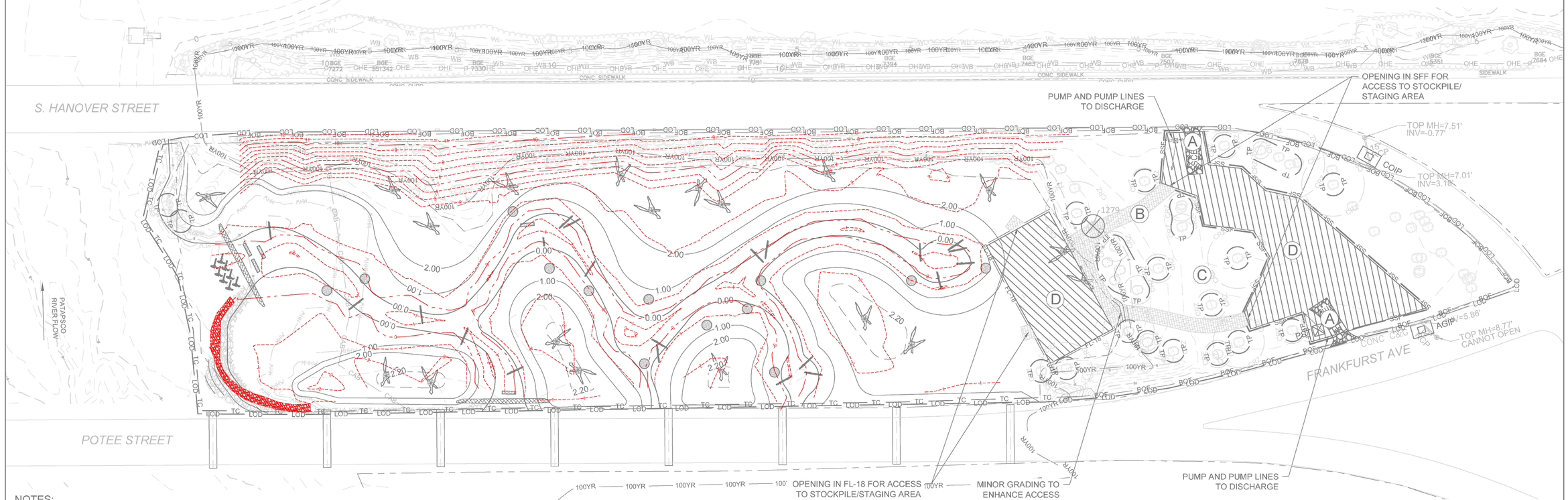
STABILIZATION SCHEDULE			
AREA	SQ.FT.	TYPE OF STABILIZATION	SEQUENCE
A STABILIZED CONSTRUCTION ENTRANCES	1,723	STONE BED (temporary)	ESC - 6
		PERMANENT SEED (permanent)	PLANT -1
B CONSTRUCTION ACCESS, WOOD CHIPS	5,851	WOOD CHIP ROAD ACCESS (permanent)	ESC - 6
C PERVIOUS AREAS	332,792	TEMPORARY SEEDING (temporary)	PLANT -1
		SEED/LANDSCAPING (permanent)	PLANT -1
D SEDIMENT CONTROLS	31,398	SEEDING (temporary)	PLANT -1
		PERMANENT SEED (permanent)	PLANT -1

AREAS ARE TO BE VEGETATIVELY STABILIZED TO SATISFY THE 3/7 DAY REQUIREMENT AS PER THE BALTIMORE CITY STANDARD EROSION AND SEDIMENT CONTROL NOTES.

SITE DATA				
SITE AREA	8.5	AC	371,764	SF
LOD	8.5	AC	371,764	SF
CUT	3494	CY		
FILL	3656	CY		



VICINITY MAP SCALE: 1" = 3,000'



NOTES:

1. SEE SHEETS ES101 AND ES102 FOR EROSION AND SEDIMENT CONTROL SPECIFICATIONS. SEE SHEET ES104 FOR EROSION AND SEDIMENT CONTROL DETAILS.
2. CONTRACTOR SHALL ACCESS THE SHORELINE AS NECESSARY THROUGH THE ORANGE SAFETY FENCE WHILE MAINTAINING PROPER EROSION AND SEDIMENT CONTROL DEVICES AND PROCEDURES.
3. THE SITE IS WITHIN THE 100-YEAR FLOODPLAIN.
4. SEE SHEETS GN101, GN102, and GN103 FOR GENERAL NOTES AND LEGEND.
5. ALL STONE OR SEDIMENT SPILLED, DROPPED, OR TRACKED OUTSIDE OF THE PROJECT LOD SHALL BE REMOVED IMMEDIATELY BY VACUUMING, SCRAPING, AND/OR SWEEPING.
6. LIMIT OF DISTURBANCE (LOD) IS 371,764 SF, 8.5 AC.
7. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN.
   - 7.1. THREE CALENDAR DAYS FOR THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN THREE HORIZONTAL TO ONE VERTICAL (3:1).
   - 7.2. SEVEN DAYS FOR ALL OTHER DISTURBED OR GRADED AREAS ON PROJECT SITE.
8. STOCKPILED MATERIALS SHALL BE AT A SLOPE NO STEEPER THAN 2:1 AND NO HIGHER THAN 20 FT.

HORIZONTAL SCALE
0 50 100

MDE Al# - 181301
BCNR - 11571

AS BUILT 3 OF 4

OWNER: SOUTH BALTIMORE GATEWAY PARTNERSHIP
101 WEST DICKMAN STREET, SUITE 1000
BALTIMORE, MD 21230
ph: 410.424.7593 / www.sbgpartnership.org

APPLICANT/DEVELOPER: GreenVest
4201 NORTHVIEW DRIVE, SUITE 202
BOWIE, MD 20716
ph: 410.987.5500 / www.greenvestus.com

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Baltimore, MD 21211 / ph: 410.554.0156
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APPROVAL				REVISIONS			
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		/ /	3	FINAL DESIGN (100%)	12/09/24	JP
		/ /				

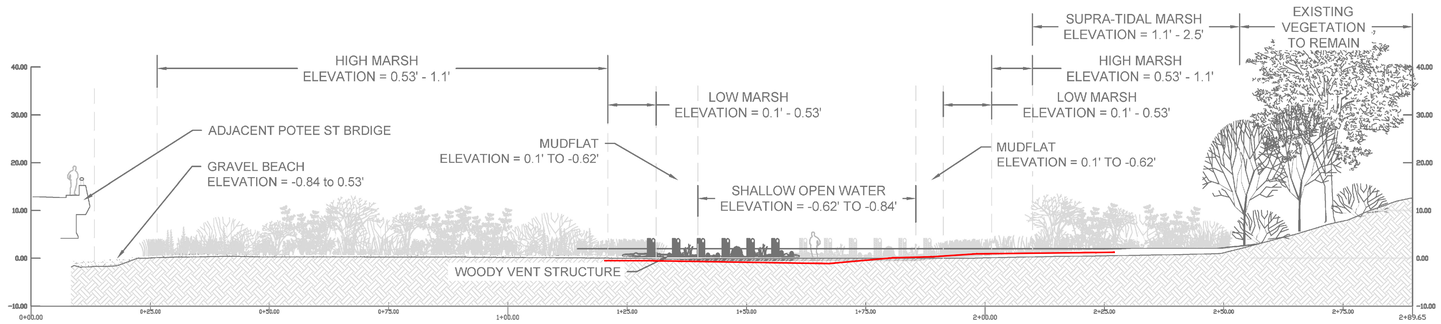
MIDDLE BRANCH RESILIENCY INITIATIVE PATAPSCO RIVER EAST BANK (EB) TIDAL MARSH RESTORATION

EROSION AND SEDIMENT CONTROL PLAN

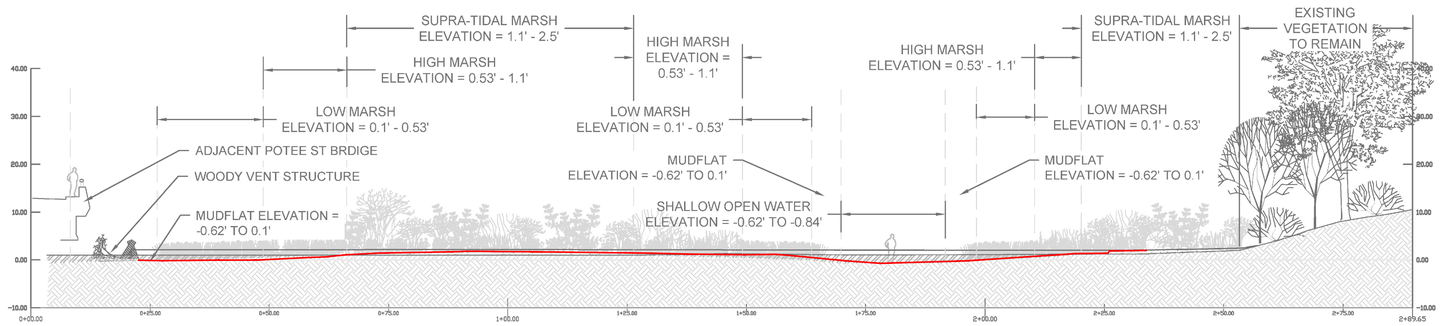
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DRAWING NO. ES100 9 OF 19

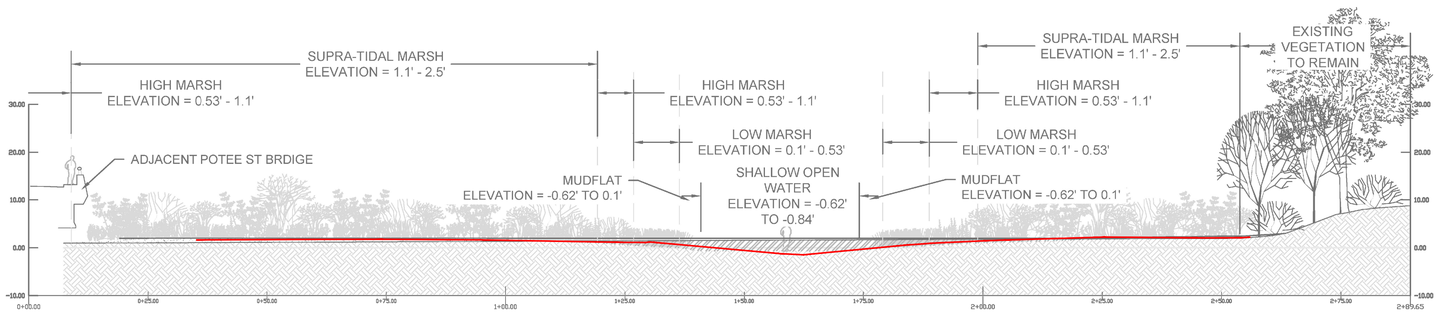
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TYPICAL SITE SECTION 1



TYPICAL SITE SECTION 2



TYPICAL SITE SECTION 3

HORIZONTAL SCALE
0 15 30

VERTICAL SCALE
30
15
0

AS BUILT 4 OF 4

MDE AI# - 181301
BCNR - 11571

MIDDLE BRANCH RESILIENCY INITIATIVE
PATAPSCO RIVER EAST BANK (EB) TIDAL MARSH RESTORATION

TYPICAL SECTIONS

SCALE: AS SHOWN
DATE: 12/9/2024
DRAWING NO. PC101
15 OF 19

OWNER:
SOUTH BALTIMORE GATEWAY PARTNERSHIP
101 WEST DICKMAN STREET, SUITE 1000
BALTIMORE, MD 21230
ph: 410.424.7593 / www.sbgpartnership.org

APPLICANT/DEVELOPER:
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4201 NORTHVIEW DRIVE, SUITE 202
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ph: 410.987.5500 / www.greenvestus.com

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		/ /				

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Appendix E: Monitoring Plan

4201 Northview Dr. Suite 202
Bowie, MD 20716
410-987-5500

3175 Route 10, Suite 100
Denville, NJ 07834
732-902-6644

MIDDLE BRANCH RESILIENCY INITIATIVE

MEDSTAR HARBOR HOSPITAL TIDAL WETLAND RESTORATION

Appendix H – Habitat Monitoring Plan

Memorandum

To: Matt Wallach, MDE, and Maria Teresi, USACE

From: Kyle Spendiff, GreenVest, LLC

Date: 09/01/2023

Re: Middle Branch Resiliency Initiative (MBRI) – Habitat Monitoring Plan

---

Introduction

The Middle Branch Resiliency Initiative (MBRI) currently proposes to construct nature-based solutions (NBS) along the coastline at five (5) locations within the Middle Branch of the Patapsco River- Site 5A, BGE Spring Gardens, Medstar Harbor Hospital (MHH,), Patapsco Delta (PDP) and Smith Cove Environmental Justice Project (SCEJP) MBRI will include a variety of NBS to address three key program goals: 1) improve coastal resiliency, improve water quality, and improve aquatic habitat structure and diversity. To effectively monitor the project's impact on the Middle Branch of the Patapsco, six (6) monitoring locations have been identified. (Figure 1) The following memorandum details the proposed monitoring plan to be completed beginning in 2023 and lasting throughout the lifespan of the MBRI project. Monitoring will cease when the regulatory agencies determine the project is complete. The proposed monitoring plan will collect valuable site data to understand the changes to habitat, fish, benthic, sediment, and project stability metrics, at the six monitored locations.

Existing Data Review

An extensive review of publicly available information on fish communities within the Middle Branch area of Baltimore Harbor resulted in generalized lists of species that are either documented to occur or are thought to be in the area. Although no systematic surveys documenting the presence or abundance of specific species within the shallow water zone (<3 feet) of the Middle Branch were found, the structural habitat requirements of these species are well documented and were used to inform the technical approach of the project.

In addition, the MBRI team has coordinated with the Masonville Cove Habitat Restoration Project (MCHRP) to better align the MBRI habitat monitoring plan with work currently underway in the area. The MBRI team has obtained data collected as part of the Masonville project and has used that data as a guide for developing the MBRI habitat monitoring plan.

MBRI Habitat Goals and Objectives

The use of marsh edges by forage fish and macroinvertebrates is well documented, as are the high rates of productivity with coastal marshes. Through the creation of highly productive habitats that are currently lacking within the proposed project limits as well as the Middle Branch at large, the MBRI will provide levels of habitat function and value that currently do not exist. Furthermore, it is presumed that this project will yield localized benefits for forage and juvenile fish and macroinvertebrate species; organisms that form an important link in the Chesapeake Bay's food web and support many recreational and sport fisheries. This key linkage will provide habitat gaps at a critical transition between fluvial and estuarine areas that have

been subject to barrier removal and restoration actions, making this project temporally and contextually appropriate as a means to uplift aquatic dependent wildlife habitat.

While it is assumed that fish and macroinvertebrate species diversity will eventually improve post-construction, population dynamics are dependent upon many factors outside the control of the MBRI. Therefore, project goals, objectives, and monitoring will focus on the re-establishment of structural habitat characteristics that can be controlled and measured in the post construction condition. Functional characteristics (fish and macroinvertebrate species presence and abundance) will also be monitored to determine if/how species are adapting to the habitat provided to supplement the documentation of achieving structural objectives.

- Habitat Goal:
    - Improve structural habitat characteristics known to benefit macroinvertebrates and juvenile and forage fish, habitat that is currently absent in the MBRI area.
- Objective:
    - Assess existing structural habitat characteristics within near shore (<3 feet) areas.
    - Create structural habitat components known to benefit macroinvertebrate and juvenile and forage fish species along the water/land interface.
    - Monitor post-construction structural habitat components to document structural and continue observing functional improvements.

Monitoring Plan

A robust monitoring plan has been developed to collect current baseline data of existing conditions, collect data at each project location and approved locations throughout the Middle Branch at various intervals post-construction. The monitoring plan will focus on collecting data for the following items of interest:

1. Habitat assessment
2. Fish monitoring
3. Benthic Macroinvertebrate monitoring
4. Sediment sampling
5. Porewater sampling
6. Project stability

Habitat Assessment

Habitat assessment data will be collected for each sample location utilizing the survey protocols from the Evaluation of Planned Wetlands (EPW) method (Bartoldus, 1994). EPW evaluates six (6) different wetlands functions:

1. Shoreline Bank Erosion Control- Capacity to provide erosion control and to dissipate erosive forces at the shoreline bank.
2. Sediment Stabilization- Capacity to stabilize and retain previously deposited sediments.
3. Water Quality- Capacity to retain and process dissolved or particulate materials to the benefit of “downstream” surface water quality.
4. Wildlife- Degree to which a wetland functions as habitat for wildlife as described by habitat complexity.
5. Fish- Degree to which a wetland habitat meets the food/ cover, reproductive, and water quality requirements of fish.

6. Uniqueness/ Heritage- Presence of characteristics that distinguish a wetland as unique, rare, or valuable.

The structural characteristics in the pre- and post-construction condition will be compared to determine the project's effect on local habitat quality.

Fish Monitoring

To support the project goals to improve habitat for smaller forage and juvenile fish species more likely to use shallow, near shore habitats, fish samples will be collected at project locations within and in the vicinity of the MBRI prior to construction activities to establish baseline data and to monitor post-construction conditions at the MBRI projects. Fish will be collected utilizing methods that are comparable with the fish sampling efforts at the nearby MCHRP, to the extent practicable. Proposed sampling methods will include Fyke Nets, Seine Nets and Minnow Traps to collect fishes and macroinvertebrates (blue crab, mud crab, etc.) from near shore habitats.

- **Fyke Net Sampling**- The primary fish sampling method to capture juvenile and forage fishes utilizing the created tidal marsh will deploy a 3'H x 4'W x 12'L knotless ¼" mesh fyke net with 3' H x 30'L x ¼" mesh wings. To capture fish and macroinvertebrates as they egress or are flushed out of the created tidal marsh with the receding tide, the fyke net will be set in a pre-determined location at the center of the vent openings with the wings extending to the edges of the vent opening to prevent fish and macroinvertebrates from evading capture. The nets will be set at or near high tide and sampled at the end of the tide cycle/ low tide providing a sampling duration of approximately six (6) hours. Sampling on the outgoing tide will help prevent net fouling, displacement, and damage caused by multi-directional tidal flow. A representative sample of up to fifty (50) individuals per species will be measured (mm) and recorded. Finfish length measurements will be recorded using the appropriate method (total length, fork length, etc.) depending on the species, while carapace measurements will be recorded for sampled blue crabs. Other macroinvertebrates such as mud crabs and grass shrimp will be counted only. Any specimen captured that cannot be identified in the field will be photographed and/or preserved in a 95% alcohol solution for later identification.
- **Beach Seine Sampling**- To sample shallow water habitat along the living shoreline areas beach seining will be conducted at each site utilizing a 4'H x 25'L x ¼" mesh beach seine. The beach seine net will be deployed perpendicular to the shoreline in a wide arc, while maintaining contact with the bottom. Three (3) replicate hauls will be conducted at different locations at each site and catch will be sorted and processed after each haul. Captured fish will be identified to species, measured and quantified, then returned to the water. Blue crabs, mud crabs and other macroinvertebrates will also be identified and counted. A representative sample of up to fifty (50) individuals per species will be measured in millimeters (mm). Finfish length measurements will be recorded using the appropriate method (total length, fork length, etc.) depending on the species, while carapace measurements will be recorded for sampled blue crabs. Any specimen captured that cannot be identified in the field will be photographed and/or preserved in a 95% alcohol solution for later identification.
- **Minnow Trap Sampling**- To sample fish utilizing the created marsh areas that are not suitable for seeing or fyke netting "Gee-type" galvanized 17 ½" L x 9"H x 1/4" mesh minnow traps will be

deployed within channels, or pools within the created marsh. The traps will be set during or near low-tide and sampled approximately 12 hours after setting to ensure fish utilizing the marsh surface at high tide are sampled. A representative sample of up to fifty (50) individuals per species will be measured (mm) and recorded. Captured fish will be identified by species, quantified, and returned to the water. Finfish length measurements will be recorded using the appropriate method (total length, fork length, etc.) depending on the species, while carapace measurements will be recorded for sampled blue crabs. Any specimen captured that cannot be identified in the field will be photographed and/or preserved in a 95% alcohol solution for later identification.

Post-construction sampling will be continued in years one (1), three (3), and five (5), at the sampling locations within the newly created habitats of the MBRI. Post-construction data will be compared to pre-construction data at the site as well as data collected from the other MBRI sites to determine if changes in structural habitat alone are able to bring about changes in the local fish community within the MBRI. The data can also be compared with sampling efforts at MCHRP. Fish species of interest can be found in Table 1.

Table1. MBRI Fish Species of Interest

Fish Target Species	Sampling Notes
Alewife *(Alosa pseudoharengus)*	Anadromous, summer juvenile sampling.
American Eel *(Anguilla rostrata)*	Summer shallows
American Shad *(Alosa sapidissima)*	Anadromous, summer juvenile sampling
Atlantic Croaker *(Micropogonias undulatus)*	Summer shallows
Atlantic Menhaden *(Brevoortia tyrannus)*	Summer shallows
Atlantic Silverside (*Menidia menidia*)	Summer shallows
Banded Killifish *(Fundulus diaphanus***)**	Resident
Bay Anchovy *(Anchoa mitchillii)*	Summer shallows
Blueback Herring *(Alosa aestivalis)*	Anadromous, summer juvenile sampling
Bluefish *(Pomatomus saltatrix)*	Juveniles May-Oct.
Gizzard Shad *(Dorosoma cepadianum)*	Resident
Hickory Shad *(Alosa mediocris)*	Anadromous, summer juvenile sampling.
Inland Silverside *(Menidia beryllina)*	Summer shallows
Largemouth Bass *(Micropterus salmoides)*	Resident. Near shore with cover
Mummichog *(Fundulus heteroclitus)*	Resident
Sheepshead Minnow *(Cyprinodon variegatus)*	Resident
Spot *(Leiostomus xanthurus)*	Summer shallows
Spottail Shiner *(Notropis hudsonius)*	Resident
Striped Bass *(Morone saxatilis)*	Resident, Anadromous
Striped Killifish *(Fundulus majalis)*	Resident, Summer shallows
Summer Flounder *(Paralichthys dentatus)*	Juveniles, Summer shallows
White Perch *(Morone americana)*	Resident, Semi-anadromous
Windowpane Flounder *(Scopthalmus aquosus)*	Adults and juveniles
Winter Flounder *(Pleuronectes americanus)*	Juveniles, Summer shallows
Yellow Perch *(Perca flavescens)*	Resident, Semi-anadromous

Benthic Macroinvertebrate Baseline Survey

A pre-construction baseline benthic community survey will be conducted to characterize the existing community composition within the proposed project areas. Additional benthic post-construction sampling

will be conducted within the created wetlands at year one (1) year three (3) and again at year five (5)- the end of the five (5) year monitoring period which should allow time for the benthic community to re-establish post-disturbance and to make comparisons between the benthic communities found within the shallow open water and tidal low marsh.

Benthic macroinvertebrate sampling will occur prior to construction activities to determine baseline conditions in the Summer of 2023. Three (3) replicate benthic grab samples will be obtained from each site, with one additional sample taken to evaluate sediment grain size and TOC. Macroinvertebrates will be sampled using a petite ponar grab sampler or equivalent equipment. Each replicate benthic sample will be sieved in the field through a 500-micron screen to remove fine sediment particles. Individual replicates are transferred to labeled bottles and preserved in the field using 95% ethanol solution and transmitted to a laboratory for processing following industry standards. Benthic macroinvertebrates will be enumerated and identified to the lowest genomic level. The samples are then analyzed for species composition and abundance. Macroinvertebrate species of interest can be found in Table 3.

Table 2. MBRI Macroinvertebrate Species of Interest

Macroinvertebrate Target Species	Sampling Notes
Atlantic Mud Crab *(Panopeus herbstii)*	Resident
Blue Crab *(Callinectes sapidus)*	Summer shallows
Eastern Elliptio *(Elliptio complanata)*	Resident
Grass Shrimp *(Palaemonetes pugio)*	Resident

Sediment Sampling

To address concerns related to the potential remobilization of contaminants in the Middle Branch of the Patapsco River resulting from the completed projects, pre- and post-construction sediment screening for metals, polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), herbicides, and pesticides will be conducted at each site. Baseline data on contamination levels will be evaluated and compared to subsequent post-construction sampling to determine measurable increases/ decreases in contaminants within the surface sediments. If a notable increase in contamination is detected, a remediation plan will be developed and implemented with the approval of the regulatory agencies.

Surficial sediment samples will be taken at pre-determined sampling locations to a depth of 0-6 inches below the surface using a petite ponar grab or equivalent sampling equipment. Samples will be properly preserved in the field and sent to an accredited laboratory for analysis. A report summarizing the sampling results will be prepared and submitted to the agencies at the end of each monitoring year. Information obtained from the sediment monitoring will be used, when appropriate, to inform adaptive management activities. Basic water quality testing for temperature, dissolved oxygen, salinity, conductivity, and turbidity will be conducted at each sample location.

Pore Water Sampling

Pre- and post-construction pore water sampling will be conducted semi-annually at the six locations depicted in Figure 1 using the standard operating procedures outlined in the February 2013 Environmental Protection Agency, Science and Ecosystem Support Division (SESD), Pore Water Sampling (513) AF. R2 guidance document. Samples will be collected using a PushPoint sampler or similar device fitted with a watertight flange to prevent surface water intrusion. Samples will be analyzed for contaminants which may include metals, polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semi-volatile

organic compounds (SVOCs), herbicides, and pesticides, and all results will be included in the monitoring reports.

Project Stability Monitoring

To ensure the installed breakwater structures and marsh fill contained within them are stable, regular inspections will be conducted during construction and during the post-construction monitoring period. During construction intensive monitoring of the breakwater structures will occur to ensure long term stability. When structure stability has been observed and verified, monitoring of the marsh fill materials will continue during construction to identify potential sediment releases, structural deficiencies, unexpected erosion, etc. After construction, visual inspections of the breakwater structures, marsh soils, and marsh vegetation will occur routinely during the 5-year monitoring period. Inspections of the breakwater will focus on the stability of structure elevations and components (riprap, sand, fill, stone, etc.) while marsh stability inspections will identify areas of erosion and wasting, vegetation loss, and sediment deposition. Inspections will be conducted on a quarterly basis and the findings reported to MDE and USACE upon request. If remedial action/ adaptive management is needed, corrective actions will be determined and completed using the specific project adaptive management plan.

Sampling Locations and Monitoring Schedule

Figure 1 depicts the MBRI project wide monitoring locations. Monitoring will be performed bi-annually at all sites throughout the Middle Branch (2023, 2025, 2027, 2029, 2031, 2033, etc.) and will continue until it is determined by the regulatory agencies that the Middle Branch Resiliency Project is complete. An individual marsh maintenance plan will be developed for each site where marsh development is proposed and will be monitored and maintained for a minimum period of five (5) years, with a potential to extend the monitoring period up to three (3) additional years depending on site conditions and monitoring results.