



Maryland
Department of
the Environment

Wes Moore, Governor
Aruna Miller, Lt. Governor

Serena McIlwain, Secretary
Suzanne E. Dorsey, Deputy Secretary

February 14, 2024

Smithsonian Institution, Environmental Research Center
c/o Sustainable Science LLC
Mr. Albert McCullough
410 S. Second Street
Denton, MD 21629

Via email: albert@sustainablesience.com, bensons@si.edu

Re: Agency Interest Number: 129052
Tracking Number: 202360783
Tidal Authorization Number: 23-WQC-0027

Dear Sam Benson, SERC:

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 at with any questions.

Sincerely,

Tammy Roberson

Tammy Roberson, Chief
Tidal Wetlands Division



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



23-WQC-0027

EFFECTIVE DATE: **February 9, 2024**
CERTIFICATION HOLDER: **Smithsonian Institution, Environmental
Research Center**
ADDRESS: **647 Contees Wharf Rd
Edgewater, MD 21037**
PROJECT LOCATION: **647 Contees Wharf Rd
Edgewater, MD 21037**

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 Smithsonian Institution, Environmental Research Center AND AS DESCRIBED IN THE ATTACHED PLAN SHEETS DATED October 27, 2023 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 November 1, 2023 to December 1, 2023 on Maryland Department of the Environment's Public Notice webpage and advertising in the The Capitol Gazette on November 8, 2023.

PROJECT DESCRIPTION

- I. Phase 1B: Construct 536 linear feet of three low-profile stone sand containment structures (J-1) each with a "Navigation Hazard" sign, 18 feet wide and a maximum of 2 feet above mean high water; emplace 51 submerged reef balls totaling 525 square feet, all channelward of existing and proposed sills; and to fill and grade with 5000 cubic yards of sand along 430 feet of eroding shoreline and plant with intertidal marsh vegetation totaling 33,271 square feet, all extending a maximum of 210 feet channelward of the mean high water line.
- II. Phase 1A: Emplace 102 submerged reef balls totaling 1029 square feet with four "Navigation Hazard" signs, all channelward of existing sills and all extending a maximum of 72 feet channelward of the mean high water line.

- III. Phase 1C: Construct 498 linear feet of five low-profile stone sand containment structures (BW1-5) each with a “Navigation Hazard” sign, 16 feet wide and a maximum of 2 feet above mean high water; emplace 180 submerged reef balls totaling 1689 square feet, all channelward of existing and proposed sills; and to fill and grade with 3009 cubic yards of sand along 830 feet of eroding shoreline and plant with intertidal marsh vegetation totaling 25,871 square feet, all extending a maximum of 105 feet channelward of the mean high water line.
- IV. Phase 2: Construct one 193-foot long by 15-foot wide and one 236-foot long by 15-foot wide hooked groin sand containment structures (S-1 and S-2) each with a “Navigation Hazard” sign, a maximum of 2 feet above mean high water; and one 155-foot long by 15-foot wide headland groin sand containment structure (S-3) with a “Navigation Hazard” sign, a maximum of 2 feet above mean high water; and to fill and grade with 3009 cubic yards of sand along 540 feet of eroding shoreline and plant with intertidal marsh vegetation totaling 40,416 square feet; and one 181-foot long by 15-foot wide headland groin sand containment structure (S-4) with a “Navigation Hazard” sign, a maximum of 2 feet above mean high water; and to fill and grade with 295 cubic yards of sand along 190 feet of eroding shoreline and plant with intertidal marsh vegetation totaling 1868 square feet, all extending a maximum of 151 feet channelward of the mean high water line.

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-2022-61531, 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 not perform any construction from November 15th through March 1st of any year to protect wintering waterfowl. The proposed project site is located in a Historic Waterfowl Concentration Area.
5. **The Certificate Holder**, due to the close proximity of the project site to an active oyster leases AA 707 and AA 628, **shall notify the below leaseholder(s) at least 30 days prior to commencement of construction** so that aquaculture gear and product may be relocated by the leaseholder as they determine necessary to avoid oyster loss or damage during construction.

Leaseholders contact information:

AA 628

Robert M. Howes, III
4951 Chestnut Street
Shady Side, MD 20764
rjhowes813@aol.com

AA 707

Patrick J. Mahoney, Jr.
180 Jewell Rd.
Dunkirk, MD 20754

Natural Resources Article §4-11A-16 establishes that a person, other than the leaseholder, may not willfully and without authority catch, willfully destroy, remove, alter or transfer any marker, shellfish, equipment, or structures on any aquaculture or submerged land lease area.

For additional information on shellfish aquaculture leasing, please contact Rebecca Thur, MD DNR Leasing and Permitting Coordinator, at rebecca.thur@maryland.gov or at 410 260-8252.

6. The Certificate Holder 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.
7. The marsh establishment area shall be planted within one year following completion of the filling operation. Maintenance planting and debris removal shall be performed as needed.
8. 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. If the fill is graded hydraulically, the 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.
9. The Certificate Holder shall submit photographs on an annual basis for the first five growing seasons to the Tidal Wetlands Division, Water and Science Administration to document the success of the project in terms of the extent of native marsh plant coverage. Photographs shall be taken from at least two directions, as necessary to fully depict the living shoreline.
10. The Certificate Holder 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 License. If the Certificate Holder 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 License. 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.

CITATIONS AND STATEMENTS OF NECESSITY

1. Statement of Necessity for General Conditions 1, 2, 3, 4, and Special Conditions 1, 3,7, 8: 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 and Special Conditions 7, 8, 9, and 10: 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(1)-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. § 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 26.08.02.10E; 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(1)(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 9, 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(1)(b); 26.08.02.03B(2); COMAR 23.02.04.04

7. Statement of Necessity for Special Condition 4: A time of year restriction is necessary to allow for wintering waterfowl to move from breeding areas to seasonally use suitable winter habitat. Breeding and wintering habitat are both essential to support waterfowl populations. Breeding habitat would not sustain waterfowl during winter. Disturbance during the closure period would interfere directly or indirectly with designated uses.

Citations: 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 9, Subtitle 3; Md. Ann. Code, Env. Article, Title 16; COMAR 26.08; COMAR 26.08.02.02.B.(3); 26.08.02.02.B.(1)(d); COMAR 26.08.02.03.B.(1)(b); COMAR 26.08.02.03.B.(2)(e); COMAR 26.24

8. Statement of Necessity for Special Condition 5: Nuisance or non-native species may spread and disrupt and dislodge native species from their habitat, leading to declines in distribution, density, growth and propagation. SAV are a critical habitat for many aquatic species. Limitations on loss will sustain habitat for a variety of aquatic species, including anadromous fish and threatened or endangered species. Water quality regulations state minimum thresholds for SAV in tidal waterways. In addition to direct loss, turbidity created by construction or ongoing operation must be limited for support of aquatic life and meet water quality standards. Oyster bar creation supports/expands designated use for growth and propagation of oyster bars in Support of designated uses for growth and propagation of fish, other aquatic life, and wildlife and the

designated use for support of estuarine and marine aquatic life and shellfish harvesting. The conditions are necessary to allow for continued oyster harvesting and propagation; and maintain and not interfere with the designated use- support of estuarine and marine aquatic life and shellfish harvesting. The conditions ensure that discharges will not result in failure to support designated uses for marine and estuarine aquatic life and submerged aquatic vegetation; and growth, propagation of fish, other aquatic life, and wildlife, and shellfish harvesting.

Citation: COMAR 26.08.02.02-1; COMAR 26.08.02.02B(1)(d); COMAR 26.08.02.03B; COMAR 26.08.02.03-3C; COMAR 26.08.02.02B(2)-B(4); COMAR 26.08.02.03B(2)(d) – (e); COMAR 26.08.02.03-3C; COMAR 26.08.02.02-1

9. Statement of Necessity for Special Conditions 6: Loss of fill material may result in violations of water quality due to turbidity and other alterations which interfere with designated uses as well as a 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.

Citations: 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

10. Statement of Necessity for Special Conditions 7: Proper placement and alignment of the discharge material will maintain habitat and maintain designated uses for support of estuarine and marine aquatic life and support of designated uses for growth and propagation of fish, other aquatic life, and wildlife.

Citations: 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 26.24; COMAR 26.08; COMAR 26.08.02.02B(1)(d); COMAR 26.08.02.02B(3); COMAR 26.08.02.03B(1)(b); COMAR 26.08.02.02B(2); COMAR 26.08.02.10E.(2); COMAR 26.24

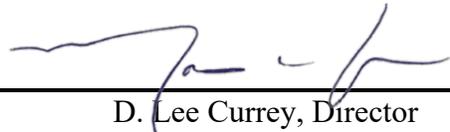
11. Statement of Necessity for Special Conditions 8, 9, 10: Tidal wetlands provide essential habitat, water quality, food, and movement corridors for wildlife, and support of estuarine and marine aquatic life and shellfish harvesting. Successful establishment is necessary to prevent discharges which interfere with designated uses, including growth and propagation of fish, other aquatic life, and wildlife through loss of stream channel habitat and wetlands. Required establishment, re-establishment, or enhancement and loss limits will maintain the designated use.

Citations: COMAR 26.08.02.02B(3); COMAR 26.08.02.03B(3) and B(4); COMAR 26.24.

12. Statement of Necessity for Special Condition 8: Requirements to structures allow for tidal flushing through living shoreline which ensures that numeric standards for dissolved oxygen and temperature may be met. Failure to meet numeric standards for temperature and dissolved oxygen levels may result in conditions that do not support shallow water submerged aquatic vegetation, shellfish harvesting, fish spawning and nurseries, and fish and shellfish survival and growth.

Citations: 1) COMAR 26.08.02.02.B.(3) 2) COMAR 26.08.02.02-1 3) COMAR 26.08.02.03- 3.C.(8)(d) 4) COMAR 26.08.02.03-3.C.(3)(a)

CERTIFICATION APPROVED



D. Lee Currey, Director
Water and Science Administration

2/17/2024

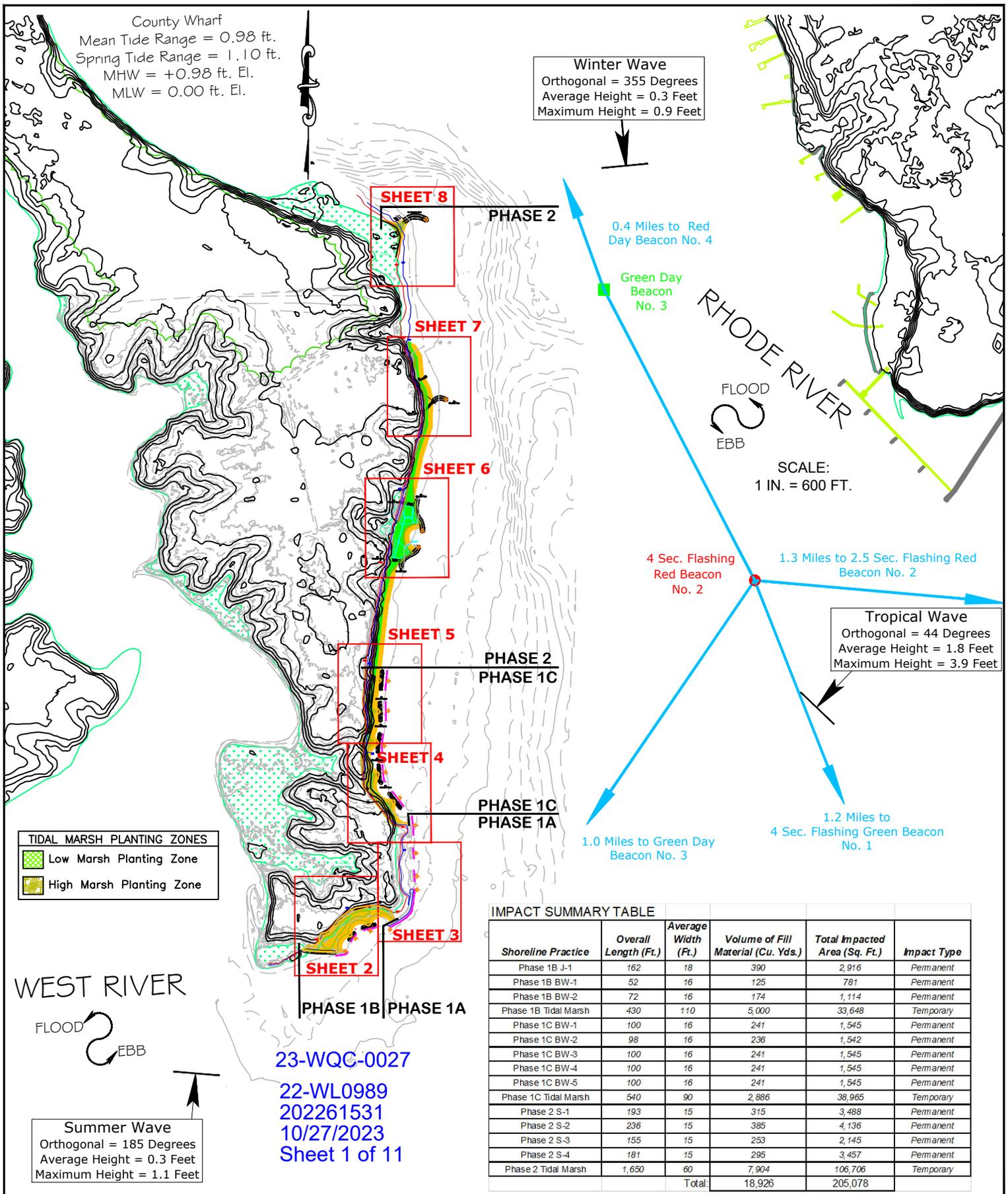
Date

Tracking Number: WQC 202360783
WL 202261531
Agency Interest Number: 129052

Effective Date: **February 9, 2024**

Enclosure: Plan Sheets dated October 27, 2023

cc: WSA Inspection & Compliance Program
Army Corps of Engineers



IMPACT SUMMARY TABLE

Shoreline Practice	Overall Length (Ft.)	Average Width (Ft.)	Volume of Fill Material (Cu. Yds.)	Total Impacted Area (Sq. Ft.)	Impact Type
Phase 1B J-1	162	18	390	2,916	Permanent
Phase 1B BW-1	52	16	125	781	Permanent
Phase 1B BW-2	72	16	174	1,114	Permanent
Phase 1B Tidal Marsh	430	110	5,000	33,648	Temporary
Phase 1C BW-1	100	16	241	1,545	Permanent
Phase 1C BW-2	98	16	236	1,542	Permanent
Phase 1C BW-3	100	16	241	1,545	Permanent
Phase 1C BW-4	100	16	241	1,545	Permanent
Phase 1C BW-5	100	16	241	1,545	Permanent
Phase 1C Tidal Marsh	540	90	2,886	38,965	Temporary
Phase 2 S-1	193	15	315	3,488	Permanent
Phase 2 S-2	236	15	385	4,136	Permanent
Phase 2 S-3	155	15	253	2,145	Permanent
Phase 2 S-4	181	15	295	3,457	Permanent
Phase 2 Tidal Marsh	1,650	60	7,904	106,706	Temporary
Total:			18,926	205,078	



LIVING SHORELINE PROJECT
SMITHSONIAN ENVIRONMENTAL
RESEARCH CENTER
647 CONTEES WHARF ROAD
EDGEWATER, MARYLAND 21037

**SHEET 1:
VICINITY &
KEY SHEET MAP**

DATE: 7/12/2023
21009
AS SHOWN
DESIGNED BY: AM
DRAWN BY: AM
CHECKED BY: SM

NOTES:

1. PROPOSED MEAN HIGH WATER REPRESENTED BY MOST WATERWARD PLANTING ZONE EDGE ON SHEETS 2 THROUGH 8.
2. PROPOSED MEAN LOW WATER REPRESENTED BY MOST WATERWARD SAND ZONE EDGE ON SHEETS 2 THROUGH 8.

MATURE FOREST

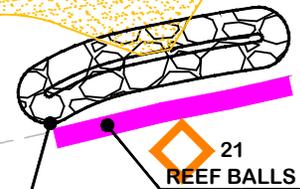
PROPOSED 25,212 FT. SQ. HIGH MARSH

MLW

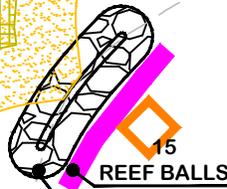
PROPOSED 8,059 FT. SQ. LOW MARSH

PHASE 1B TIDAL MARSH
 OVERALL LENGTH: 430 FT.
 AVERAGE WIDTH: 110 FT.
 FILL VOLUME: 5,000 CU. YDS.
 IMPACT AREA: 33,648 SQ. FT.
 IMPACT TYPE: TEMPORARY

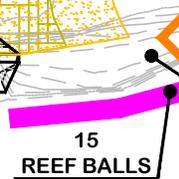
MHW



PHASE 1B STRUCTURE J-1
 OVERALL LENGTH: 187 FT.
 AVERAGE WIDTH: 18 FT.
 FILL VOLUME: 450 CU. YDS.
 IMPACT AREA: 3,186 SQ. FT.
 IMPACT TYPE: PERMANENT



PHASE 1B STRUCTURE J-1
 OVERALL LENGTH: 187 FT.
 AVERAGE WIDTH: 18 FT.
 FILL VOLUME: 450 CU. YDS.
 IMPACT AREA: 3,186 SQ. FT.
 IMPACT TYPE: PERMANENT



WORK EXECUTED UNDER
 MARYLAND WL 11-0522 &
 CENAB-OP-RN 2010-60228-M22

PROPOSED NAVIGATION
 HAZARD SIGNAGE (TYPICAL)
 SEE SHEET 11 FOR DETAIL

23-WQC-0027

22-WL0989
 202261531
 10/27/2023
 Sheet 2 of 11

PHASE 1B STRUCTURE J-1
 OVERALL LENGTH: 162 FT.
 AVERAGE WIDTH: 18 FT.
 FILL VOLUME: 450 CU. YDS.
 IMPACT AREA: 3,186 SQ. FT.
 IMPACT TYPE: PERMANENT

WEST RIVER



1 Inch = 50 Feet

0 ft. 50 ft. 75 ft. 100 ft.

SHEET 3 MATCHLINE

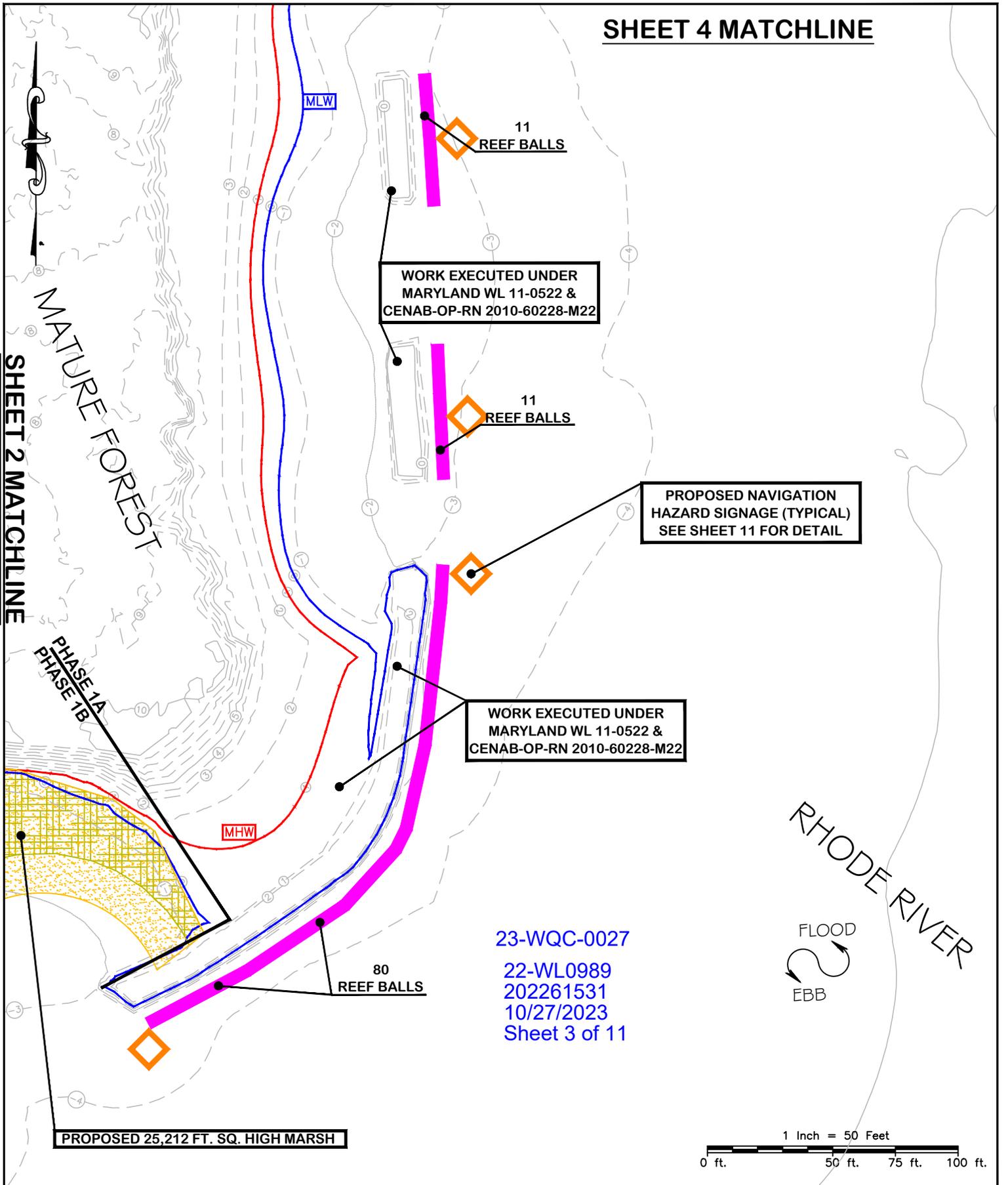


LIVING SHORELINE PROJECT
 SMITHSONIAN ENVIRONMENTAL
 RESEARCH CENTER
 647 CONTEES WHARF ROAD
 EDGEWATER, MARYLAND 21037

**SHEET 2:
 PROPOSED
 CONSTRUCTION**

DATE: 7/12/2023
21009
AS SHOWN
DESIGNED BY: AM
DRAWN BY: AM
CHECKED BY: SM

SHEET 4 MATCHLINE



SHEET 2 MATCHLINE

MATURE FOREST

WORK EXECUTED UNDER
MARYLAND WL 11-0522 &
CENAB-OP-RN 2010-60228-M22

11
REEF BALLS

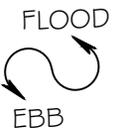
PROPOSED NAVIGATION
HAZARD SIGNAGE (TYPICAL)
SEE SHEET 11 FOR DETAIL

WORK EXECUTED UNDER
MARYLAND WL 11-0522 &
CENAB-OP-RN 2010-60228-M22

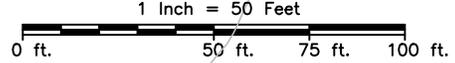
80
REEF BALLS

23-WQC-0027
22-WL0989
202261531
10/27/2023
Sheet 3 of 11

RHODE RIVER



PROPOSED 25,212 FT. SQ. HIGH MARSH

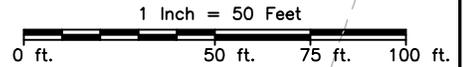


LIVING SHORELINE PROJECT
SMITHSONIAN ENVIRONMENTAL
RESEARCH CENTER
647 CONTEES WHARF ROAD
EDGEWATER, MARYLAND 21037

**SHEET 3:
PROPOSED
CONSTRUCTION**

DATE: 7/12/2023
21009
AS SHOWN
DESIGNED BY: AM
DRAWN BY: AM
CHECKED BY: SM

SHEET 5 MATCHLINE



30
REEF BALLS

PHASE 1C STRUCTURE BW-3
 OVERALL LENGTH: 100 FT.
 AVERAGE WIDTH: 16 FT.
 FILL VOLUME: 241 CU. YDS.
 IMPACT AREA: 1,545 SQ. FT.
 IMPACT TYPE: PERMANENT

S4
Structure Types

29
REEF BALLS

PHASE 1C STRUCTURE BW-2
 OVERALL LENGTH: 98 FT.
 AVERAGE WIDTH: 16 FT.
 FILL VOLUME: 236 CU. YDS.
 IMPACT AREA: 1,542 SQ. FT.
 IMPACT TYPE: PERMANENT

S4
Structure Types

PROPOSED 25,871 FT. SQ. HIGH MARSH

**PROPOSED NAVIGATION
HAZARD SIGNAGE (TYPICAL)**
 SEE SHEET 11 FOR DETAIL

30
REEF BALLS

PHASE 1C STRUCTURE BW-1
 OVERALL LENGTH: 100 FT.
 AVERAGE WIDTH: 16 FT.
 FILL VOLUME: 241 CU. YDS.
 IMPACT AREA: 1,545 SQ. FT.
 IMPACT TYPE: PERMANENT

PHASE 1C TIDAL MARSH
 OVERALL LENGTH: 540 FT.
 AVERAGE WIDTH: 90 FT.
 FILL VOLUME: 3,009 CU. YDS.
 IMPACT AREA: 40,615 SQ. FT.
 IMPACT TYPE: TEMPORARY

MATURE FOREST

31
REEF BALLS

PHASE 1C
PHASE 1A

WORK EXECUTED UNDER
MARYLAND WL 11-0522 &
CENAB-OP-RN 2010-60228-M22

23-WQC-0027

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SHEET 3 MATCHLINE



LIVING SHORELINE PROJECT
 SMITHSONIAN ENVIRONMENTAL
 RESEARCH CENTER
 647 CONTEES WHARF ROAD
 EDGEWATER, MARYLAND 21037

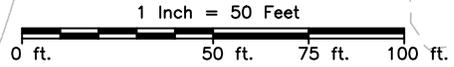
**SHEET 4:
PROPOSED
CONSTRUCTION**

DATE: 7/12/2023
21009
AS SHOWN
DESIGNED BY: AM
DRAWN BY: AM
CHECKED BY: SM

23-WQC-0027

22-WL0989
202261531
10/27/2023
Sheet 5 of 11

RHODE RIVER



MATURE FOREST

PHASE 2
PHASE 1C

MHW

MLW

PHASE 1C STRUCTURE BW-5
OVERALL LENGTH: 100 FT.
AVERAGE WIDTH: 16 FT.
FILL VOLUME: 241 CU. YDS.
IMPACT AREA: 1,545 SQ. FT.
IMPACT TYPE: PERMANENT

30
REEF BALLS

PHASE 1C TIDAL MARSH
OVERALL LENGTH: 540 FT.
AVERAGE WIDTH: 90 FT.
FILL VOLUME: 3,009 CU. YDS.
IMPACT AREA: 40,615 SQ. FT.
IMPACT TYPE: TEMPORARY

PROPOSED 25,871 FT. SQ. HIGH MARSH

S4
Structure Types

PHASE 1C STRUCTURE BW-4
OVERALL LENGTH: 100 FT.
AVERAGE WIDTH: 16 FT.
FILL VOLUME: 241 CU. YDS.
IMPACT AREA: 1,545 SQ. FT.
IMPACT TYPE: PERMANENT

**PROPOSED NAVIGATION
HAZARD SIGNAGE (TYPICAL)**
SEE SHEET 11 FOR DETAIL

30
REEF BALLS

S4
Structure Types

PHASE 1C STRUCTURE BW-3
OVERALL LENGTH: 100 FT.
AVERAGE WIDTH: 16 FT.
FILL VOLUME: 241 CU. YDS.
IMPACT AREA: 1,545 SQ. FT.
IMPACT TYPE: PERMANENT

30
REEF BALLS

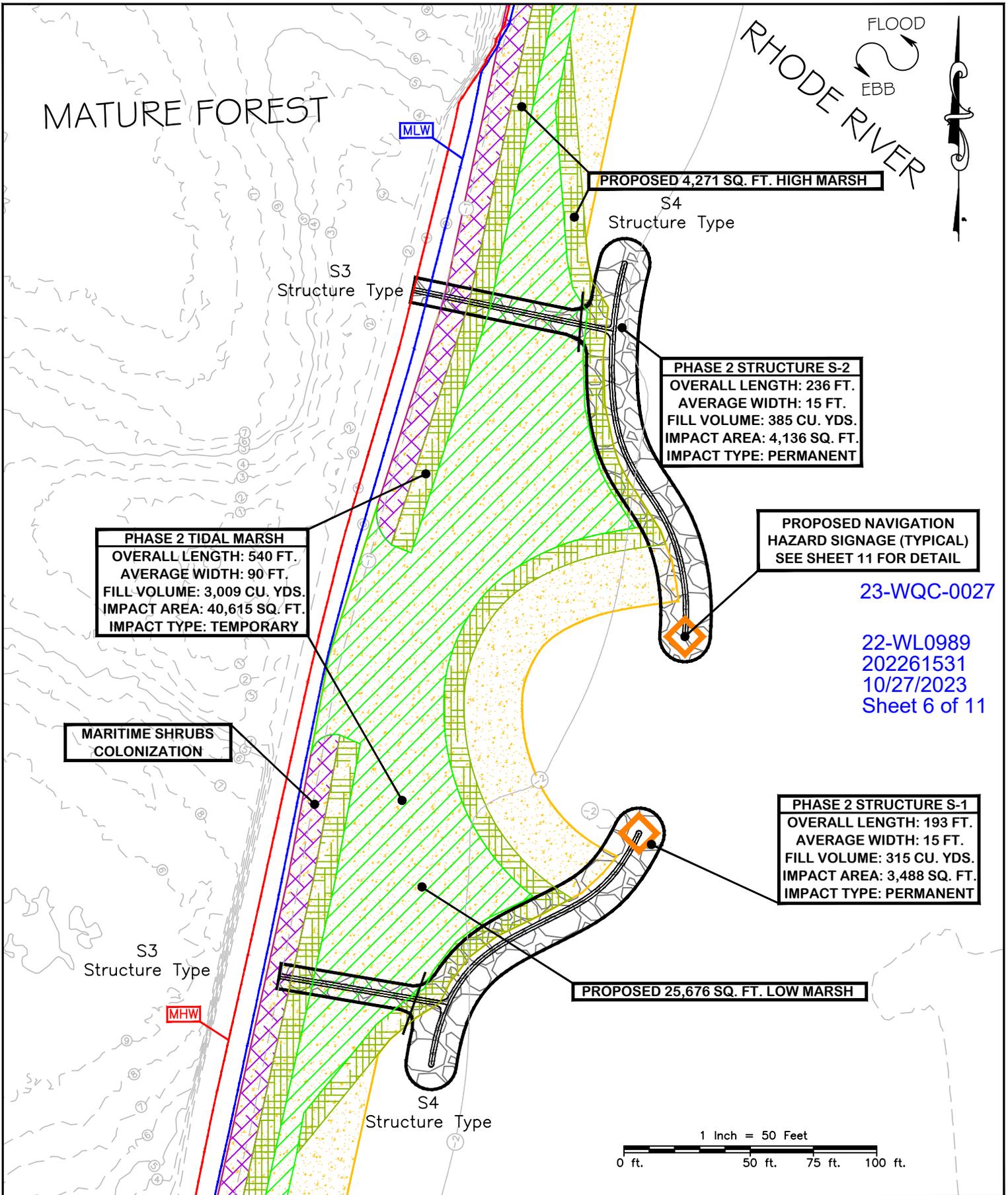
SHEET 4 MATCHLINE



LIVING SHORELINE PROJECT
SMITHSONIAN ENVIRONMENTAL
RESEARCH CENTER
647 CONTEES WHARF ROAD
EDGEWATER, MARYLAND 21037

**SHEET 5:
PROPOSED
CONSTRUCTION**

DATE: 7/12/2023
21009
AS SHOWN
DESIGNED BY: AM
DRAWN BY: AM
CHECKED BY: SM



PHASE 2 TIDAL MARSH
 OVERALL LENGTH: 540 FT.
 AVERAGE WIDTH: 90 FT.
 FILL VOLUME: 3,009 CU. YDS.
 IMPACT AREA: 40,615 SQ. FT.
 IMPACT TYPE: TEMPORARY

PROPOSED 4,271 SQ. FT. HIGH MARSH

PHASE 2 STRUCTURE S-2
 OVERALL LENGTH: 236 FT.
 AVERAGE WIDTH: 15 FT.
 FILL VOLUME: 385 CU. YDS.
 IMPACT AREA: 4,136 SQ. FT.
 IMPACT TYPE: PERMANENT

**PROPOSED NAVIGATION
 HAZARD SIGNAGE (TYPICAL)**
 SEE SHEET 11 FOR DETAIL

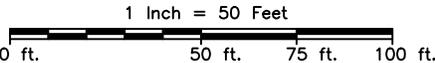
**MARITIME SHRUBS
 COLONIZATION**

PHASE 2 STRUCTURE S-1
 OVERALL LENGTH: 193 FT.
 AVERAGE WIDTH: 15 FT.
 FILL VOLUME: 315 CU. YDS.
 IMPACT AREA: 3,488 SQ. FT.
 IMPACT TYPE: PERMANENT

PROPOSED 25,676 SQ. FT. LOW MARSH

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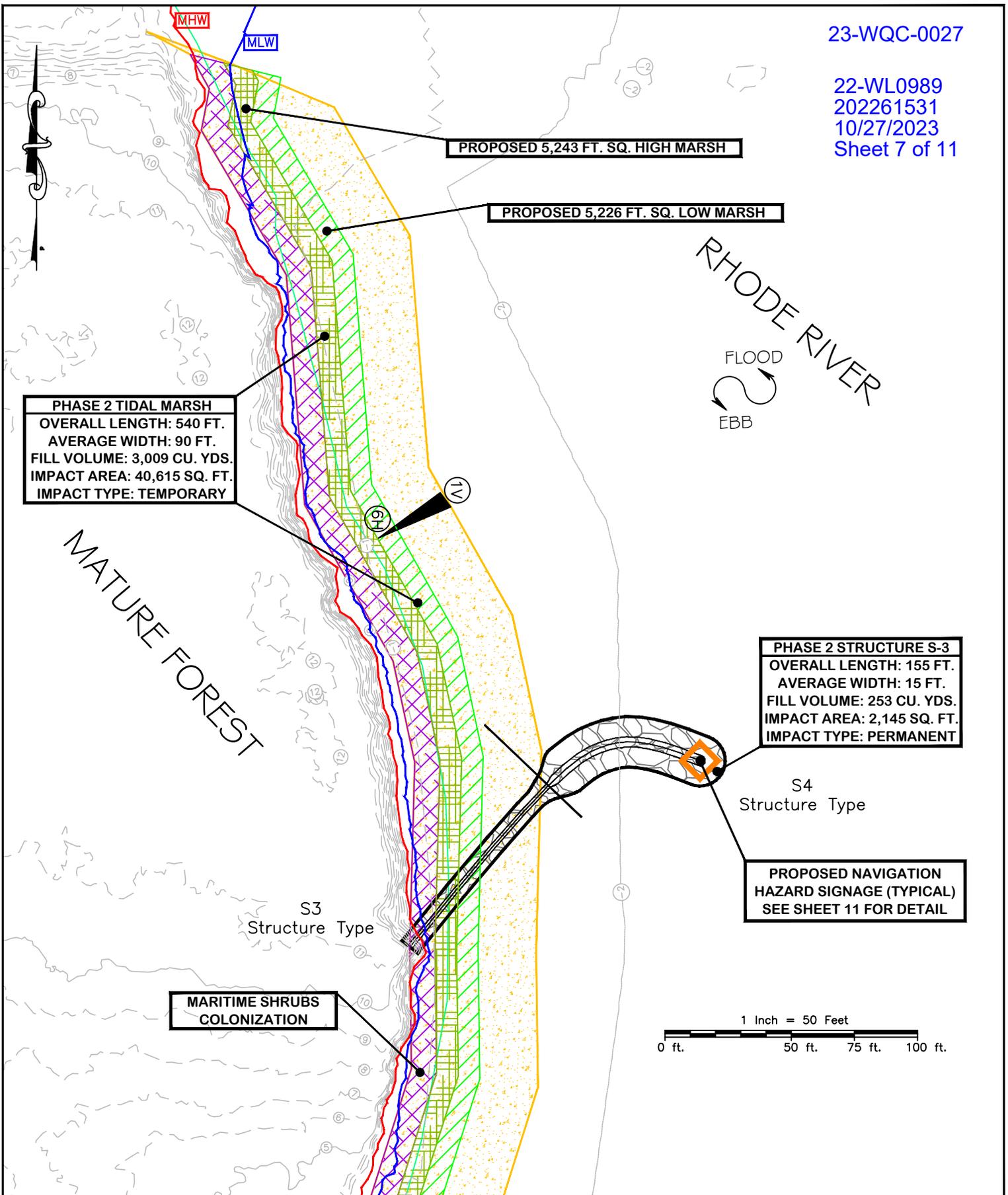
22-WL0989
 202261531
 10/27/2023
 Sheet 6 of 11



**LIVING SHORELINE PROJECT
 SMITHSONIAN ENVIRONMENTAL
 RESEARCH CENTER
 647 CONTEES WHARF ROAD
 EDGEWATER, MARYLAND 21037**

**SHEET 6:
 PROPOSED
 CONSTRUCTION**

DATE: 7/12/2023
21009
AS SHOWN
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DRAWN BY: AM
CHECKED BY: SM



PHASE 2 TIDAL MARSH
 OVERALL LENGTH: 540 FT.
 AVERAGE WIDTH: 90 FT.
 FILL VOLUME: 3,009 CU. YDS.
 IMPACT AREA: 40,615 SQ. FT.
 IMPACT TYPE: TEMPORARY

PROPOSED 5,243 FT. SQ. HIGH MARSH

PROPOSED 5,226 FT. SQ. LOW MARSH

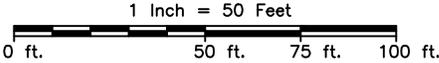
PHASE 2 STRUCTURE S-3
 OVERALL LENGTH: 155 FT.
 AVERAGE WIDTH: 15 FT.
 FILL VOLUME: 253 CU. YDS.
 IMPACT AREA: 2,145 SQ. FT.
 IMPACT TYPE: PERMANENT

S4
 Structure Type

**PROPOSED NAVIGATION
 HAZARD SIGNAGE (TYPICAL)
 SEE SHEET 11 FOR DETAIL**

S3
 Structure Type

**MARITIME SHRUBS
 COLONIZATION**



PHASE 2 S-4 TIDAL MARSH
OVERALL LENGTH: 190 FT.
AVERAGE WIDTH: 20 FT.
FILL VOLUME: 340 CU. YDS.
IMPACT AREA: 4,468 SQ. FT.
IMPACT TYPE: TEMPORARY

PHASE 2 STRUCTURE S-4
OVERALL LENGTH: 181 FT.
AVERAGE WIDTH: 15 FT.
FILL VOLUME: 295 CU. YDS.
IMPACT AREA: 3,457 SQ. FT.
IMPACT TYPE: PERMANENT

**PROPOSED NAVIGATION
HAZARD SIGNAGE (TYPICAL)**
SEE SHEET 11 FOR DETAIL

PROPOSED 1,868 FT. SQ. HIGH MARSH

S3
Structure
Type

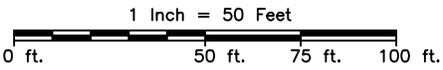
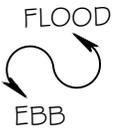
S4 Structure Type

**EXISTING
TIDAL MARSH**

MHW

MLW

RHODE RIVER



**LIVING SHORELINE PROJECT
SMITHSONIAN ENVIRONMENTAL
RESEARCH CENTER
647 CONTEES WHARF ROAD
EDGEWATER, MARYLAND 21037**

**SHEET 8:
PROPOSED
CONSTRUCTION**

DATE: 7/12/2023
21009
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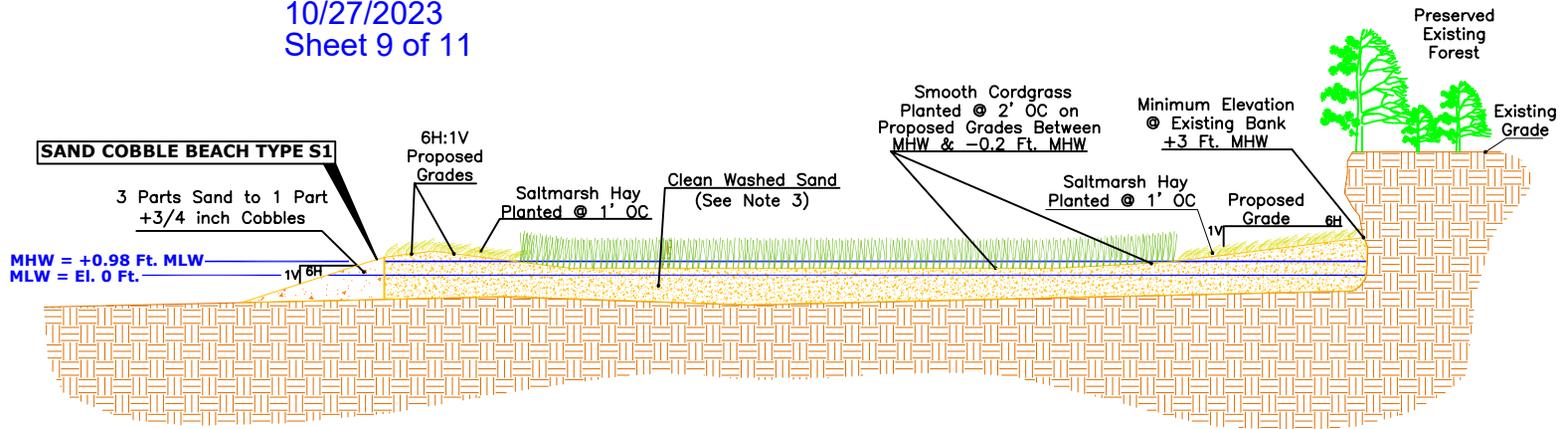
23-WQC-0027

22-WL0989
202261531
10/27/2023
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DATE: 7/12/2023
21009
AS SHOWN
DESIGNED BY: AM
DRAWN BY: AM
CHECKED BY: SM

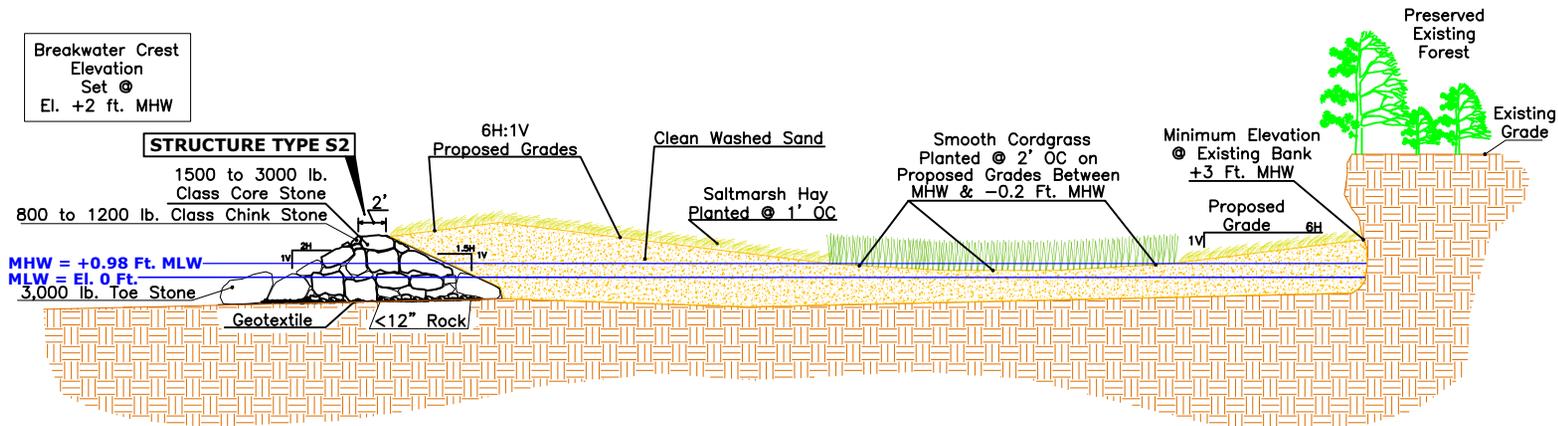
**SHEET 9:
CONSTRUCTION
DETAILS**

LIVING SHORELINE PROJECT
SMITHSONIAN ENVIRONMENTAL
RESEARCH CENTER
647 CONTEES WHARF ROAD
EDGEWATER, MARYLAND 21037



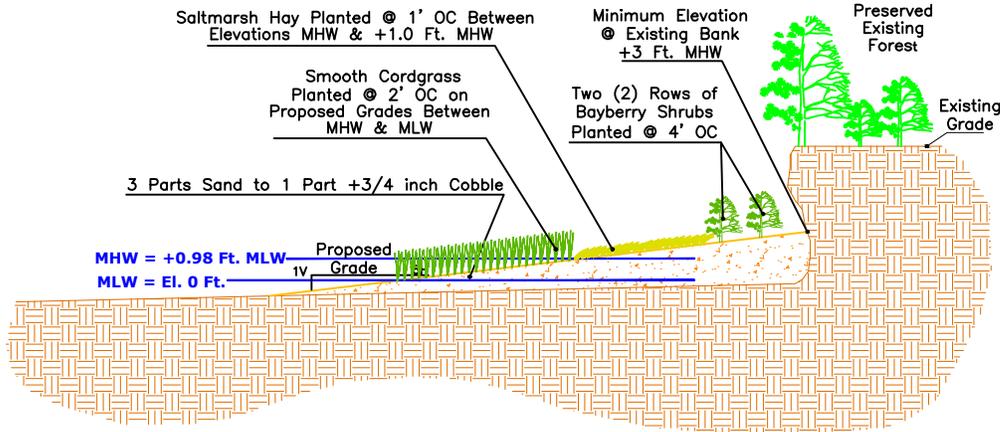
Typical Detail For Sand & Cobble in Area of
Coves in Phase 1B

SAND AND COBBLE COVE DETAIL
Not to Scale



Typical Detail For Nearshore Breakwaters in Phase 1B in Area
from Existing Bank Face to Stone Structure

NEARSHORE BREAKWATER DETAIL
Not to Scale



Typical Detail For Shoreline Restoration in Phase 2

SHORELINE RESTORATION DETAIL

Not to Scale

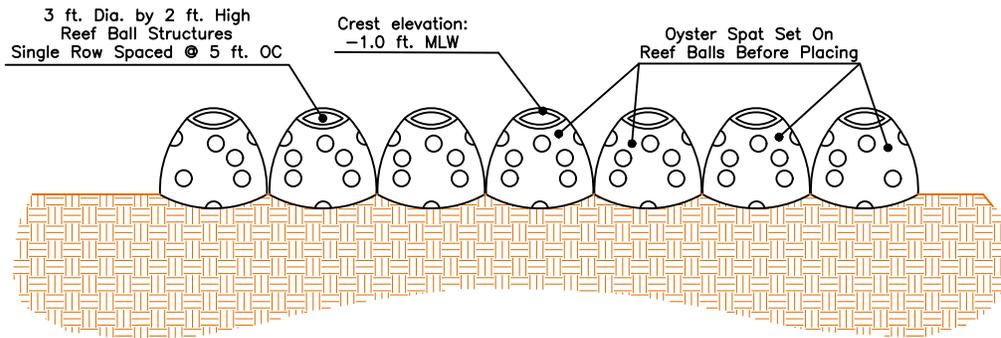
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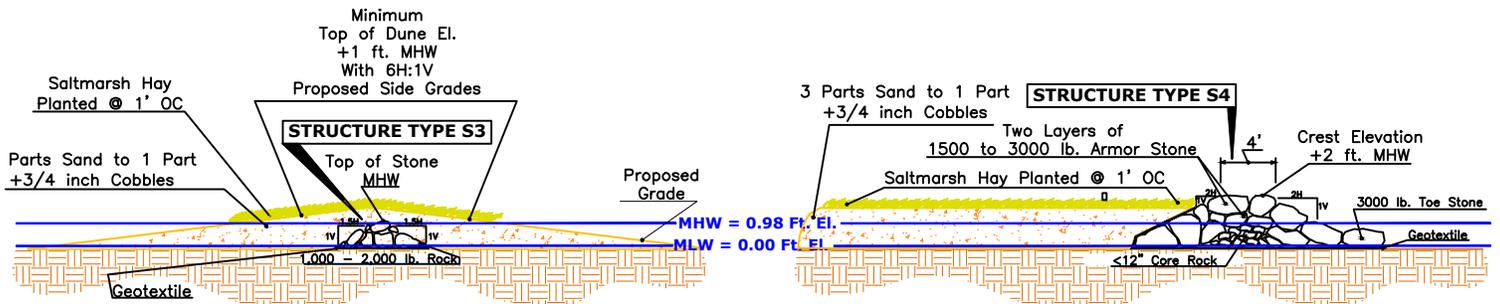
10/27/2023

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REEF BALL TYPICAL SECTION

Not to Scale



Initial Groin Section

End of Groin Section

Typical Detail For Headland Groins in Phases 1C & 2

HEADLAND GROIN DETAIL

Not to Scale





MARSH MAINTENANCE PLAN

Agency Interest Number: _____
Tidal Wetlands License Number: ____-____-_____
Licensee Name: _____
License Effective Date: _____
Address: _____

Please sign and date this Marsh Maintenance Plan and return to the address below no later than _____.

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.

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: _____
2-Year Report: _____
3-Year Report: _____
4-Year Report: _____
5-Year Report: _____

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 _____
(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)