SPRINGFIELD LANE SUBMERGED GRAVEL WETLAND
SEDIMENT AND STORMWATER MANAGEMENT PLANS
22515 SPRINGFIELD LANE
GEORGETOWN, SUSSEX COUNTY, DELAWARE
PARCEL: 135-20.00-51.01 and 135-20.00-51.02

Standard Sediment and Stormwater Construction Notes

1. The Sussex Conservation District shall be notified in writing 5 days prior to commencing with construction. Failure to do so constitutes a violation of the approved Sediment and Stormwater Management Plan.
2. Review and/or approval of the Sediment and Stormwater Management Plan shall not relieve the contractor from his or her responsibilities for compliance with the requirements of the Delaware Sediment and Stormwater Regulations, nor shall it relieve the contractor from errors or omissions in the approved plan.
3. If the approved plan needs to be modified, additional sediment and stormwater control measures may be required as deemed necessary by DNREC or the Delegated Agency.
4. Following soil disturbance or redisturbance, permanent or temporary stabilization shall be completed for all perimeter sediment controls, soil stockpiles, and all other disturbed or graded areas on the project site within 14 calendar days unless more restrictive Federal requirements
5. All erosion and sediment control practices shall comply with the Delaware Erosion and Sediment Control Handbook, latest edition.
6. At any time a dewatering operation is used, it shall be previously approved by the Agency Construction Site Reviewer for a non-erosive point of discharge, and a dewatering permit should be approved by the DNREC Well Permitting Branch.
7. Approved plans remain valid for 5 years from the date of approval.
8. Post construction verification documents shall be submitted to the Department [or the relevant Delegated Agency] within 60-days of stormwater management facility completion.
9. Approval of a Sediment and Stormwater Management Plan does not grant or imply a right to discharge stormwater runoff. The owner/developer is responsible for acquiring any and all agreements, easements, etc., necessary to comply with State drainage and other applicable laws.
10. The owner shall be familiar with and comply with all aspects of the NPDES Construction General Permit.
11. The contractor shall at all times protect against sediment or debris laden runoff or wind from leaving the site. Perimeter controls shall be checked daily and adjusted or repaired to fully contain and control sediment from leaving the site. Accumulated sediment shall be removed when it has reached half of the effective capacity of the control. In addition, the contractor may need to adjust or alter measures in times of adverse weather conditions, or as directed by the Agency Construction Site Reviewer.
12. Before any earthwork or excavation takes place, the contractor should call Miss Utility at 811 or 1-800-282-8555 at least 48 hours prior to construction, to have all existing utilities marked onsite.
13. Best available technology (BAT) shall be employed to manage turbid discharges in accordance with requirements of 7 Del.C. Ch. 60 and the current Delaware Construction General Permit (CGP).
14. Documentation of soil testing and materials used for temporary or permanent stabilization including but not limited to soil test results, seed tags, soil amendment tags, etc. shall be provided to the Department [or the relevant Delegated Agency]to verify that the permanent or temporary stabilization has been completed in accordance with the approved plan.
15. Sussex Conservation District may require additional soil testing and reapplication of permanent or temporary stabilization in accordance with the specifications in the Delaware Erosion and Sediment Control Handbook, or alternative measures that provide functional equivalency.

General Notes

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE DRAWINGS, LOCAL REGULATIONS, STATE REGULATIONS AND THE STANDARD SPECIFICATIONS.
2. THE EXISTING UTILITIES AND OBSTRUCTIONS SHOWN ARE FROM THE BEST AVAILABLE RECORDS AND SHALL BE VERIFIED BY THE CONTRACTOR TO THEIR SATISFACTION PRIOR TO CONSTRUCTION. NECESSARY PRECAUTIONS SHALL BE TAKEN BY THE CONTRACTOR TO PROTECT EXISTING SERVICES AND MAINS. ANY DAMAGE TO THEM SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
3. IT SHALL BE DISTINCTLY UNDERSTOOD THAT FAILURE TO MENTION SPECIFICALLY ANY WORK WHICH WOULD NATURALLY BE REQUIRED TO COMPLETE THE PROJECT SHALL NOT RELIEVE THE CONTRACTOR OF THEIR RESPONSIBILITY TO COMPLETE SUCH WORK.
4. THE CONTRACTOR SHALL CALL "MISS UTILITY" (1-800-257-7777) A MINIMUM OF 48 HOURS IN ADVANCE OF ANY EXCAVATION, BORING, PILE DRIVING, AND/OR DIGGING FOR THE LOCATION OF UTILITY LINES.
5. LIDAR DATA USED FOR OUTSIDE OF THE SURVEY (SITE AREA) FOR DRAINAGE AREA IS FOR REFERENCE ONLY.
6. ALL PIPE LENGTH AND SLOPES SHOWN ARE CENTER - TO - CENTER.
7. THIS PROJECT IS A STORMWATER RETROFIT THAT TREATS A PREVIOUSLY DEVELOPED AREA AND IMPROVES THE WATER QUALITY THROUGH CONSTRUCTION OF ONE (1) SUBMERGED GRAVEL WETLAND.
10. IT IS THE CONTRACTORS RESPONSIBILITY TO MAINTAIN AND REPAIR ALL EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT PRACTICES DURING CONSTRUCTION AND UTILITY INSTALLATION.
11. THE CONTRACTOR SHOULD AT ALL TIMES PROTECT AGAINST SEDIMENT OR DEBRIS LADEN RUNOFF OR WIND FROM LEAVING THE SITE. PERIMETER CONTROLS SHOULD BE CHECKED DAILY AND ADJUSTED AND/OR REPAIRED TO FULLY CONTAIN AND CONTROL SEDIMENTATION ON THE SITE. ACCUMULATED SEDIMENT SHOULD BE REMOVED WHEN IT HAS REACHED HALF OF THE EFFECTIVE CAPACITY OF THE CONTROL. IN ADDITION, THE CONTRACTOR MAY NEED TO ADJUST OR REPAIR MEASURES IN TIMES OF ADVERSE WEATHER CONDITIONS, OR AS DIRECTED BY THE AGENCY CONSTRUCTION SITE REVIEWER.
12. ANY SEDIMENT CONTROL MEASURES DISTURBED BY CONSTRUCTION MUST BE REPAIRED THE SAME DAY.
13. EQUIPMENT MUST BE STORED OUTSIDE OF THE DRIP LINE OF ANY TREE.
14. DELAWARE REGULATIONS PROHIBIT THE BURIAL OF CONSTRUCTION DEBRIS. INCLUDING TREES AND STUMPS DURING CONSTRUCTION. ANY SOLID WASTE FOUND DURING THE EXCAVATION OF STRUCTURES AND UTILITY LINES ON AND OFF SITE MUST BE REMOVED AND PROPERLY DISCARDED.
15. THE CONTRACTOR IS NOT TO EXCEED THE LIMIT OF DISTURBANCE (LOD) AS SHOWN IN THIS
16. PLAN WITHOUT THE WRITTEN PERMISSION OF THE OWNER AND THE AGENCY CONSTRUCTION SITE REVIEWER.

PLEASE SCAN THE QR CODE BELOW TO ACCESS SUSSEX CONSERVATION DISTRICTS 'HOW TO GUIDE' AND A LINK TO THE "CONTRACTOR'S PORTAL"

VICINITY MAP
SCALE 1"=200'

PROJECT SCOPE

THE PROJECT IS A VOLUNTARY SUBMERGED GRAVEL WETLAND STORMWATER PRACTICE IN THE EXISTING DECOMMISSIONED AGRICULTURAL FIELD. THE AREA IS SURROUNDED BY NON-TAX DITCHES THAT RECEIVE RUNOFF FROM PORTIONS OF PARK AVENUE AND THE NEIGHBORING RESIDENTIAL AREAS THAT ULTIMATELY DRAINS UNDER THE ADJACENT TRAIN TRACKS TO ELI WALLS TAX DITCH. THE DITCH TO THE NORTH OF THE PRACTICE WILL BE MODIFIED BY ADDING IN AN INLET TRENCH FROM THE DITCH TO THE STORMWATER PRACTICE TO ALLOW ADDITIONAL RUNOFF TO ENTER THE PRACTICE.

THIS PROJECT IS INTENDED SOLELY AS A WATER QUALITY PRACTICE. NO NEW IMPERVIOUS SURFACES WILL BE CREATED, NO NEW DEVELOPMENT WILL OCCUR AND NO CREDIT TOWARDS FUTURE DEVELOPMENT AND/OR IMPROVEMENTS IS PERMITTED.

OWNER'S CERTIFICATION

I, THE UNDERSIGNED, CERTIFY THAT ALL LAND CLEARING, CONSTRUCTION AND DEVELOPMENT SHOULD BE DONE PURSUANT TO THE APPROVED PLAN AND THAT RESPONSIBLE PERSONNEL (I.E., BLUE CARD HOLDER) INVOLVED IN THE LAND DISTURBANCE WILL HAVE A CERTIFICATION OF TRAINING PRIOR TO INITIATION OF THE PROJECT, AT A DNREC SPONSORED OR APPROVED TRAINING COURSE FOR THE CONTROL OF EROSION AND SEDIMENT DURING CONSTRUCTION. IN ADDITION, I GRANT THE DNREC SEDIMENT AND STORMWATER PROGRAM AND/OR THE RELEVANT DELEGATED AGENCY THE RIGHT TO CONDUCT ONSITE REVIEWS, AND I UNDERSTAND MY RESPONSIBILITIES UNDER THE NPDES CONSTRUCTION GENERAL PERMIT, AS REFERENCED ON THIS COVERSHEET.

Valerie Thompson — Sediment & Stormwater Designer
NAME — TITLE
SIGNATURE — 4/18/2024
DATE

Sheet Number	Sheet Title
1	COVERSHEET
2	PRE-CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN
3	CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN
4	CONSTUCTION SITE DETAILS-1
5	CONSTUCTION SITE DETAILS-2
6	CONSTUCTION SITE DETAILS-3
7	CONSTUCTION SITE DETAILS AND NOTES
8	POST CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN
9	POST CONSTUCTION SITE DETAILS
10	PLANTING PLAN

PARCEL DATA	
TAX MAP ID:	135-20.00-51.01 135-20.00-51.02
SITE ADDRESS:	22515 SPRINGFIELD LANE GEORGETOWN, DE 19947
EXISTING SITE AREA:	17.14 AC
PROPOSED SITE AREA (LIMIT OF DISTURBANCE):	0.65 AC
EXISTING WETLAND AREA:	1.54 AC
PROPOSED DISCHARGE LOCATIONS:	1
PROPOSED TOTAL LIMIT OF DISTURBANCE:	0.65 AC
WATERSHED:	INDIAN RIVER
HUNDRED:	GEORGETOWN HUNDRED
HUC 6:	020403
HUC 8:	02040303
HUC 10:	0204030302
HUC 12:	020403030202
COUNTY:	SUSSEX
BENCHMARK:	NORTH CORNER OF CATCH BASIN LAT: N38.680587 LONG: W75.372521 ELEV: 46.57

Contact Information

Owner
Sussex County
Attn: Valerie Thompson
valerie.thompson@sussexcountyde.gov
(302) 855-7718
Developer
Delaware Center for the Inland Bays
Attn: Meghan Noe Fellows
mnoefellows@inlandbays.org
(302) 226-8105
Designer
Center for Watershed Protection
Attn: Carol Wong, PE
ckw@cwp.org
(410) 696-3969

LEGEND

EXISTING MAJOR CONTOUR — 595
EXISTING MINOR CONTOUR — 595
PROPERTY LINE
EXISTING TREE LINE
SURVEY LIMIT
LIMITS OF DISTURBANCE — LOD — LOD
SOIL LINES — MvB
GEOTEXTILE DEWATERING BAG — GB
PUMPING PIT — PP-1
CONSTRUCTION ENTRANCE — SCE
STOCKPILE — SP — SP
SILT FENCE — SF — SF
PUMP LINE/HOSE
SUBMERGED GRAVEL WETLAND SURFACE
PROPOSED TREE LINE
RAILROAD TRACKS
PROPOSED MAJOR CONTOUR — 595
PROPOSED MINOR CONTOUR — 594
PROPOSED UNDERDRAIN
CLEANOUT/OBSERVATION WELL
STAND PIPE
PROPOSED STORM DRAIN
PERMANENT SEEDING
ORDINARY HIGH WATERLINE
WATERS OF U.S. STREAM CHANNEL

WETLAND CERTIFICATION

I, Edward M. Launay, SPWS, STATE THAT THE BOUNDARY OF WATERS OF THE UNITED STATES INCLUDING WETLANDS SUBJECT TO THE CORPS OF ENGINEERS REGULATORY PROGRAM AS SHOWN ON THIS PLAN WAS DETERMINED USING MY PROFESSIONAL JUDGMENT. THAT DETERMINATION IS BASED UPON THE METHODOLOGY OUTLINED IN THE 1987 CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL AND ALL CURRENTLY APPLICABLE SUPPLEMENTAL GUIDANCE INCLUDING THE ATLANTIC AND GULF COAST REGIONAL MANUAL (VERSION 2.0) INCLUDING THE 2023 WATERS OF THE U.S. RULE AS AMMENDED AUGUST 29, 2023, IN ACCORDANCE WITH (SACKETT v. EPA & RAPANOS v. U.S.) WHICH DEFINE THE JURISDICTION OF THE CLEAN WATER ACT OF 1972.

IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL WETLAND MAPS, THERE ARE NO STATE (DNREC) REGULATED WETLANDS ON THIS SITE.

EDWARD M. LAUNAY, SENIOR PWS No. 875
SOCIETY OF WETLAND SCIENTISTS
CORPS OF ENGINEERS, CERTIFIED WETLAND DELINEATOR WDCP93MD0510036B
4/18/2024
DATE

Designed and Drawing based on Delaware Coordinate System: NAD83 Delaware State Plane Zone, US Foot

NOTES:

Contours outside of the survey are derived from LiDAR data sourced from 2014 Delaware Geological Survey Data.

OWNER:
SUSSEX COUNTY
ATTN: VALERIE THOMPSON
VALERIE.THOMPSON@SUSSEXCOUNTYDE.GOV

Sussex County Engineering Department
2 The Circle, P.O. Box 589
Georgetown, DE 19947
Ph: 302-855-7718
Fax: 302-855-7799

PROJECT LOCATION:
SPRINGFIELD LANE
SUSSEX COUNTY, DE
LAT N38.679082 LONG W75.371012

DESIGNER:
CENTER FOR WATERSHED PROTECTION, INC.
CAROL WONG, PE
CKW@CWP.ORG

CENTER FOR WATERSHED PROTECTION
11711 EAST MARKET PLACE, STE 200
FULTON, MD 20759
WWW.CWP.ORG
TEL 410-461-8323

DEVELOPER:
DELAWARE CENTER FOR INLAND BAYS
ATTN: MEGHAN NOE FELLOWS
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39375 INLET ROAD
REHOBOTH BEACH, DE 19971
302-226-8105

DELAWARE CENTER FOR THE INLAND BAYS
Research. Educate. Restore.

CAROL WONG — LICENSED — No. 22950 — DELAWARE PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED UNDER MY SUPERVISION AND TO THE BEST OF MY KNOWLEDGE COMPLIES WITH THE APPLICABLE STATE AND LOCAL REGULATIONS AND ORDINANCES.

CAROL WONG, PE
4/17/2024

DATE	NO.	REVISION DESC.
-	4	-
4/17/24	3	SCD COMMENTS
3/26/24	2	SCD COMMENTS
3/1/24	1	WETLAND AND STREAM PER EL

SPRINGFIELD LANE SUBMERGED GRAVEL WETLAND
SEDIMENT AND STORMWATER MANAGEMENT PLANS

SHEET TITLE
COVERSHEET

DESIGNED BY	EST
CHECKED BY	CKW
DRAWN BY	EST
SCALE	1"=200'
PROJ. NO.	W-23-034
DATE	2/27/2024
SHEET	1 OF 10

PROJECT INFORMATION:
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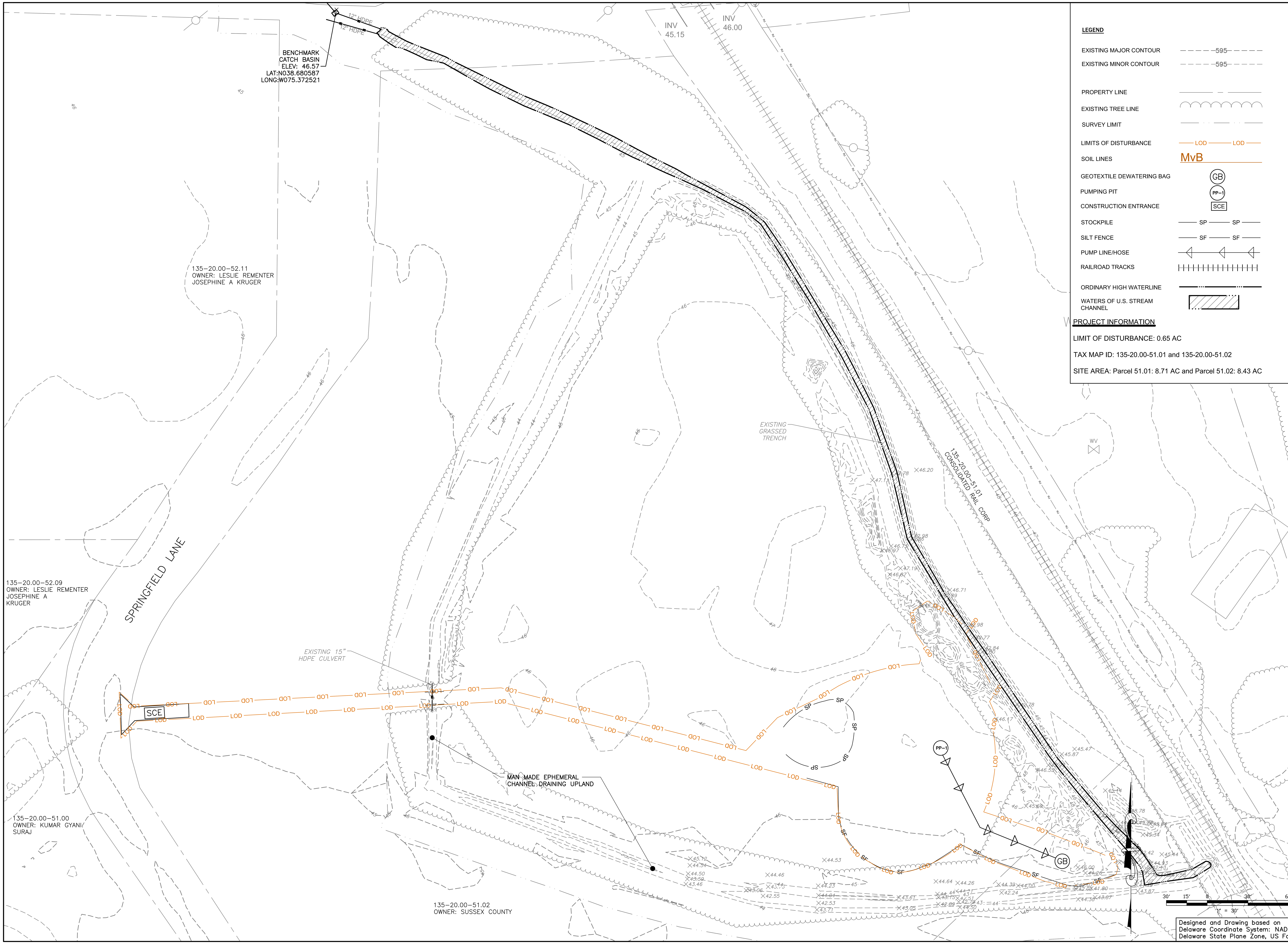
LAST SAVED DATE AND TIME: 17 Apr 2024, 12:34PM



LEGEND

EXISTING MAJOR CONTOUR	595
EXISTING MINOR CONTOUR	595
PROPERTY LINE	
EXISTING TREE LINE	
SURVEY LIMIT	
LIMITS OF DISTURBANCE	LOD LOD
SOIL LINES	MvB
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STOCKPILE	SP SP
SILT FENCE	SF SF
PUMP LINE/HOSE	
RAILROAD TRACKS	
ORDINARY HIGH WATERLINE	
WATERS OF U.S. STREAM CHANNEL	

PROJECT INFORMATION

LIMIT OF DISTURBANCE: 0.65 AC

TAX MAP ID: 135-20.00-51.01 and 135-20.00-51.02

SITE AREA: Parcel 51.01: 8.71 AC and Parcel 51.02: 8.43 AC

NOTES:

OWNER:
SUSSEX COUNTY
ATTN: VALERIE THOMPSON
VALERIE.THOMPSON@SUSSEXCOUNTYDE.GOV

Sussex County
Engineering Department
2 The Circle, P.O. Box 589
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Fax: 302-855-7799

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CAROL WONG LICENSED No. 22950 DELAWARE PROFESSIONAL ENGINEER

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CAROL WONG, PE
4/17/2024

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–	4	–
4/17/24	3	SCD COMMENTS
3/26/24	2	SCD COMMENTS
3/1/24	1	WETLAND AND STREAM PER EL

SPRINGFIELD LANE SUBMERGED GRAVEL WETLAND
SEDIMENT AND STORMWATER MANAGEMENT PLANS

SHEET TITLE

PRE-CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN

DESIGNED BY: EST	DATE: 2/27/2024
CHECKED BY: CKW	SHEET
DRAWN BY: EST	2
SCALE: 1"=30'	
PROJ. NO.: W-23-034	OF 10

PROJECT INFORMATION:
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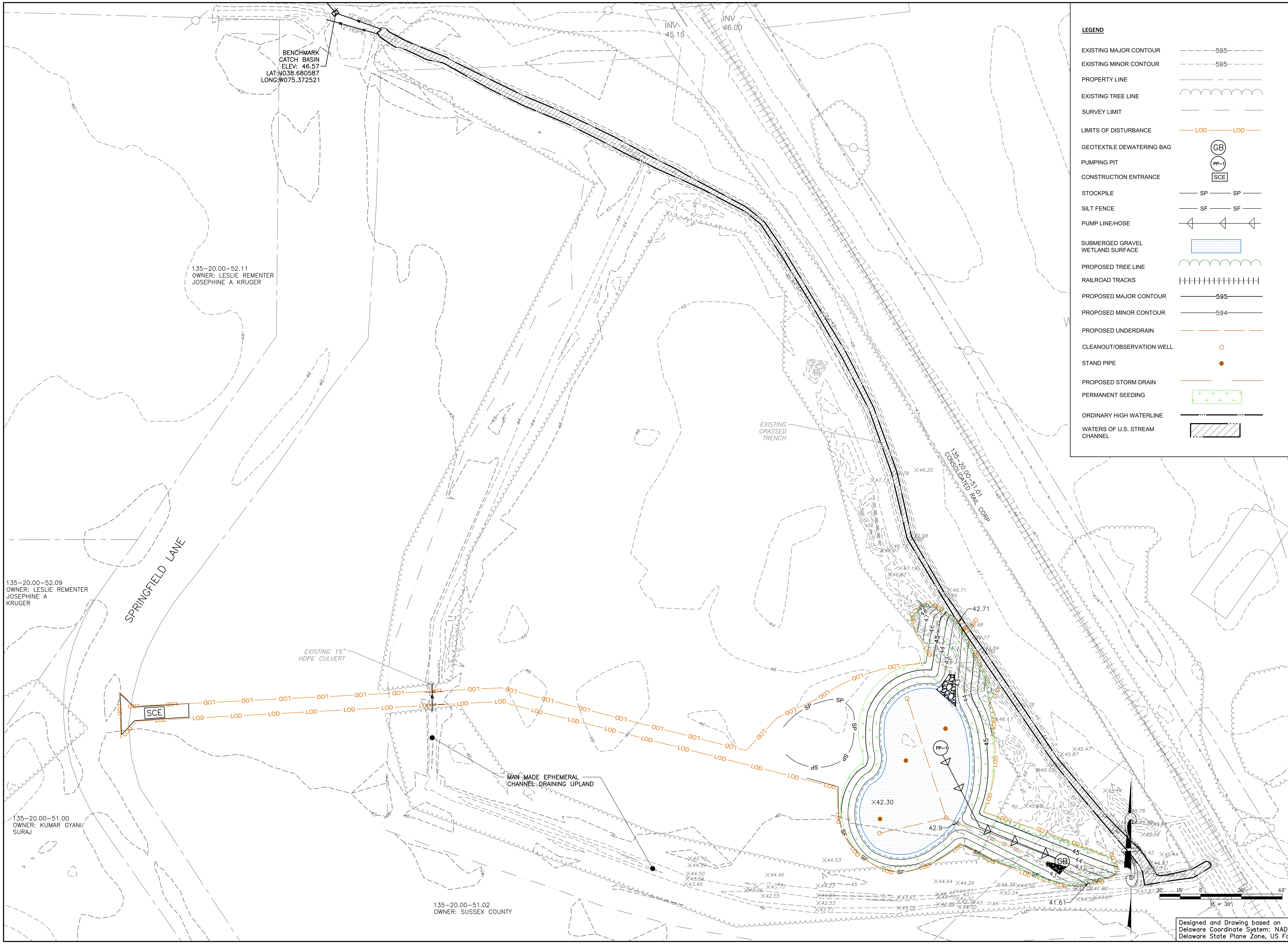

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CAROL WONG, PE
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SPRINGFIELD LANE SUBMERGED
GRAVEL WETLAND
SEDIMENT AND STORMWATER MANAGEMENT
PLANS

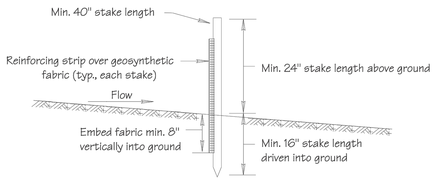
SHEET TITLE
CONSTRUCTION SITE
STORMWATER MANAGEMENT
PLAN

DESIGNED BY EST	DATE 2/27/2024
CHECKED BY CKW	SHEET 3 OF 10
DRAWN BY EST	
SCALE 1"=30'	
PROJ. NO. W-23-034	

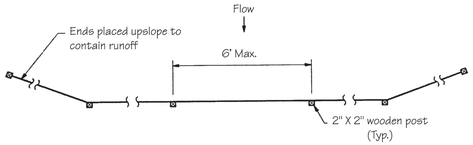
PROJECT INFORMATION:
FILE NAME: Design_App Part2.dwg
LAST SAVED DATE AND TIME: 17 Apr 2024, 12:34PM

Standard Detail & Specifications

Silt Fence



Section



DATA
Max. controlled slope

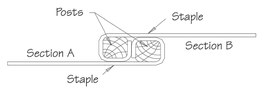
Plan

Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	SF	**DE-ESC-3.1.2.1** Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Silt Fence

Construction Detail



Method for joining continuous sections

Top

Construction Notes:

1. Geosynthetic fabric to be fastened securely to fence posts with wire ties or staples.
2. When two sections of filter cloth adjoin each other they shall be overlapped by six inches and folded.
3. Maintenance shall be performed as needed and material removed when "bulges" develop in the silt fence.

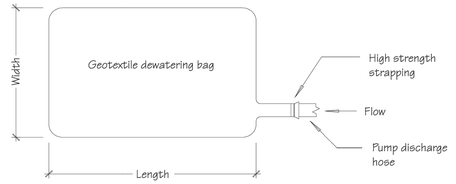
Materials:

1. Stakes: Steel (either T or U) or 2" x 2" hardwood
2. Geosynthetic Fabric: Type GD-I
3. Reinforcing strip: Wooden lath or plastic strip

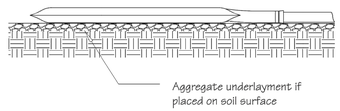
Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	SF	**DE-ESC-3.1.2.1** Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications

Geotextile Dewatering Bag



Plan



Profile

NOTE: Pre-manufactured products installed in accordance with manufacturer's recommendations may be used as an equivalent substitute with Departmental approval.

Source:	Symbol:	Detail No.
Adapted from ACF Products, Inc.	GB	**DE-ESC-3.2.1.2** Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Geotextile Dewatering Bag

Construction Notes:

1. The dewatering bag should be placed so the incoming water flows into and through the bag, and then flow off the site without creating more erosion. The neck should be tied off tightly to stop the water from flowing out of the bag without going through the walls. The dewatering bag should be placed on a gravel bed to allow water to flow in all directions.
2. The dewatering bag is considered full and should be disposed when it is impractical for the bag to filter the sediment out at a reasonable flow rate. At this point, it should be replaced with a new bag.
3. Disposal may be accomplished as directed by the construction reviewer. If the site allows, the bag may be buried on site and seeded, visible fabric removed and seeded or removed from site to a proper disposal area.

Materials:

1. The geotextile fabric shall be a Type GD-IV.
2. The dewatering bag shall be sewn with a double needle machine using high strength thread. All structural seams will be sewn with high strength, double stitched "J" type. Seam strength test will have the following minimum average roll values:

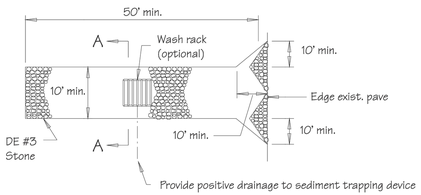
Type	TEST METHOD	TEST RESULT
Heavy duty	ASTM D-4884	100 lb / in

3. The dewatering bag shall have an opening large enough to accommodate a four (4) inch discharge hose with attached strap to tie off the hose to prevent the pumped water from escaping from the bag without being filtered.

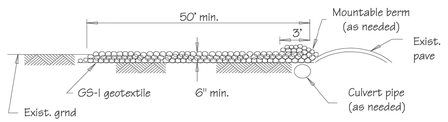
Source:	Symbol:	Detail No.
Adapted from ACF Products, Inc.	GB	**DE-ESC-3.2.1.2** Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications

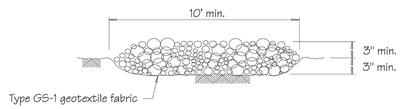
Stabilized Construction Entrance



Plan



Profile

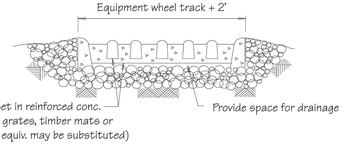


Section A-A (Std.)

Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	SCE	**DE-ESC-3.4.7** Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Stabilized Construction Entrance



Section A-A (Opt.)

Construction Notes:

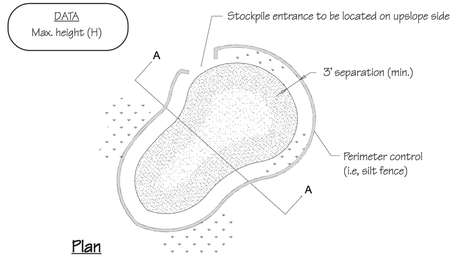
1. Stone size - Use DE #3 stone.
2. Length - As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum length would apply).
3. Thickness - Not less than size (6) inches.
4. Width - Ten (10) foot minimum, but not less than the full width at points where ingress or egress occurs.
5. Geotextile - Type GS-I; placed over the entire area prior to placing of stone.
6. Surface Water - All surface water flowing or diverted toward construction entrances shall be piped across the entrance. If piping is impractical, a mountable berm with 5:1 slopes will be permitted.
7. Maintenance - The entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment. All sediment spilled, dropped, washed or tracked onto public rights-of-way must be removed immediately.
8. Washing - Vehicle wheels shall be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with stone and which drains into an approved sediment trapping device.
9. Inspection - Periodic inspection and needed maintenance shall be provided after each rain.

Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	SCE	**DE-ESC-3.4.7** Sheet 2 of 2 Effective July 2023

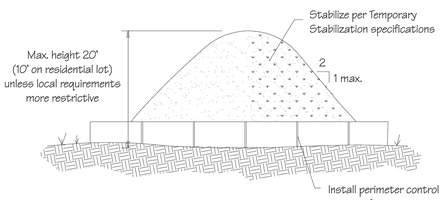
Standard Detail & Specifications

Soil Stockpile

DATA
Max. height (H)



Plan



Section A-A

Source:	Symbol:	Detail No.
Adapted from Colorado Urban Storm Drainage Criteria Manual, Vol 3	SP	**DE-ESC-3.7.3** Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Soil Stockpile

Construction Notes:

1. Locate stockpiles so that they are 50 feet from any storm drain inlet, open channel, wetland or waterbody. Redirect any concentrated flow around the stockpile using an approved erosion and sediment control measure.
2. Secure the perimeter of the stockpile with an approved erosion and sediment control perimeter device.
3. If stockpile is to remain inactive for more than 14 calendar days, the stockpile must be vegetated. Follow the temporary vegetation specifications. The vegetation chosen shall last the duration of the stockpile; the stockpile shall be restabilized if the temporary vegetation dies or erosion results.

Source:	Symbol:	Detail No.
Adapted from Colorado Urban Storm Drainage Criteria Manual, Vol 3	SP	**DE-ESC-3.7.3** Sheet 2 of 2 Effective July 2023

PROJECT INFORMATION:
FILE NAME: Design_Asp Port2.dwg
LAST SAVED DATE AND TIME: 17 Apr 2024, 12:34PM

NOTES:

OWNER:
SUSSEX COUNTY
ATTN: VALERIE THOMPSON
VALERIE.THOMPSON@SUSSEXCOUNTYDE.GOV

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Engineering Department
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PROJECT LOCATION:
SPRINGFIELD LANE
SUSSEX COUNTY, DE
LAT N38.679082 LONG W75.371012

DESIGNER:
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CAROL WONG, PE
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DEVELOPER:
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DELAWARE CENTER FOR THE INLAND BAYS
Research. Educate. Restore.

CAROL WONG LICENSE No. 22950 DELAWARE PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED UNDER MY SUPERVISION AND TO THE BEST OF MY KNOWLEDGE COMPLIES WITH THE APPLICABLE STATE AND LOCAL REGULATIONS AND ORDINANCES.

CAROL WONG, PE
4/17/2024

DATE	NO.	REVISION DESC.
–	4	
4/17/24	3	SCD COMMENTS
3/26/24	2	SCD COMMENTS
3/1/24	1	WETLAND AND STREAM PER EL

SPRINGFIELD LANE SUBMERGED GRAVEL WETLAND
SEDIMENT AND STORMWATER MANAGEMENT PLANS

SHEET TITLE
CONSTUCTION SITE DETAILS-1

DESIGNED BY: EST	DATE: 2/27/2024
CHECKED BY: CKW	SHEET: 4
DRAWN BY: EST	OF 10
SCALE: AS SHOWN	
PROJ. NO.: W-23-034	

Designed and Drawing based on
Delaware Coordinate System: NAD83
Delaware State Plane Zone, US Foot

NOTES:

Standard Detail & Specifications
Mulching

1. Materials and Amounts

a. *Straw* - Straw shall be unrotted small grain straw applied at the rate of 1-1/2 to 2 tons per acre, or 70 to 90 pounds (two bales) per 1,000 square feet. Mulch materials shall be relatively free of weeds and shall be free of noxious weeds such as; thistles, Johnsongrass, and quackgrass. Spread mulch uniformly by hand or mechanically. For uniform distribution of hand spread mulch, divide area into approximately 1,000 square feet sections and place 70-90 pounds (two bales) of mulch in each section.

b. *Wood chips* - Apply at the rate of approximately 6 tons per acre or 275 pounds per 1,000 square feet when available and when feasible. These are particularly well suited for utility and road rights-of-way. If wood chips are used, increase the application rate of nitrogen fertilizer by 20 pounds of N per acre (200 pounds of 10-10-10 or 66 pounds of 30-0-0 per acre).

c. *Hydraulically applied mulch* -The following conditions apply to hydraulically applied mulch:

i. Definitions:

a. Wood fiber mulch shall consist of specially prepared wood that has been processed to a uniform state, is packaged for sale as a hydraulic mulch for use with hydraulic seeding equipment, and consists of a minimum of 70% virgin or recycled wood fiber combined with 30% paper fiber and additives.

b. Blended fiber mulch shall consist of any hydraulic mulch that contains greater than 30% paper fiber. The paper component must consist of specially prepared paper that has been processed to a uniform fibrous state and is packaged for sale as a hydraulic mulch for use with hydraulic seeding equipment.

c. A bonded fiber matrix (BFM) consists of long strand, specially prepared wood fibers that have been processed to a uniform state held together by a water resistant bonding agent. BFMs shall contain no paper (cellulose) mulch but may contain small percentages of synthetic fibers to enhance performance.

d. Refer to **Figure 3.4.5a** for conditions and limitations of use for each of the above categories of hydraulic mulch.

ii. All components of the hydraulically applied mulches shall be pre-packaged by the manufacturer to assure material performance. Field mixing of the mulch components is acceptable, but must be done per manufacturers recommendations to ensure the proper results.

iii. Hydraulic mulches shall be applied with a viable seed and at manufacturer's recommended rates. Increased rates may be necessary based on site conditions.

iv. Hydraulically applied mulches and additives shall be mixed according to manufacturers recommendations.

iv. Materials within this category shall only be used when hydraulically applied mulch has been specified for use on the approved Sediment and Stormwater Plan, or supplemental approval from the plan approval agency has been obtained in writing for a specific area.

Source:	Symbol:	Detail No.
Delaware ESC Handbook & Filtrexx™ International		**DE-ESC-3.4.5** Sheet 1 of 3 Effective July 2023

Standard Detail & Specifications
Mulching

v. Application:

a. Apply product to geotechnically stable slopes that have been designed and constructed to divert runoff away from the face of the slope.

b. Do not apply to saturated soils, or if precipitation is anticipated within 24-48 hours.

c. During the spring (March 1 to May 31) and fall (September 1 to November 30) seasons, hydraulic mulches may be applied in a one-step process where all components are mixed together in single-tank loads. It is recommended that the product be applied from opposing directions to achieve optimum soil coverage.

d. During the summer (June 1 to August 31) and winter (December 1 to February 28) seasons, the following two-step process is required:

Step One– Mix and apply seed and soil amendments with a small amount of mulch for visual metering.

Step Two – Mix and apply mulch at manufacturers recommended rates over freshly seeded surfaces. Apply from opposing directions to achieve optimum soil coverage.

e. Minimum curing temperature is 40^{0}F (4^{0}C). The best results and more rapid curing are achieved at temperatures exceeding 60^{0}F (15^{0}C). Curing times may be accelerated in high temperature, low humidity conditions on dry soils.

vi. Recommended application rates are for informational purposes only. Conformance with this standard and specification shall be performance-based and requires **100% soil coverage**. Any areas with bare soil showing shall be top dressed until full coverage is achieved.

d. *Compost blanket (CB)* - Loosely applied with a pneumatic blower so that a 1" compost blanket uniformly covers the **soil with 100% coverage**. This application can be used with seed to promote germination by applying the approved seed mix directly into the loosely blown compost. The compost blanket performs best on slopes less than 2:1 and requires no mulch anchoring.

2. Anchoring mulch - Mulch must be anchored immediately to minimize loss by wind or water. This may be done by one of the following methods, depending upon size of area, erosion hazard, and cost.

a. *Crimping* - A crimper is a tractor drawn implement designed to punch and anchor mulch into the top two (2) inches of soil. This practice affords maximum erosion control but is limited to flatter slopes where equipment can operate safely. On sloping land, crimping should be done on the contour whenever possible.

b. *Tracking* - Tracking is the process of cutting mulch (usually straw) into the soil using a bulldozer or other equipment that runs on cleated tracks. Tracking is used primarily on slopes 3:1 or steeper and should be done up and down the slope with cleat marks running across the slope.

c. *Liquid mulch binders* - Applications of liquid mulch binders should be heavier at edges, in valleys, and at crests of banks and other areas where the mulch will be moved by wind or water. All other areas should have a uniform application of binder. The use of synthetic binders is the preferred method of mulch binding and should be applied at the rates recommended by the manufacturer.

d. *Paper fiber* - The fiber binder shall be applied at a net dry weight of 750 lbs/ac. The wood cellulose fiber shall be mixed with water, and the mixture shall contain a maximum of 50 lbs. of wood cellulose fiber per 100 gallons.

e. *Nettings* - Biodegradable nettings may be used to secure straw mulch. Install and secure according to the manufacturer's recommendations. Photodegradable or synthetic nettings are not acceptable.

Source:	Symbol:	Detail No.
Delaware ESC Handbook & Filtrexx™ International		**DE-ESC-3.4.5** Sheet 2 of 3 Effective July 2023

Standard Detail & Specifications
Mulching

MULCHING MATERIAL SELECTION GUIDE

Percent Slope	Type of Mulch / App. Rate*	Dec. 1 to Feb. 28(29)	March 1 to May 31	June 1 to Aug. 31	Sept. 1 to Nov. 30
Less than 2%	Blended Fiber @ 2000 lbs/ac. minimum	xxxxxxxxxxxxxxxxxx	OK (≤ 1 ac.)	xxxxxxxxxxxxxxxxxx	OK (≤ 1 ac.)
	Wood Fiber @ 2000 lbs/ac. min.	xxxxxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxxxxx	OK
	BFM @ 3000 lbs/ac. min.	OK	OK	OK	OK
	Straw @ 2 Tons/ac. Min.	OK	OK	OK	OK
	Stabilization Matting**	OK	OK	OK	OK
	1" Compost Blanket (CB)	OK	OK	OK	OK
2% to 5.9%	Wood Fiber @ 2000 lbs/ac. min.	xxxxxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxxxxx	OK
	BFM @ 3000-3500 lbs/ac. min	OK	OK	OK	OK
	Straw @ 2 Tons/ac. min.	OK	OK	OK	OK
	Stabilization Matting**	OK	OK	OK	OK
	1" Compost Blanket (CB)	OK	OK	OK	OK
6% to 10.9%	Wood Fiber @ 2000-2500 lbs/ac. min.	xxxxxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxxxxx	OK
	BFM @ 3500-4000 lbs/ac. min.	OK	OK	OK	OK
	Straw @ 2 Tons/ac. min.	OK	OK	OK	OK
	Stabilization Matting**	OK	OK	OK	OK
	1" Compost Blanket (CB)	OK	OK	OK	OK
11% to 24.9%	Wood Fiber @ 2500-3000 lbs/ac. min.	xxxxxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxxxxx	OK
	BFM @ 3500-4000 lbs/ac. min.	OK	OK	OK	OK
	Straw @ 2 Tons/ac. min.	OK	OK	OK	OK
	Stabilization Matting**	OK	OK	OK	OK
	1" Compost Blanket (CB)	OK	OK	OK	OK
25% to 33%	Wood Fiber @ 2500-3000 lbs/ac. min.	xxxxxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxxxxx	OK
	BFM @ 4000 lbs/ac. min.	xxxxxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxxxxx	OK
	Straw @ 2 Tons/ac. min.	OK	OK	OK	OK
	Stabilization Matting**	OK	OK	OK	OK
	1" Compost Blanket (CB)	OK	OK	OK	OK
33% and up	BFM @ 4000-4500 lbs/ac. min.	xxxxxxxxxxxxxxxxxx	OK	xxxxxxxxxxxxxxxxxx	OK
	Straw @ 2 Tons/ac. min.***	OK	OK	OK	OK
	Stabilization Matting**	OK	OK	OK	OK
	1" Compost Blanket (CB)	2:1 Max.	2:1 Max.	2:1 Max.	2:1 Max.

* Note: Manufacturers Recommended Rates for informational purposes only. Performance standard requires 100% soil coverage.
** Note: Stabilization Matting must be applied in accordance with Section 3.4.6 of the Delaware ESC Handbook.
***Note: Straw applied on slopes greater than 33% must be netted (this does not apply to topsoil stockpiles).
OK = Acceptable to use during this time period.
xxx = Not acceptable to use during this time period.
All application rates are minimums

Source:	Symbol:	Detail No.
Delaware ESC Handbook & Filtrexx™ International		**DE-ESC-3.4.5** Sheet 3 of 3 Effective July 2023

Standard Detail & Specifications
Vegetative Stabilization

TEMPORARY SEEDING BY RATES, DEPTHS AND DATES

Mix #	Species[5]	Seeding Rate		Optimum Seeding Dates[1] O = Optimum Planting Period; A = Acceptable Planting Period							Planting Depth[3]
				Coastal Plain			Piedmont			All	
	Certified Seed	lb/Ac[4]	lb/1000 sq.ft.	2/1-4/30	[2] 5/1-8/14	8/15-10/31	3/1-4/30	[2] 5/1-7/31	8/1-10/31	10/31-2/1	
1	Barley	125	4	O	A	O	O	A	O		1-2 inches 2-3" sandy soils
2	Oats	125	4	O	A	A	O	A	A		1-2 inches 2-3" sandy soils
3	Rye	125	4	O	A	O	O	A	O	A	1-2 inches 2-3" sandy soils
4	Perennial Ryegrass	125	4	O	A	O	O	A	O		0.5 inches 1-2" sandy soils
5	Annual Ryegrass	125	4	O	A	O	O	A	O	A	0.5 inches 1-2" sandy soils
6	Winter Wheat	125	4	O	A	O	O	A	O	A	1-2 inches 2-3" sandy soils
7	Foxtail Millet	30 PLS	0.7		O			O			0.5 inches 1-2" sandy soils
8	Pearl Millet	20 PLS	0.5		O			O			0.5 inches 1-2" sandy soils

1. Winter seeding requires 3 tons per acre of straw mulch for proper stabilization.
2. May be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
3. Applicable on slopes 3:1 or less.
4. Use varieties currently recommended for Delaware. Contact a County Extension Office for information.
5. Warm season grasses such as Millet may be used between 5/1 and 9/1 if desired. Seed at 3-5 lbs. per acre. Good on low fertility and acid areas. Seed after frost through summer at a depth of 0.5".

NOTE: Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 1 of 4 Effective July 2023

Standard Detail & Specifications
Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES

Mix No.	Seeding Mixtures: Certified Seed[3]	Seeding Rate[1] lb/Ac	lb/1000 sq.ft.	Coastal Plain 2/1-4/30	5/1-8/14	8/15-10/31	Piedmont 3/1-4/30	5/1-7/31	8/1-10/31	All[4] 10/31-2/1	Remarks
	Well Drained Soils										
1	Tall Fescue Canada Wild Rye	140 10	3.2 0.23	A	O	A	A	O	A	Add 100 lbs./ac Winter Rye	Good erosion control mix Tolerant of low fertility soils Good for droughty sites
2	Deertongue Sheep Fescue White Clover	30 30 10	0.69 0.69 0.35	A	O	A	A	O	A	Add 100 lbs./ac Winter Rye	Good erosion control mix Tolerant of low fertility soils Legume that fixes atmospheric N into soil
3	Tall Fescue (Turf-type) **or** Strong Creeping Red Fescue **or** Perennial Ryegrass **plus** Flatpea[5]	50 50 50 15	1.15 1.15 1.15 0.34	O	A[4]	O	O	A[4]	O	Add 100 lbs./ac. Winter Rye	Good erosion control mix Tall Fescue for droughty conditions. Creeping Red Fescue for heavy shade. Flatpea to suppress woody vegetation.
4	Strong Creeping Red Fescue Kentucky Bluegrass Perennial Ryegrass **or** Redtop **plus** White Clover[5]	100 70 15 5 3	2.3 1.61 0.35 0.11 0.07	O	A[4]	O	O	A[4]	O	Add 100 lbs./ac. Winter Rye	Suitable waterway mix. Canada Bluegrass more drought tolerant. Use Redtop for increased drought tolerance.
5	Switchgrass[6,7] **or** Coastal Panicgrass Big Bluestem Little Bluestem Indian Grass	10 10 5 5 5	0.23 0.23 0.11 0.11 0.1		O			O			Native warm-season mixture. Tolerant of low fertility soils. Drought tolerant. Poor shade tolerance. N fertilizer discouraged - weeds
6	Tall Fescue (turf-type) (Blend of 3 cultivars)	150	3.5	O	A[4]	O	O	A[4]	O		Managed filter strip for nutrient uptake.
7	Tall Fescue Ky. Bluegrass (Blend) Perennial Ryegrass	150 20 20	3.5 0.46 0.46	O	A[4]	O	O	A[4]	O		Three cultivars of Kentucky Bluegrass. Traffic tolerant.
8	Big Bluestem[7] Indian Grass[7] Little Bluestem[7] Creeping Red Fescue **plus one of:** Partridge Pea Bush Clover Wild Indigo Showy Tick-Trefoil	10 10 8 30 5 3 3 2	0.23 0.23 0.18 0.69 0.11 0.07 0.07 0.05	O	A[4]		O	A[4]			All species are native. Indian Grass and Bluestem have fluffy seeds. Plant with a specialized native seed drill. Creeping Red Fescue will provide erosion protection while the warm season grasses get established.

NOTE: Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 2 of 4 Effective July 2023

Standard Detail & Specifications
Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES (cont.)

Mix No.	Seeding Mixtures: Certified Seed[3]	Seeding Rate[1] lb/Ac	lb/1000 sq.ft.	Coastal Plain 2/1-4/30	5/1-8/14	8/15-10/31	Piedmont 3/1-4/30	5/1-7/31	8/1-10/31	All[4] 10/31-2/1	Remarks
	Poorly Drained Soils										
9	Redtop Creeping Bentgrass Sheep Fescue Rough Bluegrass	75 35 30 45	1.72 0.8 0.69 1	O	A[4]	O	O	A[4]	O	Add 100 lbs./ac. Winter Rye	Quick stabilization of disturbed sites and waterways
10	Switchgrass[6]	10	0.23	A		O	A		O		Good erosion control, wildlife cover and wetland revegetation.
	Residential Lawns										
11	Tall Fescue Perennial Ryegrass Kentucky Bluegrass Blend	100 25 30	2.3 0.57 0.69	O	A[4]	O	O	A[4]	O		High value, high maintenance, light traffic, irrigation necessary. Well drained soils, full sun.
12	Tall Fescue Perennial Ryegrass Sheep Fescue	100 25 25	2.3 0.57 0.57	O	A[4]	O	O	A[4]	O		Moderate value, low maintenance, traffic tolerant
13	Creeping Red Fescue Chewings Fescue Rough Bluegrass Kentucky Bluegrass	50 50 20 20	1.15 1.15 0.4 0.4	O	A[4]	O	O	A[4]	O		Shade tolerant, moderate traffic tolerance, moderate maintenance.
14	Creeping Red Fescue Rough Bluegrass **or** Chewings Fescue	50 90	1.15 2.1	O	A[4]	O	O	A[4]	O		Shade tolerant, moisture tolerant.
15	K-31 Tall Fescue	150	3.5	O	A[4]	O	O	A[4]	O		Monoculture, but performs well alone in lawns. Discouraged.

1. When hydroseeding is the chosen method of application, the total rate of seed should be increased by 25%.
2. Winter seeding requires 3 tons per acre of straw mulch. Planting dates listed above are average for Delaware. These dates may require adjustment to reflect local conditions.
3. All seed shall meet the minimum purity and minimum germination percentages recommended by the Delaware Department of Agriculture. The maximum % of weed seeds shall be in accordance with Chapter 15, Title 3 of the Delaware Code.
4. Turf-type species may be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
5. It is recommended that all leguminous seed be inoculated.
6. Warm season grass mix and Switchgrass cannot be mowed more than 4 times per year.
7. Warm season grasses require a soil temperature of at least 50 degrees in order to germinate and will remain dormant until then.

NOTE: Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 3 of 4 Effective July 2023

Standard Detail & Specifications
Vegetative Stabilization

Construction Notes:

1. Site Preparation

a. Prior to seeding, install needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, grassed waterways, and sediment basins.

b. Final grading and shaping is not necessary for temporary seedings.

2. Seedbed Preparation

It is important to prepare a good seedbed to ensure the success of establishing vegetation. The seedbed should be well prepared, loose, uniform, and free of large clods, rocks, and other objectionable material. The soil surface should not be compacted or crusted.

3. Soil Amendments

a. Lime - Apply liming materials based on the recommendations of a **soil test** in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply dolomitic limestone at the rate of 1 to 2 tons per acre. Apply limestone uniformly and incorporate into the top 4 to 6 inches of soil.

b. Fertilizer - Apply fertilizer based on the recommendations of a **soil test** in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply a formulation of 10-10-10 at the rate of 600 pounds per acre. Apply fertilizer uniformly and incorporate into the top 4 to 6 inches of soils.

4. Seeding

a. For **temporary stabilization**, select a mixture from **Sheet 1** . For a **permanent stabilization**, select a mixture from **Sheet 2** or **Sheet 3** depending on the conditions. Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.

b. Apply seed uniformly with a broadcast seeder, drill, cultipacker seeder or hydroseeder. All seed will be applied at the recommended rate and planting depth.

c. Seed that has been broadcast should be covered by raking or dragging and then lightly tamped into place using a roller or cultipacker. If hydroseeding is used and the seed and fertilizer is mixed, they will be mixed on site and the seeding shall be done immediately and without interruption.

5. Mulching

All mulching shall be done in accordance with detail **DE-ESC-3.4.5**.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 4 of 4 Effective July 2023

PROJECT INFORMATION:
FILE NAME: Design_App Part2.dwg
LAST SAVED DATE AND TIME: 17 Apr 2024, 12:34PM

Designed and Drawing based on Delaware Coordinate System: NAD83 Delaware State Plane Zone, US Foot

OWNER:
SUSSEX COUNTY
ATTN: VALERIE THOMPSON
VALERIE.THOMPSON@SUSSEXCOUNTYDE.GOV

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Engineering Department
2 The Circle, P.O. Box 589
Georgetown, DE 19947
Ph: 302-855-7718
Fax: 302-855-7799

PROJECT LOCATION:
SPRINGFIELD LANE
SUSSEX COUNTY, DE
LAT N38.679082 LONG W75.371012

DESIGNER:
CENTER FOR WATERSHED PROTECTION, INC.
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302-226-8105

DELAWARE CENTER FOR THE INLAND BAYS
Research. Educate. Restore.

CAROL WONG LICENSED No. 22950 PROFESSIONAL ENGINEER DELAWARE

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED UNDER MY SUPERVISION AND TO THE BEST OF MY KNOWLEDGE COMPLIES WITH THE APPLICABLE STATE AND LOCAL REGULATIONS AND ORDINANCES.

CAROL WONG, PE
4/17/2024

DATE	NO.	REVISION DESC.
–	4	–
4/17/24	3	SCD COMMENTS
3/26/24	2	SCD COMMENTS
3/1/24	1	WETLAND AND STREAM PER EL

SPRINGFIELD LANE SUBMERGED GRAVEL WETLAND SEDIMENT AND STORMWATER MANAGEMENT PLANS

SHEET TITLE

CONSTUCTION SITE DETAILS-2

DESIGNED BY: EST	DATE: 2/27/2024
CHECKED BY: CKW	SHEET
DRAWN BY: EST	5
SCALE: AS SHOWN	
PROJ. NO.: W-23-034	OF 10

Standard Detail & Specifications

Construction Site Pollution Prevention

Delaware NPDES Discharge Permit

General Permit for Discharge of Stormwater from Construction Activities

((Project Name))

((NOI Permit Number))

((Agency Plan Approval ID))

((Contact Name & Number for Additional Site Information))

((Contact Name & Number to Obtain Copy of Approved Plan))

If you observe indicators of stormwater pollutants
in the discharge or in the receiving waterbody, call the
DNREC Spill Notification 24 HR Hotline at

1-800-662-8802

Example Construction General Permit (CGP) Signage

NOTES:
1. Minimum sign size 2' x 2'
2. Minimum text size 1"
3. Sign must be posted at a safe, publicly accessible location close to construction site
4. Sign must be visible from the public road nearest the active construction site
5. Signs posted within a DelDOT or other public road right-of-way (ROW) must be in accordance with all local and/or State requirements in regards to safety, location, orientation, etc.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.6.1** Sheet 1 of 4 Effective July 2023

Standard Detail & Specifications

Construction Site Pollution Prevention

Notes:

The Construction Site Pollution Prevention Plan includes the following elements:

1. **Material Inventory**

   Document the storage and use of the following materials:
   a. Concrete
   b. Detergents
   c. Paints (enamel and latex)
   d. Cleaning solvents
   e. Pesticides
   f. Wood scraps
   g. Fertilizers
   h. Petroleum based products
2. **Good housekeeping practices**
   a. Store only enough product required to do the job.
   b. Store all materials in a neat, orderly manner in their original labeled containers and covered.
   c. Do not mix different substances.
   d. When possible, use all of a product prior to disposal of the container.
   e. Manufacturers' instructions for disposal should be strictly adhered to.
   f. Designate someone to inspect all BMPs daily.
3. **Waste management practices**
   a. Collect and store all waste materials in securely lidded dumpsters in a location that does not drain to a waterbody.
   b. Salvage and/or recycle waste materials whenever possible.
   c. The dumpsters shall be emptied a minimum of twice per week, or more if necessary. The licensed trash hauler is responsible for cleaning out dumpsters.

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		**DE-ESC-3.6.1** Sheet 2 of 4 Effective July 2023

Standard Detail & Specifications

Construction Site Pollution Prevention

Notes (cont.)

   d. Dispose of all trash in accordance with all applicable Delaware laws.
   e. Littering is strictly prohibited. Trash cans should be placed at all lunch spots and recycle bins should be placed near the construction trailer.
   f. If fertilizer bags can not be stored in a weather-proof location, they should be kept on a pallet and covered with plastic sheeting which is overlapped and anchored.
4. **Equipment maintenance practices**
   a. If possible, equipment should be taken to off-site commercial facilities for washing and maintenance.
   b. If performed on-site, wash vehicles with high-pressure water spray without detergents in an area contained by an impervious berm.
   c. Use drip pans for all equipment maintenance.
   d. Inspect equipment for leaks on a daily basis.
   e. Direct washout from concrete trucks into a temporary pit for hardening and proper disposal.
   f. Equip fuel nozzles with automatic shut-off valves.
   g. Dispose of all used products such as oil, antifreeze, solvents and tires in accordance with manufacturers' recommendations and local, state and federal laws and regulations.
5. **Spill prevention practices**
   a. Identify potential spill areas and contain them in covered areas with no connection to the storm drain system.
   b. Post warning signs in hazardous material storage areas.
   c. Perform preventive maintenance on all tanks, valves, pumps, pipes and other equipment as necessary.
   d. Prioritize low or non-toxic substances for use.

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		**DE-ESC-3.6.1** Sheet 3 of 4 Effective July 2023

Standard Detail & Specifications

Construction Site Pollution Prevention

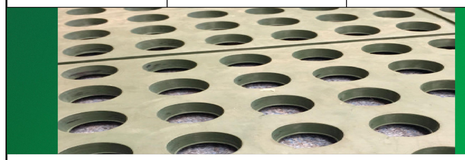
Notes (cont.)

   e. Prominently post contact information for reporting spills through the DNREC 24-Hour Toll Free Number.
6. **Education**
   a. Include Best Management Practices (BMPs) for construction site pollution control as part of regular progress meetings.
   b. Information regarding waste management, equipment maintenance and spill prevention should be prominently posted in the construction trailer.

CONTACT INFORMATION

DNREC 24-Hour Toll Free Number	**800-662-8802**
DNREC Solid & Hazardous Waste Management Section	**302-739-9403**

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		**DE-ESC-3.6.1** Sheet 4 of 4 Effective July 2023



Introduction to the ShoreMax® Transition Mat

The North American Green® RevetMax™ System ShoreMax® Transition Mat is designed for protection of high scour and high velocity applications. The flexible transition mat can be used in varying applications and can replace hard-armor designs with "green" vegetated designs.

To create the maximum vegetated design, we suggest combining two high-performance North American Green Erosion Control Products (ECPs), the ShoreMax Mat and a VMax® Turf Reinforcement Mat (TRM). North American Green offers many different VMax TRMs that can be used with the ShoreMax Mat. The VMax TRM's special structural design anchors and reinforces the roots and stems of vegetation for long-term stability, and helps create a shear plane that deflects the flowing water away from the soil surface. The ShoreMax Mat provides mechanical protection and ballasting to the protected area and increases the immediate permissible shear stress capabilities of the system.

Once installed, the ShoreMax Mat offers protection comparable to hard-armor products such as rock riprap and articulated concrete blocks in turbulent flow and wave attack applications. ShoreMax Mat can take your high flow projects to the maximum in green vegetated design with unvegetated shear performance up to 8.6 lbs/ft².

FEATURES OF SHOREMAX TRANSITION MAT

ShoreMax Mat is the first flexible soft revetment scour protection system that easily installs over difficult soil topography, and does not require heavy equipment or expensive earth anchors to install. It's also non-buoyant, so it won't float or uplift in submerged and heavy flow conditions. ShoreMax Mat is designed with "spikes" that bite into the underlying mat, which prevents horizontal shifting of the mat.

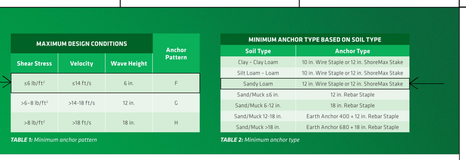
KEY APPLICATIONS

ShoreMax Transition Mat is designed for immediate to permanent protection for high scour applications such as head-to-tail protection of drainage channels, culvert and pipe outfalls, and steep chute and slope drains like those associated with parking lots, roadways, mines and landfills. The flexible transition mat can be used to create soft revetment systems. ShoreMax Mat can be utilized for shorelines, streambanks, and spillway applications where wave attack can reach the super critical stage.

SHOREMAX TRANSITION MAT DESIGN CRITERIA

TRM Underlayment Type and Phase		Maximum Permissible Shear Stress	Maximum Flow Velocity	Maximum Wave Attack Applications		
SC250	**Unvegetated**	7.5 lb/ft²	18 ft/s	6 in. wave height, ≤4:1 slope	12 in. wave height, ≤5:1 slope	N/A
	Vegetated	10 lb/ft²	18 ft/s			
C350	**Unvegetated**	8.0 lb/ft²	19 ft/s	6 in. wave height, ≤3:1 slope	12 in. wave height, ≤4:1 slope	N/A
	Vegetated	12 lb/ft²	20 ft/s			
P550	**Unvegetated**	8.5 lb/ft²	19.5 ft/s	6 in. wave height, ≤2:1 slope	12 in. wave height, ≤3:1 slope	18 in. wave height, ≤5:1 slope
	Vegetated	14 lb/ft²	25 ft/s			

The ShoreMax Transition Mat has been evaluated for its performance in conjunction with a VMax TRM in both channel and wave attack applications, resulting in these guidelines.



Anchoring and Guidelines

Installation of the ShoreMax Mat can be done simply and without the need for expensive equipment. The ShoreMax Mat and TRM underlayment are simply installed over a prepared seeded soil and fastened into place with anchors. Special percussion earth anchors are typically not required.

The ShoreMax Mat's flexibility allows it to be easily installed using a variety of fasteners such as the ShoreMax Stake, wire staples, rebar staples and percussion earth anchors. Because it easily self-conforms to the underlying terrain, fasteners are not required to force conformance with the underlayment material – they only serve to hold the panels in place. The type and size of fastener used is simply dependent upon the underlying soil and degree of compaction.

Anchoring patterns for the ShoreMax Mat vary depending on the project applications with increased anchoring patterns required for higher flow or scour applications. Please refer to the tables and figures on this page to determine the appropriate anchor type and anchor pattern. For site-specific recommendations use the Erosion Control Materials Design Software® (ECMDS) for help in selecting a ShoreMax Mat and fastening details. Visit www.ECMDS.com for more information.

ANCHORING GUIDE

1. When installing the ShoreMax Mat, the anchor pattern (Figures 1 or 2) should be selected based on the expected maximum design conditions (shear stress, velocity or wave impact) (Table 1).
2. Anchor type selection should be based on the soil type and pull-out strength required (Table 2). In soft, highly erodible soils percussion earth anchors may be necessary. Earth anchors can be installed in conjunction with staples (Figure 2).
3. When using percussion earth anchors, position anchors in each corner and the center of the panel. Place staples in the appropriate pattern through remainder of mat. Staples can be shared between two adjacent panels.

***NOTE:** Number of staples used per panel can be reduced by 30-40 percent when sharing staples between panels.*

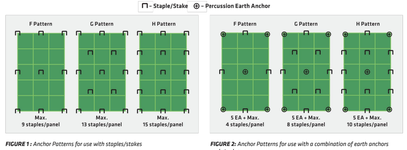
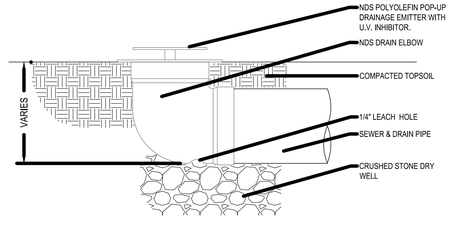


FIGURE 1: Anchor Patterns for use with staples/stakes

FIGURE 2: Anchor Patterns for use with a combination of earth anchors and staples



NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. DO NOT SCALE DRAWING.
3. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY.
4. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.

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NOTES:
TURF REINFORCEMENT MATTING SHALL BE SHOREMAX TRANSITION MAT OR APPROVED EQUAL.

POP UP EMITTER SHALL BE NDS DRAINAGE EMITTER OR APPROVED EQUAL.

OWNER:
SUSSEX COUNTY
ATTN: VALERIE THOMPSON
VALERIE.THOMPSON@SUSSEXCOUNTYDE.GOV

Sussex County
Engineering Department
2 The Circle, P.O. Box 589
Georgetown, DE 19947
Ph: 302-855-7718
Fax: 302-855-7799

PROJECT LOCATION:
SPRINGFIELD LANE
SUSSEX COUNTY, DE
LAT N38.679082 LONG W75.371012

DESIGNER:
CENTER FOR WATERSHED PROTECTION, INC.
CAROL WONG, PE
CKW@CWP.ORG

CENTER FOR
WATERSHED
PROTECTION
11711 EAST MARKET PLACE, STE 200
FULTON, MD 20759
WWW.CWP.ORG
TEL 410-461-8323

DEVELOPER:
DELAWARE CENTER FOR INLAND BAYS
ATTN: MEGHAN NOE FELLOWS
MNOEFELLOWS@INLANDBAYS.ORG
39375 INLET ROAD
REHOBOTH BEACH, DE 19971
302-226-8105

DELAWARE CENTER FOR THE INLAND BAYS
Research. Educate. Restore.

CAROL WONG LICENSED PROFESSIONAL ENGINEER No. 22958 DELAWARE

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED UNDER MY SUPERVISION AND TO THE BEST OF MY KNOWLEDGE COMPLIES WITH THE APPLICABLE STATE AND LOCAL REGULATIONS AND ORDINANCES.

CAROL WONG, PE
4/17/2024

DATE	NO.	REVISION DESC.
–	4	–
4/17/24	3	SCD COMMENTS
3/26/24	2	SCD COMMENTS
3/1/24	1	WETLAND AND STREAM PER EL

SPRINGFIELD LANE SUBMERGED GRAVEL WETLAND SEDIMENT AND STORMWATER MANAGEMENT PLANS

SHEET TITLE
CONSTUCTION SITE DETAILS-3

DESIGNED BY	EST
CHECKED BY	CKW
DRAWN BY	EST
SCALE	AS SHOWN
PROJ. NO.	W-23-034
DATE	2/27/2024
SHEET	6 OF 10

Designed and Drawing based on
Delaware Coordinate System: NAD83
Delaware State Plane Zone, US Foot

Standard Detail & Specifications

Topsoiling

Construction Notes:

1. **Site Preparation** (Where Topsoil is to be added)

   Note: When topsoiling, maintain needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, waterways and sediment basins.

   a. Grading - Grades on the areas to be topsoiled which have been previously established shall be maintained.

   b. Liming - Where the topsoil is either highly acid or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet). Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.

   c. Tilling - After the areas to be topsoiled have been brought to grade, and immediately prior to dumping and spreading the topsoil, the subgrade shall be loosened by discing or by scarifying to a depth of a least 3 inches to permit bonding of the topsoil to the subsoil. Pack by passing a bulldozer up and down over the entire surface area of the slope to create horizontal erosion check slots to prevent topsoil from sliding down the slope.

2. **Topsoil Material and Application**

   Note:Topsoil salvaged from the existing site may often be used but it should meet the same standards as set forth in these specifications. The depth of topsoil to be salvaged shall be no more than the depth described as a representative profile for that particular soil type as described in the soil survey published by USDA-SCS in cooperation with Delaware Agricultural Experimental Station.

Source:	Symbol:	Detail No.
USDA - NRCS		**DE-ESC-3.4.1** Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Topsoiling

Construction Notes (cont.)

a. Materials - Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand or other soil as approved by an agronomist or soil scientist. It shall not have a mixture of contrasting textured subsoil and contain no more than 5 percent by volume of cinders, stones, slag, coarse fragment, gravel, sticks, roots, trash or other extraneous materials larger than 1-1/2 inches in diameter. Topsoil must be free of plants or plant parts of bermudagrass, quackgrass, Johnsongrass, nutsedge, poison ivy, thistles, or others as specified. All topsoil shall be tested by a reputable laboratory for organic matter content, pH and soluble salts. A pH of 6.0 to 7.5 and an organic content of not less than 1.5 percent by weight is required. If pH value is less than 6.0 lime shall be applied and incorporated with the topsoil to adjust the pH to 6.5 or higher. Topsoil containing soluble salts greater than 500 parts per million shall not be used.

Note: No sod or seed shall be placed on soil which has been treated with soil sterilant or chemicals used for weed control until sufficient time has elapsed to permit dissipation of toxic materials.

b. Grading - The topsoil shall be uniformly distributed and compacted to a minimum of four (4) inches. Spreading shall be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets. Topsoil shall not be placed while in a frozen or muddy condition, when the subgrade is excessively wet, or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

Note:Topsoil substitutes or amendments as approved by a qualified agronomist or soil scientist, may be used in lieu of natural topsoil. Compost material used to improve the percentage of organic matter shall be provided by a certified supplier.

Compost amendments that are intended to meet specific post-construction stormwater management goals shall further meet the requirements of **Appendix 3.06.2 Post Construction Stormwater Management BMP Standards and Specifications, Section 14.0 Soil Amendments.**

Source:	Symbol:	Detail No.
USDA - NRCS		**DE-ESC-3.4.1** Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications

Dust Control

Temporary Methods:

1. Mulches - See **DE-ESC-3.4.5**, Standard Detail and Specifications for Mulching.
2. Vegetative cover - See **DE-ESC-3.4.3**, Std. Detail and Specifications for Vegetative Stabilization.
3. Adhesives - Use on mineral soils only (not effective on muck soils). Keep traffic off these areas. The following table may be used for general guidance.

Type of Emulsion	Water Dilution	Type of Nozzle	Apply Gal/Ac.
Latex emulsion	12.5:1	Fine spray	235
Resin-in-water emulsion	4.1	Fine spray	300
Acrylic emulsion (non-traffic)	7:1	Coarse spray	450
Acrylic emulsion (traffic)	3.5:1	Coarse spray	350

4. Tillage - For emergency temporary treatment, scarify the soil surface to prevent or reduce the amount of blowing dust until a more appropriate solution can be implemented. Begin the tillage operation on the windward side of the site using a chisel-type plow for best results.
5. Sprinkling - Sprinkle site with water until the surface is moist . Repeat as needed.
6. Calcium Chloride - Apply as flakes or granular material with a spreader at a rate that will keep the soil surface moist. Re-apply as necessary.
7. Barriers - Place barriers such as solid board fences, snow fences, hay bales, etc. at right angles to the prevailing air currents at intervals of approx. 10X their height.

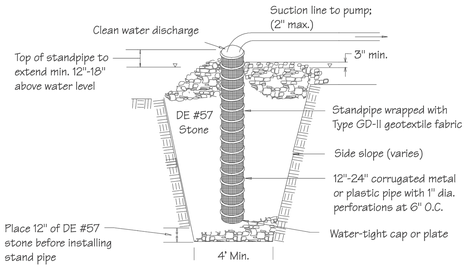
Permanent Methods:

1. Vegetative cover - See **DE-ESC-3.4.3**, Std. Detail and Specifications for Vegetative Stabilization.
2. Stone - Apply layer of crushed stone or coarse gravel to protect soil surface.

Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook		**DE-ESC-3.4.8** Sheet 1 of 1 Effective July 2023

Standard Detail & Specifications

Pumping Pit - Type 1



Section

Construction Notes:

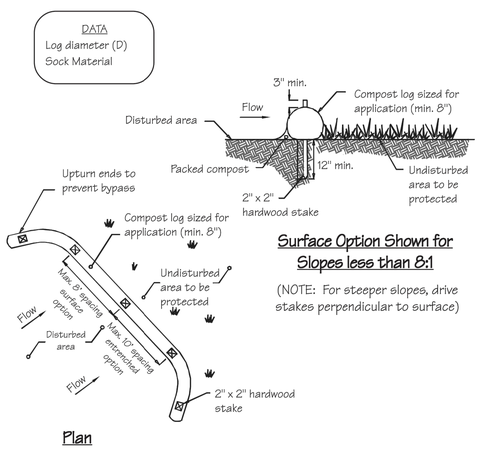
1. Pit dimensions are variable.
2. The standpipe should be constructed by perforating a 12" to 24" diameter corrugated or PVC pipe. The perforations shall be 1/2" X 6" slits or 1" diameter holes 6" on center.
3. A base of DE #57 aggregate should be placed in the pit to a depth of 12". After installing the standpipe, the pit surrounding the standpipe should then be backfilled with DE #57 aggregate.
4. The standpipe should extend 12" to 18" above the lip of the pit or riser crest elevation (basin dewatering).

NOTE: If discharge will be pumped directly to a storm drainage system, the standpipe must be wrapped with Type GD-II geotextile fabric before installation. If desired, 1/ 2" hardware cloth may be placed around the standpipe, prior to attaching the geotextile fabric. This will increase the rate of water seepage into the pipe.

Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	PP-1	**DE-ESC-3.2.2.1** Sheet 1 of 1 Effective July 2023

Standard Detail & Specifications

Compost Filter Log



Surface Option Shown for Slopes less than 8:1

(NOTE: For steeper slopes, drive stakes perpendicular to surface)

Plan

NOTE: Manufacturer's recommendations supersede any installation details shown for this practice

Source:	Symbol:	Detail No.
Adapted from MD Stds & Specs for ESC & Filtrexx™ International	CFL	**DE-ESC-3.1.7** Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Compost Filter Log

Construction Notes:

1. Prior to installation, clear bedding area of obstructions including rocks or debris larger than 1 inch and fill in any sharp depression areas.
2. If socks are prepared on-site, fill the sock fabric using a pneumatic blower so that the logs are rigid and do not deform. Terminate at the desired length.
3. For trenched applications, excavate 2 to 4 inches below grade along the width and length of the compost filter log.
4. Install the compost filter logs perpendicular to the flow direction and parallel to the slope with the beginning and end of the installation pointing up the slope a minimum of 1 foot elevation difference. On sites where this is not possible, upturn at a minimum length of 10' at a 30 degree angle to prevent runoff bypass.
5. For untrenched applications, blow or hand pack soil, mulch, or compost on the upslope side of the log, filling the bottom void area.
6. Stake the filled log every 10 feet maximum through the center of the sock for trenched applications, or every 8 feet for untrenched. The stake shall be a 2" by 2" hardwood. It should extend 12" below grade and protrude at least 3" above the top of the sock. If located on a slope greater than 8:1, the stake shall be angled downslope at a 45 degree angle to prevent the force of the water from dislodging to log.
7. When the length of the compost filter log needed exceeds the available compost filter sock length, the next sock shall be overlapped a minimum of 12" before being filled, and a stake placed through both socks at the overlap.
8. Remove accumulated sediment when it has reached half of the effective height of the log.
9. Inspect weekly and after rain event. If sock is degrading or the sock is failing, vegetate to secure the compost, replace the log, or reinforce with an additional log. If the log has been crushed due to construction equipment, it can be "fluffed" back to its effective height. If the effective height can no longer be restored, the log shall be replaced or reinforced with an additional compost filter log.

Source:	Symbol:	Detail No.
Adapted from MD Stds & Specs for ESC & Filtrexx™ International	CFL	**DE-ESC-3.1.7** Sheet 2 of 2 Effective July 2023

Volume of Cut: 1660 CY

Volume of Fill: 790 CY (Submerged Gravel Wetland Material)

Construction Sequence

SETUP

1. NOTIFY THE SUSSEX COUNTY CONSERVATION DISTRICT IN WRITING AT LEAST FIVE (5) DAYS PRIOR TO THE START OF CONSTRUCTION. FAILURE TO DO SO CONSTITUTES A VIOLATION OF THE APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLAN.
2. NOTIFY THE PERSON RESPONSIBLE FOR STORMWATER SYSTEM CONSTRUCTION REVIEW AT LEAST 3 DAYS PRIOR TO THE START OF THE STORMWATER SYSTEM CONSTRUCTION; STORMWATER FACILITIES MUST BE REVIEWED THROUGHOUT THEIR CONSTRUCTION.
3. PRIOR TO ANY CLEARING, INSTALLATION OF SEDIMENT CONTROL MEASURES OR GRADING, A PRE-CONSTRUCTION MEETING SHALL BE SCHEDULED AND CONDUCTED WITH THE AGENCY CONSTRUCTION SITE REVIEWER. THE LANDOWNER/DEVELOPER AND CONTRACTOR, ARE REQUIRED TO BE IN ATTENDANCE AT THE PRE-CONSTRUCTION MEETING; THE DESIGNER IS RECOMMENDED TO ATTEND.
4. HOLD PRE-CONSTRUCTION MEETING.
5. LOG INTO "SCD'S CONTRACTOR PORTAL" AT HTTPS://SUSSEX.ASSET-TRACKER.NET/HOME/WELCOME TO ACCESS THE BMP'S CONSTRUCTION CHECKLIST OR SCAN THE QR CODE ON THE COVER SHEET. (SCD STRONGLY RECOMMENDS THAT ALL THOSE INVOLVED WITH FILLING OUT THE BMP CONSTRUCTION CHECKLIST AND/OR THE PCVD FAMILIARIZE THEMSELVES WITH THE REQUIRED DOCUMENTATION AS SOON AS POSSIBLE.)
6. MARK THE LIMITS OF THE PRACTICES WITH ORANGE SPRAY PAINT, STAKES, OR FLAGS. ENGINEER'S APPROVAL IS REQUIRED BEFORE PROCEEDING WITH CONSTRUCTION.
7. INSTALL STABILIZED CONSTRUCTION ENTRANCE.
8. CLEAR AND GRUB AS NECESSARY FOR THE INSTALLATION OF PERIMETER CONTROLS.
9. TEMPORARY STOCKPILE AREA AND ASSOCIATED EROSION AND SEDIMENT CONTROL DEVICES AS SHOWN IN CONSTRUCTION DRAWINGS AND OUTLINED IN THE CONSTRUCTION SPECIFICATIONS.
10. DIRT TRACKED ONTO EXISTING PAVEMENT MUST BE CLEANED UP BY THE END OF THE WORK DAY OR BEFORE THE NEXT RAIN EVENT, WHICHEVER IS SOONER.
11. INSTALL PUMP AND FILTER BAG TO BE USED AS NEEDED.
12. ALL PERIMETER CONTROLS ARE TO BE REVIEWED BY THE AGENCY CONSTRUCTION SITE REVIEWER AND APPROVED PRIOR TO PROCEEDING WITH FURTHER SITE DISTURBANCE OR CONSTRUCTION.

SUBMERGED GRAVEL WETLAND

1. CLEAR AND GRUB FOR SITE GRADING.
2. EXCAVATE SUBMERGED GRAVEL WETLAND AREA AND GRADE SITE TO PROPOSED ELEVATION. SURVEY EXCAVATED AREA TO OBTAIN THE ELEVATION AND EXTENTS.
3. PLACE SILT FENCE OR 18-INCH FILTER LOGS AROUND PERIMETER OF EXCAVATION PREVENT EXCAVATED MATERIAL FROM FALLING BACK INTO THE SUBMERGED GRAVEL WETLAND AREA.
4. TEMPORARILY STORE ANY EXCESS EXCAVATED MATERIAL IN THE STOCKPILE AREA AS SHOWN ON PLANS, STABILIZED WITH STABILIZATION MATTING. ANY CLEAN SOIL THAT IS FOR SOME REASON UNSUITABLE AS BACKFILL OR CONSTRUCTION MATERIAL MAY BE DISPOSED OF AT AN APPROPRIATELY PERMITTED SITE WITH AN ACTIVE EROSION AND SEDIMENT CONTROL PERMIT PROVIDED THAT PERMIT ACCOUNTS FOR THE MATERIALS AND QUANTITIES IN QUESTION. EXCAVATE BASIN AND PIT ACCORDING TO CONTOURS AND ELEVATIONS REPRESENTED ON PLANS.
5. FOLLOW ALL PRESCRIBED OSHA SAFETY GUIDELINES FOR EXCAVATING AND WORKING IN SUBGRADE SPACES.
6. PLACE #57 AGGREGATE IN BOTTOM OF PIT.
7. INSTALL PERFORATED/SLOTTED UNDERDRAIN PIPES, OVERFLOW PIPE, CONNECTIONS, AND NON-PERFORATED UNDERDRAIN OUTLET PIPE. ANCHOR WITH STRING AND BOARD ATTACHED TO SURFACE GRADE AT SIDES TO TEMPORARILY HOLD IN PLACE WHILE AGGREGATE IS PLACED. SURVEY UNDERDRAIN, CLEANOUTS, STAND PIPES, AND OUTLET PIPE LOCATIONS TO OBTAIN THE ELEVATIONS AND LOCATION.
8. ADD #57 STONE AROUND AND ABOVE UNDERDRAIN PLUMBING TO ELEVATION INDICATED ON PLANS.
9. BACKFILL AND CAREFULLY COMPACT THE REMAINING #57 AGGREGATE AND SOIL ABOVE THE UNDERDRAIN OUTLET PIPE THAT IS OUTSIDE OF THE PRACTICE, MATCHING SURROUNDING GRADE AND CONTOURS SHOWN ON PLANS. IMMEDIATELY AFTER PLACEMENT OF STONE IN ANY SPOT, INSTALL SILT FENCE OR 18-INCH FILTER LOGS ON THE UPHILL SIDE TO PREVENT ANY UPGRADIENT DISTURBED AREAS FROM WASHING SILT/SEDIMENT ON TO THE STONE. SURVEY AREA TO OBTAIN THE ELEVATION AND EXTENTS OF #57 STONE LAYER.
10. PLACE THE CHOKER STONE TO THE ELEVATIONS SHOWN ON THE PLAN. PLACE THE STONE CAREFULLY TO AVOID DAMAGING THE CLEANOUT. DO NOT COMPACT THIS MATERIAL, BUT LIGHTLY TAMP WITH THE EXCAVATOR BUCKET. IMMEDIATELY AFTER PLACEMENT OF STONE IN ANY SPOT, INSTALL SILT FENCE OR 18-INCH FILTER LOGS ON THE UPHILL SIDE TO PREVENT ANY UPGRADIENT DISTURBED AREAS FROM WASHING SILT/SEDIMENT ON TO THE STONE. SURVEY AREA TO OBTAIN THE ELEVATION AND EXTENTS OF CHOKER STONE LAYER.
11. PLACE SUBMERGED GRAVEL WETLAND SOIL MEDIA TO ELEVATION SHOWN ON PLANS. IF POSSIBLE WET SLIGHTLY WITH WATER TO AID SETTLING. SOIL MEDIA WILL SETTLE SLIGHTLY OVER TIME. INSTALL SILT FENCE OR 18-INCH FILTER LOGS ON THE UPHILL SIDE TO PREVENT ANY UPGRADIENT DISTURBED AREAS FROM WASHING SILT/SEDIMENT ON TO THE FILTER MEDIA.SURVEY AREA TO OBTAIN THE ELEVATION AND EXTENTS OF WETLAND SOIL MEDIA LAYER.
12. SATURATE SOIL MEDIA THOROUGHLY TO ENSURE PROPER SETTLING PRIOR TO PLANTING. THIS MAY BE DONE WITH WATER TANK/TRUCK, NEARBY HOSE CONNECTION, OR POTENTIALLY A RAINFALL EVENT IF ALL AREAS ARE SUFFICIENTLY STABILIZED IN ADVANCE OF THE RAIN.
13. INSTALL RIPRAP AS SHOWN ON THE PLAN.
14. INSTALL STONE CHECK DAMN.
15. TEMPORARILY STABILIZE SIDE SLOPES, AND REMOVE CLEANOUT STRING AND BOARD ANCHORS.

COMPLETION

1. REPAIR AND SMOOTH ANY GRADING THAT IS IRREGULAR.
2. PERMANENTLY STABILIZE ALL WORK AREAS WITH SEED AND STRAW PER STABILIZATION SPECIFICATIONS ON THE PLANTING PLAN AND CONSTRUCTION DETAILS SHEETS 5-6.
3. INSTALL WETLAND PLANTS ACCORDING TO PLANTING PLAN .
4. COMPLETE AS-BUILT AND CONSTRUCTION CHECKLIST AND SUBMIT TO SUSSEX CONSERVATION DISTRICT FOR APPROVAL. CONTRACTOR SHALL REMEDY AND DEFICIENCIES AS REQUIRED BY SUSSEX CONSERVATION DISTRICT. AS-BUILT APPROVAL MUST BE OBTAINED PRIOR TO PROJECT CLOSEOUT.
5. CALL INSPECTOR FOR APPROVAL BEFORE REMOVING EROSION AND SEDIMENT CONTROL (E&SC) MEASURES. EROSION AND SEDIMENT CONTROL DEVICES TO BE REMOVED ONLY AFTER WORK IN AN AREA HAS BEEN COMPLETED AND STABILIZED, WITH WRITTEN APPROVAL FROM THE AGENCY CONSTRUCTION SITE REVIEWER.
6. UPON APPROVAL, REMOVE E&SC DEVICES.
7. PERMANENTLY STABILIZE ANY AREAS DISTURBED DURING THE REMOVAL OF THE E&SC CONTROLS, SUCH AS THE STABILIZED CONSTRUCTION ENTRANCE.
8. THE TERMINATION OF THE CONSTRUCTION GENERAL PERMIT WILL REQUIRE SUBMISSION AND ACCEPTANCE OF THE POST CONSTRUCTION VERIFICATION DOCUMENTS, INCLUDING FINAL STABILIZATION THROUGHOUT THE SITE, ALL ELEMENTS OF THE SEDIMENT AND STORMWATER MANAGEMENT PLAN IMPLEMENTED, AND ACCEPTANCE OF THE FINAL OPERATION AND MAINTENANCE PLAN.

Designed and Drawing based on Delaware Coordinate System: NAD83 Delaware State Plane Zone, US Foot

NOTES:

A SURVEY IS REQUIRED FOR EACH "LAYER" OF THE SUBMERGED GRAVEL WETLAND AS IT IS INSTALLED. THIS ASSIST IN COMPLETING AS-BUILT DRAWING TO CONFIRM THAT THE FACILITY IS BUILT PER DESIGN.

OWNER:
SUSSEX COUNTY
ATTN: VALERIE THOMPSON
VALERIE.THOMPSON@SUSSEXCOUNTYDE.GOV

Sussex County Engineering Department
2 The Circle, P.O. Box 589
Georgetown, DE 19947
Ph: 302-855-7718
Fax: 302-855-7799

PROJECT LOCATION:
SPRINGFIELD LANE
SUSSEX COUNTY, DE
LAT N38.679082 LONG W75.371012

DESIGNER:
CENTER FOR WATERSHED PROTECTION, INC.
CAROL WONG, PE
CKW@CWP.ORG

CENTER FOR WATERSHED PROTECTION
11711 EAST MARKET PLACE, STE 200
FULTON, MD 20759
WWW.CWP.ORG
TEL 410-461-8323

DEVELOPER:
DELAWARE CENTER FOR INLAND BAYS
ATTN: MEGHAN NOE FELLOWS
MNOEFELLOWS@INLANDBAYS.ORG
39375 INLET ROAD
REHOBOTH BEACH, DE 19971
302-226-8105

DELAWARE CENTER FOR THE INLAND BAYS
Research. Educate. Restore.

CAROL WONG LICENSED No. 22950 DELAWARE PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED UNDER MY SUPERVISION AND TO THE BEST OF MY KNOWLEDGE COMPLIES WITH THE APPLICABLE STATE AND LOCAL REGULATIONS AND ORDINANCES.

CAROL WONG, PE
4/17/2024

DATE	NO.	REVISION DESC.
	4	
4/17/24	3	SCD COMMENTS
3/26/24	2	SCD COMMENTS
3/1/24	1	WETLAND AND STREAM PER EL

SPRINGFIELD LANE SUBMERGED GRAVEL WETLAND SEDIMENT AND STORMWATER MANAGEMENT PLANS

SHEET TITLE
CONSTUCTION SITE DETAILS AND NOTES

DESIGNED BY EST	DATE 2/27/2024
CHECKED BY CKW	SHEET 7
DRAWN BY EST	OF 10
SCALE AS SHOWN	
PROJ. NO. W-23-034	

PROJECT INFORMATION:
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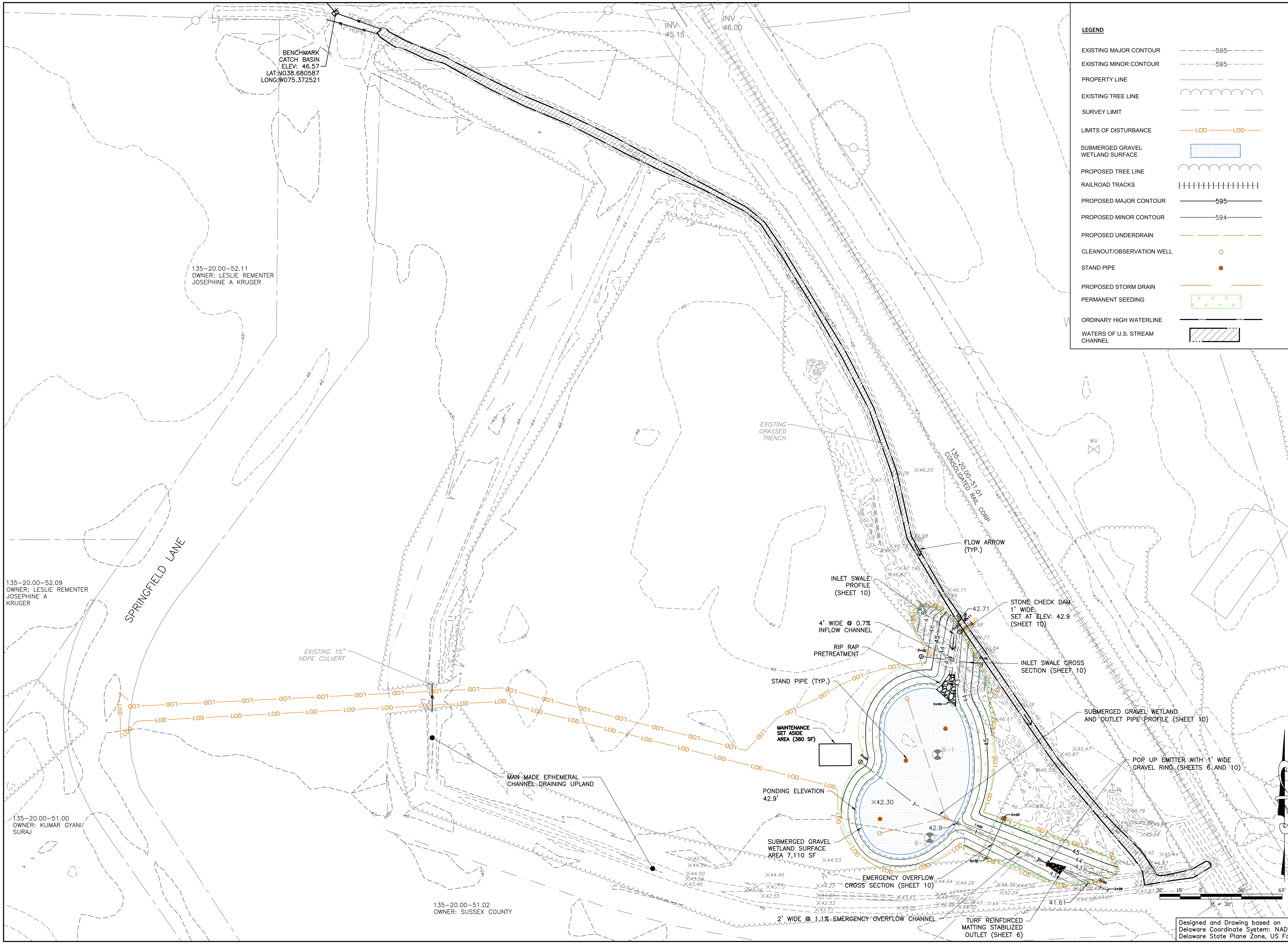
LAST SAVED DATE AND TIME: 17 Apr 2024, 12:34PM



NOTES:

B-XX Indicates location and number of soil boring test performed.

OWNER:
SUSSEX COUNTY
ATTN: VALERIE THOMPSON
VALERIE.THOMPSON@SUSSEXCOUNTYDE.GOV

Sussex County
Engineering Department
2 The Circle, P.O. Box 589
Georgetown, DE 19947
Ph: 302-855-7718
Fax: 302-855-7799

PROJECT LOCATION:
SPRINGFIELD LANE
SUSSEX COUNTY, DE
LAT N38.679082 LONG W75.371012

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CAROL WONG, PE
4/17/2024

DATE	NO.	REVISION DESC.
-	4	-
4/17/24	3	SCD COMMENTS
3/26/24	2	SCD COMMENTS
3/1/24	1	WETLAND AND STREAM PER EL

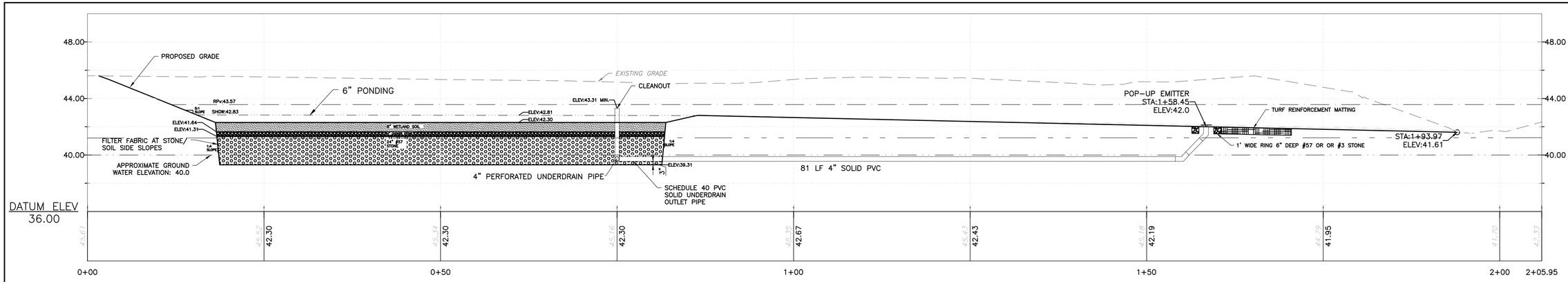
SPRINGFIELD LANE SUBMERGED GRAVEL WETLAND
SEDIMENT AND STORMWATER MANAGEMENT PLANS

SHEET TITLE

POST CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN

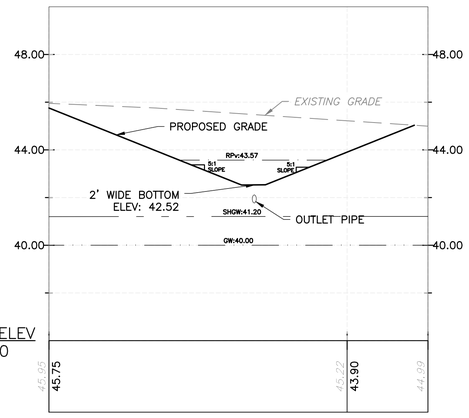
DESIGNED BY: EST	DATE: 2/27/2024
CHECKED BY: CKW	SHEET
DRAWN BY: EST	8
SCALE: 1"=30'	
PROJ. NO.: W-23-034	OF 10

PROJECT INFORMATION:
FILE NAME: Design_App Part2.dwg
LAST SAVED DATE AND TIME: 17 Apr 2024, 12:34PM



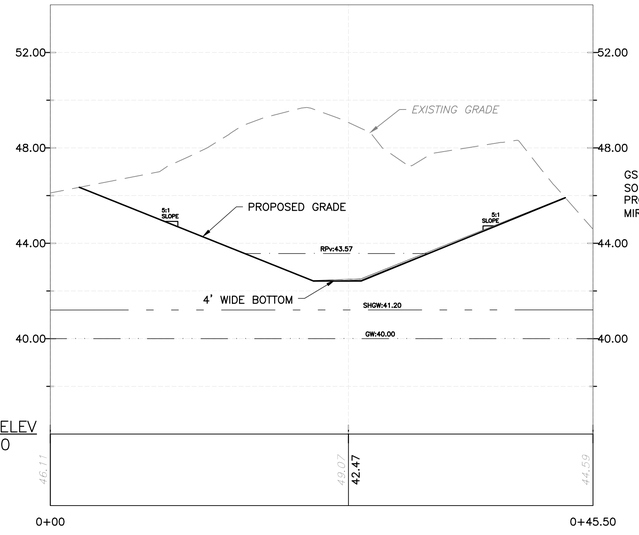
VERTICAL SCALE 1"=3.5'
HORIZONTAL SCALE 1"=7'

SUBMERGED GRAVEL WETLAND AND OUTLET PIPE
STA 0+00 TO 2+06



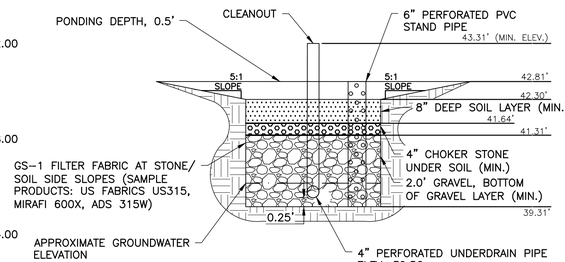
EMERGENCY OVERFLOW SWALE CROSS SECTION
STA 0+00 TO 0+32

VERTICAL SCALE 1"=3'
HORIZONTAL SCALE 1"=6'

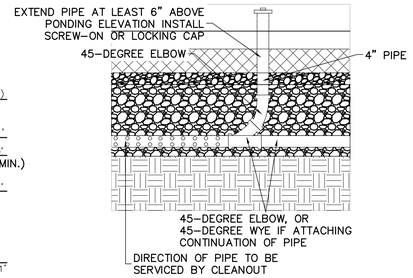


VERTICAL SCALE 1"=3'
HORIZONTAL SCALE 1"=6'

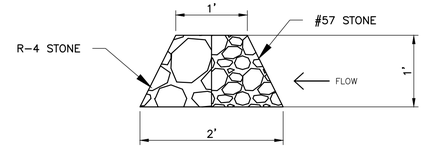
INLET SWALE CROSS SECTION
STA 0+00 TO 0+46



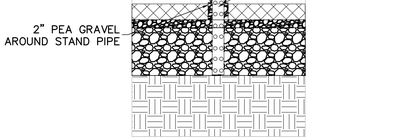
TYPICAL SUBMERGED GRAVEL WETLAND DETAIL
1" = 2'



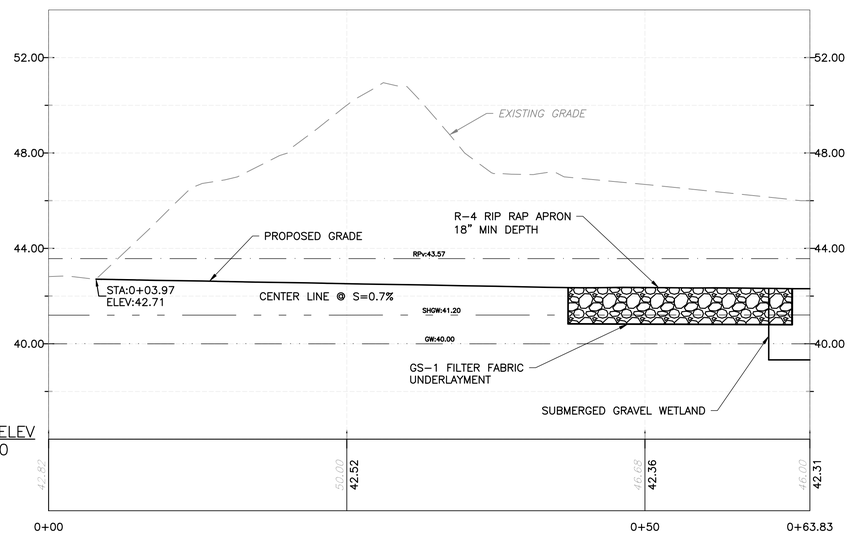
CLEANOUT DETAIL
1" = 2'



CUT SECTION STONE CHECK DAM
1" = 1'

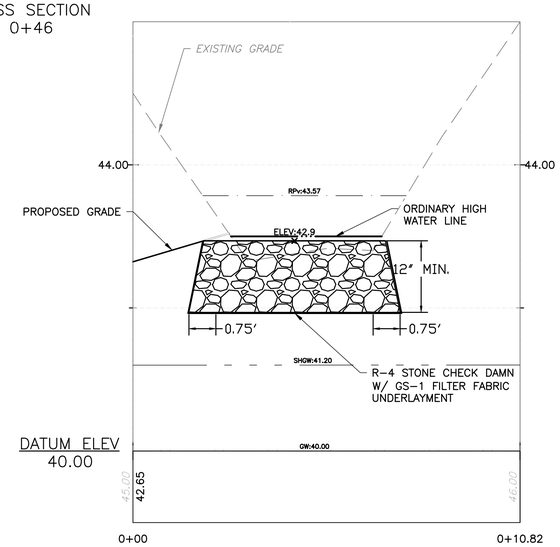


STANDPIPE DETAIL
1" = 3'



VERTICAL SCALE 1"=3'
HORIZONTAL SCALE 1"=6'

INLET SWALE PROFILE
STA 0+00 TO 0+64



CHECK DAM
STA 0+00 TO 0+11

VERTICAL SCALE 1"=1'
HORIZONTAL SCALE 1"=2'

MATERIAL SPECIFICATIONS - SUBMERGED GRAVEL WETLAND

Riprap
R-4: d50 = 6 inches, d100 = 12 inches

Non-woven Geotextile (Filter Fabric)
Must meet Delaware Erosion & Sediment Control Handbook specifications for Type GS-1 Nonwoven Geotextile (Section 921.09). Apparent opening size equal to or greater than No. 40 sieve. No geotextile is allowed between layers of the submerged gravel wetland. Sample Products: US Fabrics US315, Mirafi 600X, ADS 315W

#57 aggregate
Underdrain gravel and chimney gravel shall be 3/8 - 1-½ (0.375 - 1.5) inches in diameter (double washed, AASHTO #57 stone). River-run, washed gravel is preferred. Placement of the gravel over the underdrain must be done with care. Avoid dropping the gravel from high levels from a backhoe or front-end loader bucket. Spill directly over underdrain and spread manually..
Used for flow side of the check damn.

Choker stone / #8 or #89 aggregate
1/8 - 3/8 (0.125 - 0.375) inches diameter (double washed, AASHTO #8 or #89 stone). Washed gravel is preferred. Sometimes referred to as "pea gravel."Max. 2% passing the #200 sieve.

Mulch
Acceptable mulch shall be shredded hardwood only. It shall consist of bark from hardwood trees which have been milled and screened to a maximum of 4 inches particle size and provide a uniform texture free from sawdust, toxic substances, and foreign materials including plant material. Mulch must be aged 6 months, minimum. Pine mulch and wood chips will float and move to the perimeter of the micro-bioretention area during a storm event and are not acceptable.

Underdrain plumbing
Rigid Schedule 40 PVC 4-inch diameter pipe either slotted or perforated. Perforated pipe shall be drilled or bought in a commonly available perforated style (e.g. 3/8 inch perforations, 6 inch center to center, along four longitudinal rows). Perforated pipe shall be double-wrapped in 1/4" mesh hardware cloth. Pipe sections shall be coupled using suitable connection rings and flanges, or PVC cement for watertight connections. Cleanouts shall be attached to underdrain with 45-degree connections and capped with screw top.

Observation wells/Cleanout
Pipe specifications shall be the same as the underdrain plumbing. Perforations or slots should be confined to the elevations of media layers consisting of aggregate with particle sizes greater than 3/8-inch: #57 and #2 or #3 aggregate only. If using a wholly perforated/slotted pipe, wrap portions of pipe which will be in contact with sand, choker stone (#8 or #89), or soil media with geotextile, making sure to leave the portion of pipe in the underdrain or reservoir gravel layers unwrapped.

Drainage pipes
Rigid Schedule 40 PVC 4-inch diameter solid pipe. Pipe sections shall be coupled using suitable connection rings and flanges, or PVC cement for watertight connections. Cleanouts shall be attached to underdrain with 45-degree connections and capped with screw top.

Wetland Soil
Wetland Soil must be A-horizon contain a minimum of 15% organic material and a maximum of 15% clay content and free of subsoil, large stones, clay lumps, roots, viable noxious weed seed, or other debris.

Wetland Surface Stabilization
See PLANTING PLAN

Wetland Slope Stabilization
Ernst Native Northeast Wildflower Seed Mix. See PLANTING PLAN for more details.

Designed and Drawing based on
Delaware Coordinate System: NAD83
Delaware State Plane Zone, US Foot

NOTES:

OWNER:
SUSSEX COUNTY
ATTN: VALERIE THOMPSON
VALERIE.THOMPSON@SUSSEXCOUNTYDE.GOV

Sussex County
Engineering Department
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CAROL WONG, PE
4/17/2024

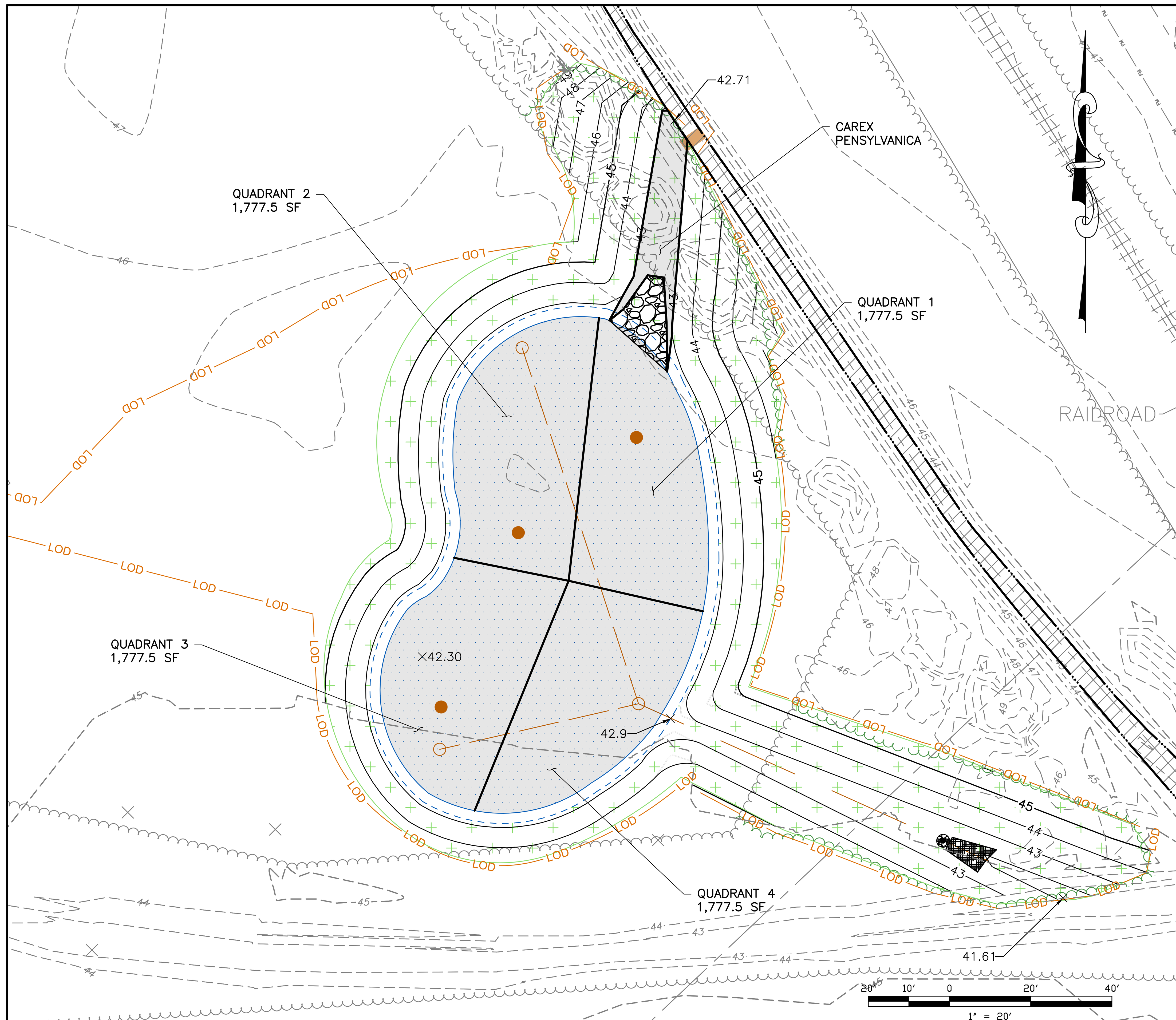
DATE	NO.	REVISION DESC.
	–	
4/17/24	3	SCD COMMENTS
3/26/24	2	SCD COMMENTS
3/1/24	1	WETLAND AND STREAM PER EL

SPRINGFIELD LANE SUBMERGED GRAVEL WETLAND
SEDIMENT AND STORMWATER MANAGEMENT PLANS

SHEET TITLE
POST CONSTUCTION SITE DETAILS

DESIGNED BY: EST	DATE: 2/27/2024
CHECKED BY: CKW	SHEET: 9
DRAWN BY: EST	OF 10
SCALE: AS SHOWN	
PROJ. NO.: W-23-034	

PROJECT INFORMATION:
FILE NAME: Design_App Part2.dwg
LAST SAVED DATE AND TIME: 17 Apr 2024, 12:34PM



PLANTING LEGEND

WETLAND PLANTINGS
(SEE PLANTING SCHEDULE SUBMERGED GRAVEL WETLAND SURFACE)

PERMANENT SEEDING
(SEE ERNST NATIVE NORTHEAST WILDFLOWER SEED MIX SPECIFICATION)

PERMANENT SEEDING SWALE
(CAREX PENSYLVANICA SEE SWALE PLANTING SCHEDULE)

Planting Notes

1. Prior to final stabilization and topsoil the existing topsoil must be tested in accordance with standards in details DE-ESC-3.41 on Sheet 5 . If topsoil does not meet this then the existing topsoil must be amended in accordance with Appendix A-3 of Post Construction Stormwater Management BMP Standards and Specifications on this sheet or imported topsoil may be used that meets standards in details DE-ESC-3.41 on Sheet 6.
2. Plantings within each quadrant shall be spaced triangularly.
3. The seed mix is the Ernst Native Northeast Wildflower Seed Mix. Seeding rate of 7 lb/ac with cover crop (annual rye or oat depending on season).

Material

Seed Mix: Native Northeast Wildflower Seed Mix
Note: Ernst has recommended a seeding rate of 7 lb/ ac with cover crop

Ernst Conservation Seeds Inc
8884 Mercer Pike
Meadville, PA 16335-9275
Phone (814) 336-2404; (800) 873-3321; Fax (814) 336-5191
www.ernstseed.com; sales@ernstseed.com

QUOTE

Quote Number Q276826
Quote Date 5/19/2023
Page Number 1 of 1

BILL TO:
Aquatic Resource Restoration Company
ATTN: Accounts Payable
350 Hill St
York, PA 17403-2619
Phone 717-428-9368
Fax
Email invoices@arrc1.com

SHIP TO:
Aquatic Resource Restoration Company
15073 Bonnair Rd
Glen Rock, PA 17327-7804
UNITED STATES
Phone: 717-428-9368

Customer PO#	Customer ID	Shipping Method	UPS Shipper #	Terms	Salesperson ID
EM 051823 PM	AQUA011	UPS GROUND RES		Net 30	

Bulk Qty	PLS Qty	UOM	Item Number	Description
1.000		EACH	SUSSEX CUSTOM MIX	
0.036		LB BLK	AQUCAN01	Eastern Columbine
0.043		LB BLK	ASCINC01	Swamp Milkweed, PA Ecotype
0.036		LB BLK	ASCTUB01	Butterfly Milkweed, PA Ecotype
0.071		LB BLK	ASTNOV01	New England Aster, PA Ecotype
0.086		LB BLK	CHAFAS01	Partridge Pea, PA Ecotype
0.086		LB BLK	CORLAN01	Lanceleaf Coreopsis
0.009		LB BLK	EUPMAC01	Spotted Joe Pye Weed, PA Ecotype
0.143		LB BLK	GAIPUL01	Annual Gaillardia (Indian Blanket)
0.057		LB BLK	HELHEL01	Oxeye Sunflower, PA Ecotype
0.136		LB BLK	LIASPI01	Marsh Blazing Star
0.086		LB BLK	LUPPER06	Perennial Blue Lupine, Common Commercial *sub for Wild Blue Lupine
0.014		LB BLK	MONFIS03	Wild Bergamot, Fort Indiantown Gap-PA Ecotype
0.006		LB BLK	OENBIE01	Evening Primrose
0.114		LB BLK	PENDIG01	Tall White Beardtongue, PA Ecotype
0.043		LB BLK	RUDHIR04	Blackeyed Susan
0.007		LB BLK	RUDSUB01	Sweet Blackeyed Susan
0.007		LB BLK	RUDTRI02	Browneyed Susan, WV Ecotype
0.020		LB BLK	SOLRIG01	Stiff Goldenrod, OH Ecotype
1.000		EA	TOTAL	MIX NOTES
				Suggested seeding rate 7 lb/ac with a cover crop
1.000		EACH	COVER CROP	

SWALE PLANTING SCHEDULE (PLANTING BY OTHERS)

Scientific Name	Common Name	Quantity	Spacing	Size at Planting
Carex Pensylvanica	Oak Sedge	450	12" OC	3" cont.

PLANTING SCHEDULE SUBMERGED GRAVEL WETLAND SURFACE (PLANTING BY OTHERS)

Scientific Name	Common Name	Percentage of planting per Quadrant	Quantity					Spacing				Size at Planting
			Quadrant 1	Quadrant 2	Quadrant 3	Quadrant 4	Total	Quadrant 1	Quadrant 2	Quadrant 3	Quadrant 4	
Andropogon virginicus var. virginicus	Broomsedge	25%	739	228	739	228	1934	10" OC	18" OC	10" OC	18" OC	2x2" 5" deep plugs
Eragrostis spectabilis	Purple Lovegrass	25%	739	228	739	228	1934	10" OC	18" OC	10" OC	18" OC	2x2" 5" deep plugs
Dichanthelium clandestinum	Deer-tongue Witchgrass	25%	739	228	739	228	1934	10" OC	18" OC	10" OC	18" OC	2x2" 5" deep plugs
Carex vulpinoidea	Fox Sedge	10%	296	91	296	91	774	10" OC	18" OC	10" OC	18" OC	2x2" 5" deep plugs
Solidago nemoralis	Gray Golden Rod	5%	148	46	148	46	388	10" OC	18" OC	10" OC	18" OC	2x2" 5" deep plugs
Penstemon digitalis	Foxglove Beardtongue	5%	148	46	148	46	388	10" OC	18" OC	10" OC	18" OC	2x2" 5" deep plugs
Eupatorium perfoliatum	Common Boneset	5%	148	46	148	46	388	10" OC	18" OC	10" OC	18" OC	2x2" 5" deep plugs

Appendix 3. Compost Material Properties

This specification shall apply for all applications where compost is used as or within a construction or post-construction stormwater best management practice. Particle size specifications vary depending on use, as noted in Table 3.1. Table 3.1: Compost Material Properties

Parameter	Range	Testing Method
Particle Size	For Amendments: 100% pass through a ½" screen For Compost Logs: 99% pass through a 2" screen; max. 40% pass through a 3/8" screen	TMECC 2.02-B
pH	6.0-8.0	TMECC 4.11
Manufactured Inert Material	<1% dry weight basis	TMECC 3.08-A
Organic Matter	35-95% dry weight basis	TMECC 5.07-A
Soluble Salt Concentration	≤ 6.0 mmhos/cm	TMECC 4.10-A
Carbon to Nitrogen Ratio (C:N)	≤ 25:1	
Stability (Carbon Dioxide evolution rate)	≤ 4 C / unit VS / day	TMECC 5.08-B
Maturity (seed emergence and seedling vigor)	>80% relative to positive control	TMECC 5.05-A
Trace Metals	Arsenic < 11 mg/kg[2] Cadmium < 4 mg/kg Chromium < 35 mg/kg[3] Copper < 310 mg/kg Lead < 400 mg/kg Mercury < 10 mg/kg Molybdenum < 2 mg/kg Nickel < 160 mg/kg Selenium < 26 mg/kg Zinc < 2.300 mg/kg	EPA SW-846
Dry Bulk Density	30-45 lb/cu.ft.	
Moisture content	35-55%	

Compost Specifications

Compost used to fulfill regulatory requirements shall meet the criteria set forth in this specification. In addition, it must be provided by an active member of the U.S. Composting Seal of Testing Assurance (STA) program.

The compost shall be the result of the biological degradation and transformation of plant-derived materials under conditions that promote anaerobic decomposition. No manure or biosolids shall be included. The material shall be well composted, free of viable weed seeds, and stable with regard to oxygen consumption and carbon dioxide generation. The compost shall have a moisture content that has no visible free water or dust produced when handling the material. It shall meet the following criteria, as reported by the U.S. Composting Council STA Program Compost Technical Data Sheet (See Table 14.3).

Soluble salt refers to the amount of soluble ions in a solution of compost and water. The concentration of soluble ions is typically estimated by determining the solution's ability to carry an electrical current, i.e., electrical conductivity. The units of measure for soluble salts are either mmhos/cm or dS/m (they are 1:1 equivalent). Plant essential nutrients are actually supplied to plants in a salt form. While some specific soluble salts, (e.g., sodium, chloride), may be more detrimental to plants, most composts do not contain sufficient levels of these salts to be a concern in landscape applications. Plant species have a salinity tolerance rating and maximum tolerable quantities are known. Excess soluble salts can cause phytotoxicity to plants. Compost may contribute to, or dilute, the cumulative soluble salts content of a growing media or soil. Reduction in soluble salts content can be achieved through thorough watering at the time of planting. Most composts have a soluble salt conductivity of 1.0 to 10.0 mmhos/cm, whereas typical conductivity values in soil range from 0 to 1.5 in most areas of the country. 6 mmhos/cm is moderately saline and will inhibit the growth of some plants. The final selection of plants should be made after a soil test identifies the limiting characteristics of the soil mix.

The *Carbon to Nitrogen Ratio* is the first step in evaluating the maturity and stability of a compost sample. A Carbon to Nitrogen (C:N) ratio of less than or equal to 25 is acceptable prior to the additional tests of maturity and stability. Currently there are a number of tests available to determine compost stability and maturity. Some have been published in Test Methods for the Examination of Composting and Compost (TMECC) by the U.S. Composting Council (USCC), while commercial laboratories have developed others.

Stability refers to a specific stage or state of organic matter decomposition during composting, which is related to the type of organic compounds remaining and the resultant biological activity in the material. The stability of a given compost is important in determining the potential impact of the material on nitrogen availability, volume, and porosity in soil or growth media. Compost as a soil amendment requires a stable to very stable product that will prevent nutrient tie up and maintain or enhance oxygen availability in soil or growth media.

Maturity is the degree or level of completeness of composting. Maturity is not described by a single property and therefore maturity is best assessed by measuring two or more compost characteristics. Some immature composts may contain high amounts of free ammonia, certain organic acids or other water-soluble compounds which can limit seed germination and root development, or cause odor. All uses of compost require a mature product free of these potentially phytotoxic components. The bioassay used in the STA Program uses a seed germination and growth test to measure the percent of seed emergence and relative seedling vigor.

Trace metals are elements whose concentrations are regulated due to the potential for toxicity to humans, animals, or plants. Regulations governing the heavy metal content of composts, fertilizers, and certain other horticultural and agricultural products have been promulgated on both the State and Federal levels. Specific trace elements, often referred to as heavy metals include arsenic, cadmium, chromium, copper, lead, mercury, molybdenum nickel, selenium, and zinc. The quantity of these elements are measured on a dry weight basis and expressed as mg/kg (milligram per kilogram) or ppm (parts per million). Many of these elements are actually needed by plants for normal growth, although in limited quantities. Therefore, measuring the concentration of these elements, as well as other plant nutrients, can provide valuable management data relevant to the fertilizer requirements of plants and subsequent fertilizer application rates. All composts that contain regulated feedstocks must meet national and/or state safety standards for metals in order to be marketed.

Moisture content (percent) is the measure of the quantity of water present in a compost product; expressed as a percentage of total weight. The moisture content of compost affects its *bulk density* (weight per unit volume) and, therefore, affects handling and transportation. Overly dry compost (35% moisture, or below) can be dusty and irritating to work with, while very wet compost (55 to 60%) can become heavy and clumpy, making its application more difficult and delivery more expensive. A preferred moisture percent for finished compost is 35-55%.

Pathogens, such as bacteria and other infectious microorganisms, should be limited in compost derived from plant-based material, versus bio-solids, but may be present due to animal feces and other sources. Pathogen removal of the compost shall be in compliance with Title 40 of the Code of Federal Regulations Part 503 (or 40 CFR 503).

Operation and Maintenance

1. IT IS THE OWNER'S RESPONSIBILITY TO MAINTAIN AND REPAIR THE STORMWATER MANAGEMENT FACILITY.
2. THE DNREC SEDIMENT AND STORMWATER PROGRAM AND/OR THE RELEVANT DELEGATED AGENCY RESERVES THE RIGHT TO ENTER PRIVATE PROPERTY FOR PURPOSES OF PERIODIC SITE REVIEWS.
3. THE SUSSEX COUNTY CONSERVATION DISTRICT SHOULD BE NOTIFIED WITHIN 30 BUSINESS DAYS IF THE PROPERTY OWNERSHIP IS TRANSFERRED TO A NEW PERSON OR ENTITY."
4. THE DNREC SEDIMENT AND STORMWATER PROGRAM AND/OR THE RELEVANT DELEGATED AGENCY MAY SEEK ENFORCEMENT ACTION AGAINST ANY OWNER DEEMED NEGLIGENT IN FULFILLING THE OPERATION AND MAINTENANCE REQUIREMENTS OF THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS.
5. THE SUSSEX COUNTY CONSERVATION DISTRICT SHOULD BE CONTACTED IF A CONCERN ARISES REGARDING A STORMWATER MANAGEMENT FACILITY, BEFORE ANY NON-ROUTINE MAINTENANCE, OR IF MODIFICATIONS TO THE FACILITY ARE ESIRED.
6. ANY DESIGN MODIFICATIONS MADE TO THE STORMWATER SYSTEM SHALL REQUIRE THE CREATION OF A NEW POST CONSTRUCTION STORMWATER MANAGEMENT PLAN AND/OR OPERATIONS AND MAINTENANCE PLAN, WITH APPROVAL OF THE PLAN(S) BY THE SUSSEX COUNTY CONSERVATION DISTRICT.
7. FOR ALL STORMWATER EASEMENT AREAS (I.E., ACCESS, MAINTENANCE, OR OFFSITE) AND THE MINIMUM 15-FOOT WIDE ACCESSWAYS TO ALL STORMWATER FACILITIES AND THEIR STRUCTURAL COMPONENTS, REGULAR MOWING SHOULD BE PERFORMED TO KEEP THE GRASS 6 INCHES OR LESS; NO TREES OR SHRUBS SHOULD BE PLANTED, AND ANY FOUND GROWING SHOULD BE REMOVED; AND NO PERMANENT STRUCTURES, SUCH AS FENCES OR SHEDS, SHOULD BE LOCATED WITHIN THE EASEMENT OR ACCESSWAY.
8. TREES SHOULD NOT BE PLANTED, AND SHOULD BE REMOVED IF FOUND GROWING, ON AND WITHIN 15 FEET OF ALL POND EMBANKMENTS, ON POND SLOPES OR SAFETY BENCHES, AND WITHIN 10 FEET OF STRUCTURAL COMPONENTS, SUCH AS PIPE INLETS.
9. WHEN THE FACILITY IS EXCAVATED TO REMOVE ACCUMULATED SEDIMENT, THE DISPOSAL AREA SHALL BE PERMANENTLY STABILIZED SO THAT IT DOES NOT RECREATE AN EROSION PROBLEM. ANY MATERIAL TAKEN OFFSITE SHALL STILL BE USED OR DISPOSED OF IN AN APPROVED DNREC MANNER.
10. BEFORE ANY EARTHWORK OR EXCAVATION TAKES PLACE, THE CONTRACTOR SHOULD CALL MISS UTILITY AT 811 OR 1-800-282-8555 AT LEAST 48 HOURS PRIOR TO CONSTRUCTION, TO HAVE ALL EXISTING UTILITIES MARKED ONSITE.

DURING ESTABLISHMENT (2 YEARS)

11. STABILIZE ANY BARE OR ERODING AREAS IN THE CONTRIBUTING DRAINAGE AREA INCLUDING THE SUBMERGED GRAVEL WETLAND PERIMETER, AND IN SUBMERGED GRAVEL WETLAND.
12. •WATER TREES AND SHRUBS PLANTED IN THE SUBMERGED GRAVEL WETLAND PLANTING BED DURING THE FIRST GROWING SEASON. IN GENERAL, WATER EVERY 3 DAYS FOR FIRST MONTH, AND THEN WEEKLY DURING THE REMAINDER OF THE FIRST GROWING SEASON (APRIL - OCTOBER), DEPENDING ON RAINFALL
13. PROVIDE REINFORCEMENT PLANTINGS AS NEEDED.
14. NOXIOUS PLANTS AND UNDESIRED INVASIVE PLANTS SHOULD BE DEALT WITH AS SOON AS THEY BEGIN TO COLONIZE THE WETLAND. AS A GENERAL RULE, CONTROL OF NOXIOUS WEEDS AND UNDESIRABLE INVASIVE SPECIES (E.G., CATTAILS AND PHRAGMITES) SHOULD COMMENCE AS SOON AS THEY ARE SPOTTED AND BEFORE THEIR COVERAGE EXCEEDS MORE THAN 5% OF A WETLAND CELL AREA. HERBICIDES MUST BE APPLIED BY A CERTIFIED AQUATIC PESTICIDE APPLICATOR THROUGH THE DEPARTMENT OF AGRICULTURE AND BE AQUATIC SAFE (I.E., GLYPHOSATE-BASED PRODUCTS). EXTENDED PERIODS OF DEWATERING MAY ALSO WORK BECAUSE EARLY MANUAL REMOVAL PROVIDES ONLY SHORT-TERM RELIEF FROM INVASIVE SPECIES.
15. INSPECT THE SITE AFTER STORM EVENT THAT EXCEEDS 0.5 INCHES OF RAINFALL.

ANNUALLY

16. REGULAR MOWING OPERATIONS ONLY NEED TO OCCUR ALONG MAINTENANCE ACCESS WAYS AND SHOULD OCCUR AT MINIMUM TWICE A YEAR.

EVERY TWO YEARS

17. REMOVE WOODY SPECIES ON OR NEAR THE EMBANKMENT, STRUCTURAL COMPONENTS SUCH AS INFLOW SWALES AND OUTFLOW PIPES, AND MAINTENANCE ACCESS AREAS.

EVERY 5-7 YEARS

18. THINNING OR HARVESTING OF EXCESS FOREST GROWTH WILL BE NEEDED PERIODICALLY TO GUIDE THE FORESTED WETLAND INTO A MORE MATURE STATE AND PREVENT IT FROM BECOMING OVERGROWN.
19. SEDIMENT REMOVAL IN THE PRETREATMENT FOREBAYS OCCUR WHEN 50% OF TOTAL FOREBAY CAPACITY HAS BEEN LOST.
20. SEDIMENT REMOVED FROM THE FOREBAY SHOULD BE DEPOSITED IN THE DESIGNATED MAINTENANCE SET ASIDE AREA FOR DEWATERING, PRIOR TO LEVELING AND STABILIZATION OR REMOVAL FROM THE SITE. SEDIMENTS EXCAVATED FROM CONSTRUCTED WETLANDS ARE NOT USUALLY CONSIDERED TOXIC OR HAZARDOUS. THEY CAN BE SAFELY DISPOSED OF BY EITHER LAND APPLICATION OR LAND FILLING.

Designed and Drawing based on Delaware Coordinate System: NAD83 Delaware State Plane Zone, US Foot

NOTES:

OWNER:
SUSSEX COUNTY
ATTN: VALERIE THOMPSON
VALERIE.THOMPSON@SUSSEXCOUNTYDE.GOV

Sussex County
Engineering Department
2 The Circle, P.O. Box 589
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PROJECT LOCATION:
SPRINGFIELD LANE
SUSSEX COUNTY, DE
LAT N38.679082 LONG W75.371012

DESIGNER:
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CAROL WONG, PE
CKW@CWP.ORG

CENTER FOR WATERSHED PROTECTION
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DEVELOPER:
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ATTN: MEGHAN NOE FELLOWS
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39375 INLET ROAD
REHOBOTH BEACH, DE 19971
302-226-8105

DELAWARE CENTER FOR THE INLAND BAYS
Research. Educate. Restore.

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED UNDER MY SUPERVISION AND TO THE BEST OF MY KNOWLEDGE COMPLIES WITH THE APPLICABLE STATE AND LOCAL REGULATIONS AND ORDINANCES.

MEGHAN NOE FELLOWS
4/17/2024

DATE	NO.	REVISION DESC.
–	4	–
4/17/24	3	SCD COMMENTS
3/26/24	2	SCD COMMENTS
3/1/24	1	WETLAND AND STREAM PER EL

SPRINGFIELD LANE SUBMERGED GRAVEL WETLAND
SEDIMENT AND STORMWATER MANAGEMENT PLANS

SHEET TITLE

PLANTING PLAN

DESIGNED BY EST	DATE 2/27/2024
CHECKED BY CKW	SHEET 10 OF 10
DRAWN BY EST	
SCALE 1"=20'	
PROJ. NO. W-23-034	

PROJECT INFORMATION:
FILE NAME: Design_App Part2.dwg
LAST SAVED DATE AND TIME: 17 Apr 2024, 12:34PM