June 23, 2025

Fishing Creek Farm Homeowners Association
c/o Haley Kelly
Wetland Studies & Solutions, Inc
1131 Benfield Boulevard, Ste L
Millersville, MD 21108

Via email: HKelly@wetlands.com

Re: Agency Interest Number: 180378
Tracking Number: 202461044
Tidal Authorization Number: 25-WQC-0005

Dear Fishing Creek Farm Homeowners Association:

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 Mel Throckmorton at mel.throckmorton@maryland.gov or 410-375-2803 with any questions.

Sincerely,

Jonathan Stewart
Division Chief
Tidal Wetlands Division

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

25-WQC-0005

EFFECTIVE DATE: **June 23, 2025**
CERTIFICATION HOLDER: **Fishing Creek Farm Homeowners Association**
ADDRESS: **1222 Cherry Tree Lane**
Annapolis, MD 21403
PROJECT LOCATION: **Beachview Rd and Southbreeze Ln.**
38.918888 / -76.478108
Annapolis, MD 21403

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 FISHING CREEK FARM LIVING SHORELINE AND AS DESCRIBED IN THE ATTACHED PLAN SHEETS DATED FEBRUARY 20TH, 2025, 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 the Environment satisfied the statutory and regulatory public notice requirements by placing the WQC on Public Notice from March 15th, 2025 to April 15th, 2025 on Maryland Department of the Environment's Public Notice webpage and advertising in the Capital Gazette on March 20th, 2025.

PROJECT DESCRIPTION

1. Construct three stone breakwaters measuring 136-foot long by 28-foot wide, 165-foot long by 26-foot wide, and 97-foot long by 21-foot wide along approximately 520 linear feet of shoreline within a maximum of 134 feet channelward of the mean high water line; and

2. Fill and grade approximately 15,480 square feet with 670 cubic yards of sand along 253 feet of eroding shoreline to nourish an eroded beach and plant two areas with approximately 1,525 square feet of low marsh vegetation and 675 square feet of high 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 authorization NAB-202461044 (Fishing Creek Farm HOA) until such time that it 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. 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.

4. The Certificate Holder shall have all work proposed above the mean high water line reviewed and authorized by Anne Arundel County Department of Permits and Inspections. This does not include work under the jurisdiction of Non-Tidal Wetlands.

5. 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.

6. The Certificate Holder shall construct the beach nourishment and the marsh establishment area in accordance with the following conditions:
    a. The Certificate Holder shall use clean substrate fill material, no more than 10% of which shall pass through a standard number 100 sieve.
    b. The marsh establishment area shall be planted within one year following completion of the filling operation.
    c. 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.
    d. If the fill is graded hydraulically, the Certificate Holder shall use a turbidity curtain around the perimeter of the instream work.
    e. If the existing bank is to be cleared or graded:
        i. 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
        ii. 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.

7. 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 Certification. 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 Certification. 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.

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

STATEMENTS OF NECESSITY

1. Statement of Necessity for General Conditions 1, 2, 3, 4, and Special Conditions 1, 3, 4: 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 6, 7, 8: 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; COMAR 26.23; 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 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 Conditions 6, 7: 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.

8. Statement of Necessity for Special Condition 5: A time of year restriction is necessary to maintain the designated use for support of estuarine and marine aquatic life and shellfish harvesting.

   Citation: Federal and state laws which authorize this condition include but are not limited to: COMAR: 26.08.02.02B(1)(d); 26.08.02.02B(3); COMAR 26.08.02.02-16.

CERTIFICATION APPROVED

D. Lee Currey
D. Lee Currey (Jun 23, 2025 22:32 EDT)

Jun 23, 2025

D. Lee Currey, Director
Water and Science Administration

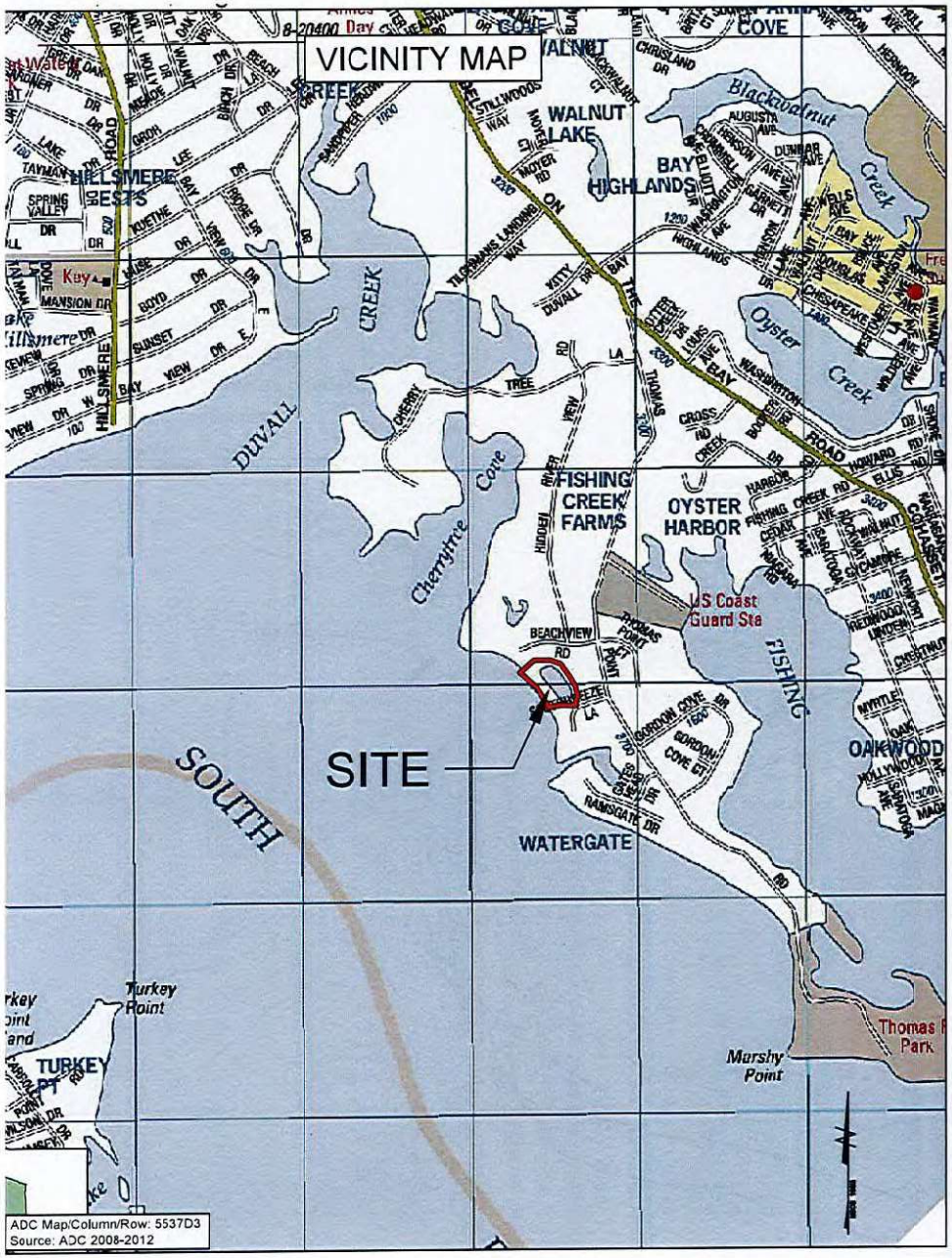
Date

Tracking Number: 202461044
Agency Interest Number: 180378

Effective Date: June 23th, 2025

Enclosure: Plan Sheets dated February 20th, 2025

cc: WSA Inspection & Compliance Program
Army Corps of Engineers

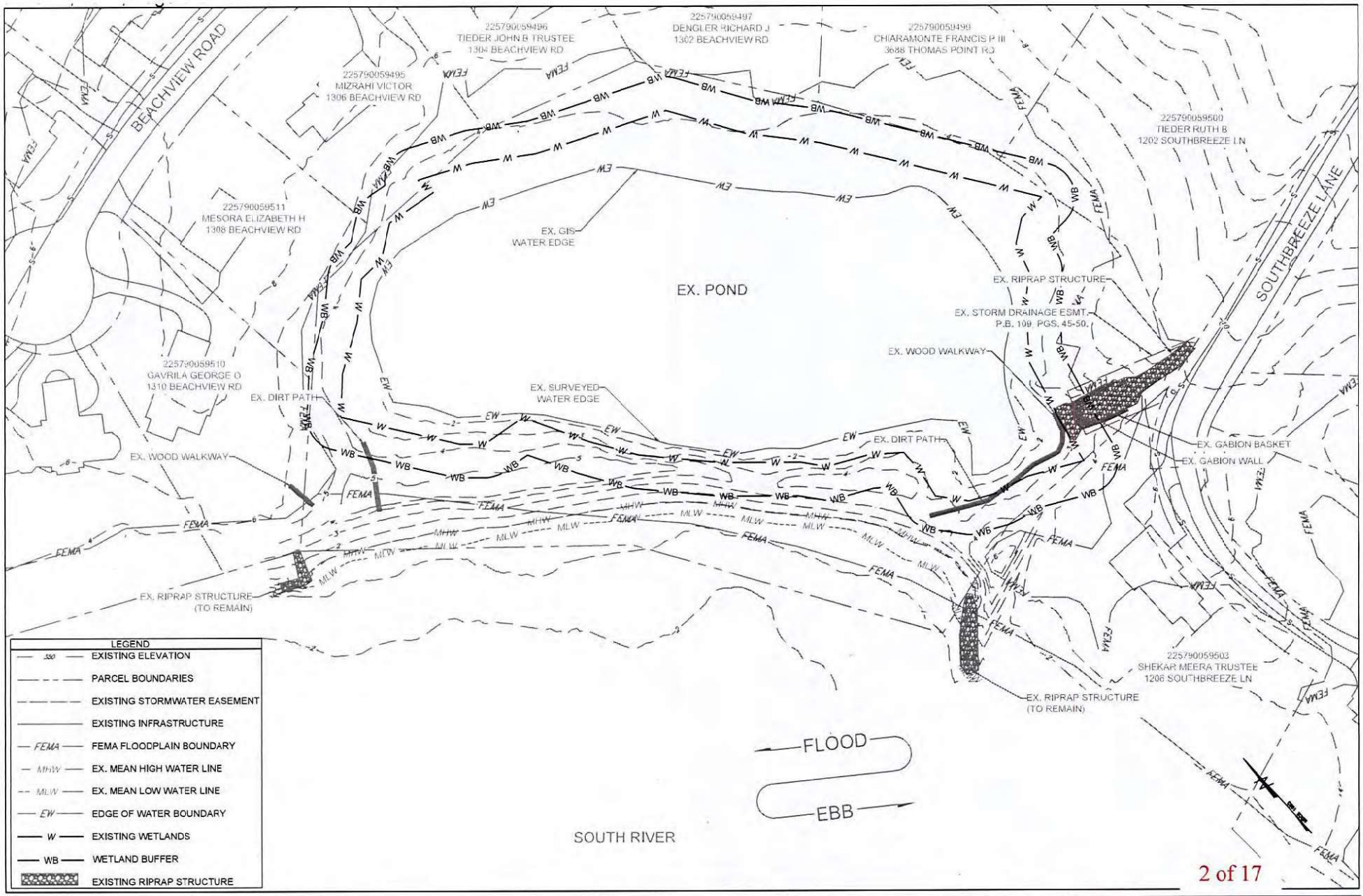


PROJECT VICINITY MAPS
PROJECT: Southbreeze Community Living Shoreline Stabilization

PROPOSED PROJECT FOR:
Fishing Creek Farm HOA
1222 Cherry Tree Lane

VICINITY MAP SCALE 1":2000'

24-WL-0711/24-NT-0204/25-WQC-0005
202461044
180378
2/20/25
MT (TW), CK (NTW)



2 of 17

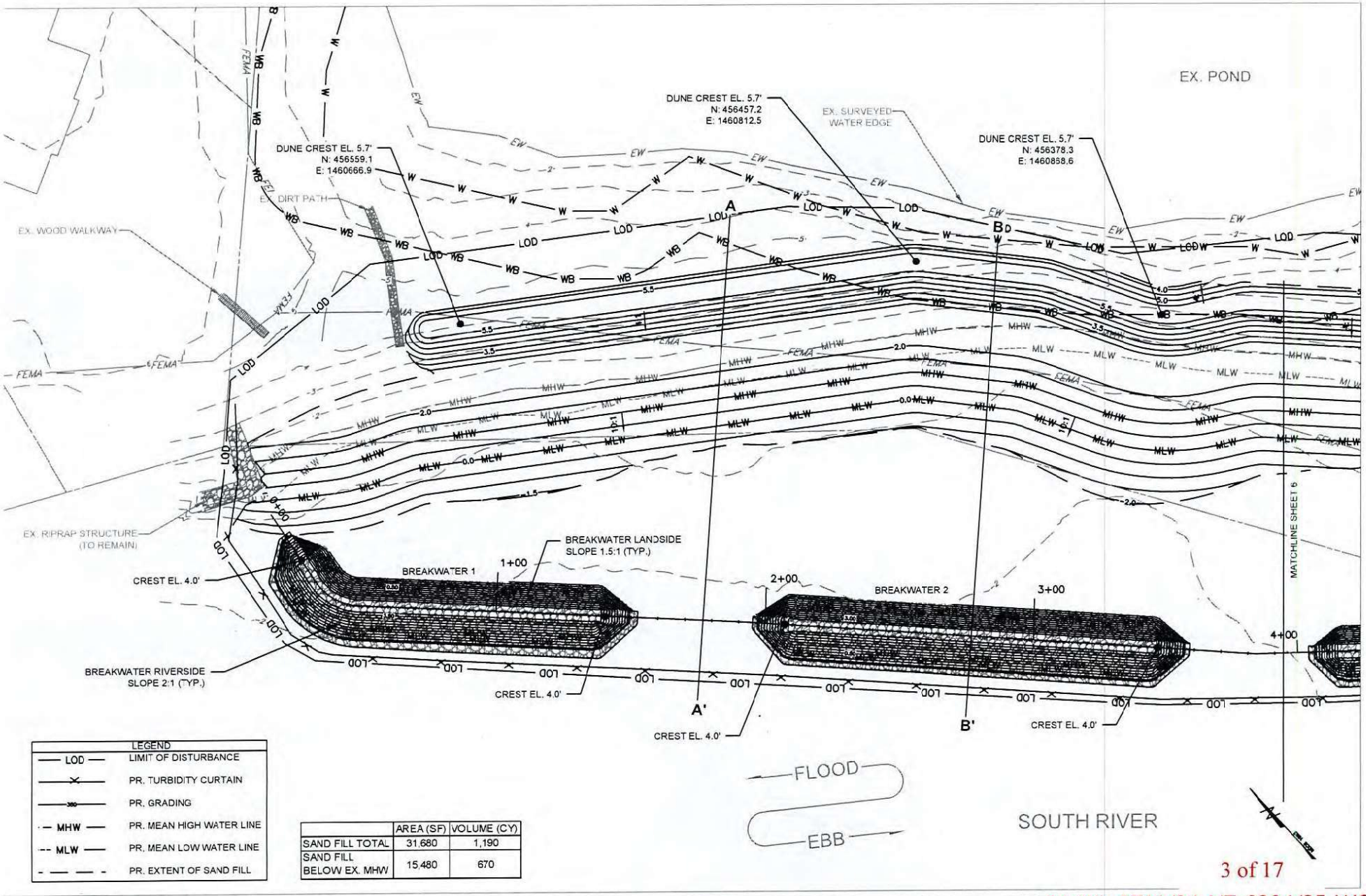
EXISTING CONDITIONS
PROJECT: Southbreeze Community Living Shoreline Stabilization

PROPOSED PROJECT FOR:
Fishing Creek Farm HOA
1222 Cherry Tree Lane
Annapolis, MD 21403

NOTES:
1. The length of impacted tidal shoreline is 518 LF.
2. No SAV was mapped near the project area within the last five years.

0 50 100 200
1" = 100'

24-WL-0711/24-NT-0204/25-WQC-0005
202461044
180378
2/20/25
MT (TW), CK (NTW)



LEGEND	
LOD	LIMIT OF DISTURBANCE
	PR. TURBIDITY CURTAIN
	PR. GRADING
MHW	PR. MEAN HIGH WATER LINE
MLW	PR. MEAN LOW WATER LINE
	PR. EXTENT OF SAND FILL

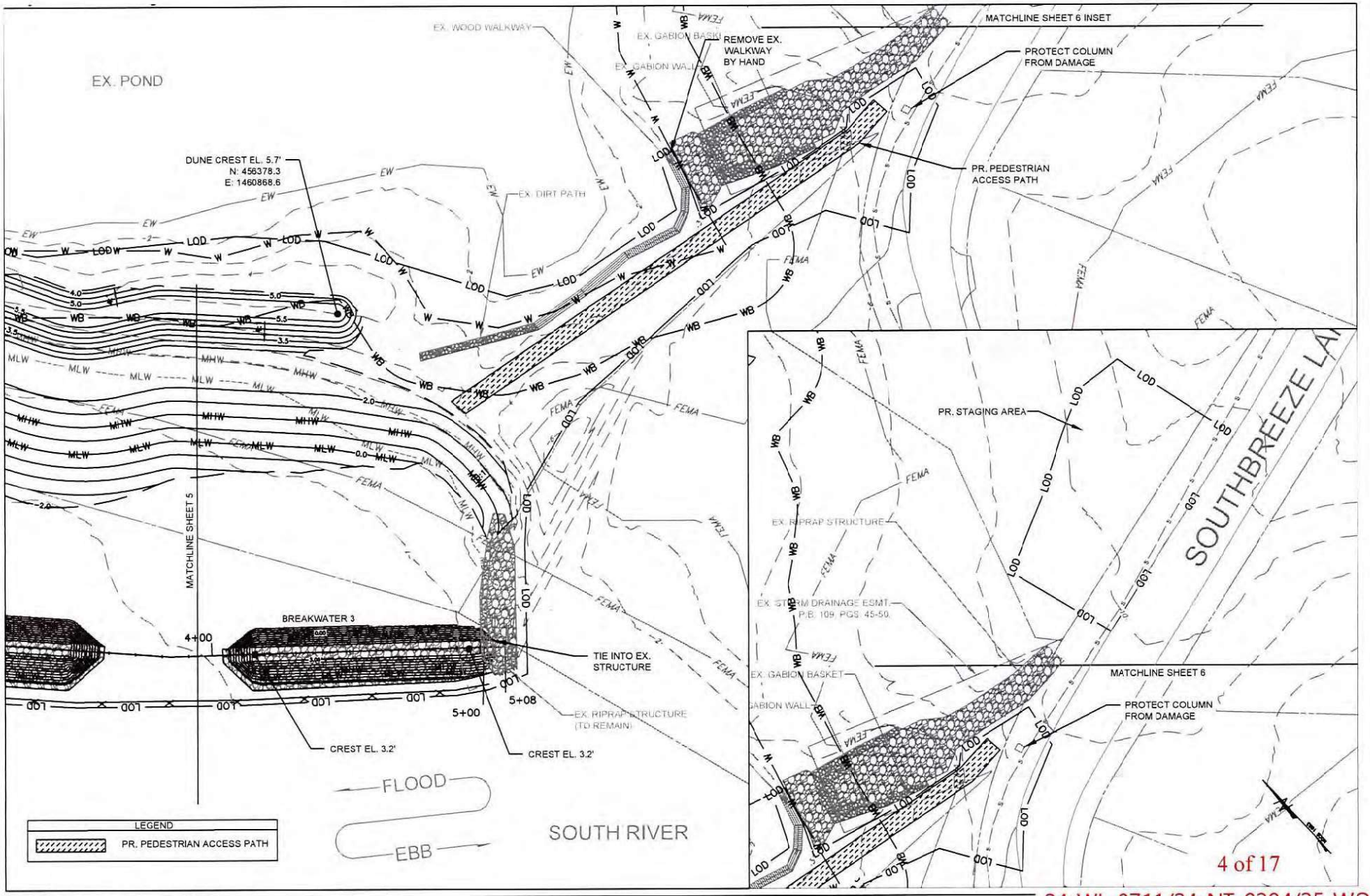
	AREA (SF)	VOLUME (CY)
SAND FILL TOTAL	31,680	1,190
SAND FILL BELOW EX. MHW	15,480	670

PROPOSED CONDITIONS
PROJECT: Southbreeze Community Living Shoreline Stabilization

PROPOSED PROJECT FOR:
Fishing Creek Farm HOA
1222 Cherry Tree Lane
Annapolis, MD 21403

0 25 50 100
1" = 50'

24-WL-0711/24-NT-0204/25-WQC-000
202461044
180378
2/20/25
MT (TW), CK (NTW)



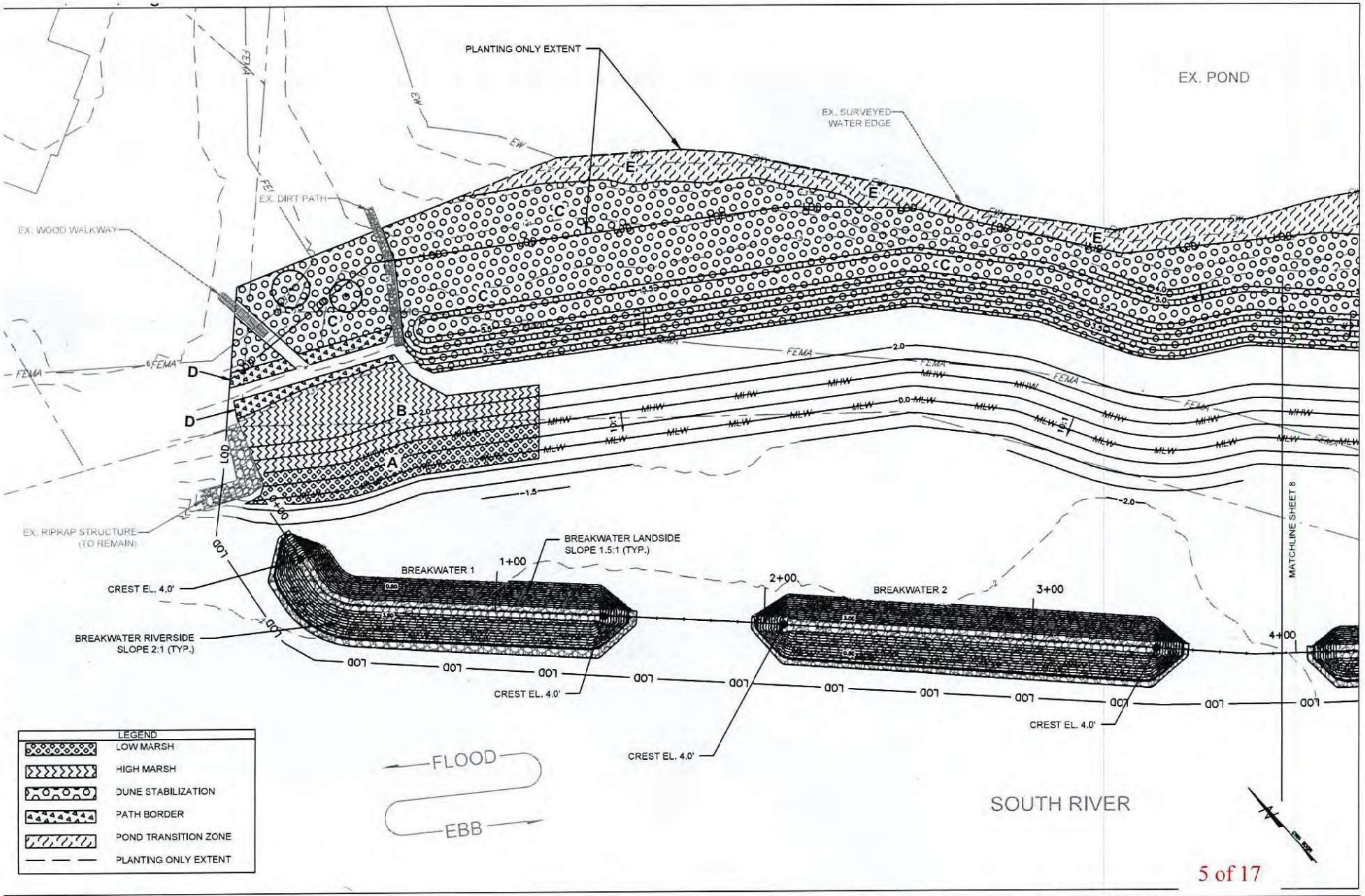
PROPOSED CONDITIONS (cont.)
PROJECT: Southbreeze Community Living Shoreline Stabilization

PROPOSED PROJECT FOR:
Fishing Creek Farm HOA
1222 Cherry Tree Lane
Annapolis, MD 21403

0 25 50 100
1" = 50'

4 of 17

24-WL-0711/24-NT-0204/25-WQC-000
202461044
180378
2/20/25
MT (TW), CK (NTW)

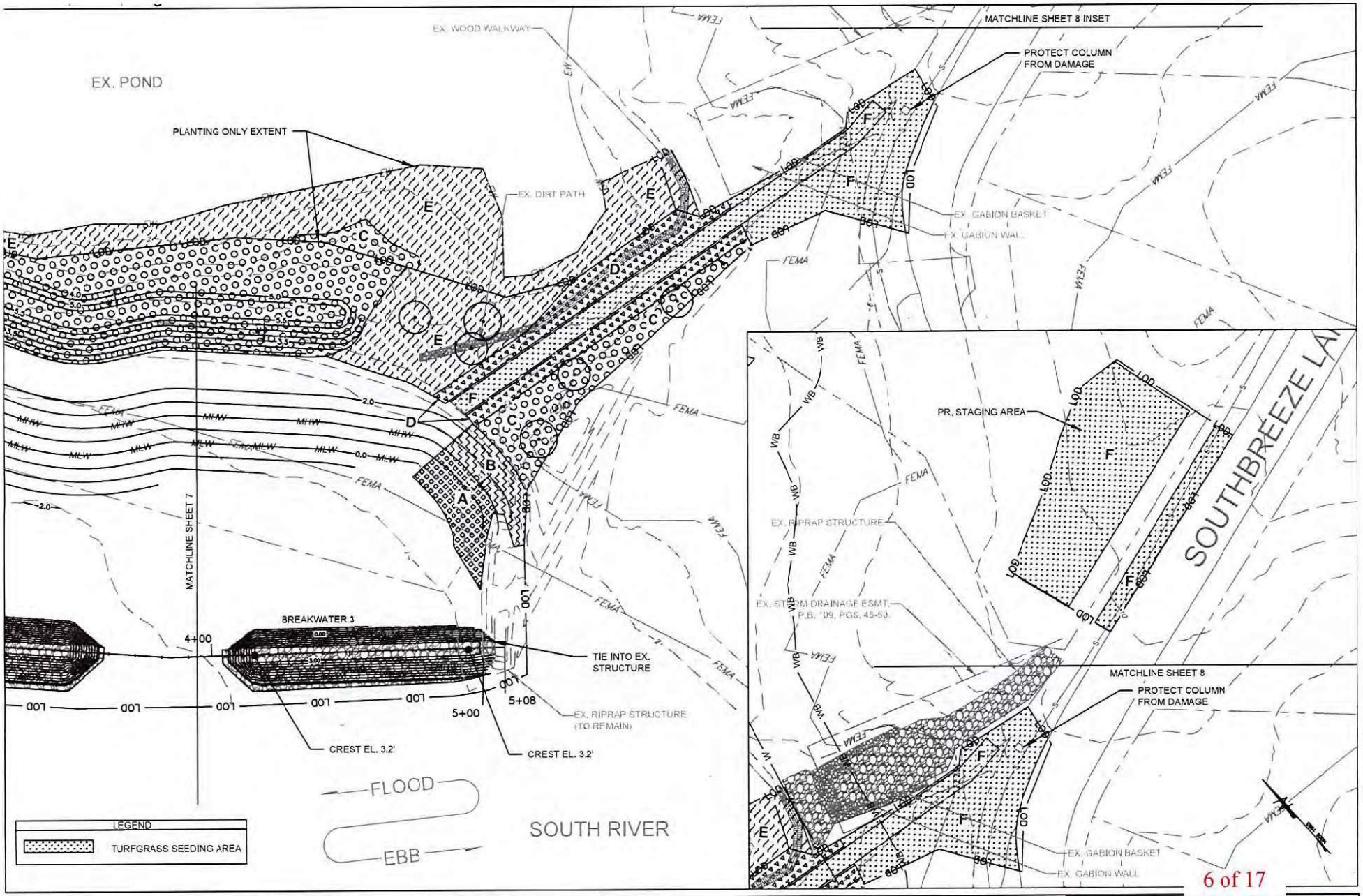


PLANTING AREAS
PROJECT: Southbreeze Community Living Shoreline Stabilization

PROPOSED PROJECT FOR:
Fishing Creek Farm HOA
1222 Cherry Tree Lane

0 25 50 100
1" = 50'

24-WL-0711/24-NT-0204/25-WQC-0005
202461044
180378
2/20/25
MT (TW), CK (NTW)



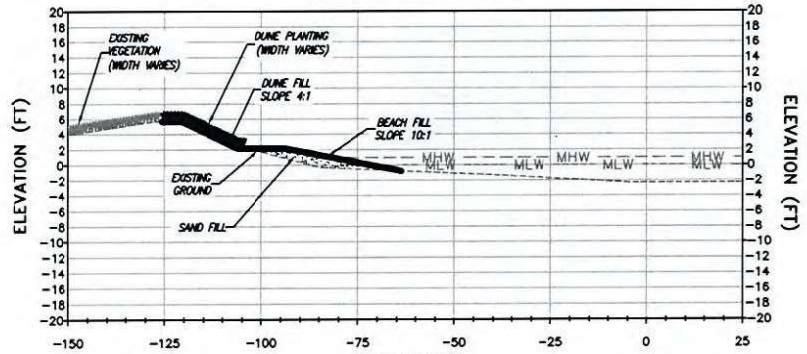
PLANTING AREAS (cont.)
PROJECT: Southbreeze Community Living Shoreline Stabilization

PROPOSED PROJECT FOR:
Fishing Creek Farm HOA
1222 Cherry Tree Lane
Annapolis, MD 21403

0 25 50 100
1" = 50'

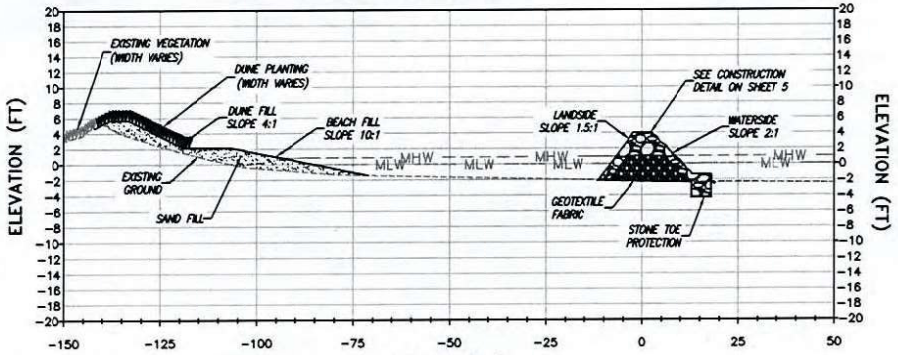
24-WL-0711/24-NT-0204/25-WQC-0005
202461044
180378
2/20/25
MT (TW), CK (NTW)

SECTION A–A'



HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 25'

SECTION B–B'

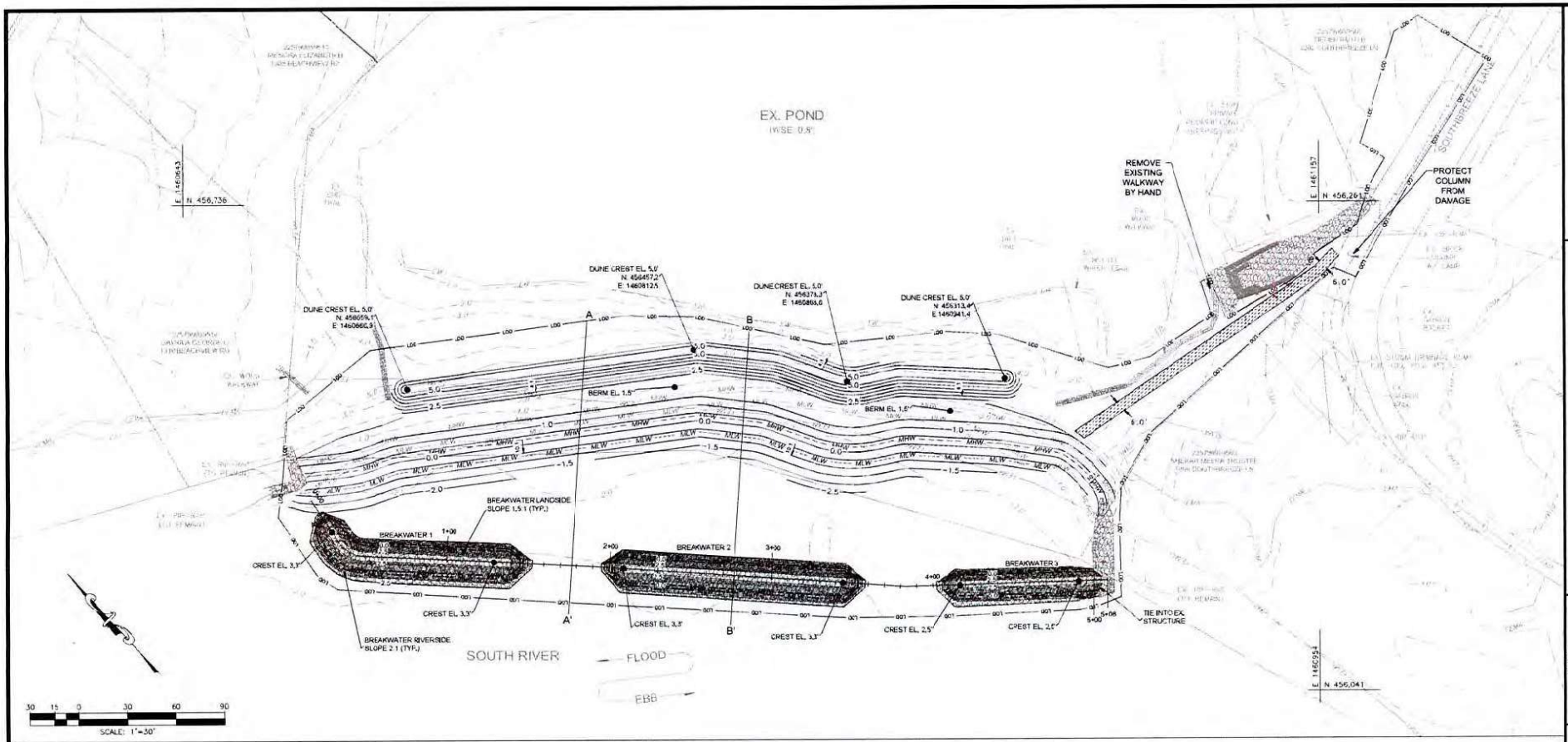


HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 25'

CROSS SECTION VIEWS
PROJECT: Southbreeze Community Living Shoreline Stabilization

PROPOSED PROJECT FOR:
Fishing Creek Farm HOA
1222 Cherry Tree Lane

24-WL-0711/24-NT-0204/25-WQC-0005
202461044
180378
2/20/25
MT (TW), CK (NTW)



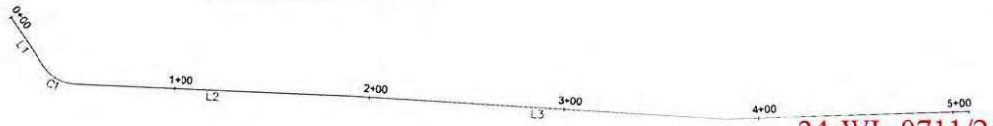
LEGEND

- PROPERTY BOUNDARIES
- EASEMENT BOUNDARIES
- EXISTING INFRASTRUCTURE
- EXISTING CONTOURS (0.5')
- EXISTING MEAN HIGH WATER LINE (0.3' EL.)
- EXISTING MEAN LOW WATER LINE (-0.7' EL.)
- EX. POND EDGE OF WATER
- FEMA FLOODPLAIN
- EX. WETLAND BOUNDARY
- PROPOSED GRADING (0.5')
- PROPOSED MEAN HIGH WATER LINE (0.3' EL.)
- PROPOSED MEAN LOW WATER LINE (-0.7' EL.)
- LIMIT OF DISTURBANCE
- PROPOSED BREAKWATER
- PROPOSED GEOGRID PATH

BREAKWATER CENTERLINE ALIGNMENT

ALIGNMENT VERTEX BEARINGS			
	NORTHING	EASTING	STA (FT)
L1	455697	1456641.9	0+00.00
	455667	1456637.1	0+30.18
C1	455664	1456656.8	0+39.57
L2	455650	1456642.6	0+48.96
	455550	1456741.7	1+90.40
L3	455550	1456741.7	1+90.40
	455410	1456874.5	3+83.06
L4	455410	1456874.5	3+83.06
	455327	1456968.5	5+08.00

GEOMETRY TABLE						
NO.	LENGTH	RADIUS	BEARING/DELTA	TANGENT	CHORD BEARING	CHORD
L1	30.18'	--	N 09°11'38" E	--	--	--
C1	18.78'	20.00'	53°48'03"	10.15'	N 17°42'24" W	18.10'
L2	141.08'	--	N 44°36'25" W	--	--	--
L3	193.02'	--	N 43°28'07" W	--	--	--
L4	124.94'	--	N 48°50'27" W	--	--	--



Wetland Studies and Solutions, Inc.
1131 Benfield Boulevard • Suite L
Millersville, Maryland 21108
Phone: 410-672-5990 • Fax: 410-672-2097
www.wetlandsi.com

Southbreeze Community Shoreline Stabilization
Final Design Plan
Anne Arundel County, Maryland

Grading Plan

No	Date	Description	Key Init.	Agt Init.

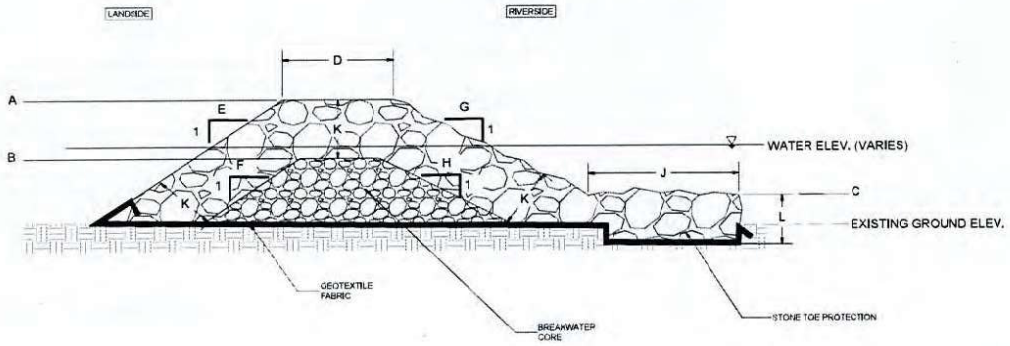
DATE: FEBRUARY 2025 SCALE: 1" = 30'

Horizontal Datum: NAD83
Vertical Datum: NAVD88
Boundary and Topo Source: WSSI & Anne Arundel County Data

Design	Draft	Approved

24-WL-0711/24-NT-0204/25-WQC-0005
202461044
180378
2/20/25
MT (TW), CK (NTW)

BREAKWATER
NOT TO SCALE

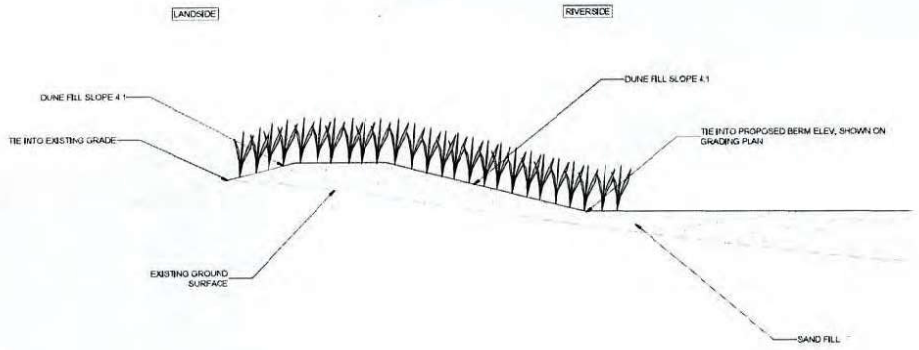


BREAKWATER ID	SITE LOCATION PER BASELINE STATION* FROM	TO	ELEVATIONS (FT) A	B	C	BREAKWATER DIMENSIONS CROSS SECTION PARAMETERS (FT) D	E	F	G	H*	J	K	L	NOTES
BREAKWATER 1	0+21.01	1+36.85	3.3'	0.3'	-2.0'	4.5'	1.5:1	1.5:1	2.0:1	2.0:1	5.0'	3.0'	3.0' MIN	
BREAKWATER 2	2+07.74	3+45.74	3.3'	0.3'	-2.0'	4.5'	1.5:1	1.5:1	2.0:1	2.0:1	5.0'	3.0'	3.0' MIN	
BREAKWATER3	4+13.97	4+94.66	3.6'	-0.5	-2.0'	4.5'	1.5:1	1.5:1	2.0:1	2.0:1	5.0'	3.0'	3.0' MIN	

BREAKWATER NOTES

1. STRUCTURES SHALL BE UNDERLAIN WITH WOVEN POLYPROPYLENE GEOTEXTILE, SUCH AS MIRAFI FW700X, OR APPROVED EQUAL. THE FABRIC SHALL HAVE PUNCTURE RESISTANCE GREATER THAN 100 LBS, APPARENT OPENING SIZE SHALL BE U.S. 70 SIEVE, AND PERCENT OPEN AREA LESS THAN 6%. IT SHALL BE INERT TO COMMONLY ENCOUNTERED CHEMICALS AND HYDROCARBONS, ROT AND MILDEW RESISTANT, AND SHALL RESIST DETERIORATION FROM UV RADIATION.
2. GEOTEXTILE PLACEMENT
   A. ENSURE THAT THE SUBGRADE IS SMOOTH AND FIRM, FREE FROM PROTRUDING OBJECTS THAT WOULD DAMAGE THE GEOTEXTILE.
   B. LAY GEOTEXTILE ON THE PREPARED SUBGRADE TO COVER THE ENTIRE BOTTOM OF THE BREAKWATER AND TOE, WITH ENOUGH TO KEY A MINIMUM OF 12 INCHES ON ALL SIDES OF THE STRUCTURE.
   C. THE STRIPS OF GEOTEXTILE SHALL BE SPREAD PARALLEL TO THE MAJOR AXIS OF THE STRUCTURE. THE FABRIC SHALL BE LOOSELY LAID (NOT STRETCHED). ROLLS OF AS GREAT A LENGTH AS IS ECONOMICAL FOR THE CONTRACTOR TO HANDLE SHALL BE USED WHENEVER POSSIBLE IN ORDER TO MINIMIZE THE NUMBER OF OVERLAPS PERPENDICULAR TO THE MAJOR AXIS OF THE STRUCTURE. OVERLAPS PERPENDICULAR TO THE MAJOR AXIS OF THE STRUCTURE SHALL BE STAGGERED A MINIMUM OF 5 FEET. OVERLAP SHALL BE A MINIMUM OF 3 FEET. OVERLAP AT OR ONTO EXISTING STRUCTURE FROM SUBGRADE SHALL ALSO BE A MINIMUM OF 3 FEET.
   D. THE GEOTEXTILE MAY BE TEMPORARILY PINNED IN PLACE WITH SECURING PINS TO PREVENT SLIPPAGE DURING CONSTRUCTION. THE PINS SHALL BE RETAINED UNTIL SUFFICIENT ARMOR STONES ARE SET TO HOLD THE GEOTEXTILE. THE SECURING PINS SHALL THEN BE REMOVED AS ADDITIONAL ARMOR STONES ARE PLACED TO RELIEVE HIGH TENSILE STRESS WHICH MAY CAUSE DAMAGE TO THE GEOTEXTILE. ALTERNATE ANCHORING MAY BE USED AS APPROPRIATE.
   E. ADEQUATE PRECAUTION SHALL BE TAKEN TO PREVENT DAMAGE OF THE GEOTEXTILE FROM PLACEMENT OF OVERLAYING MATERIALS. STONE WEIGHING MORE THAN 100 POUNDS SHOULD NOT BE DROPPED FROM A HEIGHT GREATER THAN 5 FEET ONTO THE CLOTH. STONES WEIGHING MORE THAN 500 POUNDS SHOULD NOT BE DROPPED FROM A HEIGHT GREATER THAN 2 FEET. ANY GEOTEXTILE DAMAGED OR DISPLACED BEFORE OR DURING PLACEMENT OF OVERLAYING LAYERS SHALL BE REPLACED OR REPAIRED TO THE SATISFACTION OF THE ENGINEER OR PROJECT OWNER AT THE CONTRACTOR'S EXPENSE.
3. STONE SPECIFICATIONS
   A. ARMOR STONE SHALL BE SIZED SUCH THAT A MINIMUM OF 90% OF THE INDIVIDUAL STONES SHALL WEIGH FROM 600 TO 3,000 POUNDS AND SHALL HAVE A WELL GRADED DISTRIBUTION THROUGHOUT THESE LIMITS. NOT MORE THAN 10% OF THE INDIVIDUAL STONES SHALL WEIGH MORE OR LESS THAN THE NOTED RANGE LIMITS.
   B. CORE STONE SHALL BE WELL-GRADED CLASS I RIPRAP WITH A D50 OF 9.5 INCHES AND MINIMAL FINES.
   C. CHINKING STONE SHALL BE SIZED APPROPRIATELY TO FILL VOIDS.
   D. ALL STONE SHALL BE DURABLE QUARRIED STONE. GRAY OR BROWN IN COLOR, WITH A MINIMUM DENSITY OF 165 POUNDS PER CUBIC FOOT. THE STONE SHALL BE HARD AND ANGULAR, FREE FROM EITHER LAMINATIONS, WEAK CLEAVAGES OR UNDESIRABLE WEATHERING, AND OF SUCH CHARACTER THAT IT WILL NOT DISINTEGRATE FROM THE ACTION OF AIR, SALTWATER, OR HANDLING. SEDIMENTARY STONE WILL GENERALLY BE UNACCEPTABLE. INDIVIDUAL STONES WILL BE APPROXIMATELY RECTANGULAR IN CROSS-SECTION AND FREE FROM THIN, SLABBY PIECES HAVING A MAXIMUM DISTANCE OF MORE THAN THREE AND ONE-HALF TIMES THE LEAST DIMENSION. CONTRACTOR SHALL PROVIDE AN EXAMPLE OF ALL STONE TO BE USED FOR ENGINEER AND PROJECT OWNER APPROVAL.
4. STONE PLACEMENT
   A. STONE SHALL BE PLACED IN SUCH A MANNER AS TO PRODUCE A WELL-GRADED MASS OF ROCK WITH A MINIMUM PERCENTAGE OF VOIDS AND SHALL BE CONSTRUCTED TO THE SPECIFIED LINES AND GRADES SHOWN IN THE DRAWINGS AND NOTED IN THE CONSTRUCTION DETAIL TABLE. STONES SHALL BE PLACED SUCH THAT THERE IS A WELL-GRADED DISTRIBUTION OF THE VARIOUS SIZES THROUGHOUT THE APPROPRIATE ZONE. ANY OVERSIZED STONES SHALL BE PLACED AT THE TOE OF THE STRUCTURE. THE FINISHED STRUCTURE SHALL BE FREE FROM POCKETS OF SMALL STONES AND CLUSTERS OF LARGE STONES. REARRANGING OF INDIVIDUAL STONES BY MECHANICAL EQUIPMENT OR BY HAND WILL BE REQUIRED TO THE EXTENT NECESSARY TO OBTAIN A WELL-GRADED DISTRIBUTION OF STONE SIZE, TO ENSURE STABILITY AND OBTAIN AT LEAST THREE POINTS OF CONTACT BETWEEN ADJACENT ARMOR STONES, AND TO ACHIEVE THE LINES AND GRADES SHOWN ON THE DRAWINGS.
   B. STONES ON THE LANDSIDE AND CREST OF THE STRUCTURES SHALL CREATE A RELATIVELY SMOOTH SURFACE. STONES ON THE RIVERSIDE OF THE STRUCTURE AND ON TIE-OUT FACES PERPENDICULAR TO THE ALIGNMENT SHALL BE ROUGH AND ANGULAR TO BREAK UP WAVE ENERGY.
   C. CONTRACTOR SHALL CREATE A STABLE CONNECTION BETWEEN BREAKWATER 3 AND THE EXISTING RIPRAP STRUCTURE. EXISTING STRUCTURE SHALL NOT BE ALTERED UNLESS APPROVED BY ENGINEER, PROJECT OWNER, AND PROPERTY OWNER.
   D. CHINKING STONE SHALL BE APPLIED AFTER THE PLACEMENT OF ARMOR STONE, ONLY SURFACE VOIDS AT OR NEAR GRADE ON THE LANDSIDE OR CREST WHICH ARE LARGE ENOUGH TO RECEIVE CHINKING STONE SHALL BE FILLED.
5. STATION RANGE PROVIDED INDICATES THE EXTENT OF THE GIVEN ARMOR CREST ELEVATION. TIE-OUT SLOPES ALONG THE MAJOR AXIS OF THE STRUCTURES SHALL BE 2:1 UNLESS OTHERWISE NOTED. REFER TO THE GRADING PLAN AND LONGITUDINAL PROFILE FOR ADDITIONAL INFORMATION.
6. PARAMETER H MAY VARY BETWEEN 1.5:1 AND 2:1 PROVIDED OTHER PARAMETERS ARE ADHERED TO. IF PARAMETER H VARIES FROM THE VALUE IN THE TABLE PARAMETER C SHALL BE THE MINIMUM ARMOR THICKNESS ALLOWED.

DUNE
NOT TO SCALE



DUNE NOTES

1. DUNE SHALL BE CONSTRUCTED TO THE SPECIFIED LINES AND GRADES SHOWN IN THE DRAWINGS. DUNE CREST SHALL BE CONSTRUCTED TO AN ELEVATION OF 5 FT WITH A MINIMUM CREST WIDTH OF 5 FT.
2. SAND FILL SHALL BE PLACED FROM THE BOTTOM UP IN SUCCESSIVE HORIZONTAL LAYERS NO MORE THAN 6 INCHES THICK.
3. ALL DUNE SLOPES SHALL BE 4:1 OR FLATTER, WHETHER TYING INTO EXISTING GRADE OR PROPOSED BEACH ELEVATION.
4. LOCATION OF TIE-IN WITH EXISTING GRADE WILL VARY BASED ON CONDITIONS IN THE FIELD AT THE TIME OF CONSTRUCTION. FILL SLOPE SHALL REMAIN 4:1 OR FLATTER. SEE PLANTING PLAN AND VEGETATION SCHEDULE FOR ADDITIONAL INFORMATION.

Wetland Studies and Solutions, Inc.
1131 Benfield Boulevard • Suite L
Millersville, Maryland 21108
Phone: 410.672.5990 • Fax: 410.672.5993
www.wetlandsinc.com

Southbreeze Community Shoreline Stabilization
Final Design Plan
Anne Arundel County, Maryland

Construction Details

02/19/2025
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. 22501, Expiration Date: 12/10/2025.

No.	Date	Description	Rev. By	App. By

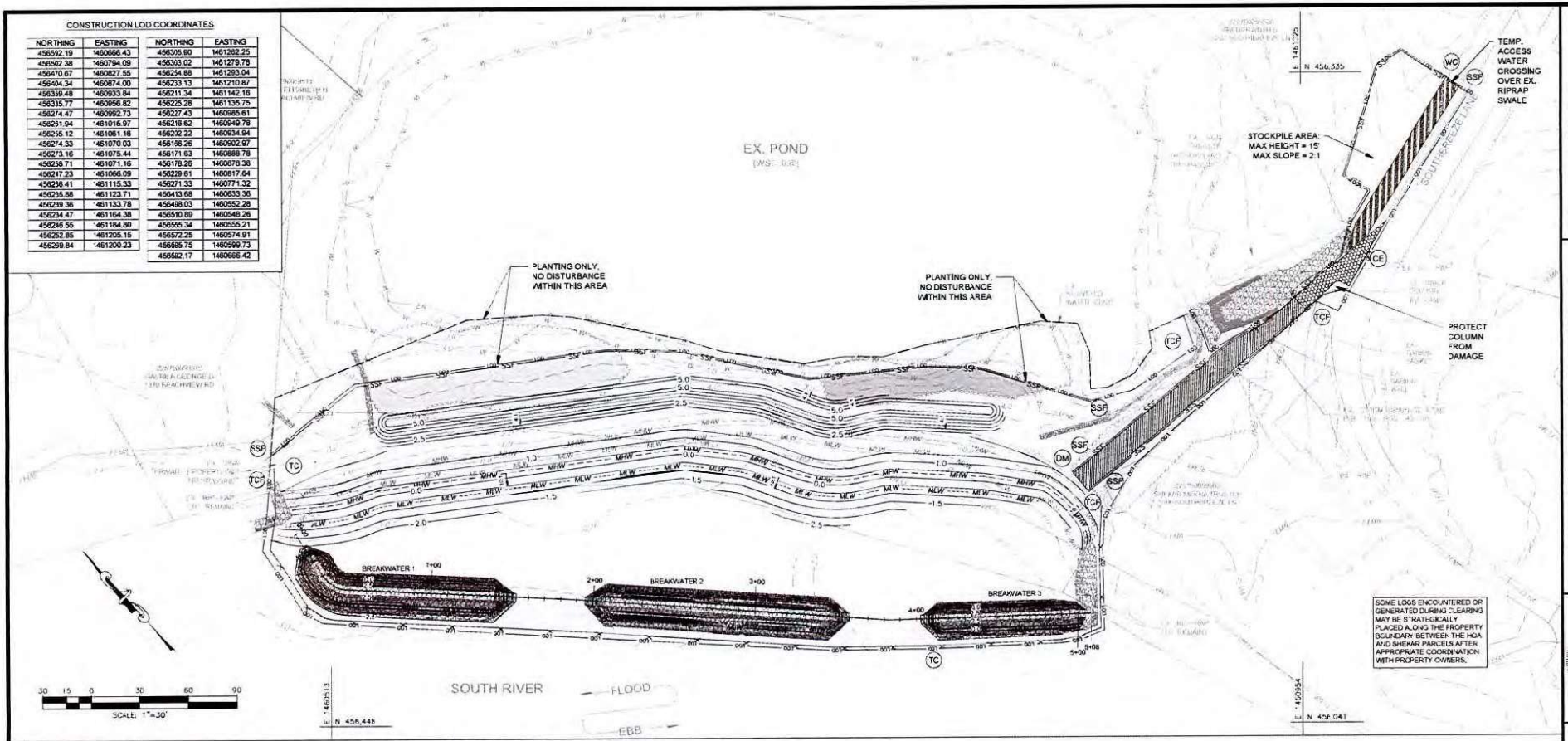
DATE: FEBRUARY 2025 | SCALE: AS NOTED

Horizontal Datum: N/A
Vertical Datum: N/A
Boundary and Topo Source: N/A

Design	Draft	Approved

CONSTRUCTION LOD COORDINATES

NORTHING	EASTING	NORTHING	EASTING
456592.19	1460666.43	456305.90	1461262.25
456502.38	1460794.09	456303.02	1461279.78
456470.67	1460827.55	456254.88	1461293.04
456404.34	1460874.00	456233.13	1461210.87
456359.48	1460933.84	456211.34	1461142.16
456335.77	1460956.82	456225.28	1461135.75
456274.47	1460992.73	456227.43	1460985.61
456251.94	1461015.97	456216.62	1460949.78
456256.12	1461061.18	456232.22	1460934.94
456274.33	1461070.03	456196.26	1460902.97
456273.16	1461075.44	456171.63	1460886.78
456258.71	1461071.16	456178.26	1460878.38
456247.23	1461066.09	456229.61	1460817.64
456236.41	1461115.33	456271.33	1460771.32
456235.88	1461123.71	456413.68	1460633.36
456239.36	1461133.78	456498.03	1460552.28
456234.47	1461164.38	456510.89	1460548.26
456246.55	1461184.80	456555.34	1460555.21
456252.85	1461205.15	456572.25	1460574.91
456269.84	1461200.23	456595.75	1460599.73
		456592.17	1460666.42



EROSION AND SEDIMENT CONTROL NOTES:

1. ADDITIONAL SEDIMENT CONTROLS MAY BE REQUIRED IF DEEMED NECESSARY BY INSPECTOR.
2. THE CONTRACTOR MAY ACCESS THE SITE AND RECEIVE MATERIALS VIA LAND, WATER, OR A COMBINATION THEREOF. IF ACCESS REQUIRES A MODIFICATION TO THE EROSION AND SEDIMENT CONTROL PLANS, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SUBMIT THE PLAN TO THE ANNE ARUNDEL SCD FOR REVIEW AND APPROVAL.
3. STOCKPILE/STAGING AREA ON PLAN TO BE USED IF CONTRACTOR DOES NOT DETERMINE A STOCKPILE/STAGING AREA WITH INSPECTOR'S APPROVAL.
4. THE LIMIT OF DISTURBANCE SHALL BE CLEARLY DELINEATED IN THE FIELD PRIOR TO THE PRE-CONSTRUCTION MEETING AND ANY GRADING ACTIVITIES TO ENSURE COMPLIANCE WITH THE APPROVED PLAN.
5. THE CONTRACTOR MUST REQUEST THAT THE SEDIMENT CONTROL INSPECTOR APPROVE WORK COMPLETED IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN, THE GRADING AND BUILDING PERMIT AND THE ANNE ARUNDEL COUNTY EROSION AND SEDIMENT CONTROL ORDINANCE AT THE FOLLOWING POINTS OF PROJECT DEVELOPMENT:
   A. UPON COMPLETION OF THE INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROL MEASURES BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING,
   B. UPON COMPLETION OF THE INSTALLATION OF REMAINING EROSION AND SEDIMENT CONTROL MEASURES BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING,
   C. UPON COMPLETION OF THE INSTILLATION OF REMAINING EROSION AND SEDIMENT CONTROL MEASURES BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING,
   D. PRIOR TO REMOVAL OR MODIFICATION OF ANY SEDIMENT CONTROL STRUCTURE(S), AND
   E. UPON FINAL STABILIZATION OF THE SITE AND PRIOR TO THE REMOVAL OF ANY SEDIMENT CONTROL MEASURES.
6. THE FOLLOWING MINOR PLAN MODIFICATIONS MAY BE APPROVED BY THE SEDIMENT CONTROL INSPECTOR IN THE FIELD:
   A. SEDIMENT CONTROL STRUCTURES (EXCEPT BASINS AND TRAPS) MAY BE MOVED TO MEET THE EXISTING CONTOURS AND FIELD CONDITIONS. WHEN MOVING THESE STRUCTURES WOULD HAVE NO IMPACT ON THEIR FUNCTION OR DESIGN CRITERIA,
   B. SUBSTITUTION OF PERIMETER CONTROL MEASURES MAY BE MADE PROVIDED THE MEASURE SUBSTITUTED IS EQUIVALENT (I.E., SILT FENCE FOR STRAW BALES) OR IS AN UPGRADE OF THE ORIGINAL MEASURE (I.E., SILT FENCE TO A PERIMETER BERM WITH PROPERLY SIZED OUTLET),
   C. ADDITION AND EXTENSION OF PERIMETER CONTROLS (INCLUDING STONE CONSTRUCTION ENTRANCES) MAY BE MADE TO MEET FIELD CONDITIONS,
5. ANY MODIFICATIONS TO THE PLAN WHICH ARE NOT LISTED ABOVE REQUIRE THE PLAN TO BE SUBMITTED TO THE ANNE ARUNDEL SCD FOR REVIEW AND APPROVAL.
6. CONSTRUCTION SHALL BE LIMITED TO NO MORE THAN 20 ACRES OF DISTURBED AREA AT ANY GIVEN TIME.
7. NO WORK SHALL BE STARTED THAT CANNOT BE COMPLETED AND STABILIZED IN ONE DAY.
8. THE CONTRACTOR SHALL ENSURE THAT ALL RUNOFF FROM DISTURBED AREAS IS DIRECTED TO THE SEDIMENT CONTROL DEVICES AND SHALL NOT REMOVE ANY EROSION OR SEDIMENT CONTROL MEASURE WITHOUT PRIOR PERMISSION FROM THE SEDIMENT CONTROL INSPECTOR.
9. THE CONTRACTOR SHALL PROTECT ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS TO PREVENT THE DEPOSITION OF MATERIALS ONTO PUBLIC ROADS. ALL MATERIALS DEPOSITED ONTO PUBLIC ROADS SHALL BE REMOVED IMMEDIATELY.
10. THE CONTRACTOR SHALL INSPECT CONTROLS DAILY AND MAINTAIN CONTINUOUSLY IN AN EFFECTIVE OPERATING CONDITION UNTIL THE ENTIRE CONTRIBUTING AREA TO THE PRACTICE HAS BEEN PERMANENTLY STABILIZED AND MEETS THE SATISFACTION OF THE SEDIMENT CONTROL INSPECTOR. SEDIMENT CONTROLS MAY ONLY BE REMOVED WITH THE AUTHORIZATION OF THE SEDIMENT CONTROL INSPECTOR.
11. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN:
   A. THREE CALENDAR DAYS FOR THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND
   B. SEVEN DAYS FOR ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

THE ABOVE REQUIREMENTS DO NOT APPLY TO INTERIOR AREAS OF A SURFACE MINE SITE WHERE THE STABILIZATION MATERIAL WOULD CONTAMINATE THE RECOVERABLE RESOURCE. MAINTENANCE SHALL BE PERFORMED AS NECESSARY TO ENSURE THAT THE STABILIZED AREAS CONTINUOUSLY MEET THE APPROPRIATE REQUIREMENTS OF THE '2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.'

ALL AREAS DISTURBED BY THE REMOVAL OF SEDIMENT CONTROL DEVICES MUST BE IMMEDIATELY STABILIZED.

LEGEND

- PROPERTY BOUNDARIES
- EASEMENT BOUNDARIES
- EXISTING INFRASTRUCTURE
- EXISTING CONTOURS (1.0')
- MHW — EXISTING MEAN HIGH WATER LINE (0.3' EL.)
- MLW — EXISTING MEAN LOW WATER LINE (-0.7' EL.)
- EX. POND EDGE OF WATER
- FEMA FLOODPLAIN
- NO DISTURBANCE PLANTING AREA
- PROPOSED GRADING (2.5')
- MHW — PROPOSED MEAN HIGH WATER LINE (0.3' EL.)
- MLW — PROPOSED MEAN LOW WATER LINE (-0.7' EL.)
- PROPOSED STABILIZED CONSTRUCTION ENTRANCE
- PROPOSED TEMP. ACCESS ROAD
- PROPOSED BREAKWATER
- COUNTY-MAPPED VEGETATION AREA TO BE CLEARED (0.2 AC)
- STOCKPILE/STAGING AREA
- PROPOSED WATER CROSSING

ESC LEGEND

NO.	TITLE	KEY	SYMBOL	UNITS	QTY
N/A	TURBIDITY CURTAIN	TC		LF	660
N/A	TEMPORARY CONSTRUCTION FENCE	TCF		LF	AS NEEDED
N/A	DECK MATTING	DM		SF	1,750
B-1	STABILIZED CONSTRUCTION ENTRANCE	CE		SF	650
E-3	SILT FENCE WITH WIRE SUPPORT (SUPER SILT FENCE)	SSF	SSF	LF	1,145
H-1, H-2	TEMP. ACCESS WATER CROSSING	WC		EA	AS NEEDED

Wetland Studies and Solutions, Inc. — 1131 Benfield Boulevard • Suite L, Millersville, Maryland 21108 • Phone 410.672.5582 • Fax 410.672.5593 • www.wetlandsi.com

Southbreeze Community Shoreline Stabilization
Final Design Plan
Anne Arundel County, Maryland

Erosion And Sediment Control Plan

02/18/2025

REVISIONS

No.	Date	Description	Key Sh.	Mgr. Sh.

DATE: FEBRUARY 2025 — SCALE: 1" = 30'

Horizontal Datum: NAD83

Vertical Datum: NAVD88

Boundary and Topo Source: WSSI & Anne Arundel County Data

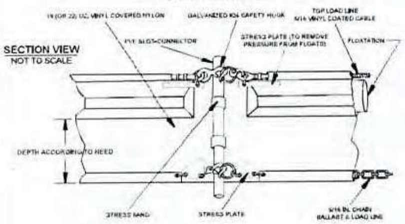
Design	Draft	Approved

10 of 17

24-WL-0711/24-NT-0204/25-WQC-0005
202461044
180378
2/20/25
MT (TW), CK (NTW)

(TC) TURBIDITY CURTAIN - TYPE 2

NOT TO SCALE



TIDAL WATERS AND/OR HEAVY WIND & WAVE ACTION

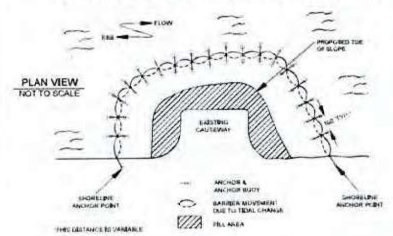


TABLE 3.27-A

PHYSICAL PROPERTIES OF TURBIDITY CURTAIN FABRIC

Physical Property	Requirement
Thickness, mils	45
Weight/oz./sq. yd.:	
Type I	18
Type II	18 or 22
Type III	22
Grab Tensile Strength, lbs.	300
UV Inhibitor	Must be included

CONSTRUCTION SPECIFICATIONS

MATERIALS

1. BARRIERS SHOULD BE A BRIGHT COLOR (YELLOW OR "INTERNATIONAL" ORANGE ARE RECOMMENDED) THAT WILL ATTRACT THE ATTENTION OF NEARBY BOATERS.
2. THE CURTAIN FABRIC MUST MEET THE MINIMUM REQUIREMENTS NOTED IN TABLE 3.27-A.
3. SEAMS IN THE FABRIC SHALL BE EITHER VULCANIZED WELDED OR SEWN, AND SHALL DEVELOP THE FULL STRENGTH OF THE FABRIC.
4. FLOATATION DEVICES SHALL BE FLEXIBLE, BUOYANT UNITS CONTAINED IN AN INDIVIDUAL FLOATATION SLEEVE OR COLLAR ATTACHED TO THE CURTAIN. BUOYANCY PROVIDED BY THE FLOATATION UNITS SHALL BE SUFFICIENT TO SUPPORT THE WEIGHT OF THE CURTAIN AND MAINTAIN A FREEBOARD OF AT LEAST 3 INCHES ABOVE THE WATER SURFACE LEVEL (SEE PLATE 3.27-2).
5. LOAD LINES MUST BE FABRICATED INTO THE BOTTOM OF ALL FLOATING TURBIDITY CURTAINS. TYPE II AND TYPE III MUST HAVE LOAD LINES ALSO FABRICATED INTO THE TOP OF THE FABRIC. THE TOP LOAD LINE SHALL CONSIST OF WOVEN WEBBING OR VINYL-SHEATHED STEEL CABLE AND SHALL HAVE A BREAK STRENGTH IN EXCESS OF 10,000 POUNDS. THE SUPPLEMENTAL (BOTTOM) LOAD-LINE SHALL CONSIST OF A CHAIN INCORPORATED INTO THE BOTTOM HEM OF THE CURTAIN OF SUFFICIENT WEIGHT TO SERVE AS BALLAST TO HOLD THE CURTAIN IN A VERTICAL POSITION. ADDITIONAL ANCHORAGE SHALL BE PROVIDED AS NECESSARY. THE LOAD LINES SHALL HAVE SUITABLE CONNECTING DEVICES WHICH DEVELOP THE FULL BREAKING STRENGTH FOR CONNECTING TO LOAD LINES IN ADJACENT SECTIONS (SEE PLATES 3.27-1 AND 3.27-2 WHICH PORTRAY THIS ORIENTATION).
6. EXTERNAL ANCHORS MAY CONSIST OF WOODEN OR METAL STAKES (2- X 4-INCH OR 2½-INCH MINIMUM DIAMETER WOOD OR 1.33 POUNDS/LINEAR FOOT STEEL) WHEN TYPE I INSTALLATION IS USED; WHEN TYPE II OR TYPE III INSTALLATIONS ARE USED, BOTTOM ANCHORS SHOULD BE USED.
7. BOTTOM ANCHORS MUST BE SUFFICIENT TO HOLD THE CURTAIN IN THE SAME POSITION RELATIVE TO THE BOTTOM OF THE WATERCOURSE WITHOUT INTERFERING WITH THE ACTION OF THE CURTAIN. THE ANCHOR MAY DIG INTO THE BOTTOM (GRAPPLING HOOK, PLOW OR FLUKE-TYPE) OR MAY BE WEIGHTED (MUSHROOM TYPE) AND SHOULD BE ATTACHED TO A FLOATING ANCHOR BUOY VIA AN ANCHOR LINE. THE ANCHOR LINE WOULD THEN RUN FROM THE BUOY TO THE TOP LOAD LINE OF THE CURTAIN. WHEN USED WITH TYPE III INSTALLATIONS, THESE LINES MUST CONTAIN ENOUGH SLACK TO_ ALLOW THE BUOY AND CURTAIN TO FLOAT FREELY WITH TIDAL CHANGES WITHOUT PULLING THE BUOY OR CURTAIN DOWN AND MUST BE CHECKED REGULARLY TO MAKE SURE THEY DO NOT BECOME ENTANGLED WITH DEBRIS. AS PREVIOUSLY NOTED, ANCHOR SPACING WILL VARY WITH CURRENT VELOCITY AND POTENTIAL WIND AND WAVE ACTION; MANUFACTURER'S RECOMMENDATIONS SHOULD BE FOLLOWED. SEE ORIENTATION OF EXTERNAL ANCHORS AND ANCHOR BUOYS FOR TIDAL INSTALLATION IN F'LATE 3.27-2.

INSTALLATION

1. IN THE CALM WATER OF LAKES OR PONDS (TYPE I INSTALLATION) IT IS USUALLY SUFFICIENT TO MERELY SET THE CURTAIN END STAKES OR ANCHOR POINTS (USING ANCHOR BUOYS IF BOTTOM ANCHORS ARE EMPLOYED). THEN TOW THE CURTAIN IN THE FURLED CONDITION OUT AND ATTACH IT TO THESE STAKES OR ANCHOR POINTS. FOLLOWING THIS, ANY ADDITIONAL STAKES OR BUOYED ANCHORS REQUIRED TO MAINTAIN THE DESIRED LOCATION OF THE CURTAIN MAY BE SET AND THESE ANCHOR POINTS MADE FAST TO THE CURTAIN. ONLY THEN, THE FURLING LINES SHOULD BE CUT TO LET THE CURTAIN SKIRT DROP.
2. IN RIVERS OR IN OTHER MOVING WATER (TYPE II AND TYPE III INSTALLATIONS) IT IS IMPORTANT TO SET ALL THE CURTAIN ANCHOR POINTS. CARE MUST BE TAKEN TO ENSURE THAT ANCHOR POINTS ARE OF SUFFICIENT HOLDING POWER TO RETAIN THE CURTAIN UNDER THE EXISTING CURRENT . CONDITIONS. PRIOR TO PUTTING THE FURLED CURTAIN INTO THE WATER. AGAIN, ANCHOR BUOYS SHOULD BE EMPLOYED ON ALL ANCHORS TO PREVENT THE CURRENT FROM SUBMERGING THE FLOTATION AT THE ANCHOR POINTS. IF THE MOVING WATER INTO WHICH THE CURTAIN IS BEING INSTALLED IS TIDAL AND WILL SUBJECT THE CURTAIN TO CURRENTS IN BOTH DIRECTIONS AS THE TIDE CHANGES, IT IS IMPORTANT TO PROVIDE ANCHORS ON BOTH SIDES OF THE CURTAIN FOR TWO REASONS:
   A. CURTAIN MOVEMENT WILL BE MINIMIZED DURING TIDAL CURRENT REVERSALS.
   B. THE CURTAIN WILL NOT OVERRUN THE ANCHORS AND PULL THEM OUT WHEN THE TIDE REVERSES. WHEN THE ANCHORS ARE SECURE, THE FURLED CURTAIN SHOULD BE SECURED TO THE UPSTREAM ANCHOR POINT AND THEN SEQUENTIALLY ATTACHED TO EACH NEXT DOWNSTREAM ANCHOR POINT UNTIL THE ENTIRE CURTAIN IS IN POSITION. AT THIS POINT, AND BEFORE UNFURLING, THE "LAY" OF THE CURTAIN SHOULD BE ASSESSED AND ANY NECESSARY ADJUSTMENTS MADE TO THE ANCHORS. FINALLY, WHEN THE LOCATION IS ASCERTAINED TO BE AS DESIRED, THE FURLING LINES SHOULD BE CUT TO ALLOW THE SKIRT TO DROP.
3. ALWAYS ATTACH ANCHOR LINES TO THE FLOTATION DEVICE, NOT TO THE BOTTOM OF THE CURTAIN. THE ANCHORING LINE ATTACHED TO THE FLOATATION DEVICE ON THE DOWNSTREAM SIDE WILL PROVIDE SUPPORT FOR THE CURTAIN. ATTACHING THE ANCHORS TO THE BOTTOM OF THE CURTAIN COULD CAUSE PREMATURE FAILURE OF THE CURTAIN DUE TO THE STRESSES IMPARTED ON THE MIDDLE SECTION OF THE CURTAIN.
4. THERE IS AN EXCEPTION TO THE RULE THAT TURBIDITY CURTAINS SHOULD NOT BE INSTALLED ACROSS CHANNEL FLOWS. IT OCCURS WHEN THERE IS A DANGER OF CREATING A SILT BUILD-UP IN THE MIDDLE OF A WATERCOURSE, THEREBY BLOCKING ACCESS OR CREATING A SAND BAR. CURTAINS HAVE BEEN USED EFFECTIVELY IN LARGE AREAS OF MOVING WATER BY FORMING A VERY LONG-SIDED, SHARP "V" TO DEFLECT CLEAN WATER AROUND A WORK SITE, CONFINE A LARGE PART OF THE SILT-LADEN WATER TO THE WORK AREA INSIDE THE "V" AND DIRECT MUCH OF THE SILT TOWARD THE SHORELINE _ CARE MUST BE TAKEN, HOWEVER, NOT TO INSTALL THE CURTAIN PERPENDICULAR TO THE WATER CURRENT.

REMOVAL

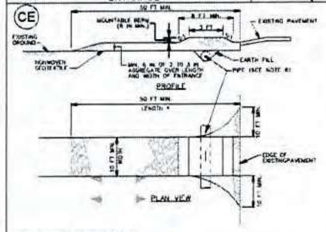
1. CARE SHOULD BE TAKEN TO PROTECT THE SKIRT FROM DAMAGE AS THE TURBIDITY CURTAIN IS DRAGGED FROM THE WATER.
2. THE SITE SELECTED TO BRING THE CURTAIN ASHORE SHOULD BE FREE OF SHARP ROCKS, BROKEN CEMENT, DEBRIS, ETC. SO AS TO MINIMIZE DAMAGE WHEN HAULING THE CURTAIN OVER THE AREA.
3. IF THE CURTAIN HAS A DEEP SKIRT, IT CAN BE FURTHER PROTECTED BY RUNNING A SMALL BOAT ALONG ITS LENGTH WITH A CREW INSTALLING FURLING LINES BEFORE ATTEMPTING TO REMOVE THE CURTAIN FROM THE WATER.

MAINTENANCE

1. THE DEVELOPER/ OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE FILTER CURTAIN FOR THE DURATION OF THE PROJECT IN ORDER TO ENSURE THE CONTINUOUS PROTECTION OF THE WATERCOURSE.
2. SHOULD REPAIRS TO THE GEOTEXTILE FABRIC BECOME NECESSARY, THERE ARE NORMALLY REPAIR KITS AVAILABLE FROM THE MANUFACTURERS; MANUFACTURER'S INSTRUCTIONS MUST BE FOLLOWED TO ENSURE THE ADEQUACY OF THE REPAIR.
3. WHEN THE CURTAIN IS NO LONGER REQUIRED AS DETERMINED BY THE INSPECTOR, THE CURTAIN AND RELATED COMPONENTS SHALL BE REMOVED IN SUCH A MANNER AS TO MINIMIZE TURBIDITY. REMAINING SEDIMENT SHALL BE SUFFICIENTLY SETTLED BEFORE REMOVING THE CURTAIN. SEDIMENT MAY BE REMOVED AND THE ORIGINAL DEPTH (OR PLAN ELEVATION) RESTORED. ANY SPOILS MUST BE TAKEN TO UPLAND AREA AND BE STABILIZED.

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

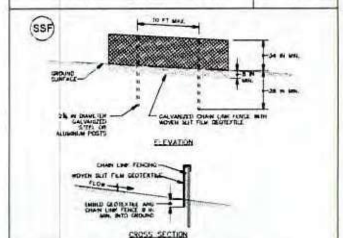
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING 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 2⅜ 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 (2⅜ 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

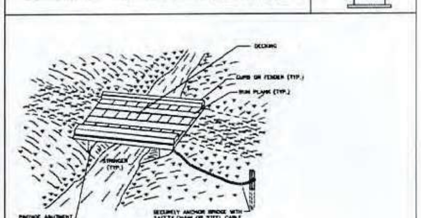
TEMPORARY ACCESS WATER CROSSING OPTIONS (WC)

TEMPORARY ACCESS WATER CROSSING CONSTRUCTION SPECIFICATIONS

1. CONTRACTOR SHALL DECIDE WHETHER TO USE TEMPORARY ACCESS BRIDGE OR TEMPORARY ACCESS CULVERT TO CROSS OVER THE EXISTING SWALE ON-SITE TO ALLOW ACCESS TO THE STAGING AREA.
2. CONTRACTOR SHALL BUILD THE TEMPORARY ACCESS WATER CROSSING TO THE SPECIFICATIONS OF EITHER THE TEMPORARY ACCESS BRIDGE OR TEMPORARY ACCESS CULVERT LISTED ABOVE.

DETAIL H-4-1 TEMPORARY ACCESS BRIDGE

STANDARD SYMBOL: TB



CONSTRUCTION SPECIFICATIONS

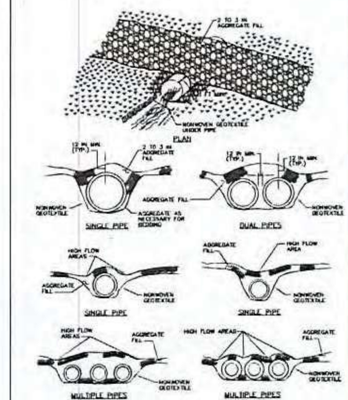
1. CONSTRUCT TEMPORARY BRIDGE STRUCTURE AT OR ABOVE THE BANK ELEVATION TO PREVENT IMPACTS FROM FLOATING MATERIALS AND DEBRIS.
2. PLACE ABUTMENTS PARALLEL TO, AND ON, STABLE BANKS.
3. CONSTRUCT BRIDGE TO SPAN ENTIRE CHANNEL UNLESS OTHERWISE INDICATED ON APPROVED PLAN.
4. USE STRINGERS CONSISTING OF LOGS, SAWN TIMBER, PRESTRESSED CONCRETE BEAMS, METAL BEAMS, OR OTHER APPROVED MATERIALS.
5. SELECT DECKING MATERIALS TO PROVIDE SUFFICIENT STRENGTH TO SUPPORT THE ANTICIPATED LOAD. PLACE ALL DECKING MEMBERS PERPENDICULAR TO THE STRINGERS, BUTT TIGHTLY, AND SECURELY FASTEN. DECKING MATERIALS MUST BE BUTTED TIGHTLY TO PREVENT ANY SOIL MATERIAL TRACKED ONTO THE BRIDGE FROM FALLING INTO THE WATERWAY BELOW.
6. SECURELY FASTEN OPTIONAL RUN PLANKING FOR THE LENGTH OF THE SPAN. PROVIDE A RUN PLANK FOR EACH TRACK OF THE EQUIPMENT WHEELS. ALTHOUGH RUN PLANKS ARE OPTIONAL, THEY MAY BE NECESSARY TO PROPERLY DISTRIBUTE LOADS.
7. INSTALL CURBS THE ENTIRE LENGTH OF THE OUTER SIDES OF THE DECK TO PREVENT SEDIMENT FROM ENTERING THE STREAM CHANNEL.
8. ANCHOR BRIDGE SECURELY AT ONLY ONE END USING STEEL CABLE OR CHAIN. ANCHORING AT ONLY ONE END WILL PREVENT CHANNEL OBSTRUCTION IN THE EVENT THAT FLOODWATERS FLOAT THE BRIDGE. ACCEPTABLE ANCHORS ARE LARGE TREES, LARGE BOULDERS, OR DRIVEN STEEL POSTS. ANCHOR MUST BE SUFFICIENT TO PREVENT THE BRIDGE FROM FLOATING DOWNSTREAM.
9. AREAS DISTURBED DURING BRIDGE INSTALLATION AND\OR REMOVAL MUST NOT BE LEFT UNSTABILIZED OVERNIGHT UNLESS THE RUNOFF IS DIRECTED TO AN APPROVED SEDIMENT CONTROL DEVICE.
10. STABILIZE APPROACH TO BRIDGE AND KEEP FREE OF EROSION. CLEAN SEDIMENT FROM DECKING AND CURBS DAILY BY SCRAPING, SWEEPING, AND/OR VACUUMING. ENSURE THAT DECKING AND CURBS REMAIN TIGHTLY BUTTED WITHOUT GAPS. REMOVE DEBRIS TRAPPED BY BRIDGE. MAINTAIN AREAS ADJACENT TO CROSSING TO CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.
11. AFTER THE TEMPORARY CROSSING IS NO LONGER NEEDED, REMOVE IT WITHIN 14 CALENDAR DAYS. IF SUBJECT TO THE USE DESIGNATION CLOSURE, REMOVE AT THE END OF CLOSURE PERIOD. PROTECT STREAM BANKS DURING BRIDGE REMOVAL AND STABILIZE ALL DISTURBED AREAS WITH EROSION CONTROL MATTING. ACCOMPLISH REMOVAL OF THE BRIDGE AND CLEAN UP OF THE AREA WITHOUT CONSTRUCTION EQUIPMENT WORKING IN THE WATERWAY CHANNEL. STORE ALL REMOVED MATERIALS IN AN APPROVED STAGING AREA.

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 H-4-2 TEMPORARY ACCESS CULVERT

STANDARD SYMBOL



CONSTRUCTION SPECIFICATIONS

1. CONSTRUCTION OR REMOVAL OF A TEMPORARY ACCESS CULVERT WILL NOT BE PERMITTED DURING THE FOLLOWING PERIODS:

USE I AND IP	MARCH 1 – JUNE 15
USE II	JUNE 1 – SEPTEMBER 30 AND DECEMBER 16 – MARCH 14
USE III AND IIIP	OCTOBER 1 – APRIL 30
USE IV	MARCH 1 – MAY 31
SAV* (ALL FLOWING STREAMS)	APRIL 15 – OCTOBER 15

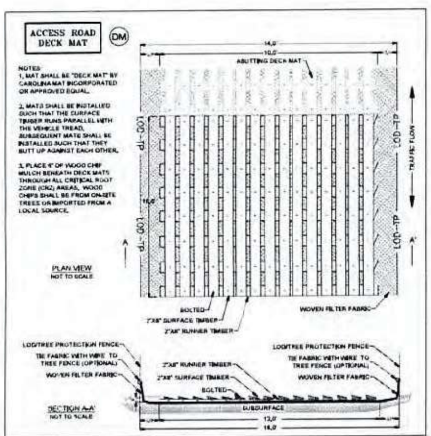
*SUBMERGED AQUATIC VEGETATION

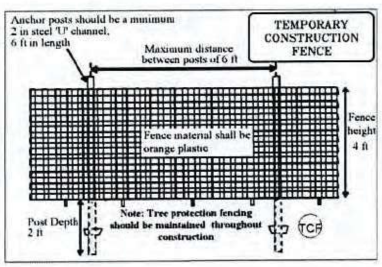
2. EXTEND THE CULVERT(S) A MINIMUM OF ONE FOOT BEYOND THE UPSTREAM AND DOWNSTREAM TOE OF THE AGGREGATE PLACED AROUND THE CULVERT.
3. PLACE NONWOVEN GEOTEXTILE ON THE STREAM BED AND STREAM BANKS PRIOR TO PLACEMENT OF THE PIPE CULVERT(S) AND AGGREGATE. COVER THE STREAM BED WITH THE GEOTEXTILE AND EXTEND IT A MINIMUM SIX INCHES AND A MAXIMUM OF ONE FOOT BEYOND THE END OF THE CULVERT AND BEDDING MATERIAL. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS. GEOTEXTILE REDUCES SETTLEMENT AND IMPROVES CROSSING STABILITY.
4. PLACE CULVERT(S) ON THE NATURAL STREAM BED GRADE TO MINIMIZE INTERFERENCE WITH FISH PASSAGE.
5. COVER THE CULVERT WITH A MINIMUM OF ONE FOOT OF WASHED AGGREGATE. FOR MULTIPLE CULVERTS PROVIDE AT LEAST 12 INCHES OF COMPACTED AGGREGATE FILL BETWEEN CULVERTS.
6. STABILIZE ALL AREAS DISTURBED DURING CULVERT INSTALLATION WITHIN 24 HOURS OF THE DISTURBANCE IN ACCORDANCE WITH STANDARDS FOR PERMANENT STABILIZATION, SECTION B-4-5, OR TEMPORARY STABILIZATION, SECTION B-4-4, AS APPLI
7. STABILIZE APPROACH TO CROSSING AND KEEP FREE O MAINTAIN HIGH FLOW AREAS. REMOVE DEBRIS TRAPPEC MAINTAIN AREAS ADJACENT TO CROSSING TO CONTINU

ACCESS ROAD DECK MAT (DM)

NOTES:

1. MAT SHALL BE "DECK MAT" BY CAROLINA MAT INCORPORATED OR APPROVED EQUAL.
2. MATS SHALL BE INSTALLED SUCH THAT THE SURFACE TIMBER RUNS PARALLEL WITH THE VEHICLE TREAD. SUBSEQUENT MATS SHALL BE INSTALLED SUCH THAT THEY BUTT UP AGAINST EACH OTHER.
3. PLACE 6" OF WOOD CHIP MULCH BENEATH DECK MATS THROUGH ALL CRITICAL ROOT ZONE (CRZ) AREAS. WOOD CHIPS SHALL BE FROM ON-SITE TREES OR IMPORTED FROM A LOCAL SOURCE.





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. 45317, Expiration Date: 12/29/2026.

Wetland Studies and Solutions, Inc. a DAVEY company

1131 Benfield Boulevard • Suite L
Millersville, Maryland 21108
Phone: 410.672.5990 • Fax: 410.672.5993
www.wetlandstudies.com

Southbreeze Community Shoreline Stabilization

Final Design Plan

Anne Arundel County, Maryland

Erosion And Sediment Control Details

REVISIONS

No.	Date	Description	Rev. By	App. By

DATE: FEBRUARY 2025 | SCALE: 1" = 30'

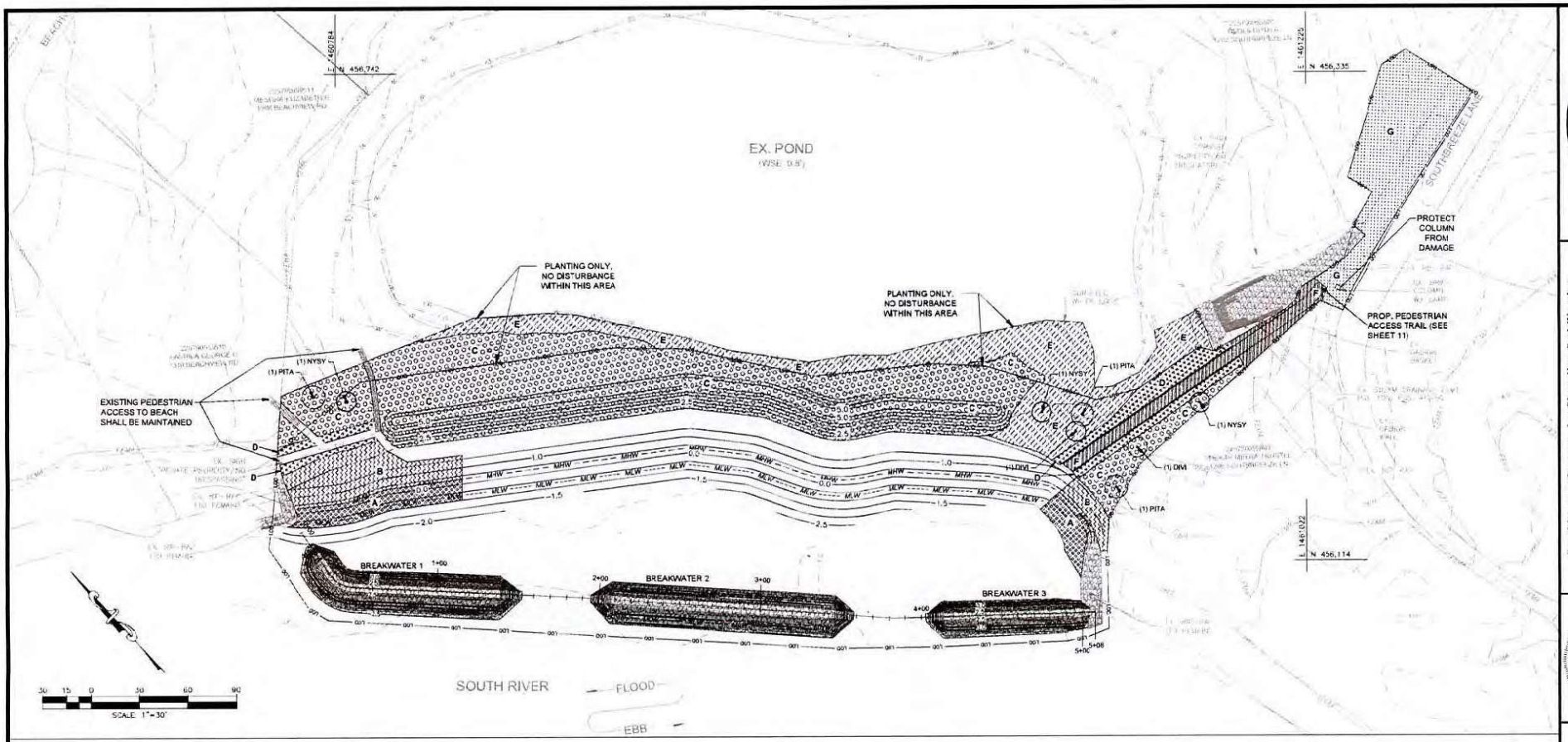
Horizontal Datum: NAD83

Vertical Datum: NAVD88

Boundary and Topo Source: WSSI & Anne Arundel County Data

Design	Draft	Approved

24-WL-0711/24-NT-0204/25-WQC-0005
202461044
180378
2/20/25
MT (TW), CK (NTW)



PLANTING AREAS	
A	LOW MARSH
B	HIGH MARSH
C	DUNE STABILIZATION*
D	PATH BORDER*
E	POND TRANSITION ZONE*
F	STABILIZATION SEEDING*
G	TURFGRASS SEEDING*

*APPROPRIATE SEED MIXES SHALL BE DISTRIBUTED EVENLY THROUGHOUT ALL DISTURBED AREAS IN THE AMOUNT AND TYPE SPECIFIED ON THE SEEDING AND VEGETATION SCHEDULE SHEETS.

LEGEND	
PROPERTY BOUNDARIES	PROPOSED GRADING (0.5')
EASEMENT BOUNDARIES	MHW — PROPOSED MEAN HIGH WATER LINE (0.3' EL.)
EXISTING INFRASTRUCTURE	MLW — PROPOSED MEAN LOW WATER LINE (-0.7' EL.)
EXISTING CONTOURS (1.0')	PLANTING ONLY EXTENT
EX. POND EDGE OF WATER	PROPOSED BREAKWATER
FEMA FLOODPLAIN	PROPOSED OVERSTORY TREE (SEE PLANTING SCHEDULE, SHEET 10)
EXISTING WETLAND BOUNDARY	

PLANTING NOTES:
1. THE INTENT OF THE PLANTING ONLY OUTSIDE THE LOD IS TO RESTORE THE DUNE TO A FULLY VEGETATED STATE. STORMS DURING THE WINTER OF 2023-2024 CAUSED SIGNIFICANT EROSION AND SAND MOVEMENT ALONG THE DUNE, AND IT IS CURRENTLY UNCERTAIN WHETHER VEGETATION WITHIN THE AREA WILL FULLY RECOVER. AFTER CONSTRUCTION, AREAS WITHIN THE PLANTING ONLY ZONE THAT LACK SUFFICIENT VEGETATIVE COVERAGE SHALL BE PLANTED AND/OR SEEDED AS INDICATED.
2. IF STAGING AND STOCKPILE AREA SHOWN IS USED, LANDSCAPING MUST BE REPLACED IN-KIND TO THE SATISFACTION OF THE HOA AND LANDOWNER.
3. ADDITIONAL LANDSCAPING ON PRIVATE PROPERTY WITHIN LOD MAY BE REQUESTED BY PROJECT OWNER VIA CHANGE ORDER. THESE CHANGES AND THE AGREEMENT WILL BE NEGOTIATED AND AGREED UPON BETWEEN THE PROJECT OWNER AND THE LAND OWNER.

Wetland Studies and Solutions, Inc.
1151 Benfield Boulevard • Suite L
Millersville, Maryland 21108
Phone: (410) 923-9440 • Fax: (410) 923-9501
www.wetlandsi.com

Southbreeze Community Shoreline Stabilization
Final Design Plan
Anne Arundel County, Maryland

Planting Plan

STATE OF MARYLAND — CHRISTOPHER KAMMERER — 21705 — REGISTERED PROFESSIONAL ENGINEER
02/18/2025
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. 21705, Expiration Date: 12/09/25.

No.	Date	Description	Rev. By	App. By

REVISIONS

DATE: FEBRUARY 2025 | SCALE: 1" = 30'

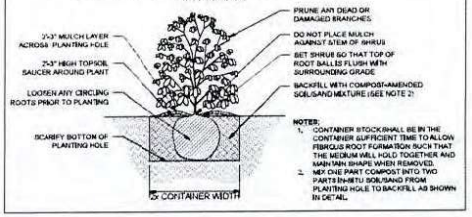
Horizontal Datum: NAD83
Vertical Datum: NAVD88
Boundary and Topo Source: WSSI & Anne Arundel County Data

Design	Draft	Approved

12 of 17
24-WL-0711/24-NT-0204/25-WQC-0005
202461044
180378
2/20/25
MT (TW), CK (NTW)

CONTAINER TREE/SHRUB PLANTING DETAIL

NOT TO SCALE

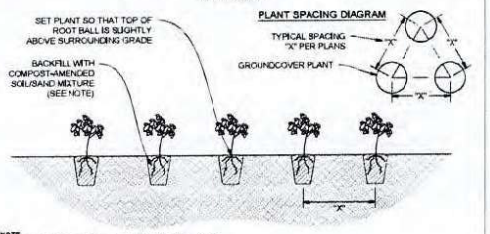


NOTES:

1. CONTAINER STOCK SHALL BE IN THE CONTAINER SUFFICIENT TIME TO ALLOW FIBROUS ROOT FORMATION SUCH THAT THE MEDIUM WILL HOLD TOGETHER AND MAINTAIN SHAPE WHEN REMOVED.
2. MIX ONE PART COMPOST INTO TWO PARTS IN-SITU SOIL/SAND FROM PLANTING HOLE TO BACKFILL AS SHOWN IN DETAIL.

GROUNDCOVER PLANTING DETAIL

NOT TO SCALE

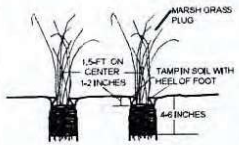


NOTE

MIX ONE PART COMPOST INTO TWO PARTS IN-SITU SOIL/SAND FROM PLANTING HOLE TO BACKFILL AS SHOWN IN DETAIL.

MARSH PLUG PLANTING DETAIL

NOT TO SCALE



PLUG INSTALLATION NOTES

1. CREATE PLANTING HOLE FOR PLANT PLUG.
2. INSTALL 1.0-OZ. OF OSMOCOTE 18-6-12 FERTILIZER AT THE BOTTOM OF EACH PLANTING HOLE.
3. PLACE A SMALL AMOUNT OF SAND OVER FERTILIZER SO ROOTS ARE NOT IN DIRECT CONTACT WITH FERTILIZER.
4. GENTLY REMOVE PLANTS FROM CONTAINERS. CAREFUL NOT TO DAMAGE SECONDARY ROOT GROWTH. CUT AND LOOSEN ROOTS
5. ENSURE ALL LOOSE ROOTS ARE FACING DOWNWARD WHEN PLACING PLANTING PLUG.
6. PLANT AT THE SAME DEPTH AS WHEN PREVIOUSLY GROWN.
7. IF CONTAINER IS NON-ORGANIC, REMOVE CONTAINER COMPLETELY.
8. FIRMLY COMPACT THE PLANT INTO THE HOLE AND BACKFILL TO ELIMINATE ANY AIR POCKETS AND ENSURE THE PLANTIS ANCHORED WELL INTO PLANTING HOLE.

ANNE ARUNDEL COUNTY VEGETATIVE ESTABLISHMENT NOTES

FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN THREE CALENDAR DAYS FOR THE SURFACE OF ALL PERIMETER CONTROLS, DIKES SWALES, DITCHES, PERIME"ER SLOPES, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1) AND SEVEN DAYS FOR ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

1. PERMANENT SEEDING*

B. SEEDBED PREPARATION: AREA TO BE SEEDED SHALL BE LOOSE AND FRIABLE TO A DEPTH OF AT LEAST 3-5 INCHES. THE TOP LAYER SHALL BE LOOSENED BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING OCCURS. FOR SITES LESS THAN 5 ACRES, APPLY 100 POUNDS DOLOMITIC LIMESTONE AND 21 POUNDS OF 10-10-10 FERTILIZER PER 1,000 SQUARE FEET. HARROW OR DISK LIME AND FERTILIZER INTO THE SOIL TO A DEPTH OF AT LEAST 3-5 INCHES ON SLOPES FLATTER THAN 3:1.

D. MULCHING: MULCH SHALL BE APPLIED TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING. DURING THE TIME PERIODS WHEN SEEDING IS NOT PERMITTED, MULCH SHALL BE APPLIED IMMEDIATELY AFTER GRADING. MULCH SHALL BE UNROTTED, UNCHOPPED, SMALL GRAIN STRAW APPLIED AT A RATE OF 2 TONS PER ACRE OR 90 POUNDS PER 1,000 SQUARE FEET (2 BALES). APPLY MULCH TO ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. IF A MULCH-ANCHORING TOOL IS USED, APPLY 2.5 TONS PER ACRE. MULCH MATERIALS SHALL BE RELATIVELY FREE OF ALL KINDS OF WEEDS AND SHALL BE COMPLETELY FREE OF PROHIBITED NOXIOUS WEEDS. SPREAD MULCH UNIFORMLY, MECHANICALLY OR BY HAND, TO A DEPTH OF 1-2 INCHES.

E. SECURING STRAW MULCH: STRAW MULCH SHALL BE SECURED IMMEDIATELY FOLLOWING MULCH APPLICATION TO MINIMIZE MOVEMENT BY WIND OR WATER. THE FOLLOWING METHODS ARE PERMITTED:

I. USE A MULCH-ANCHORING TOOL WHICH IS DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE TO A MINIMUM DEPTH OF 2 INCHES. THIS IS THE MOST EFFECTIVE METHOD FOR SECURING MULCH, HOWEVER, IT IS LIMITED TO RELATIVELY FLAT AREAS WHERE EQUIPMENT CAN OPERATE SAFELY.

II. WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. APPLY THE FIBER BINDER AT A NET DRY WEIGHT OF 750 POUNDS PER ACRE. IF MIXED WITH WATER, USE 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.

III. LIQUID BINDERS MAY BE USED. APPLY AT HIGHER RATES AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF SLOPES. THE REMAINDER OF THE AREA SHOULD APPEAR UNIFORM AFTER BINDER APPLICATION. BINDERS LISTED IN THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL OR APPROVED EQUAL SHALL BE APPLIED AT RATES RECOMMENDED BY THE MANUFACTURERS.

IV. LIGHTWEIGHT PLASTIC NETTING MAY BE USED TO SECURE MULCH. THE NETTING WILL BE STAPLED TO THE GROUND ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

* STANDARD NOTES A AND C DO NOT APPLY AND HAVE NOT BEEN INCLUDED.

PLANTING NOTES

1. CONTRACTOR SHALL USE CURRENT ANNE ARUNDEL COUNTY LANDSCAPE SPECIFICATIONS AND THOSE SPECIFICATIONS SHALL GOVERN IN ALL QUESTIONS WHERE THERE ARE CONFLICTS BETWEEN THE PLANS AND THE LANDSCAPE SPECIFICATIONS.
2. ALL PLANT MATERIALS SHALL BE WARRANTED FOR ONE YEAR.
3. ALL PLANT MATERIALS SHALL BE IN A HEALTHY CONDITION AND SHALL CONFORM TO THE STANDARDS OF THE MOST RECENT EDITION OF THE AMERICAN STANDARD OF NURSERY STOCK, PUBLISHED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION, AND SHALL BE INSTALLED ACCORDING TO STANDARD PLANTING PRACTICES AND PROCEDURES.
4. ALL PLANTING SHALL BE INSTALLED IN A SOUND, WORKMANSHIP-LIKE MANNER AND ACCORDING TO ACCEPTED GOOD PLANTING PRACTICES AND PROCEDURES.
5. ALL PLANT MATERIAL SHALL BE TRANSPORTED AND STORED OUT OF DIRECT EXPOSURE TO SUN AND WIND AND SHALL BE KEPT MOIST THROUGH PERIODIC WATERING UNTIL THE TIME OF PLANTING. THE PLANTS SHALL BE PROTECTED BY COVERING WITH STRAW, PEAT MOSS, COMPOST, OR OTHER SUITABLE MATERIALS AND SHALL BE MAINTAINED MOIST THROUGH PERIODIC WATERING, UNTIL THE TIME OF PLANTING.
6. ALL REQUIRED PLANTINGS MUST BE APPROVED AT THE END OF THE FIRST PLANTING SEASON FOLLOWING CONSTRUCTION.
7. THE OWNER SHALL BE RESPONSIBLE FOR THE CONTINUED PROPER MAINTENANCE FOLLOWING THE ORIGINAL WARRANTY, REPAIR, AND REPLACEMENT OF ALL LANDSCAPING MATERIALS.
8. REPLACEMENT OF NEW PLANTINGS: AT THE END OF THE WARRANTY PERIOD OR AT ANY TIME DURING THE WARRANTY PERIOD, INSPECTIONS WILL BE MADE BY THE OWNER, OR HIS DESIGNEE, AT HIS DISCRETION. ANY PLANT REQUIRED UNDER THIS CONTRACT THAT IS DEAD, UNHEALTHY, UNSIGHTLY, OR IN A BADLY IMPAIRED CONDITION, AS DETERMINED BY THE OWNER, OR HIS DESIGNEE, SHALL BE REMOVED FROM THE SITE AND REPLACED WITHIN TEN (10) WORKING DAYS, WEATHER CONDITIONS PERMITTING, AT NO ADDITIONAL COST TO THE OWNER. ALL REPLACEMENTS SHALL BE IN COMPLIANCE WITH PLANS AND SPECIFICATIONS.
9. REPLACEMENT PLANT WARRANTY: ALL PLANTS REPLACED SHALL BE WARRANTED FOR ONE YEAR. THE MAINTENANCE OF THESE PLANTS WILL BE THE RESPONSIBILITY OF THE PLANTING CONTRACTOR UNTIL THE ORIGINAL ONE YEAR WARRANTY PERIOD EXPIRES. AFTER THE EXPIRATION OF THE ORIGINAL WARRANTY PERIOD, THE OWNER WILL PROVIDE MAINTENANCE FOR THE REMAINDER OF THE REPLACEMENT PLANT WARRANTY PERIOD.
10. IN-SITU SOIL AND/OR SAND FROM PLANTING HOLES SHALL BE COMBINED WITH ONE PART COMPOST PER TWO PARTS IN-SITU SOIL/SAND BEFORE USING BACKFILLING PLANTING HOLE WITH MIXTURE.

LOW AND HIGH MARSH PLANTING NOTES

1. A MINIMUM OF 1-FOOT OF CLEAN SAND SHALL BE APPLIED TO THE GRADED WETLAND PLANTING AREA. SEE CLEAN SAND NOTES BELOW.
2. WHEN PURCHASING PLANT SPECIES THE CONTRACTOR SHALL TEST WATER SALINITY AT THE SITE AND ADVISE THE NURSERY OF SITE SALINITY TO OBTAIN PLANTS CONDITIONED TO SITE SALINITY CONDITIONS.
3. EACH PLANT PLUG SHALL HAVE ONE OUNCE OF OSMOCOTE 18-6-12 FERTILIZER, OR A BALANCED SLOW RELEASE FERTILIZER, PLACED BENEATH IT. THE FERTILIZER SHALL BE COVERED WITH A SMALL AMOUNT OF SAND SO NOT TO BE IN DIRECT CONTACT WITH THE ROOTS.
4. *SPARTINA ALTERNIFLORA* PLUGS SHALL BE INSTALLED 24" ON CENTER AT THE AREA LABELED LOW MARSH PLANTING ZONE, AS SHOWN ON THE PLANTING PLAN.
5. *SPARTINA PATENS* AND *JUNCUS EFFUSUS* PLUGS SHALL BE INSTALLED 24" ON CENTER AT THE AREA LABELED HIGH MARSH PLANTING AREA, AS SHOWN ON THE PLANTING PLAN.
6. LITTER REMOVAL SHALL BE PERFORMED AS NECESSARY TO REMOVE TRASH, DEBRIS, AND FLOATABLES, WHICH SHALL NOT BE ALLOWED TO SMOTHER THE PLANTED MARSH GRASS SPECIES.

SEEDING NOTES

1. A SEED GERMINATION AND PURITY RATE OF 75% IS REQUIRED. EVIDENCE OF SUCH SHALL BE PROVIDED TO OWNER OR OWNER'S REPRESENTATIVE PRIOR TO PLANTING.
2. THE LANDSCAPE CONTRACTOR SHALL INSPECT THE AREAS AND CONDITIONS UNDER WHICH THE SEEDING WORK IS TO BE PERFORMED PRIOR TO COMMENCING WORK. IF CONDITIONS ARE DETRIMENTAL TO THE PROPER AND TIMELY COMPLETION OF THE WORK, HE/SHE SHALL NOTIFY THE OWNER VERBALLY AND IN WRITING AND POSTPONE COMMENCING WORK UNTIL THE UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
3. PRIOR TO SEEDING, THE SEEDING AREA SHALL BE RAKED SMOOTH AND CLEARED OF ALL TRASH, DEBRIS, BRANCHES AND OTHER MATTER DETRIMENTAL TO THE SUCCESS OF SEEDING.
4. CARE SHOULD BE EXERCISED TO INSURE UNIFORM SEED COVERAGE IS OBTAINED. SEED SHALL BE APPLIED AT THE RATE SPECIFIED ON THE PLANTING SCHEDULE.
5. THE SPECIFIED SEED SHALL BE BROADCAST IN AREAS SPECIFIED ON THE PLANTING PLAN. FOLLOWING SEEDING, MECHANICALLY SOW SEED TO THE MAXIMUM DEPTH OF AN INCH BY THE USE OF A HAND RAKE.
6. APPLY STRAW MULCH ABOVE MHW AT A RATE SPECIFIED BY THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, 3RD EDITION, 1992.

Wetland Studies and Solutions, Inc.
1131 Benfield Boulevard • Suite L
Millersville, Maryland 21108
Phone: 410.672.5990 • Fax: 410.672.5993
www.wetlandstudies.com

Southbreeze Community Shoreline Stabilization
Final Design Plan
Anne Arundel County, Maryland

Planting And Seeding Notes And Details

02/18/2025

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. 45911, Expiration Date: 12/31/2026.

REVISIONS				
No.	Date	Description	By	Appd. By

DATE: FEBRUARY 2025 | SCALE: N.A.

Horizontal Datum: NAD83
Vertical Datum: NAVD88
Boundary and Topo Source: WSSI & Anne Arundel County Data

Design	Draft	Approved

13 of 17
24-WL-0711/24-NT-0204/25-WQC-0005
202461044
180378
2/20/25
MT (TW), CK (NTW)

SOUTHBREEZE SHORELINE STABILIZATION VEGETATION SCHEDULE

STABILIZATION PLANTING SCHEDULE

CONTAINER PLANTING ZONE	SPECIES[1,2]	INDICATOR STATUS (AGCP)	STOCK SIZE	PLANT SPACING[3]	QUANTITY	PLANTING QUANTITIES AREA (SF): / AREA (AC):	A 2,013 0.05	B 3,128 0.07	C 22,124 0.51	D 2,141 0.05	E 8,517 0.20
LOW MARSH (-1' TO MHW)	SPARTINA ALTERNIFLORA (SALTMARSH CORDGRASS)	OBL	PLUGS	24" O.C.	504		504	-	-	-	-
HIGH MARSH (MHW TO +2')	SPARTINA PATENS (SALTMEADOW CORDGRASS)	FACW	PLUGS	24" O.C.	782		-	391	-	-	-
	JUNCUS EFFUSUS (SOFT RUSH)	OBL					-	391	-	-	-
DUNE (+2' TO +5')	AMMOPHILA BREVILIGULATA (AMERICAN BEACHGRASS)	UPL	PLUGS	24" O.C.	5,532		-	-	1383	-	-
	PANICUM AMARUM (COASTAL PANICGRASS)	FAC					-	-	1383	-	-
	PANICUM VIRGATUM (SWITCHGRASS)	FAC					-	-	1383	-	-
	SCHIZACHYRIUM LITTORALE (SHORE LITTLE BLUESTEM)	FAC					-	-	1383	-	-
	AMORPHA FRUTICOSA (FALSE INDIGO)	FACW	1-GAL.	16' O.C.	88		-	-	22	-	-
	BACCHARIS HALIMIFOLIA (GROUNDSEL)	FAC					-	-	22	-	-
	CLETHRA ALNIFOLIA (COASTAL SWEET PEPPERBUSH)	FACW					-	-	22	-	-
	MORELLA PENSYLVANICA (NORTHERN BAYBERRY)	FAC					-	-	22	-	-
PATH BORDER (ELEV. VARIES)	AMMOPHILA BREVILIGULATA (AMERICAN BEACHGRASS)	UPL	PLUGS	18" O.C.	952		-	-	-	238	-
	CONOCLINIUM COELESTINUM (BLUE MISTFLOWER)	FAC					-	-	-	238	-
	JUNCUS EFFUSUS (SOFT RUSH)	OBL					-	-	-	238	-
	SCHIZACHYRIUM LITTORALE (SHORE LITTLE BLUESTEM)	FAC					-	-	-	238	-
POND TRANSITION ZONE (+0.8' TO +2')	ASCLEPIAS INCARNATA (SWAMP MILKWEED)	OBL	PLUGS	24" O.C.	2,135		-	-	-	-	305
	EUTROCHIUM DUBIUM (COASTAL PLAIN JOE PYE WEED)	FACW					-	-	-	-	305
	LOBELIA SIPHILITICA (GREAT BLUE LOBELIA)	OBL					-	-	-	-	305
	PANICUM AMARUM (COASTAL PANICGRASS)	FAC					-	-	-	-	305
	PANICUM VIRGATUM (SWITCHGRASS)	FAC					-	-	-	-	305
	SCHIZACHYRIUM LITTORALE (SHORE LITTLE BLUESTEM)	FAC					-	-	-	-	305
	SOLIDAGO SEMPERVIRENS (SEASIDE GOLDENROD)	FACW					-	-	-	-	305
	ALNUS SERRULATA (SMOOTH ALDER)	FACW	1-GAL.	16' O.C.	36		-	-	-	-	9
	AMORPHA FRUTICOSA (FALSE INDIGO)	FACW					-	-	-	-	9
	ARONIA MELANOCARPA (BLACK CHOKEBERRY)	FACW					-	-	-	-	9
	CLETHRA ALNIFOLIA (COASTAL SWEET PEPPERBUSH)	FACW					-	-	-	-	9
STABILIZATION PLANTING TOTALS					10,029		504	782	5,620	952	2,171

PLANTING NOTES:

1. It is expected and preferred that all species in each of the Species Groups are planted. The tolerances listed in this note are intended to incorporate flexibility according to species availability. At a minimum, Contractor is to provide at least:
   a) All of the species in the Low Marsh and High Marsh zones.
   b) 3 of the 4 herbaceous (plug) species in the Dune zone.
   c) 3 of the 4 shrub (1-gallon) species in the Dune zone.
   d) 3 of the 4 species in the Path Border zone.
   e) 6 of the 7 herbaceous (plug) species in the Pond Transition zone.
   f) 3 of the 4 shrub (1-gallon) species in the Pond Transition zone.
2. Substitutions for selected species based upon availability shall be requested in writing to engineer, documenting the lack of availability. If the flexibility inherent in the above schedule is still not sufficient, Engineer is under no obligation to approve substitutions.
3. The planted forb, grass, and shrub species shall be randomly mixed at the spacing specified throughout the planting areas.

SUPPLEMENTARY OVERSTORY TREE PLANTING SCHEDULE

SYMBOL	CODE	SPECIES	STOCK SIZE	QTY
•	DIVI	DIOSPYROS VIRGNIANA (COMMON PERSIMMON)	1" CAL.	3
	NYSY	NYSSA SYLVATICA (BLACKGUM)	1" CAL.	3
	PITA	PINUS TAEDA (LOBLOLLY PNE)	1" CAL.	3
SUPPLEMENTARY TREE PLANTING TOTAL				9

SOUTHBREEZE STABILIZATION SEEDING SCHEDULE

SEED MIX[1]	SPECIES[2]	INDICATOR STATUS (AGCP)	SEEDING RATE[3] (LBS/AC)	SEEDING QUANTITIES AREA (SF): / AREA (AC):	F 1,946 0.04
COOL SEASON: FEB 15-APR 30, AUG 15-NOV 30	LOLIUM PERENNE SSP. MULTIFLORUM (ANNUAL RYEGRASS)	FACU	20.00		0.80
	TRITICUM AESTIVUM (WHEAT)	NI	60.00		2.40
COOL SEASON SEEDING TOTALS			80.00		3.20
WARM SEASON: MAY 1-AUG 14	PENNISETUM GLAUCUM (PEARL MILLET)	FACU	20.00		0.80
WARM SEASON SEEDING TOTALS			20.00		0.80

STABILIZATION SEEDING NOTES:

1. Cool Season or Warm Season seed mix shall be selected based on date of seeding.
2. Substitutions for selected species based upon availability shall be requested in writing to engineer, documenting the lack of availability.
3. All seeding rates are expressed in pounds of pure live seed (PLS).

SOUTHBREEZE SHORELINE STABILIZATION VEGETATION SCHEDULE

RESTORATION SEEDING SCHEDULE

SEED MIX	SPECIES[1]	INDICATOR STATUS (AGCP)	SEEDING RATE[2] (LBS/AC)	QUANTITY (LBS)	SEEDING QUANTITIES AREA (SF): / AREA (AC):	C 22,124 0.51	D 2,141 0.05	E 8,517 0.20
E&S COVER CROP	SECALE CEREALE (GRAIN RYE)	NI	45.00	34.20		22.95	2.25	9.00
	CHAMAECRISTA FASCICULATA (PARTRIDGE PEA)	FACU	5.00	3.80		2.55	0.25	1.00
NATIVE GRASSES	PANICUM AMARUM (COASTAL PANICGRASS)	FAC	5.00	3.80		2.55	0.25	1.00
	PANICUM VIRGATUM 'HIGH TIDE' (SWITCHGRASS, 'HIGH TIDE')	FAC	5.00	3.80		2.55	0.25	1.00
SEEDING TOTALS			60.00	45.60		30.60	3.00	12.00

SEEDING NOTES:

1. Substitutions based upon availability shall be requested in writing to engineer, documenting the lack of availability.
2. All seeding rates are expressed in pounds of pure live seed (PLS).

SOUTHBREEZE TURFGRASS SEEDING SCHEDULE

SEED PLANTING ZONE	SPECIES[1,2]	INDICATOR STATUS (AGCP)	SEEDING RATE[3] (LBS/AC)	PERCENT OF MIX	SEEDING QUANTITIES AREA (SF): / AREA (AC):	G 5,268 0.12
TURFGRASS SEEDING	TURF-TYPE TALL FESCUE CULTIVAR	FACW	210.00	95%		25.40
	KENTUCKY BLUE GRASS CULTIVAR	FACW	10.00	5%		1.21
SEEDING TOTALS			220.00	100%		26.61

TURFGRASS SEEDING NOTES:

1. Substitutions for selected species based upon availability shall be requested in writing to engineer, documenting the lack of availability.
2. All cultivars shall be selected from the most current University of Maryland Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland" and certified by the Maryland Department of Agriculture, Turf and Seed Section.
3. All seeding rates are expressed in pounds of pure live seed (PLS).

Wetland Studies and Solutions, Inc.
1131 Benfield Boulevard • Suite L
Millersville, Maryland 21108
Phone: 410-672-5990 • Fax: 410-672-5993
www.wetlandsi.com

Southbreeze Community Shoreline Stabilization
Final Design Plan
Anne Arundel County, Maryland

Vegetation Schedule

I HEREBY CERTIFY THAT THE PLANS AND SPECIFICATIONS HEREIN ARE IN COMPLIANCE WITH THE LAWS OF THE STATE OF MARYLAND GOVERNING LANDSCAPE ARCHITECTURE AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND LICENSE NO. 1900XXX
Expiration Date: 12/31/2026

No	Date	Description	Rev. Init. By:
REVISIONS			

DATE: FEBRUARY 2025 | SCALE: N/A

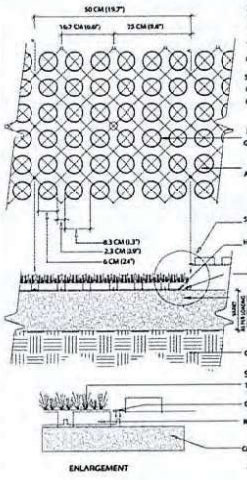
Horizontal Datum: N/A
Vertical Datum: N/A
Boundary and Topo Source: N/A

Design	Draft	Approved

24-WL-0711/24-NT-0204/25-WQC-0005
202461044
180378
2/20/25
MT (TW), CK (NTW)

PEDESTRIAN ACCESS TRAIL

NOT TO SCALE



NOTE: GRASS/PLANT TYPES SHALL BE SPECIFIED BY A LANDSCAPE ARCHITECT OR LANDSCAPE DESIGNER.

SPECIFICATIONS

UNIT SIZE - 50 CM X 50 CM X 2.5 CM OR 1 M X 1 M X 2.5 CM (20" X 20" X 1" OR 40" X 40" X 1")

AVAILABLE IN 9 STANDARD ROLL SIZES

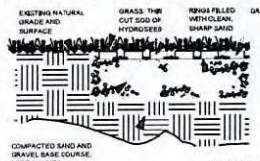
UNIT WEIGHT - 510 GRAMS (18 OZ.) OR 2.0 KG (4.5 POUNDS)

STRENGTH - 1121 KG/CM (15,950 PSI)

COLOR - BLACK

RESIN - 100% RECYCLED HDPE

FLUSH, NATURAL (EXISTING) EDGING



NOTES

1. PEDESTRIAN ACCESS PATH SHALL BE GRASSPAVE2, MODEL 2020, AN EQUAL PRODUCT MAY BE USED IF APPROVED BY ENGINEER.
2. BASE COURSE DEPTH SHALL BE 2 INCHES.
3. ACCESS PATH BASE COURSE SHALL BE UNDERLAIN WITH WOVEN OR NON-WOVEN POLYPROPELYNE GEOTEXTILE, SUCH AS MIRAFI 700X. MIRAFI 70/20, FILTERWEAVE 500, N080, OR APPROVED EQUAL. THE FABRIC SHALL HAVE PUNCTURE RESISTANCE GREATER THEN 100 LBS. APPARENT OPENING SIZE GREATER THAN U.S. 70 SIEVE, AND 30 LBS. OF TENSILE STRENGTH AT 20% (MAXIMUM).
4. REFER TO "INSTALLATION GUIDE - GRASSPAVE2 POROUS GRASS PAVEMENT" ON THIS SHEET AND THE OTHER LANDSCAPING SHEETS IN THIS PLAN FOR ADDITIONAL INFORMATION.

INVISIBLE STRUCTURES

Base Course Depth Recommendations
GRASSPAVE2 and GRAVELPAVE2

	Normal Traffic		Occasional Passes		Infrequent Passes	
	CBR 7-9	CBR >9	CBR 7-9	CBR >9	CBR 7-9	CBR >9
Heavy Fire Truck & H-20 Loading Max 110 psi 80000 lb	14 in	12-14 in	12-14 in	12 in	12 in	10-12 in
Light Fire Truck & H-15 Loading Typical 85 psi 60,000 lb	12 in	10-12 in	10 in	8-10 in	8-10 in	8 in
Utility & Delivery Truck & H-10 Loading Typical 60 psi 45,000 lb	8-10 in	8 in	8-10 in	6-8 in	6-8 in	6 in
Cars & Pick-up Truck Access Typical 45 psi 8,000 lb	6-8 in	6 in	6 in	4-6 in	4-6 in	2-4 in
Trail Use and Cart Paths < 1,000 lb	6 in	4-6 in	2-4 in	0-2 in	None	None

Base course shall have a depth of 2 inches

* THESE DEPTH RECOMMENDATIONS SHOULD BE VERIFIED BY THE PROJECT ENGINEER AND LOCAL AUTHORITIES

GRASSPAVE² GRAVELPAVE²

INSTALLATION GUIDE - Grasspave2 Porous Grass Pavement

Introduction

A. This document describes step-by-step information on how to properly install the Grasspave2 Porous Pavement System. Grasspave2 provides vehicular and pedestrian load support for grass areas, while protecting grass roots from harmful effects of traffic. The major components of the complete system are the Grasspave2 units, an engineered base course, Hydrogrow soil amendment/fertilizer, sand, and grass from seed, hydromulch, or sod.

B. **Contractors:** Only licensed contractors should install the Grasspave2 system. The contractor should have a good performance record with similar construction projects. *Homeowners should only attempt installation after they have read and understood fully this installation guide and/or our Technical Specifications.*

C. **Landscaping:** ~~Plant a~~ ~~climate appropriate, 3) will~~ SEE PLANTING SHEETS ~~and fertilizer support) -It is~~ ~~wear resistant to hold up t~~ ~~in a sand based root zone. It is~~ ~~shade tolerant (if applicable).~~

F. **Warning:** Unless there is an emergency, DO NOT DRIVE, PARK ON, or use Grasspave2 system for two or three mowing cycles until grass root system has matured (about 3 to 4 weeks for sod or 6 to 8 weeks for seeded areas). Any barricades constructed to prevent traffic flow must still be accessible by emergency and fire equipment during and after installation.

G. **Warranty:** Invisible Structures, Inc. (ISI) warrants to its purchasers that all products furnished by ISI will be free from defects in material and/or workmanship. This warranty shall be extended for a period of five (5) years following the date of shipment by ISI. Providing a written claim is presented to ISI within the warranty period and after inspection by ISI showing the materials have failed under this warranty, all defective materials shall be refurnished under this warranty, at no charge, excluding re-installation costs. This in lieu of all other warranties expressed or implied and is the sole warranty extended by ISI. Our liability under this warranty is limited to the refurnishing of materials and does not include any responsibility for incidental, consequential, or other damages of any nature.

Delivery, Storage, and Handling

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Protect Grasspave2 units/rolls from damage during delivery and store rolls upright (like a soda can), and under a tarp to protect from sunlight when time for delivery to installation exceeds one week. Do not store rolls on their sides.

C. Store Hydrogrow in a dark and dry location.

D. Handling: Protect materials during handling and installation to prevent damage.

Installation Considerations

A. Examine subgrade and base course installed conditions. Do not start porous paving installation until unsatisfactory conditions are corrected. Check for improperly compacted trenches, debris, and improper gradients.

B. ~~For fire installations: prior to installing base course for turf paving, obtain approval of local fire authorities of sub base.~~

C. Start of installation constitutes acceptance of existing conditions and responsibility for satisfactory performance. If existing conditions are found unsatisfactory, contact Architect for resolution.

Preparation

(Ensure that subbase materials are structurally adequate to receive designed base course, wearing course, and designed loads. Generally, excavation into undisturbed normal strength soils will require no additional modification. Fill soils and otherwise structurally weak soils may require modifications, such as geotextiles, geogrids, and/or compaction (not to exceed 90%). Ensure that grading and soil porosity of the subbase will provide adequate subsurface drainage)

A. Subgrade Preparation:
1. Prepare subgrade as specified for project.
2. Proper subgrade preparation will enable the Grasspave2 rolls/units to connect properly and remain level and stationary after installation.
3. Excavate area allowing for unit thickness (1 in), the engineered base depth (where required), and 0.5 inch (1.25 cm) for depth of sod root zone or topsoil germination area (when applicable).
4. Provide adequate drainage from excavated area if area has potential to collect water, when working with in-place soils that have poor permeability.
5. Ensure in-place soil is relatively dry and free from standing water.
6. Uniformly grade base.
7. Level and clear base of large objects, such as rocks and pieces of wood.

B. Base Preparation:
1. Install Base as specified.
2. ~~Coordinate base installation and preparation with subdrains (if necessary).~~
3. If required, place a geotextile separation layer between the natural ground and the 'engineered base'.
4. ~~If required, install the specified sub-drain and outlet according to construction drawings.~~
5. ~~Coordinate base installation and preparation with irrigation and drip irrigation lines.~~
6. Pace engineered base in lifts not to exceed 6 inches (150 mm), compacting each lift separately to 95 percent Modified Proctor.
7. Leave 1 inch (2.5 cm) of depth below final grade for porous paver unit and sand fill and 0.5 inch (1.25 cm) for depth of sod root zone or topsoil germination area (when applicable).

Hydrogrow Installation

A. Spread all Hydrogrow mix provided (spreader rate = 4.53 kg per 100 m2 (10 lbs per 1076 ft2) evenly over the surface of the base course with a hand-held, or wheeled, rotary spreader.

A. Review installation procedures and coordinate Grasspave2 work with other work affected. Generally, Grasspave2 is installed at the same time as project grass installation, nearly the last site construction activity.

B. Do not begin installation of porous pavement until all hard surface paving adjacent to porous pavement areas, including concrete walks and asphalt paving, is completed.

C. Install turf when ambient air temperatures is at least 55 degrees F (13 degrees C).

D. In cold weather, do not use frozen materials or materials mixed or coated with ice or frost, and do not build on frozen base or wet, saturated or muddy subgrade.

E. Protect partially completed paving against damage from other construction traffic when work is in progress.

F. Adequately water sod or grass seed to assure germination of seed and growth of root system.

G. Grass coverage on the sand-filled Grasspave2 rings must be completed within one week.

H. DO NOT DRIVE, PARK ON, or use Grasspave2 system for two or three mowing cycles until grass root system has matured (about 3 to 4 weeks for sod or 6 to 8 weeks for seeded areas). Any barricades constructed must still be accessible by emergency and fire equipment during and after installation.

Materials

A. Grasspave2 Porous Paving Rolls

B. Base Course: Sandy gravel material from local sources commonly used for road base construction (recycled materials such as crushed concrete or crushed aggregate are NOT acceptable).
1. Conforming to the following sieve analysis and requirements:
100 percent passing sieve size 1 inch (25 mm)
90-100 percent passing sieve size 3/4 inch (19 mm).
70-80 percent passing sieve size 3/8 inch (9 mm).
55-70 percent passing sieve size #4.
45-55 percent passing sieve size #10.
25-35 percent passing sieve size #40.
3-8 percent passing sieve size #200.
2. Provide a base course material nearly neutral in pH (range from 6.5 to 7.2) to provide adequate root zone development for turf.
3. Material may be either "pit run" or "crusher run." Avoid using clay based crusher run/pit run. Crusher run material will generally require coarse, well-draining sand conforming to AASHTO M6 or ASTM C 33 to be added to mixture (20 to 30 percent by volume) to ensure long-term porosity.
4. Alternative materials such as crushed shell, limerock, or crushed lava may be used for base course use, provided they are mixed with sharp sand (20 to 30 percent by volume) to ensure long-term porosity, and are brought to proper compaction. Without added sand, crushed shell and limerock set up like concrete and become impervious.
5. Alternative size and/or composition of base course materials should be submitted to Invisible Structures, Inc. (Manufacturer) for approval.

B. The Hydrogrow mix should be placed **immediately** before installing the Grasspave2.

Grasspave2 Unit Installation

A. Install the Grasspave2 units by placing units with rings facing up, and using snap-fit connectors, pegs and holes, provided to maintain proper spacing and interlock the units. Units can be easily shaped with pruning shears or knife. Units placed on curves, slopes, and high traffic areas shall be anchored to the base course, using skid common nails with fender washer, as required to secure units in place. Tops of rings shall be between 6 mm to 13 mm (0.25" to 0.5") below the surface of adjacent hard-surface pavements.

B. Install sand in rings as they are laid in sections by "back-dumping" directly from a dump truck, or from buckets mounted on tractors, which then exit the site by driving over rings already filled with sand. The sand is then spread laterally from the pile using flat bottomed shovels and/or wide "asphalt rakes" to fill the rings. A stiff bristled broom should be used for final "finishing" of the sand. The sand must be "compacted" by using water from hose, irrigation heads, or rainfall, with the finish grade no less than the top of rings and no more than 6 mm (0.25") above top of rings.

Installation of Grass

A. Grass coverage on the sand-filled rings must be completed within one week. Sand must be re-installed and leveled and Grasspave2 checked for integrity if rings become exposed due to wind, rain, traffic, or other factors.

Notes: Choose one paragraph below to match grass installation method

~~1. Preferred method: Hydroseeding/hydro-mulching - A combination of water, seed and fertilizer are homogeneously mixed in a purpose built, truck mounted tank. The seed mixture is sprayed onto the site at rates shown on plans and per hydroseeding manufacturer's recommendations. Coverage must be uniform and complete. Following germination of the seed, areas lacking germination larger than 20 cm x 20 cm (8" x 8") must be reseeded immediately. Seeded areas must be fertilized and kept moist during development of the turf plants). 2. DO NOT DRIVE ON SYSTEM: Hydroseed/hydro-mulch areas must be protected from any traffic, other than emergency vehicles, for a period of 4 to 8 weeks, or until the root system has penetrated and established well below the Grasspave2 units.~~

~~2. Install thin sod directly over sand fillet rings, filled no higher than the top of the rings. Sod strips should be placed with very tight joints. Seeded areas must be fertilized and kept moist during root establishment (minimum of 3 weeks). DO NOT DRIVE ON SYSTEM: Seeded areas must be protected from any traffic, other than emergency vehicles, for a period of 3 to 4 weeks, or until the root system has penetrated and established well below the Grasspave2 units.~~

OR

3. Install grass seed at rates per grass type. A light "chasing" of commercial topsoil mix, not to exceed 1/2" (25 mm) will be placed above the rings and seed mix to aid germination rates. Seeded areas must be fertilized and kept moist during development of the turf plants). DO NOT DRIVE ON SYSTEM: Seeded areas must be protected from any traffic, other than emergency vehicles, for a period of 6 to 8 weeks, or until the root system has penetrated and established well below the Grasspave2 units.

B. Adequately water sod or grass seed to assure germination of seed and growth of root system.

Protection

Choose one paragraph below to match grass installation method.

A. Seeded areas must be protected from any traffic, other than emergency vehicles, for a period of 4 to 8 weeks, or until the grass is mature to handle traffic.

~~B. Sodded areas must be protected from any traffic, other than emergency vehicles, for a period of 3 to 4 weeks, or until the root system has penetrated below the Grasspave2 units.~~

Field Quality Control

A. Remove and replace segments of Grasspave2 units where three or more adjacent rings are broken or damaged, reinstalling as specified, so no evidence of replacement is apparent.

B. Perform cleaning during the installation of work and upon completion of the work. Remove all excess materials, debris, and equipment from site. Repair any damage to adjacent materials and surfaces resulting from installation of this work.

INVISIBLE STRUCTURES

Invisible Structures, Inc.
303.233.8383
www.invisiblestructures.com

Wetland Studies and Solutions, Inc.
1131 Benfield Boulevard • Suite L
Millersville, Maryland 21108
Phone: 410.672.5990 • Fax: 410.672.5993
www.wetlands.com

Southbreeze Community Shoreline Stabilization
Final Design Plan
Anne Arundel County, Maryland

Pedestrian Access Details And Specifications

STATE OF MARYLAND — MICHAEL R. REUTER — 22501 — PROFESSIONAL ENGINEER — 02/18/2026

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. 22501, Expiration Date: 12/24/2026.

No.	Date	Description	By	Appd.
		REVISIONS		

DATE: FEBRUARY 2025 | SCALE: NTS

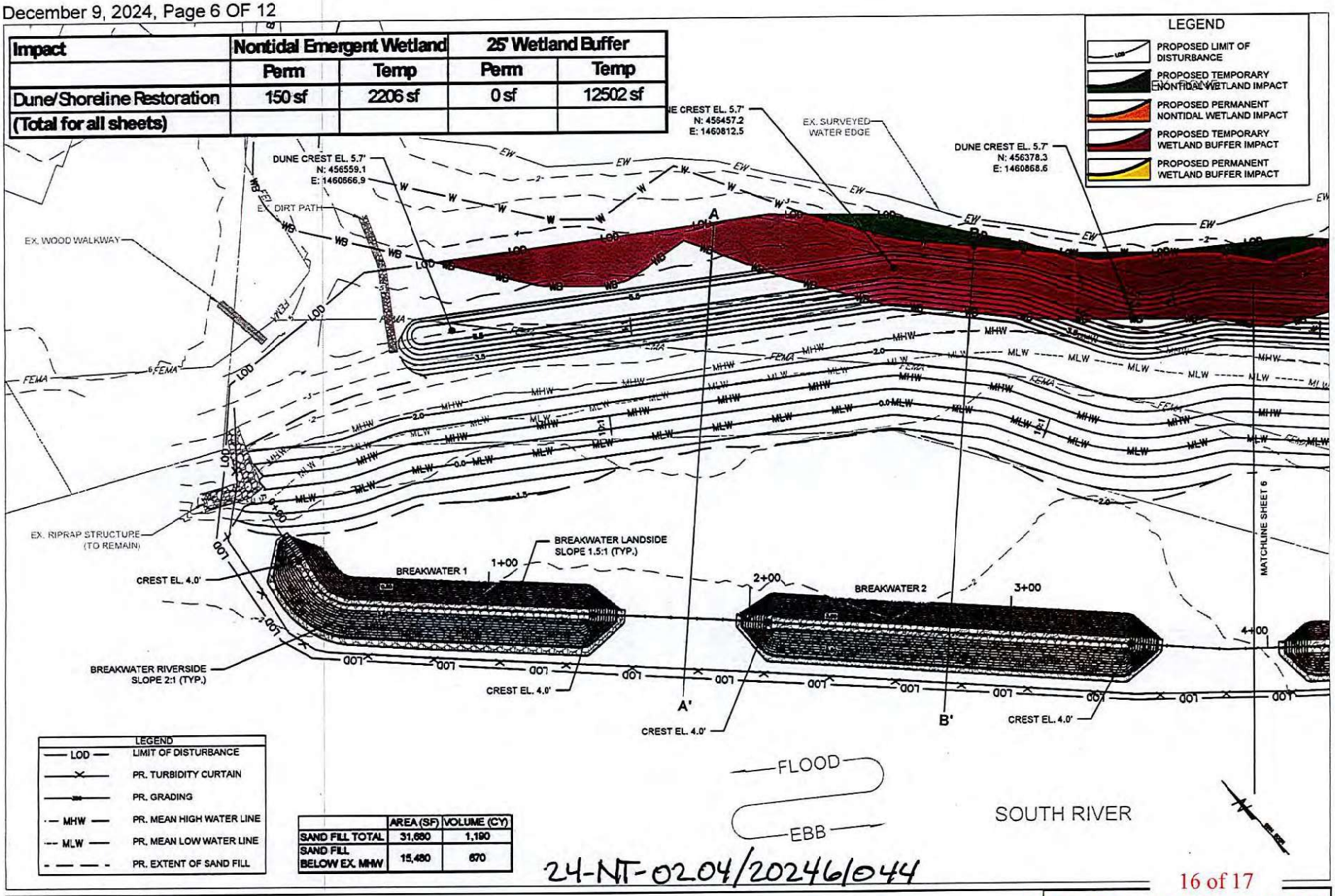
Horizontal Datum: NAD83
Vertical Datum: NAVD88
Boundary and Topo Source: WSSI & Anne Arundel County Data

Design	Draft	Approved

15 of 17

24-WL-0711/24-NT-0204/25-WQC-0005
202461044
180378
2/20/25
MT (TW), CK (NTW)

Impact	Nontidal Emergent Wetland		25' Wetland Buffer	
	Perm	Temp	Perm	Temp
Dune/Shoreline Restoration	150 sf	2206 sf	0 sf	12502 sf
(Total for all sheets)				



	AREA (SF)	VOLUME (CY)
SAND FILL TOTAL	31,680	1,190
SAND FILL BELOW EX. MHW	15,480	670

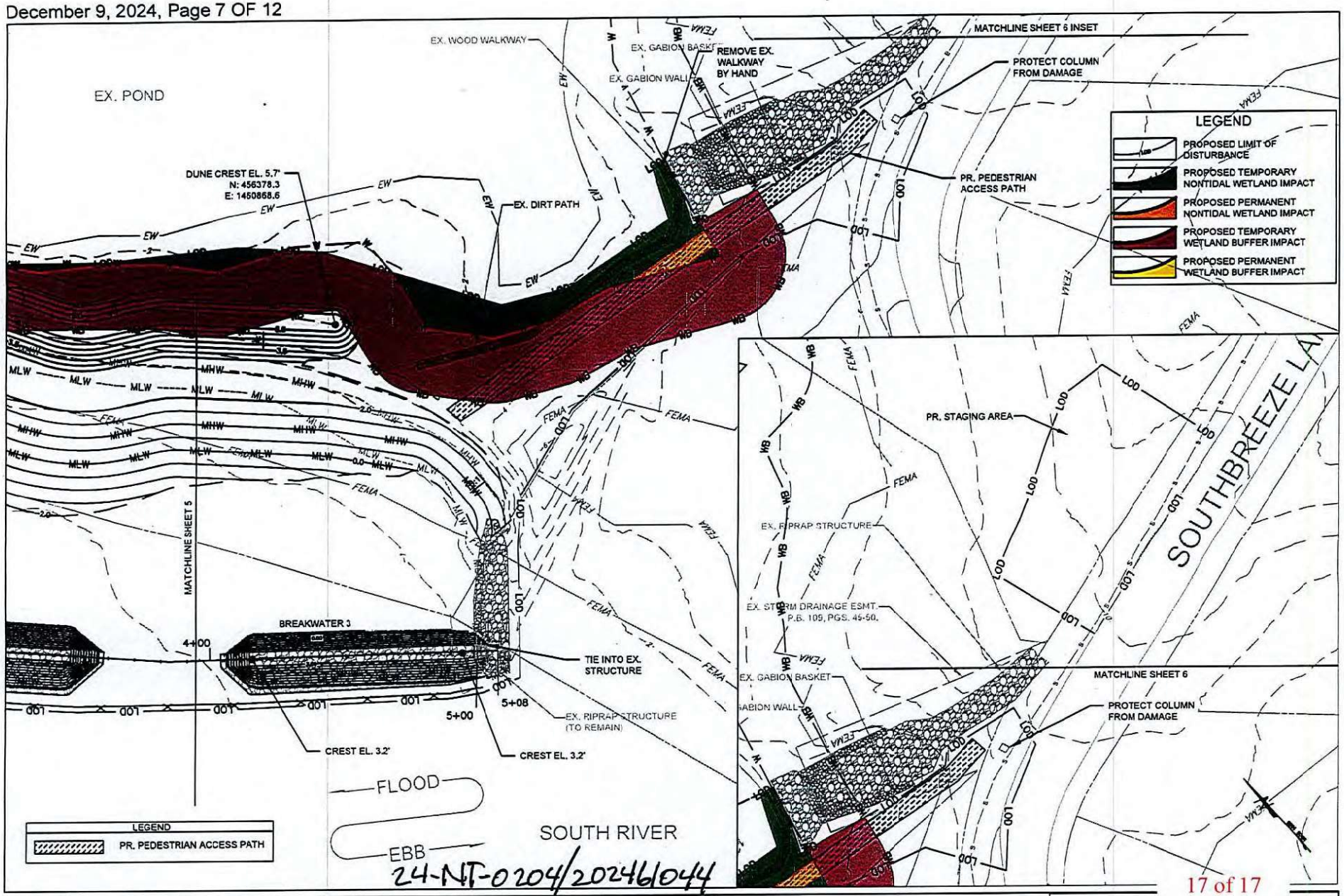
24-NT-0204/202461044

PROPOSED CONDITIONS
PROJECT: Southbreeze Community Living Shoreline Stabilization

PROPOSED PROJECT FOR:
Fishing Creek Farm HOA
1222 Cherry Tree Lane
Annapolis, MD 21403

0 25 50 100
1" = 50'

24-WL-0711/24-NT-0204/25-WQC-0005
202461044
180378
2/20/25
MT (TW), CK (NTW)



24-NT-0204/202461044

PROPOSED CONDITIONS (cont.)
PROJECT: Southbreeze Community Living Shoreline Stabilization

PROPOSED PROJECT FOR:
Fishing Creek Farm HOA
1222 Cherry Tree Lane
Annapolis, MD 21403

0 25 50 100
1" = 50'

17 of 17
24-WL-0711/24-NT-0204/25-WQC-0005
202461044
180378
2/20/25
MT (TW), CK (NTW)