

WETLANDS AND SUBAQUEOUS LANDS SECTION PERMIT APPLICATION FORM

**For Subaqueous Lands, Wetlands, Marina and
401 Water Quality Certification Projects**

**State of Delaware
Department of Natural Resources and Environmental Control
Division of Water**

Wetlands and Subaqueous Lands Section



**APPLICATION FOR APPROVAL OF
SUBAQUEOUS LANDS, WETLANDS, MARINA
AND WATER QUALITY CERTIFICATION PROJECTS**

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY**Application Instructions:**

1. Complete each section of this basic application and appropriate appendices as thoroughly and accurately as possible. Incomplete or inaccurate applications will be returned.
2. All applications must be accompanied by a scaled plan view and cross-section view plans that show the location and design details for the proposed project. Full construction plans must be submitted for major projects.
3. All applications must have an original signature page and proof of ownership or permitted land use agreement.
4. Submit an original and two (2) additional copies of the application (total of 3) with the appropriate application fee and public notice fee* (prepared in separate checks) to:

**Department of Natural Resources and Environmental Control
Wetlands and Subaqueous Lands Section
89 Kings Highway
Dover, Delaware 19901**

*Application and public notice fees are non-refundable regardless of the Permit decision or application status.

5. No construction may begin at the project site before written approval has been received from this office.

Helpful Information:

1. Tax Parcel Information:

New Castle County	(302) 395-5400
Kent County	(302) 736-2010
Sussex County	(302) 855-7878
2. Recorder of Deeds:

New Castle County	(302) 571-7550
Kent County	(302) 744-2314
Sussex County	(302) 855-7785
3. A separate application and/or approval may be required through the Army Corps of Engineers. Applicants are strongly encouraged to contact the Corps for a determination of their permitting requirements. For more information, contact the Philadelphia District Regulator of the Day at (215) 656-6728 or visit their website at: <http://www.nap.usace.army.mil/Missions/Regulatory.aspx>.
4. For questions about this application or the Wetlands and Subaqueous Lands Section, contact us at (302) 739-9943 or visit our website at: <http://www.dnrec.delaware.gov/wr/Services/Pages/WetlandsAndSubaqueousLands.aspx>. Office hours are Monday through Friday 8:00 AM to 4:30 PM, except on State Holidays.

APPLICANT'S REVIEW BEFORE MAILING**DID YOU COMPLETE THE FOLLOWING?**

_____ Yes	BASIC APPLICATION
_____ Yes	SIGNATURE PAGE (Page 3)
_____ Yes	APPLICABLE APPENDICES
_____ Yes	SCALED PLAN VIEW
_____ Yes	SCALED CROSS-SECTION OR ELEVATION VIEW PLANS
_____ Yes	VICINITY MAP
_____ Yes	COPY OF THE PROPERTY DEED & SURVEY
_____ Yes	THREE (3) COMPLETE COPIES OF THE APPLICATION PACKET
_____ Yes	APPROPRIATE APPLICATION FEE & PUBLIC NOTICE FEE (Separate checks made payable to the State of Delaware)

Submit 3 complete copies of the application packet to:

**Department of Natural Resources and Environmental Control
Wetlands and Subaqueous Lands Section
89 Kings Highway
Dover, Delaware 19901**

Before signing and mailing your application packet, please read the following:

The Department requests that the contractor or party who will perform the construction of your proposed project, if other than the applicant, sign the application signature page along with the applicant in the spaces provided. When the application is signed by the contractor as well as the applicant, the Department will issue the Permit to both parties. For Leases, the contractor will receive a separate construction authorization that will make them subject to all of the terms and conditions of the Lease relating to the construction

Section 1: Applicant Identification

1. Applicant's Name: Mr. Brett Warner Telephone #: 302-539-8011
 Mailing Address: Town of Bethany Beach Fax #: _____
214 Garfield Parkway E-mail: bbpw@townofbethanybeach.com
Bethany Beach, DE 19930
2. Consultant's Name: Ms. Jennifer Bird Company Name: KCI Technologies, Inc
 Mailing Address: 936 Ridgebrook Rd Telephone #: 410-316-7959
Sparks, MD 21152 Fax #: _____
 E-mail: jennifer.bird@kci.com
3. Contractor's Name: TBD Company Name: _____
 Mailing Address: _____ Telephone #: _____
 Fax #: _____
 E-mail: _____

Section 2: Project Description

4. Check those that apply:
☐ New Project/addition to existing project? ☒ Repair/Replace existing structure? (If checked, must answer #16)
5. Project Purpose (attach additional sheets as necessary):
The Town of Bethany Beach is proposing to replace a storm drain pipe in the Bethany Beach Loop Canal.
6. Check each Appendix that is enclosed with this application:

☐	A. Boat Docking Facilities	☐	G. Bulkheads	☐	N. Preliminary Marina Checklist
☐	B. Boat Ramps	☐	H. Fill	☐	O. Marinas
☐	C. Road Crossings	☐	I. Rip-Rap Sills and Revetments	☐	P. Stormwater Management
☐	D. Channel Modifications/Dams	☐	J. Vegetative Stabilization	☐	Q. Ponds and Impoundments
☐	E. Utility Crossings	☐	K. Jetties, Groins, Breakwaters	☐	R. Maintenance Dredging
☒	F. Intake or Outfall Structures	☐	M. Activities in State Wetlands	☐	S. New Dredging

Section 3: Project Location

7. Project Site Address: _____ County: ☐ N.C. ☐ Kent ☒ Sussex
1st Street and N Pennsylvania Ave Site owner name (if different from applicant): Same
Bethany Beach DE 19930 Address of site owner: _____
8. Driving Directions: From Rt 26 approaching the Rt 1 intersection - Head east on Garfield Pkwy towards Rt 1 S,
Turn left on Rd 51/ N Pennsylvania Ave, go past Central Blvd, the site is on the left at the 1st St intersection
 (Attach a vicinity map identifying road names and the project location)
9. Tax Parcel ID Number: 134-13.19-129.00 Subdivision Name: NA

WSLS Use Only:		Permit #s: _____	
Type	SP ☐ SL ☐ SU ☐ WE ☐ WQ ☐ LA ☐ SA ☐ MP ☐ WA ☐		
Corps Permit: SPGP 18 ☐ 20 ☐ Nationwide Permit #: _____		Individual Permit # _____	
Received Date: _____		Project Scientist: _____	
Fee Received? Yes ☐ No ☐ Amt: \$ _____		Receipt #: _____	
Public Notice #: _____		Public Notice Dates: ON _____ OFF _____	

Section 3: Project Location (Continued)

10. Name of waterbody at Project Location: Bethany Beach Loop Canal waterbody is a tributary to: Salt Pond

11. Is the waterbody: ☒ Tidal ☐ Non-tidal Waterbody width at mean low or ordinary high water 1.6 MHWL

12. Is the project: ☒ On public subaqueous lands? ☐ On private subaqueous lands?*

☐ In State-regulated wetlands? ☐ In Federally-regulated wetlands?

*If the project is on private subaqueous lands, provide the name of the subaqueous lands owner:

(Written permission from the private subaqueous lands owner must be included with this application)

13. Present Zoning: ☐ Agricultural ☐ Residential ☐ Commercial ☐ Industrial ☒ Other

Section 4: Miscellaneous

14. A. List the names and complete mailing addresses of the immediately adjoining property owners on all sides of the project (attach additional sheets as necessary):

Town of Bethany Beach - 214 Garfield Parkway, Bethany Beach, DE 19930

Michael Emerson, David Lorence, Mark Pellicano, & Jerren Pellicano - 7001 Croom Station Rd, Upper Marlboro, MD 20772

B. For wetlands and marina projects, list the names and complete mailing addresses of property owners within a 1,000 foot radius of the project (attach additional sheets as necessary):

15. Provide the names of DNREC and/or Army Corps of Engineers representatives whom you have discussed the project with:
Michael Yost - USACE

A. Have you had a State Jurisdictional Determination performed on the property? ☐ Yes ☒ No

B. Has the project been reviewed in a monthly Joint Permit Processing Meeting? ☐ Yes ☒ No

*If yes, what was the date of the meeting? _____

16. Are there existing structures or fill at the project site in subaqueous lands? ☒ Yes ☐ No

*If yes, provide the permit and/or lease number(s): _____

*If no, were structures and/or fill in place prior to 1969? ☐ Yes ☒ No

17. Have you applied for or obtained a Federal permit from the Army Corps of Engineers?

☐ No ☒ Pending ☐ Issued ☐ Denied Date: _____

Type of Permit: _____ Federal Permit or ID #: _____

18. Have you applied for permits from other Sections within DNREC?

☒ No ☐ Pending ☐ Issued ☐ Denied Date: _____ Permit or ID #: _____

Type of permit (circle all that apply): Septic Well NPDES Storm Water

Other: _____

Section 5: Signature Page**19. Agent Authorization:**

If you choose to complete this section, all future correspondence to the Department may be signed by the duly authorized agent. In addition, the agent will become the primary point of contact for all correspondence from the Department.

I do not wish to authorize an agent to act on my behalf ☐

I wish to authorize an agent as indicated below ☒

I, Brett Warner, hereby designate and authorize Jennifer Bird, KCI Technologies, Inc.
(Name of Applicant) (Name of Agent)
to act on my behalf in the processing of this application and to furnish any additional information requested by the Department.

Authorized Agent's Name: Jennifer Bird, KCI Technologies, Inc.

Telephone #: 410-316-7959

Mailing Address: 936 Ridgebrook Road, Sparks, MD 21152

Fax #: _____

E-mail: jennifer.bird@kci.com

20. Agent's Signature:

I hereby certify that the information on this form and on the attached plans are true and accurate to the best of my knowledge. I further understand that the Department may request information in addition to that set forth herein if deemed necessary to appropriately consider this application.

Jennifer H. Bird

Agent's Signature

12/31/2025

Date

21. Applicant's Signature:

I hereby certify that the information on this form and on the attached plans are true and accurate to the best of my knowledge and that I am required to inform the Department of any changes or updates to the information provided in this application. I further understand that the Department may request information in addition to that set forth herein if deemed necessary to appropriately consider this application. I grant permission to authorized Department representatives to enter upon the premises for inspection purposes during working hours.

Brett J. Warner

Applicant's Signature

01/08/2025

Date

Brett Warner, Town of Bethany Beach

Print Name

22. Contractor's Signature:

I hereby certify that the information on this form and on the attached plans are true and accurate to the best of my knowledge, and that I am required to inform the Department of any changes or updates to the information provided in this application. I further understand that the Department may request information in addition to that set forth herein if deemed necessary to appropriately consider this application.

Contractor's Name

Date

Print Name



ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

936 Ridgebrook Road
Sparks, MD 21152
PHONE: (410) 316-7800
FAX: (410) 316-7817
www.kci.com

DATE:
DECEMBER 2025

SCALE:
1"= 2,000'

KCI JOB#:
272307963

DRAWN BY:
JY

TOWN OF BETHANY BEACH
NORTH PENNSYLVANIA AVENUE DRAINAGE IMPROVEMENTS
BETHANY BEACH, DELAWARE

VICINITY MAP

2,000' 0 2,000'
SCALE: 1"=2,000'

SHEET 1 OF 3

Dec 30, 2025 -- 2:49pm User: amanda.wagner M: \\2023\\272307963 Town of Bethany Beach\\Town Projects\\North PA Ave Drainage Improvements\\NR - Impact Plates\\PA Loop Impacts.dwg

LEGEND

PROPERTY LINE	
PROPERTY BOUNDARY	
BUILDING OUTLINE	
BUILDING FOUNDATION	
FENCE	
SIDE WALK	
ELECTRICAL OVERHEAD LINE	
FIBER CABLES	
ELECTRICAL POLE	
STORM SEWAGE PIPE	
MAIN WATER PIPE	
SEWER LINE	
CONTOURS	
RIPRAP	
LOD	
TREELINE	
STREAM	
MEAN HIGH WATER LINE (MHWL)	
MEAN LOW LOWER WATER LINE (MLLWL)	

IMPACT LEGEND

	TIDAL IMPACT 779 SF / 0.02 AC 34 LF CHANNELWARD
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ENGINEERS
PLANNERS
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CONSTRUCTION MANAGERS

936 Ridgebrook Road
Sparks, MD 21152
PHONE: (410) 316-7800
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DATE:
DECEMBER 2025

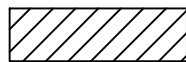
SCALE:
AS SHOWN

KCI JOB#:
272307963

DRAWN BY:
JY

TOWN OF BETHANY BEACH
NORTH PENNSYLVANIA AVENUE DRAINAGE IMPROVEMENTS
BETHANY BEACH, DELAWARE

LEGEND



EROSION & SEDIMENT CONTROL PLAN
FOR
NORTH PENNSYLVANIA AVENUE
DRAINAGE IMPROVEMENTS

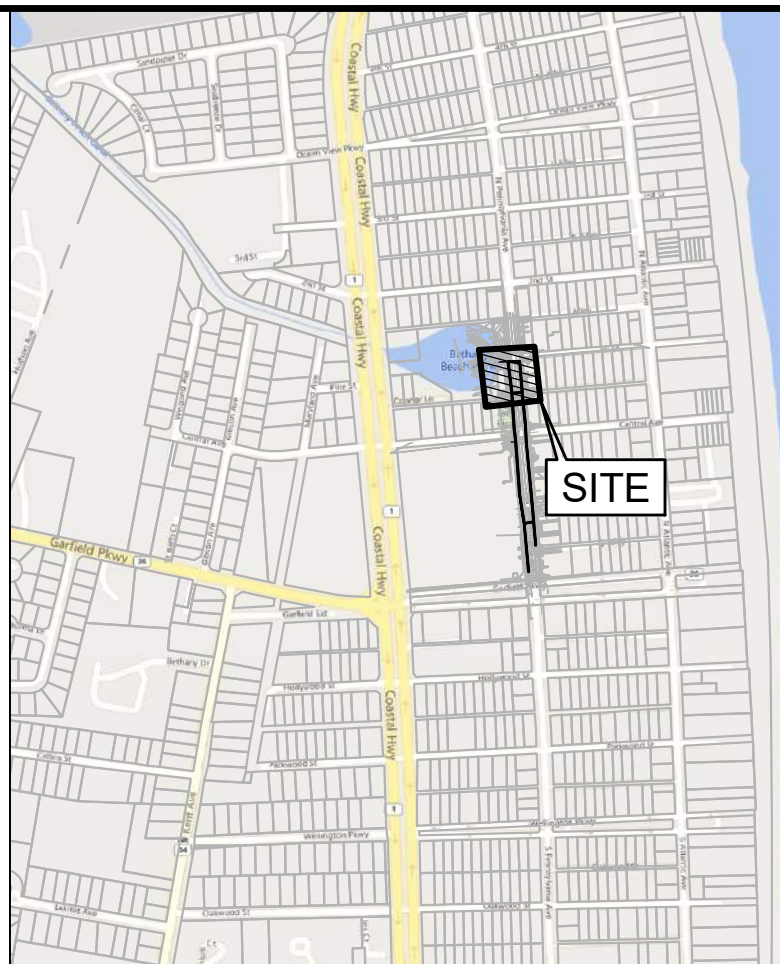
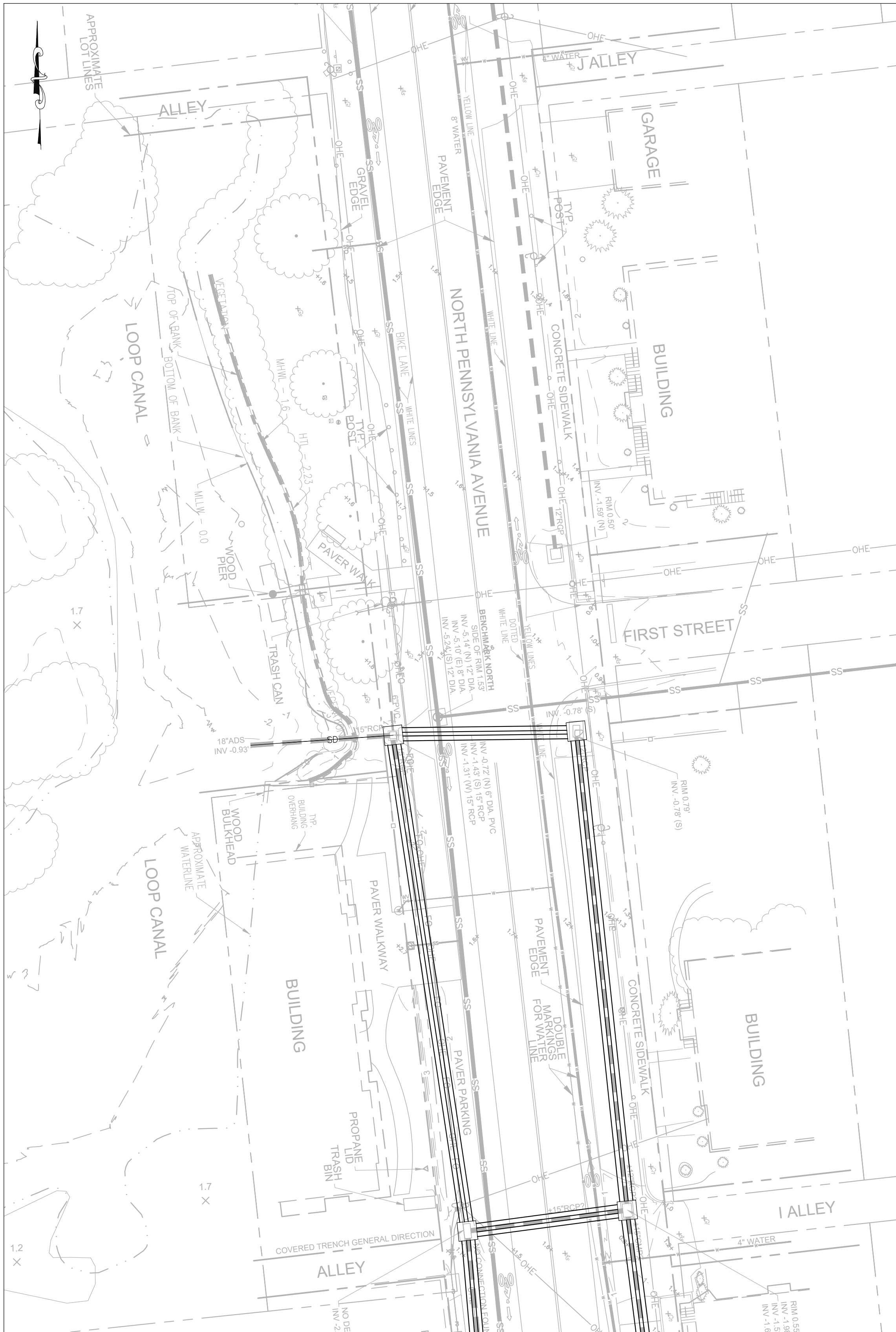
BETHANY BEACH, DELAWARE

STANDARD SEDIMENT AND STORMWATER CONTROL NOTES

1. THE DNREC SEDIMENT AND STORMWATER PROGRAM 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 APPLY.
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, IS 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 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 NOTICE OF INTENT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER A NPDES GENERAL PERMIT FOR THIS PROJECT IS # _____. THE PERMITTEE OF RECORD SHALL NOT BE RELIEVED OF THEIR RESPONSIBILITIES UNTIL A NOTICE OF TERMINATION HAS BEEN PROCESSED BY THE DEPARTMENT.
11. THE OWNER SHALL BE FAMILIAR WITH AND COMPLY WITH ALL ASPECTS OF THE NPDES CONSTRUCTION GENERAL PERMIT.
12. 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.
13. 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.
14. 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).
15. 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 TO VERIFY THAT THE PERMANENT OR TEMPORARY STABILIZATION HAS BEEN COMPLETED IN ACCORDANCE WITH THE APPROVED PLAN.
16. THE DEPARTMENT 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.
17. WHEN DIRECTED BY THE DEPARTMENT, THE OWNER SHALL ACQUIRE THE SERVICES OF A THIRD PARTY CERTIFIED CONSTRUCTION REVIEWER (CCR) TO PERFORM WEEKLY CONSTRUCTION REVIEWS. SEDIMENT AND STORMWATER MANAGEMENT PLANS APPROVED BY THE DEPARTMENT SHALL HAVE A THIRD PARTY CCR.

SEQUENCE OF CONSTRUCTION

1. NOTIFY THE DNREC SEDIMENT AND STORMWATER PROGRAM 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. PRIOR TO ANY CLEARING, INSTALLATION OF SEDIMENT CONTROL MEASURES OF GRADING, A PRE-CONSTRUCTION MEETING SHALL BE SCHEDULED AND CONDUCTED WITH THE AGENCY CONSTRUCTION SITE REVIEWER. THE LANDOWNER/DEVELOPER, CONTRACTOR, AND THIRD PARTY CERTIFIED CONSTRUCTION REVIEWER (CCR) ARE REQUIRED TO BE IN ATTENDANCE AT THE PRE-CONSTRUCTION MEETING. THE DESIGNER IS RECOMMENDED TO ATTEND.
3. CLEAR AND GRUB AREAS AS NECESSARY TO INSTALL PERIMETER CONTROLS.
4. INSTALL PERIMETER CONTROLS. 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 SITE. ACCUMULATED SEDIMENT SHOULD BE REMOVED WHEN IT HAS REACHED HALF OF THE EFFECTIVE CAPACITY OF THE CONTROL. IN ADDITION, CONTRACTOR MAY NEED TO ADJUST OR REPAIR MEASURES IN TIMES OF ADVERSE WEATHER CONDITIONS, OR AS DIRECTED BY THE AGENCY CONSTRUCTION SITE REVIEWER.
5. ALL PERIMETER CONTROLS ARE TO BE REVIEWED BY THE AGENCY CONSTRUCTION SITE REVIEWER AND APPROVED PRIOR TO PROCEEDING WITH FURTHER SITE DISTURBANCE OR CONSTRUCTION.
6. CLEAR AND GRUB REMAINING AREAS AND INSTALL STABILIZED CONSTRUCTION ENTRANCE.
7. INSTALL TURBIDITY CURTAIN IN LOOP CANAL.
8. INSTALL METAL SHEET PILING AT A HEIGHT OF AT LEAST ELEVATION 3 TO SERVE AS A TEMPORARY COFFERDAM. METHOD TO BE DETERMINED BY CONTRACTOR.
9. BLOCK UPSTREAM PIPES AT TWO UPSTREAM STORM DRAIN INLETS AS SHOWN ON THE PLAN.
10. INSTALL PUMP IN BOTH UPSTREAM STORM DRAIN INLETS AND CONNECT TO DEWATERING BAG AS SHOWN ON THE PLAN.
11. REMOVE EXISTING STORM DRAIN INLET ON WEST SIDE OF FIRST STREET ADJACENT TO THE LOOP CANAL AND REMOVE EXISTING STORM PIPE IN THE LOOP CANAL.
12. INSTALL PROPOSED STORM DRAIN INLET ON THE WEST SIDE OF FIRST STREET AS SHOWN ON THE PLAN AND INSTALL PROPOSED STORM PIPE THAT OUTFALLS IN LOOP CANAL AS SHOWN ON THE PLAN.
13. PERFORM FINAL GRADING, LANDSCAPING OR STABILIZATION AS NECESSARY TO MATCH EXISTING GRADING.
14. 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.
15. 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.



LOCATION MAP

SCALE: 1"=800'

SHEET INDEX

C-100	COVER SHEET
C-101 - C-102	EROSION & SEDIMENT CONTROL PLAN
C-103 - C-104	DETAILS
C-105	PROFILE

PLAN PURPOSE NOTE

THE PURPOSE OF THIS PLAN IS TO SHOW AN EROSION AND SEDIMENT CONTROL PLAN FOR REPLACEMENT OF THE PIPE OUTFALLING IN THE LOOP CANAL.

SITE DATA COLUMN

1. SITE ADDRESS: NORTH PENNSYLVANIA AVENUE, BETHANY BEACH, DE 19930
2. OWNER INFORMATION: TOWN OF BETHANY BEACH
214 GARFIELD PARKWAY
BETHANY BEACH, DE 19930
3. ENGINEER INFORMATION: KCI TECHNOLOGIES INC
600 WHITE CLAY CENTER DRIVE, SUITE 200
NEWARK, DE 19711
4. EXISTING ZONING: N/A
PROPOSED ZONING: N/A
5. EXISTING USE: ROADWAY
PROPOSED USE: ROADWAY
6. SURVEY DATUM:
VERTICAL DATUM: NAVD 88
HORIZONTAL DATUM: DELAWARE STATE PLAN NAD83
7. TOPOGRAPHY:
THE TOPOGRAPHY DEPICTED ON THIS PLAN IS BASED UPON TOPOGRAPHIC SURVEY PREFORMED BY CORNERSTONE SURVEYING, INC IN SEPTEMBER 2024.
8. LIMIT OF DISTURBANCE: N/A
9. UTILITY PROVIDERS:
WATER: TIDEWATER UTILITIES
SEWER: SUSSEX COUNTY
GAS: CHESAPEAKE UTILITIES
ELECTRIC: DELAWARE ELECTRIC CO-OP
10. FLOODPLAIN
THIS SITE LIES WITHIN THE FEMA 100 YEAR FLOODPLAIN ZONE AE. LIMITS OF THE 100 YEAR FLOODPLAIN WERE TAKEN FROM FLOOD INSURANCE RATE MAP NO. 10005C0516K EFFECTIVE DATE MARCH 16, 2015.
11. MISS UTILITY NOTE:
THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT ALL EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY AND ALL DAMAGE DONE TO THEM DUE TO THE CONTRACTOR'S NEGLIGENCE SHALL BE IMMEDIATELY AND COMPETENTLY REPAIRED AT HIS EXPENSE. EXISTING UTILITIES ARE SHOWN IN ACCORDANCE WITH THE BEST AVAILABLE INFORMATION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY AND ALLOW FOR THEIR LOCATIONS. CONTACT "MISS UTILITY" THREE (3) WORKING DAYS PRIOR TO CONSTRUCTION.

MISS UTILITY 1-800-282-8555

PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE IN THE AREA OF ANY POTENTIAL UTILITY CROSSING TO VERIFY THAT THE UTILITY WILL NOT INTERFERE WITH CONSTRUCTION. IF, AFTER UNCOVERING OF THE UTILITY, THERE IS ANY QUESTION CONCERNING A POSSIBLE CONFLICT, THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE ENGINEER.
12. CRITICAL NATURAL AREAS
THE STATE INVENTORY OF NATURAL AREAS HAS BEEN EXAMINED AND AS PER THE CRITICAL NATURAL AREAS MAP, NO CRITICAL NATURAL AREAS (CNA) ARE LOCATED ON SITE.

CERTIFICATION OF OWNERSHIP

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.

OWNER
TOWN OF BETHANY BEACH

DATE

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.

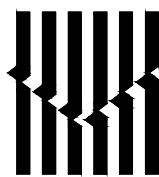
NAME AND TITLE

DATE

COVER SHEET

FOR
NORTH PA AVE DRAINAGE IMPROVEMENTS
BALTIMORE HUNDRED
SUSSEX COUNTY
DELAWARE

KCI TECHNOLOGIES, INC.



ENGINEERS - PLANNERS - SURVEYORS
600 WHITE CLAY CENTER DRIVE - SUITE 200 - NEWARK, DELAWARE 19711
PHONE: (857) 751-6176 FAX: (857) 751-6667 Website: www.kci.com

OWNER/DEVELOPER:

TOWN OF BETHANY BEACH
214 GARFIELD PARKWAY, BETHANY BEACH
302-533-8011

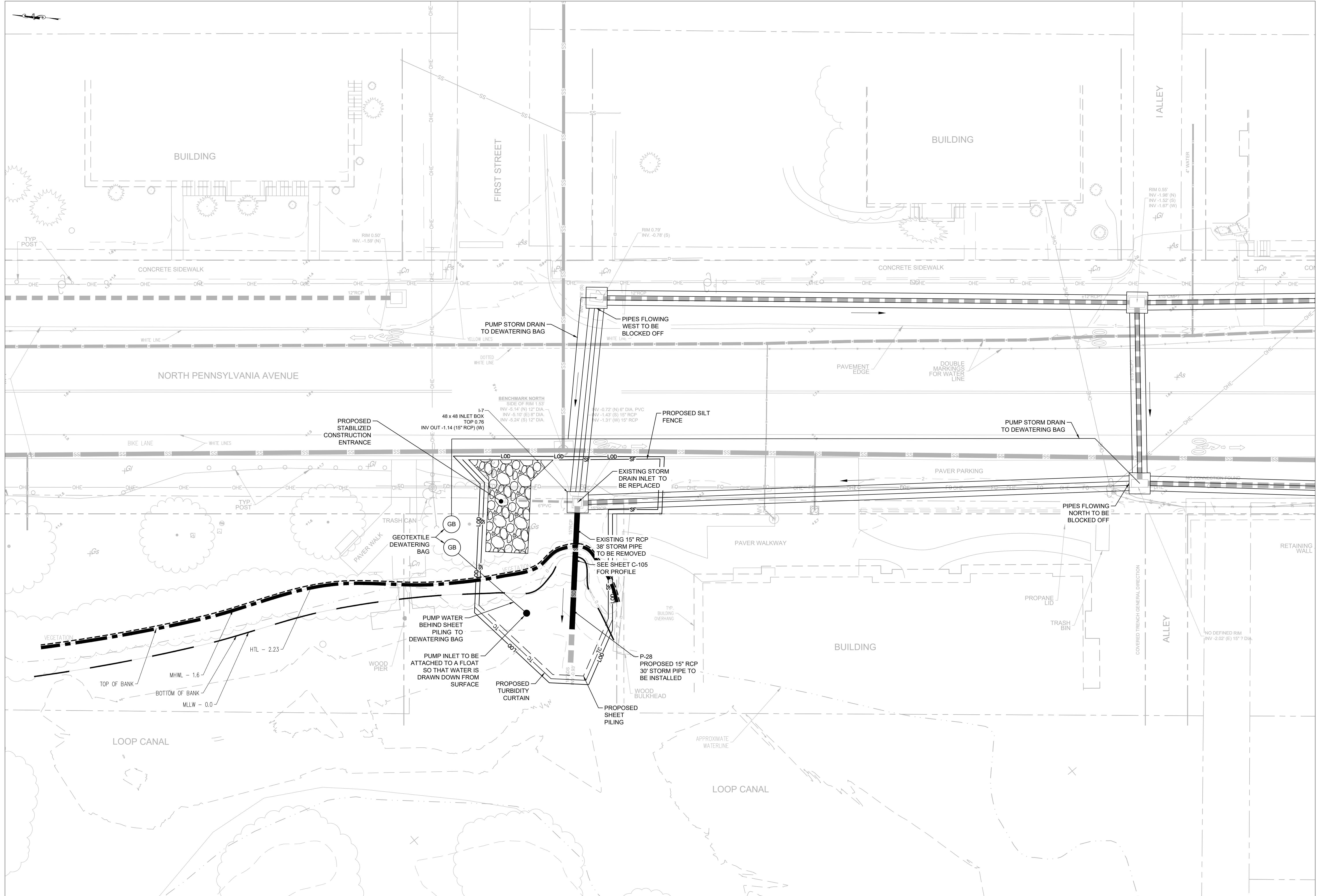
DATE

REVISION

SCALE: 1" = 80'
60 80 120
SCALE - PLAN: 1" = 80'

Drafting:	MD	Check:	JL
Design:	MD	Check:	JL
SCALE:	1" = 60'		
DATE:	2/10/26		
KCI JOB #:	00008434		
SHEET:	C-100		

DATE: 2/10/26
DRAWN BY: JLD
CHECKED BY: JLD
SCALE: 1" = 10'



EROSION & SEDIMENT CONTROL PLAN

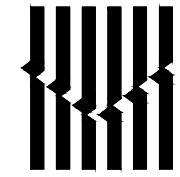
NORTH PA AVE DRAINAGE IMPROVEMENTS

BALTIMORE HUNDRED SUSSEX COUNTY DELAWARE

OWNER/DEVELOPER:

TOWN OF BETHANY BEACH
214 GARFIELD PARKWAY
BETHANY BEACH, MD 20758
302-593-8011

KCI TECHNOLOGIES, INC.
ENGINEERS - PLANNERS - SURVEYORS
600 WHITE CLAY CENTER DRIVE - SUITE 200 - NEWARK, DELAWARE 19711
PHONE: (302) 731-9176 FAX: (302) 731-1867 Website: www.kci.com



SCALE: PLAN: 1" = 10'

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Drafting:	MD	Check:	JL
Design:	MD	Check:	JL
SCALE:	1" = 10'		
DATE:	2/10/26		
KCI JOB #:	00006440		
SHEET:	C-101		

DATE

REVISION

Standard Detail & Specifications

Geotextile Dewatering Bag

The diagram illustrates the components and installation of a geotextile dewatering bag. The **Plan** view shows a rectangular bag with a rounded end, labeled "Geotextile dewatering bag". It has a "Width" dimension on the left and a "Length" dimension at the bottom. A "High strength strapping" is shown on the right side, connected to a "Flow" arrow pointing into the bag. A "Pump discharge hose" is also shown on the right, connected to the bag. The **Profile** view shows the bag installed on a "soil surface" with an "Aggregate underlayment" layer on top. A "Flow" arrow points into the bag from the right.

Plan

Profile

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

Source: Adapted from ACF Products, Inc.	Symbol: 	Detail No. DE-ESC-3.2.1.2 Sheet 1 of 2 Effective July 2023
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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: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 33%; padding: 5px;">Type</th> <th style="width: 33%; padding: 5px;">TEST METHOD</th> <th style="width: 33%; padding: 5px;">TEST RESULT</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Heavy duty</td> <td style="padding: 5px;">ASTM D-4884</td> <td style="padding: 5px;">100 lb / in</td> </tr> </tbody> </table> 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.			Type	TEST METHOD	TEST RESULT	Heavy duty	ASTM D-4884	100 lb / in
Type	TEST METHOD	TEST RESULT						
Heavy duty	ASTM D-4884	100 lb / in						
Maintenance: 1. Any sediment captured by the geotextile dewatering bag must be taken to an approved upland disposal area.								
Source: Adapted from ACF Products, Inc.	Symbol: 	Detail No. DE-ESC-3.2.1.2 Sheet 2 of 2 Effective July 2023						

Standard Detail & Specifications

Stabilized Construction Entrance

The diagram illustrates a stabilized construction entrance. The **Plan** view shows a rectangular structure 50' min. long. It consists of a 10' min. section of DE #3 Stone on the left, followed by a central area containing a 'Wash rack (optional)' and another 10' min. section of DE #3 Stone. The right side features a sloped outlet with a 10' min. vertical height and a 10' min. horizontal distance to the 'Edge exist. pave'. Section lines A-A are indicated. A note states: 'Provide positive drainage to sediment trapping device'. The **Profile** view shows the structure's cross-section, 50' min. long, with a 3' high 'Mountable berm (as needed)' at the right end. It shows a '6" min.' deep layer of stone over a 'G5-1 geotextile' layer, which sits on 'Exist. grnd'. A 'Culvert pipe (as needed)' is shown at the right end. The **Section A-A (Std.)** shows a 10' min. wide stone-filled area with a 3" min. layer of 'Type G5-1 geotextile fabric' at the base.

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:

- Stone size - Use DE #3 stone.
- Length - As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum length would apply).
- Thickness - Not less than size (6) inches.
- Width - Ten (10) foot minimum, but not less than the full width at points where ingress or egress occurs.
- Geotextile - Type GS-I; placed over the entire area prior to placing of stone.
- 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.
- 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.
- 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.
- Inspection - Periodic inspection and needed maintenance shall be provided after each rain.

Source: Adapted from VA ESC Handbook	Symbol: SC	Detail No. DE-ESC-3.4.7 Sheet 2 of 2 Effective July 2023
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Standard Detail & Specifications

Turbidity Curtain

1/4 IN. TIE ROPE

5/8 IN. POLYPROPYLENE ROPE

FLOATATION

FOLDS FOR COMPACT STORAGE

DEPTH ACCORDING TO NEED

NYLON REINFORCED VINYL

ALL SEAMS HEAT SEALED

ECONOMY FABRICS AVAILABLE
18 OZ. 300 L.B./IN. STANDARD

1/4 IN. CHAIN

(BLOW-UP OF SHACKLE CONNECTION)

Typical Section - Type 1

DATA

Curtain type (1,2, or 3)
Layout (Std. or Alt.)

Source: Adapt. from Amer. Boom and Barrier Corp.	Symbol: TC-(1/2/3) (Std/Alt)	Detail No. DE-ESC-3.5.3 Sheet 1 of 8 Effective July 2023
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Standard Detail & Specifications

Turbidity Curtain

18 (OR 22) OZ. VINYL COVERED NYLON

PVC SLOT-CONNECTOR

GALVANIZED #24 SAFETY HOOK

WATER SEAL

TOP LOAD LINE
5/16 VINYL COATED CABLE

STRESS PLATE (TO REMOVE PRESSURE FROM FLOATS)

FLATATION

100 FT. STANDARD LENGTH

DEPTH ACCORDING TO NEED

FOLDS EVERY 6 FEET

STRESS BAND

STRESS PLATE

5/16 IN. CHAIN BALLAST & LOAD LINE

Typical Section - Type 2

DATA

Curtain type (1, 2, or 3)
Layout (Std. or Alt.)

Source: Adapt. from Amer. Boom and Barrier Corp.	Symbol: TC-(1/2/3) (Std/Alt)	Detail No. DE-ESC-3.5.3 Sheet 2 of 8 Effective July 2023
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Standard Detail & Specifications

Turbidity Curtain

22 OZ. NYLON REINFORCED VINYL

STRESS BAND

PVC SLOT - CONNECTOR

FLOATATION

DEPTH ACCORDING TO NEED

5/16 VINYL COATING CABLE
(ON BOTH SIDES OF CURTAIN
TO REDUCE STRAIN)

#24 SAFETY HOOK

STRESS PLATE

LAP LINK

5/16 IN.
CHAIN

Typical Section - Type 3

DATA

Curtain type (1, 2, or 3)
Layout (Std. or Alt.)

Source: Adapt. from Amer. Boom and Barrier Corp.	Symbol: TC-(1/2/3) (Std/Alt)	Detail No. DE-ESC-3.5.3 Sheet 3 of 8 Effective July 2023
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Standard Detail & Specifications

Turbidity Curtain

NOTE: The standard layout shown is intended for use in streams, ponds and other non-tidal waters

Plan - Std. Layout

Source: Adapt. from Amer. Boom and Barrier Corp.	Symbol: TC-(1/2/3) (Std/Alt)	Detail No. DE-ESC-3.5.3 Sheet 4 of 8 Effective July 2023
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NORTH PA AVE DRAINAGE IMPROVEMENTS	
BALTIMORE HUNDRED	SUSSEX COUNTY
DELAWARE	

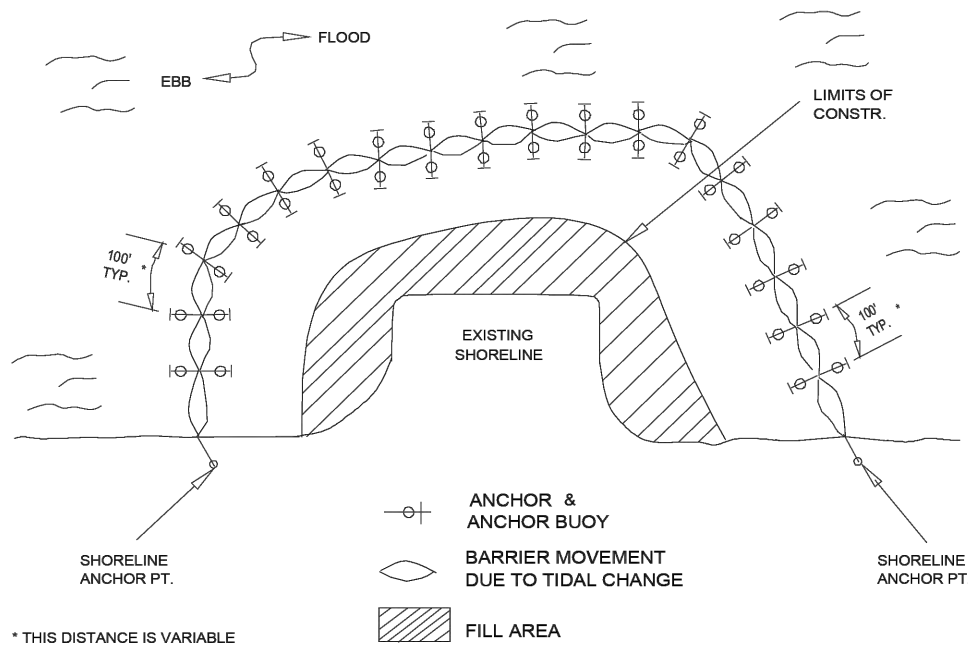
TOWN OF BETHANY BEACH
RIVERFIELD PARKWAY, BETHANY BEACH
DE 19930
302-539-8011

DATE	REVISION
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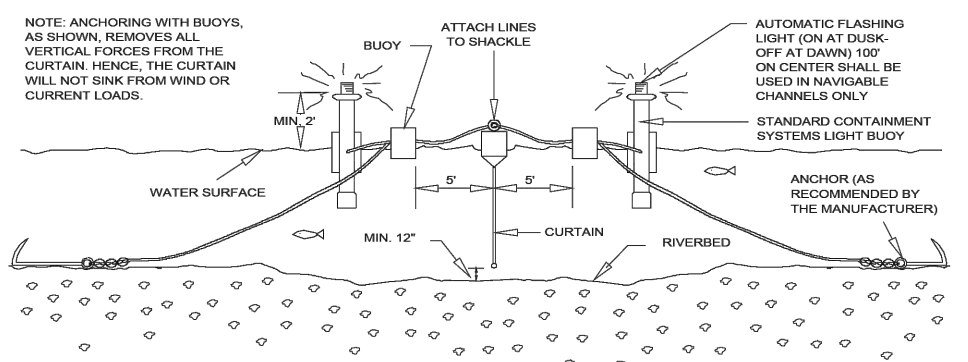
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JOB #:	00008434		
EET:	C-103		

Standard Detail & Specifications
Turbidity Curtain

NOTE: The alternative layout shown is intended for tidal waters and/or heavy wind and wave action



Plan - Alt. Layout



Additional Requirements for Navigable Waters

Source:	Symbol:	Detail No.
Adapt. from Amer. Boom and Barrier Corp.	TC-(1/2/3) (Std/Alt)	DE-ESC-3.5.3 Sheet 5 of 8 Effective July 2023

Standard Detail & Specifications
Turbidity Curtain

Construction Notes:

- Materials**
 - Barriers should be a bright color (yellow or "international" orange are recommended) that will attract the attention of nearby boaters.
 - The curtain fabric shall meet manufacturer's recommendations for the application.
 - Seams in the fabric shall be either vulcanized welded or sewn and shall develop the full strength of the fabric.
 - Floatation devices shall be flexible, buoyant units contained in an individual floatation sleeve or collar attached to the curtain. Buoyancy provided by the floatation units shall be sufficient to support the weight of the curtain and maintain a freeboard of at least 3 inches above the water surface level.
 - Load lines must be fabricated into the bottom of all floating turbidity curtains. Type II and Type III must have load lines also fabricated into the top of the fabric. The top load line shall consist of woven webbing or vinyl-sheathed steel cable and shall have a break strength in excess of 10,000 pounds. The supplemental (bottom) load line shall consist of a chain incorporated into the bottom hem of the curtain of sufficient weight to serve as ballast to hold the curtain in a vertical position. Additional anchorage shall be provided as necessary. The load lines shall have suitable connecting devices which develop the full breaking strength for connection to load lines in adjacent sections as shown in the detail.
 - External anchors may consist of wooden or metal stakes (2- x 4-inch or 2-1/2-inch minimum diameter wood or 1.33 lbs/linear foot steel) when Type I installation is used; when Type II or Type III installations are used, bottom anchors should be used.
 - Bottom anchors must be sufficient to hold the curtain in the same position relative to the bottom of the watercourse without interfering with the action of the curtain. The anchor may dig into the bottom (grappling hook, plow or fluke-type) or may be weighted (mushroom type) and should be attached to a floating anchor buoy via an anchor line. The anchor line should then run from the buoy to the to load line of the curtain. When used with Type II installations, these lines must contain enough slack to allow the buoy and curtain to float freely with tidal changes without pulling the buoy or curtain down and must be checked regularly to make sure they do not become entangled with debris. As previously noted, anchor spacing will vary with current velocity and potential wind and wave action; manufacturer's recommendations should be followed. See detail for orientation of external anchors and anchor buoys for tidal installations.

Source:	Symbol:	Detail No.
Adapt. from Amer. Boom and Barrier Corp.	TC-(1/2/3) (Std/Alt)	DE-ESC-3.5.3 Sheet 6 of 8 Effective July 2023

Standard Detail & Specifications
Turbidity Curtain

Construction Notes (cont.)

- Installation**
 - In the calm water of lakes or ponds (Type I installation) it is usually sufficient to set the curtain end stakes or anchor points (using anchor buoys if bottom anchors are employed), then tow the curtain in the furled condition out and attach it to the stakes or anchor points. Following this, any additional stakes or buoyed anchors required to maintain the desired location of the curtain may be set and these anchor points made fast to the curtain. Only then shall the furling lines be cut to allow the curtain skirt to drop.
 - In rivers or in other moving waters (Type II and Type III installations) it is important to set all curtain anchor points. Care must be taken to ensure that anchor points are of sufficient holding power to retain the curtain under the existing current conditions, prior to putting the furled curtain into the water. Anchor buoys should be employed on all anchors to prevent the current from submerging the flotation at the anchor points. If the curtain is being installed into tidal areas which would be subject to currents in both directions, anchors should be provided on both sides of the curtain. This will minimize curtain movement and prevent the curtain from overrunning the anchors during tide reversals. After the anchors have been secured, the furled curtain should be secured to the upstream anchor point and then sequentially attached to each next downstream anchor point until the entire curtain is in position. Before unfurling, the "lay" of the curtain should be assessed and any necessary adjustments made to the anchors. Once the location has been deemed adequate, the furling lines may be cut to allow the skirt to drop.
 - Anchor lines should be attached to the flotation device, not to the bottom of the curtain. The anchoring line attached to the flotation device on the downstream side will provide support for the curtain. Attaching the anchors to the bottom of the curtain could cause premature failure of the curtain due to the stresses imparted on the middle section of the curtain.
 - Turbidity curtain shall not be installed across channel flows unless there is a danger of causing sediment deposition to occur in the middle of a watercourse, thereby blocking access or creating a sand bar. In such situations, the curtain may be installed so as to form a long-sided, sharp "V" to deflect clean water around a work site, confining most of the silt-laden water to the work area inside the "V" and directing it to the shoreline. In no case shall the curtain be installed perpendicular to the channel flow.

Source:	Symbol:	Detail No.
Adapt. from Amer. Boom and Barrier Corp.	TC-(1/2/3) (Std/Alt)	DE-ESC-3.5.3 Sheet 7 of 8 Effective July 2023

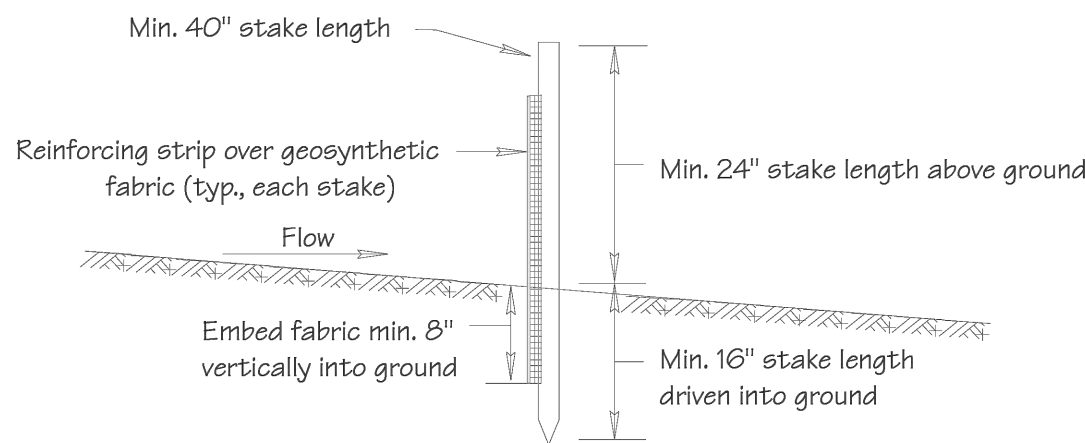
Standard Detail & Specifications
Turbidity Curtain

Construction Notes (cont.)

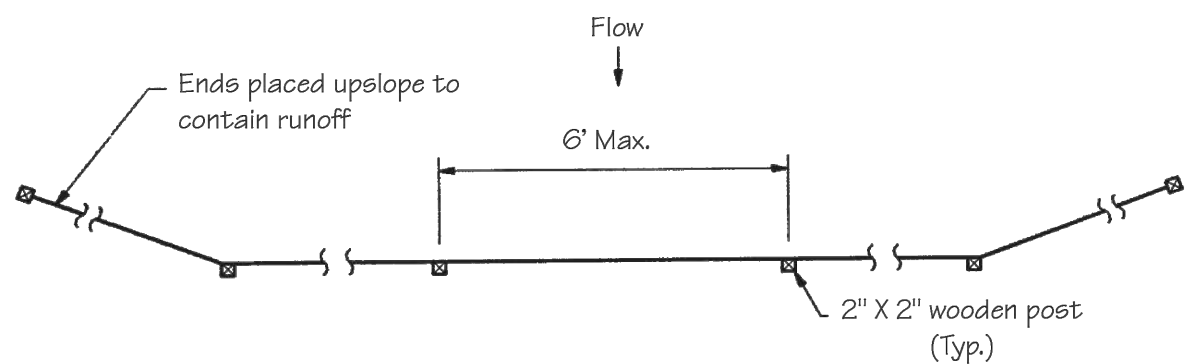
- Maintenance**
 - The individual(s) identified on the plan as responsible for maintenance of the curtain shall do so for the duration of the project in order to ensure the continuous protection of the watercourse.
 - Should repairs to the geotextile fabric become necessary, repair kits are generally available from the manufacturer. The manufacturer's instructions must be followed to ensure the adequacy of the repair.
 - When the curtain is no longer required as determined by the inspector, the curtain and related components shall be removed in such a manner as to minimize turbidity. Remaining sediment shall be sufficiently settled before removing the curtain. Sediment may be removed and the original depth (or plan elevation) restored. Any spoils must be taken to an approved upland disposal area and stabilized in accordance with the approved plan.
- Removal**
 - Care shall be taken to protect the skirt from damage as the turbidity curtain is dragged from the watercourse.
 - The site selected to bring the curtain ashore should be free of sharp rocks, broken cement, debris, etc. so as to minimize damage when hauling the curtain over the area.
 - If the curtain has a deep skirt, it can be further protected by running a small boat along its length with a crew installing furling lines before attempting to remove the curtain from the water.

Source:	Symbol:	Detail No.
Adapt. from Amer. Boom and Barrier Corp.	TC-(1/2/3) (Std/Alt)	DE-ESC-3.5.3 Sheet 8 of 8 Effective July 2023

Standard Detail & Specifications
Silt Fence



Section

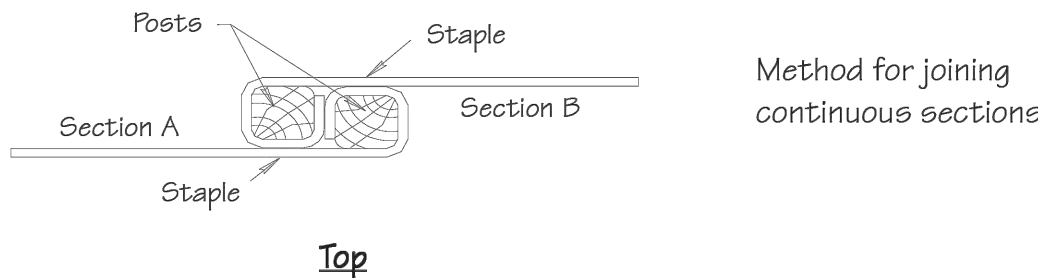


Plan

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

Construction Notes:

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

Materials:

- Stakes:** Steel (either T or U) or 2" x 2" hardwood
- Geosynthetic Fabric:** Type GD-I
- 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

EROSION & SEDIMENT CONTROL DETAILS

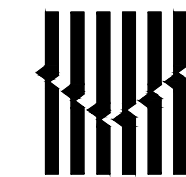
FOR
NORTH PA AVE DRAINAGE IMPROVEMENTS
BALTIMORE HUNDRED SUSSEX COUNTY DELAWARE

Drafting:	MD	Check:	JL
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DATE:	2/10/26		
KCI JOB #:	00008434		
SHEET:	C-104		

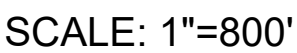
OWNER/DEVELOPER:

TOWN OF BETHANY BEACH
214 GARFIELD PARKWAY, BETHANY BEACH
302-553-8011

KCI TECHNOLOGIES, INC.
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600 WHITE CLAY CENTER DRIVE - SUITE 200 - NEWARK, DELAWARE 19711
PHONE (302) 731-5176 FAX (302) 731-5187 Website: www.kci.com



BETHANY BEACH, DELAWARE



SITE DATA COLUMN

- ## CERTIFICATION OF OWNERSHIP

I, _____, HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY WHICH IS THE SUBJECT OF THIS PLAN AND THAT THE LAND USE ACTION PROPOSED BY THIS PLAN IS MADE AT MY DIRECTION AND THAT I AUTHORIZE THIS PLAN TO BE APPROVED PURSUANT TO THE RECORD PLAN FOR _____, INSTRUMENT NO. _____ IN ACCORDANCE WITH THE REGULATIONS OF THE SUSSEX COUNTY ZONING ORDINANCE.

OWNER
TOWN OF BETHANY BEACH

DATE _____

CERTIFICATION OF ACCURACY

I, , HEREBY CERTIFY THAT I AM A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF DELAWARE WITH A BACKGROUND IN CIVIL ENGINEERING, AND THAT ALL OF THE INFORMATION ON THIS PLAN IS TRUE AND CORRECT TO THE ACCURACY REQUIRED BY ACCEPTED SURVEYING STANDARDS AND PRACTICES AND BY THE SUSSEX COUNTY ZONING ORDINANCE.

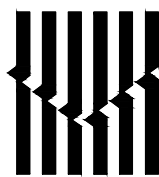
REGISTERED PROFESSIONAL ENGINEER (LICENSE #)

DATE _____

OWNER/DEVELOPER:

TOWN OF BETHANY BEACH
2114 GARFIELD PARKWAY, BETHANY BEACH
DE 19930
302-539-8011

KCI TECHNOLOGIES, INC.



COVER SHEET

FOR

NORTH PA AVE DRAINAGE IMPROVEMENTS

BALTIMORE HUNDRED SUSSEX COUNTY DELAWARE

COVER SHEET

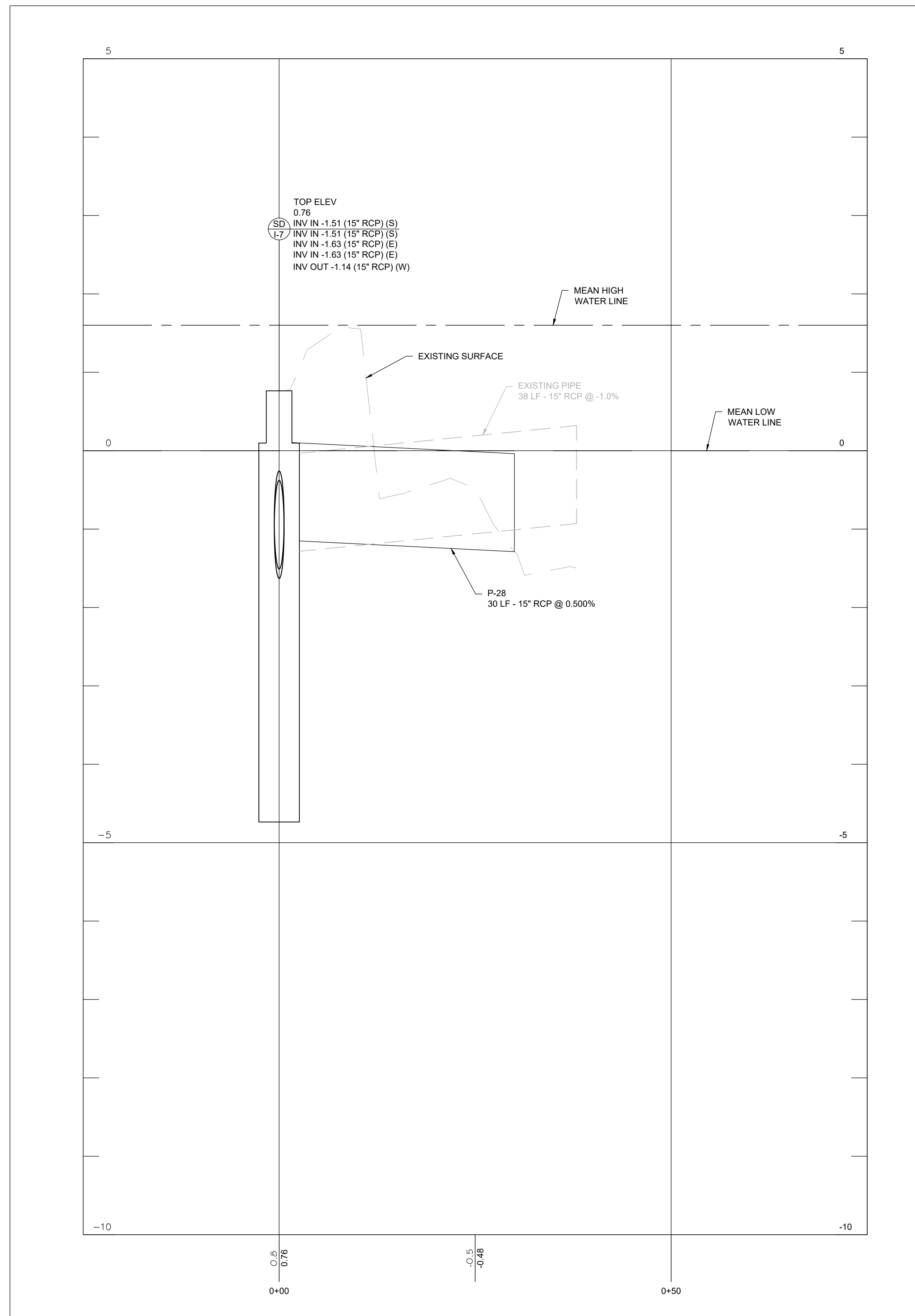
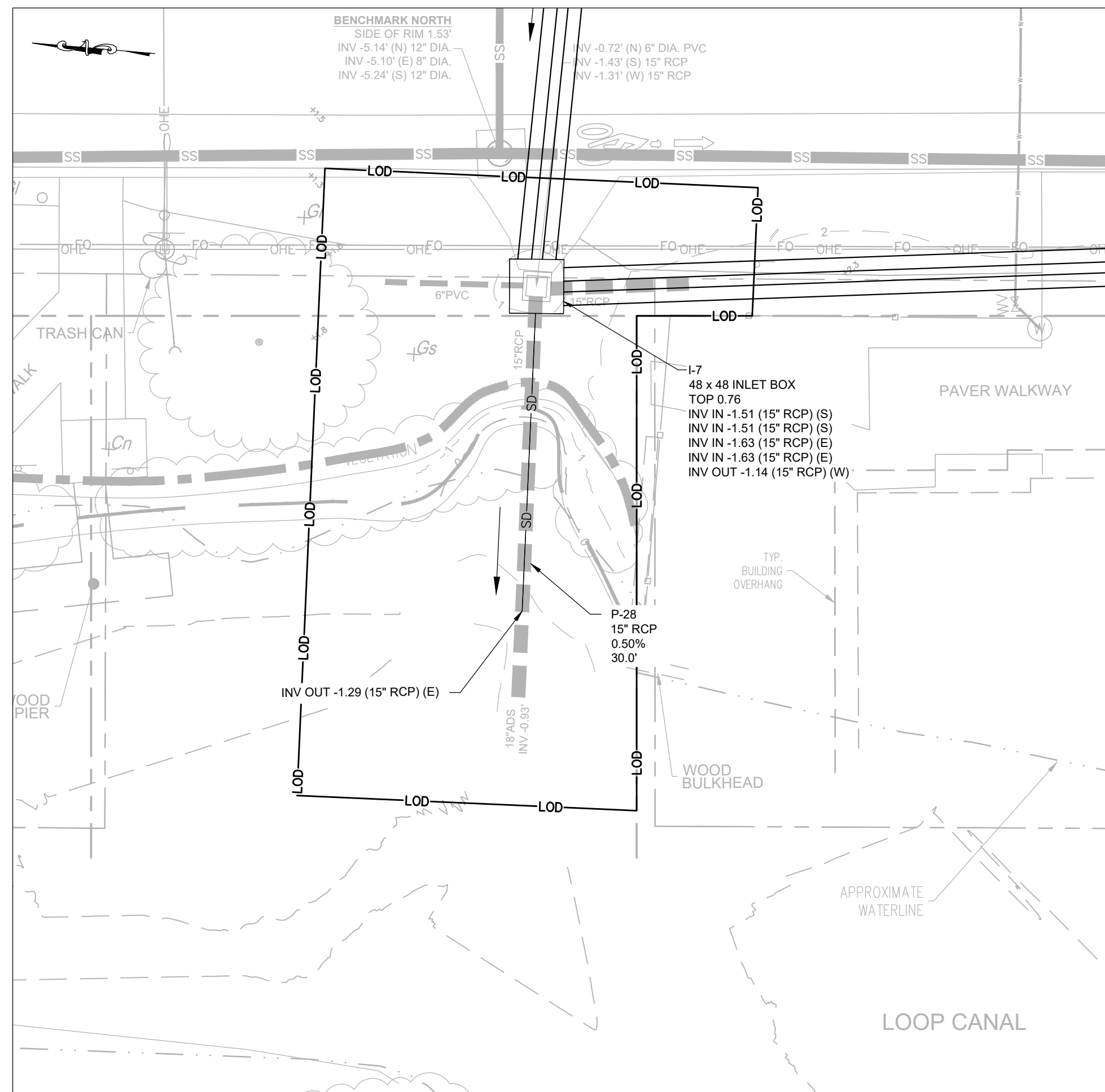
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NIA OF

SUSSEX COUNTY

BALTIMORE HUNDRED

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BY: MICHAEL DEARD



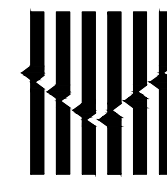
STORMWATER PLAN & PROFILE

FOR
NORTH PA AVE DRAINAGE IMPROVEMENTS
BALTIMORE HUNDRED SUSSEX COUNTY DELAWARE

OWNER/DEVELOPER:

TOWN OF BETHANY BEACH
214 GARFIELD PARKWAY, BETHANY BEACH
DE 19930
302-539-8011

KCI TECHNOLOGIES, INC.



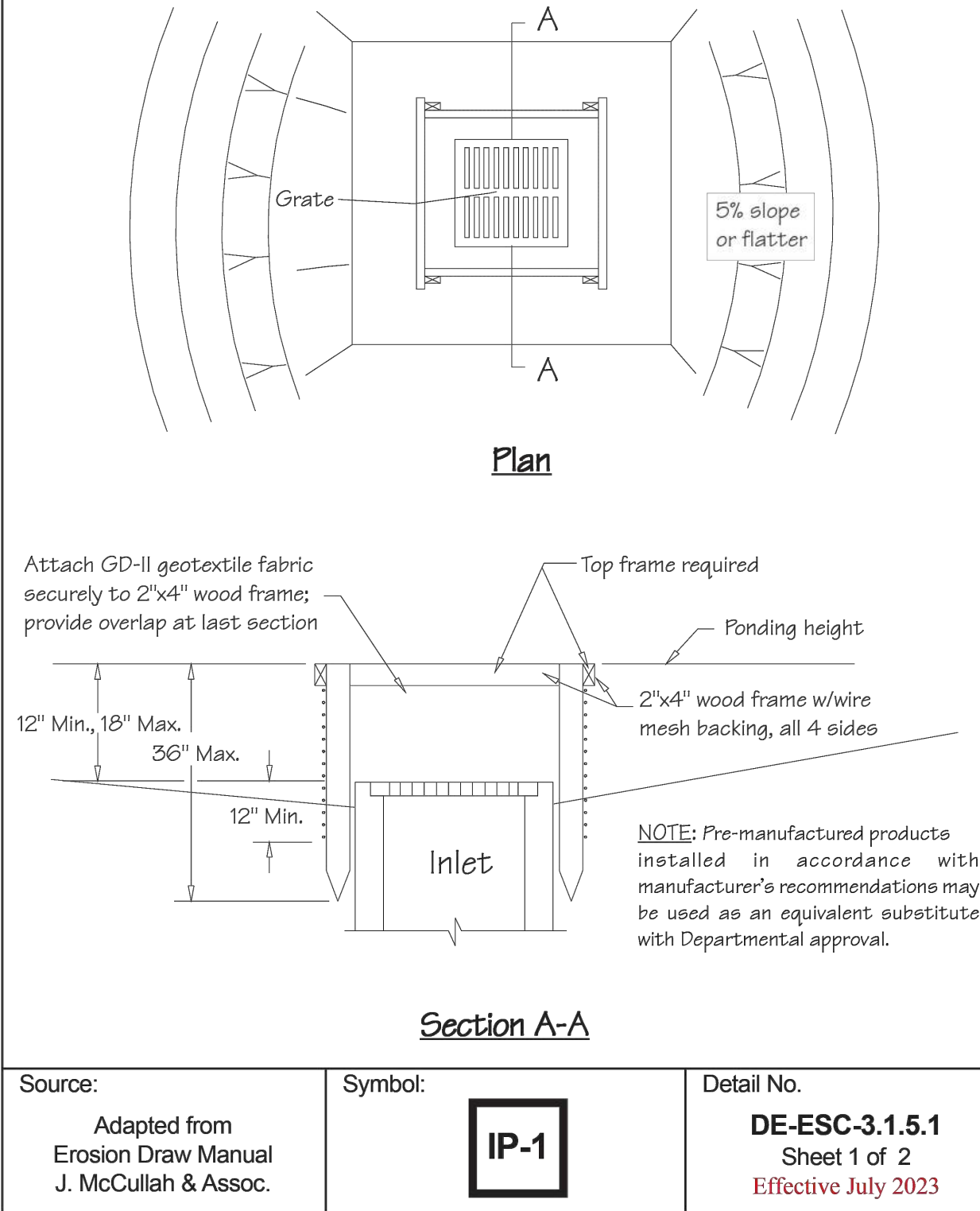
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DATE	REVISION
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REVISION

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Design:	MD	Check:	JL
SCALE:	1" = 10'		
DATE:	2/10/26		
KCI JOB #:	00008434		
SHEET:	C-103		

Standard Detail & Specifications
Inlet Protection - Type 1



Standard Detail & Specifications
Inlet Protection - Type 1

Construction Notes:

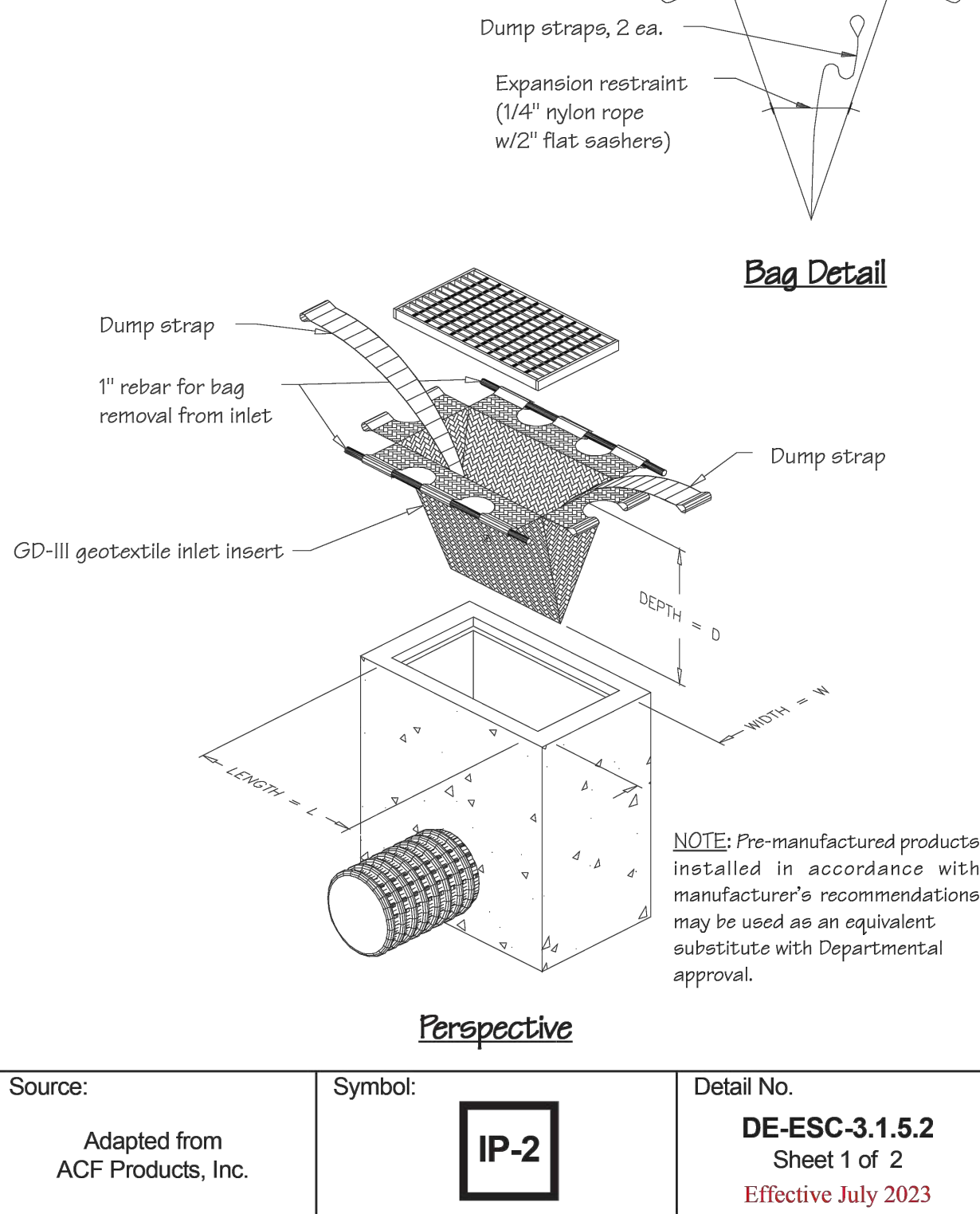
- Excavate completely around inlet to a depth of 18" below grate elevation.
- Drive 2" x 4" post 1' into ground at four corners of inlet. Place nail strips between posts on ends of inlet. Assemble top portion of 2" x 4" frame using overlap joint shown. Top of frame (weir) must be 6" below edge of roadway adjacent to inlet.
- Stretch wire mesh tightly around frame and fasten securely. Ends must meet at post.
- Stretch geotextile fabric tightly over wire mesh, the cloth must extend from top of frame to 18" below inlet grate elevation. Fasten securely to frame. Ends must meet at post, be overlapped and folded, then fastened down.
- Backfill around inlet in compacted 6" layers until at least 12" of geotextile fabric is buried.
- If the inlet is not in a low point, construct a compacted earth dike in the ditchline below it. The top of this dike is to be at least 6" higher than the top of frame (weir).
- This structure must be inspected frequently and the filter fabric replaced when clogged.

Materials:

- Wooden frame is to be constructed of 2" x 4" construction grade lumber.
- Wire mesh must be of sufficient strength to support filter fabric with water fully impounded against it.
- Geotextile fabric: Type GD-II

Source:	Symbol:	Detail No.
Adapted from Erosion Draw Manual J. McCullah & Assoc.	IP-1	DE-ESC-3.1.5.1 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications
Inlet Protection - Type 2



Standard Detail & Specifications
Inlet Protection - Type 2

Notes:

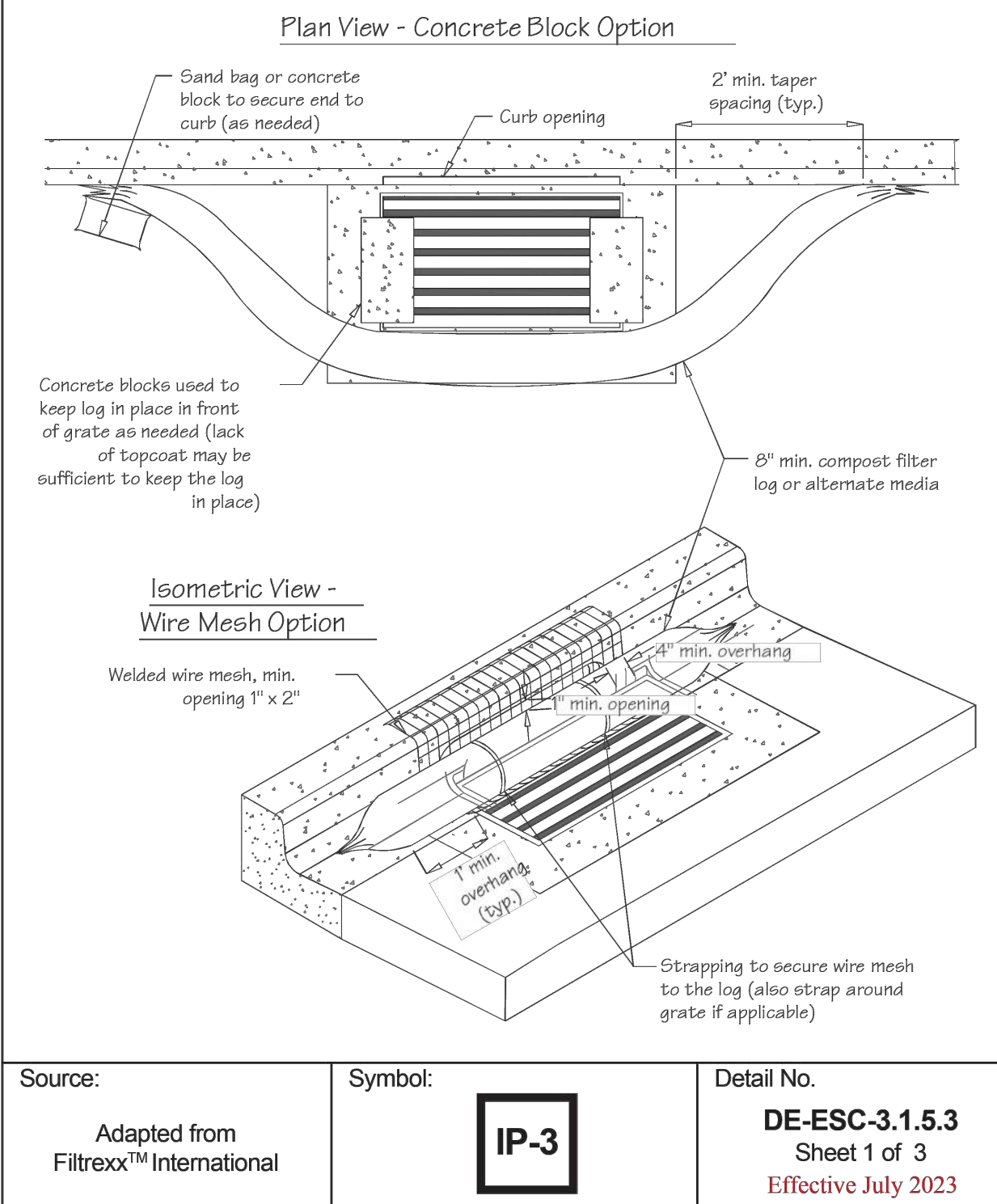
- This practice shall only be used in situations in which Inlet Protection - Type 1 cannot be used due to site constraints. These include, but are not limited to partially completed parking areas, streets, roads, etc.
- It may be necessary to transition from Type 1 to Type 2 Inlet Protection as construction proceeds.
- For areas where there is a concern for oil run-off or spills, insert shall meet one of the above specifications with an oil-absorbant pillow or shall be made completely from an oil-absorbant material with a woven pillow.

Materials:

The geotextile inlet insert shall meet or exceed the specifications of Type GD-III geotextile in accordance with Appendix A-3 of the Delaware Erosion & Sediment Control Handbook.

Source:	Symbol:	Detail No.
Adapted from ACF Products, Inc.	IP-2	DE-ESC-3.1.5.2 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications
Inlet Protection - Type 3



Standard Detail & Specifications
Inlet Protection - Type 3

Notes:

- This practice shall only be used in situations in which Inlet Protection - Type 1 cannot be used due to site constraints. These include, but are not limited to partially complete parking areas, streets, roads, etc., having a throat or curb opening. It should be used in conjunction with Type 2 Inlet Protection when a grate is also present.
- The filter log sock fabric shall be high durability netting material to resist puncture and wear in the traffic areas. If compost media is used to fill the sock it must meet the Standards and Specifications for Compost Material in the Appendix, except that the maximum pass through for a 3/8" screen shall be 20% to allow for higher flow through. Additives, such as soluble phosphorus and petroleum hydrocarbons, can be mixed with the compost media to aid in pollutant removal, if desired. Reference the Compost Filter Log design guidelines for additional requirements on the high durability netting material, compost media, and sock filling and installation procedures. Reference the design alternatives below for additional log media options.
- The maximum contributing drainage area shall be 3 acres, or as recommended by the manufacturer. 8" diameter socks shall be used for standard roadway applications. If in a highly disturbed area, the Engineer or Site Reviewer may opt for larger socks, either 12" or 18" depending on the need. (If used as a replacement for Type 1 Inlet Protection with special approval, minimum 12" diameter socks shall be used.) The top of the log may need to be flattened so that it is always below the top of curb elevation with a minimum 1" opening in order to prevent localized flooding.
- Concrete blocks shall be used to aid in the log shape and prevent it from entering into the throat. They should be placed between the log and the throat opening, and used to secure the ends of the log against the curb if needed. The end of the log shall extend a minimum of 2 feet past the end of the throat opening. If a grate is also present in addition to the throat opening, the concrete blocks can either be laid perpendicular to the curb (recommended) so that the log lies on the outside of the grate, or parallel to the curb so that the log lies on top of the grate (note, Type 2 Inlet Protection is also used in conjunction with Type 3 if a grate is present). Sand bags can be used as an alternate to the concrete blocks at the end of the log to secure the log against the curb.

Source:	Symbol:	Detail No.
Adapted from Filtrexx™ International	IP-3	DE-ESC-3.1.5.3 Sheet 2 of 3 Effective July 2023

Standard Detail & Specifications
Inlet Protection - Type 3

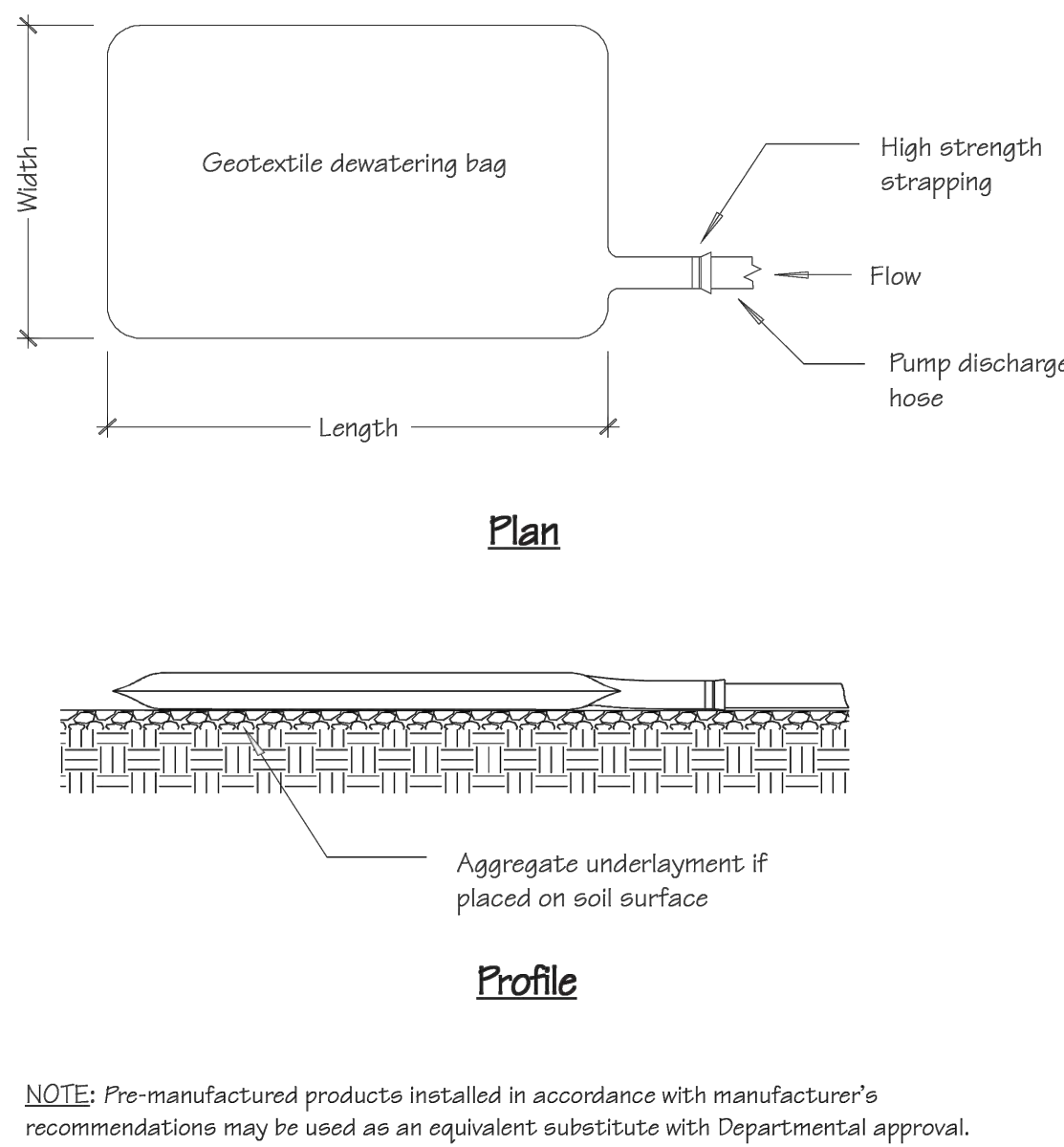
- If concrete blocks are not desired due to high traffic volumes, a welded wire screen in an "S" shape can be fitted over the length of the opening and secured to the log with straps, such as zip-ties. This will prevent the sock from falling into the opening. In this case, the log only needs to extend past the curb opening a minimum of 1 foot.
- In all cases, the log shall provide a physical barrier to the catchbasin to allow for ponding and sedimentation along the upstream side of the log. The logs shall be placed on flat surfaces and maintain constant contact with the paved surface. Any daylight will allow for untreated discharge and is not permitted.
- All structures must be inspected frequently (24 hours after a storm event and weekly) for proper function. Accumulated sediment shall be removed to avoid future failure, and must not exceed half of the effective height of the log. Reference manufacturer's recommendations for additional maintenance.

Alternatives:

- In lieu of the compost filter log, crushed DE #3 stone with a fractured face on all sides that is double wrapped in 1" chicken wire made from 10 gauge wire may be used. The wire should be secured using hog rings or wire ties on 6" centers along the length of the joint, and on 1" center on the ends of the rock sock. All installation and maintenance criteria are the same as the compost log above.
- In lieu of the compost filter media, 100% shredded rubber (typically from tires) can be used.
- For applications that have a grate and a throat inlet, some Type 2 Inlet Protection manufacturers have developed a catchbasin sack insert that also have a tubular attachment which rests above the grate and against the throat. As long as the sack meets the requirements of Type 2 Inlet Protection, and the provided throat protection extends a minimum of 1' past the limits of the curb opening, without any daylight along the edges, these combination Type 2 and Type 3 devices may be used upon approval of the Department or Delegated Agency.

Source:	Symbol:	Detail No.
Adapted from Filtrexx™ International	IP-3	DE-ESC-3.1.5.3 Sheet 3 of 3 Effective July 2023

Standard Detail & Specifications
Geotextile Dewatering Bag



DETAILS

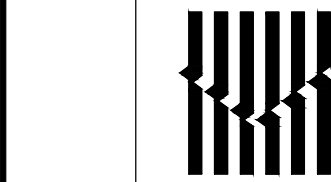
FOR
NORTH PA AVE DRAINAGE IMPROVEMENTS
BALTIMORE HUNDRED
SUSSEX COUNTY
DELAWARE

OWNER/DEVELOPER:

TOWN OF BETHANY BEACH
214 GARFIELD PARKWAY
BETHANY BEACH, DE 19810
302-583-8011

KCI TECHNOLOGIES, INC.
ENGINEERS - PLANNERS - SURVEYORS
600 WHITE CLAY CENTER DRIVE - SUITE 200 - NEWARK, DELAWARE 19711
PHONE: (862) 731-9176 FAX: (302) 731-1667 Website: www.kci.com

SCALE - PLAN: NTS



Drafting: MD Check: JL
Design: MD Check: JL
SCALE: NTS
DATE: 2/10/26
KCI JOB #: 00008434
SHEET: C-104

Standard Detail & Specifications
Geotextile Dewatering Bag

Construction Notes:

- 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.
- 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.
- 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.

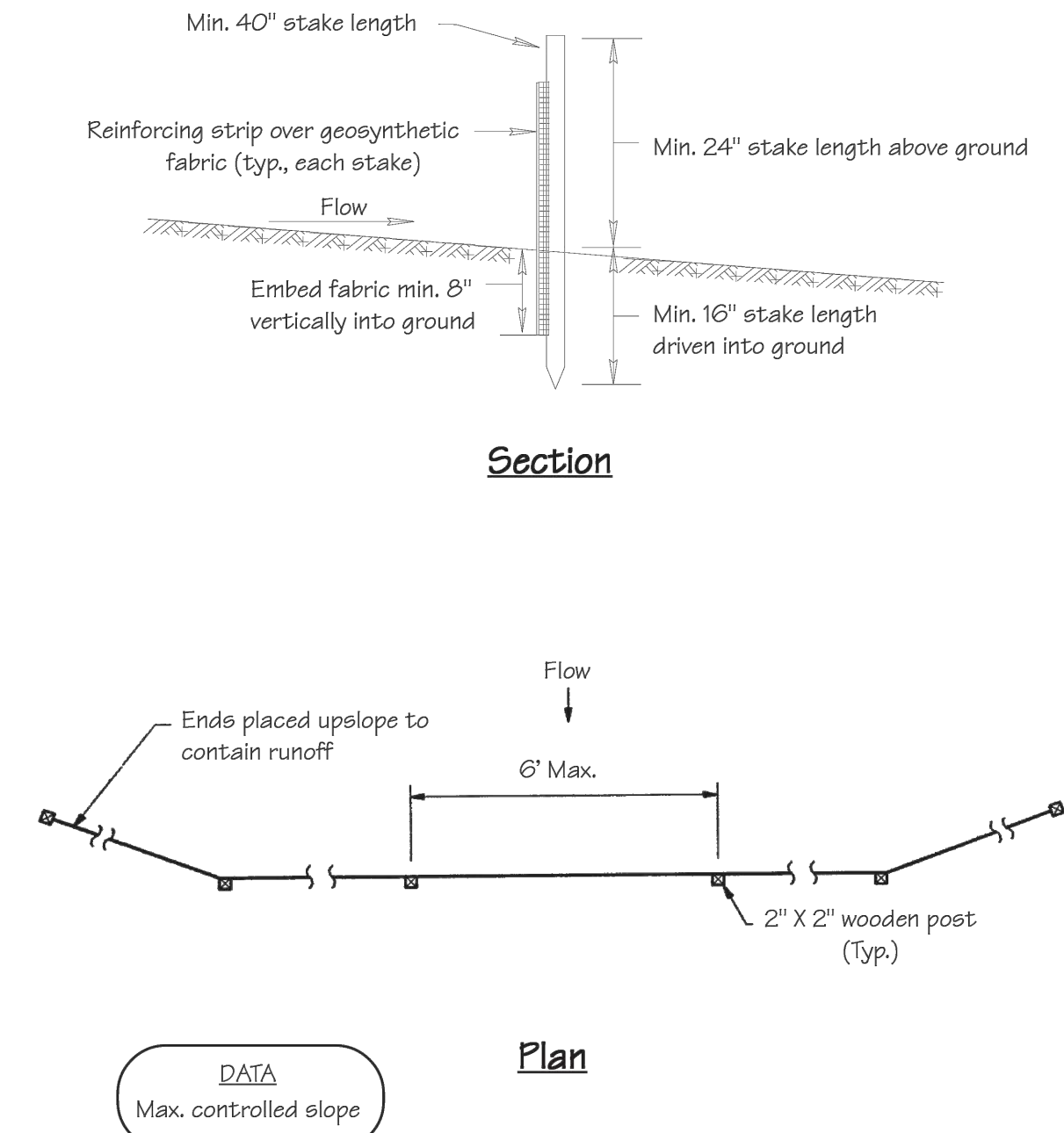
Materials:

- The geotextile fabric shall be a Type GD-IV.
- 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.
- 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.

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

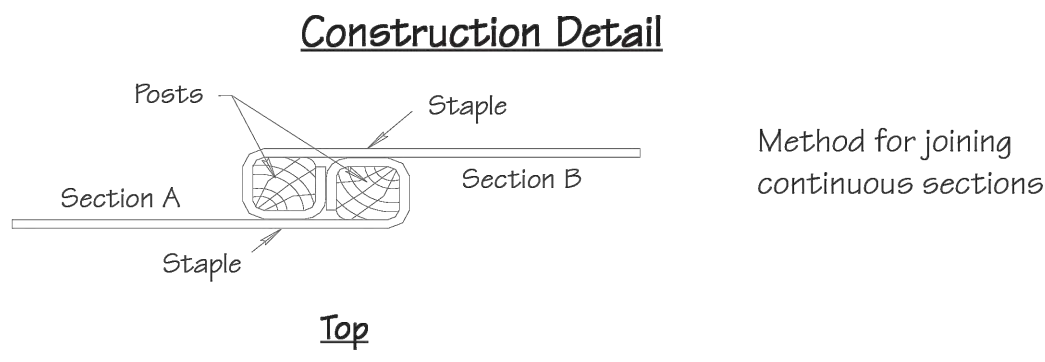
Source:	Symbol:	Detail No.
Adapted from ACF Products, Inc.	GB	DE-ESC-3.2.1.2 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications
Silt Fence



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 Notes:

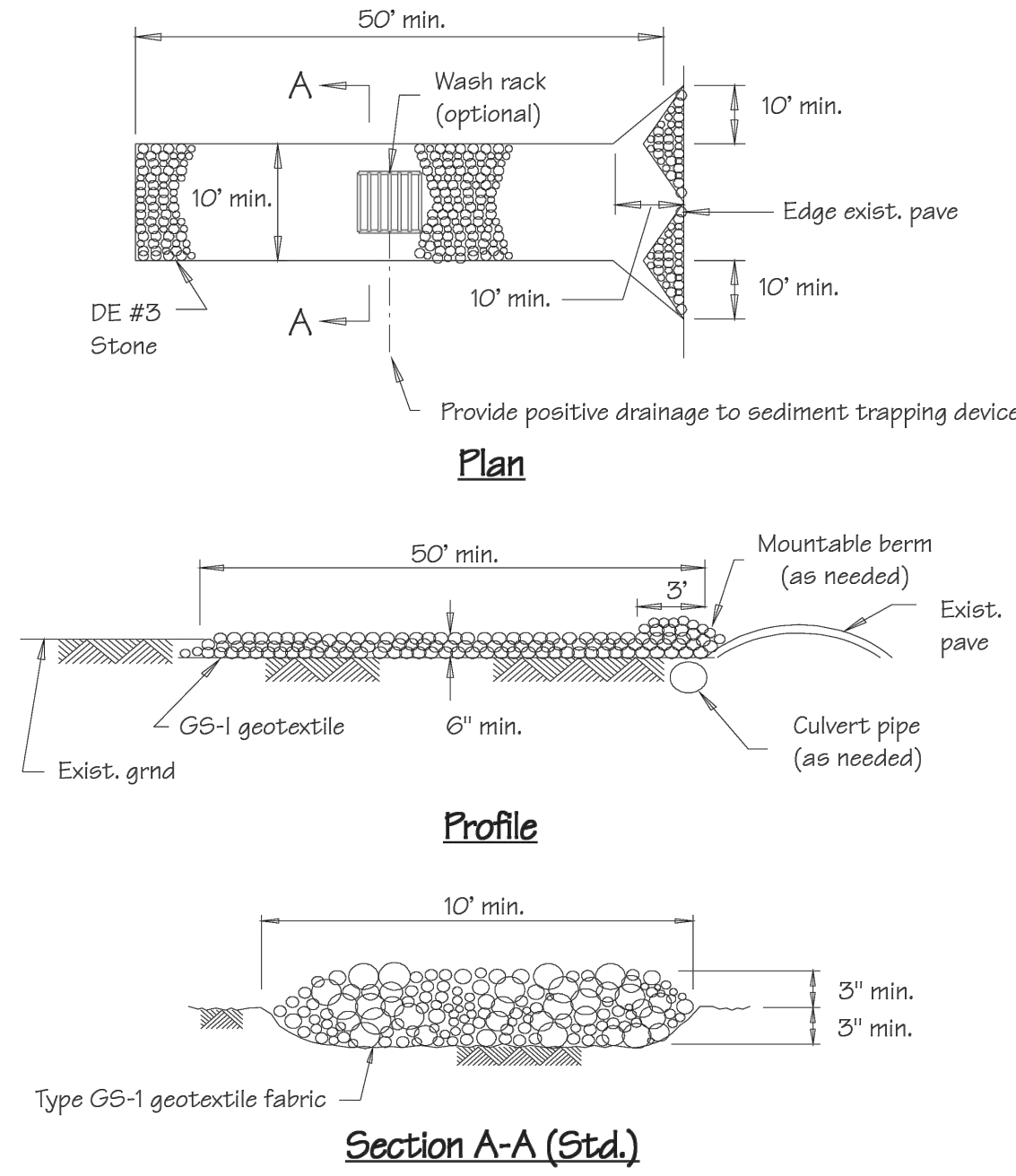
- Geosynthetic fabric to be fastened securely to fence posts with wire ties or staples.
- When two sections of filter cloth adjoin each other they shall be overlapped by six inches and folded.
- Maintenance shall be performed as needed and material removed when "bulges" develop in the silt fence.

Materials:

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

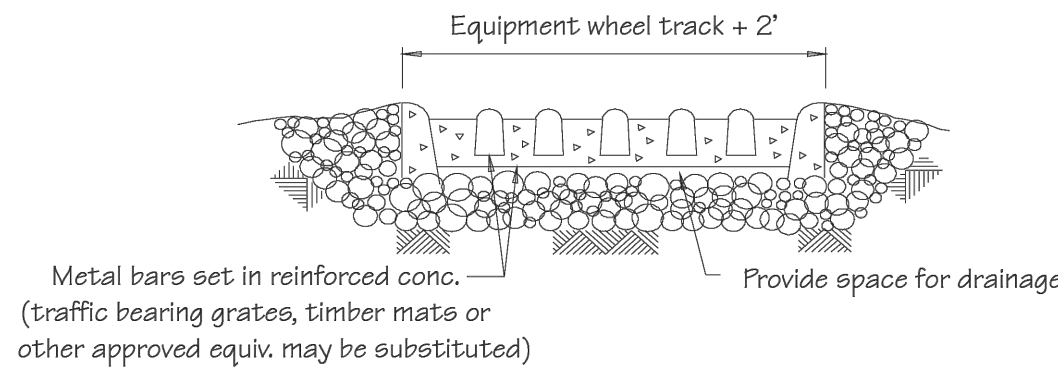
Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	SF	DE-ESC-3.1.2.1 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications
Stabilized Construction Entrance



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

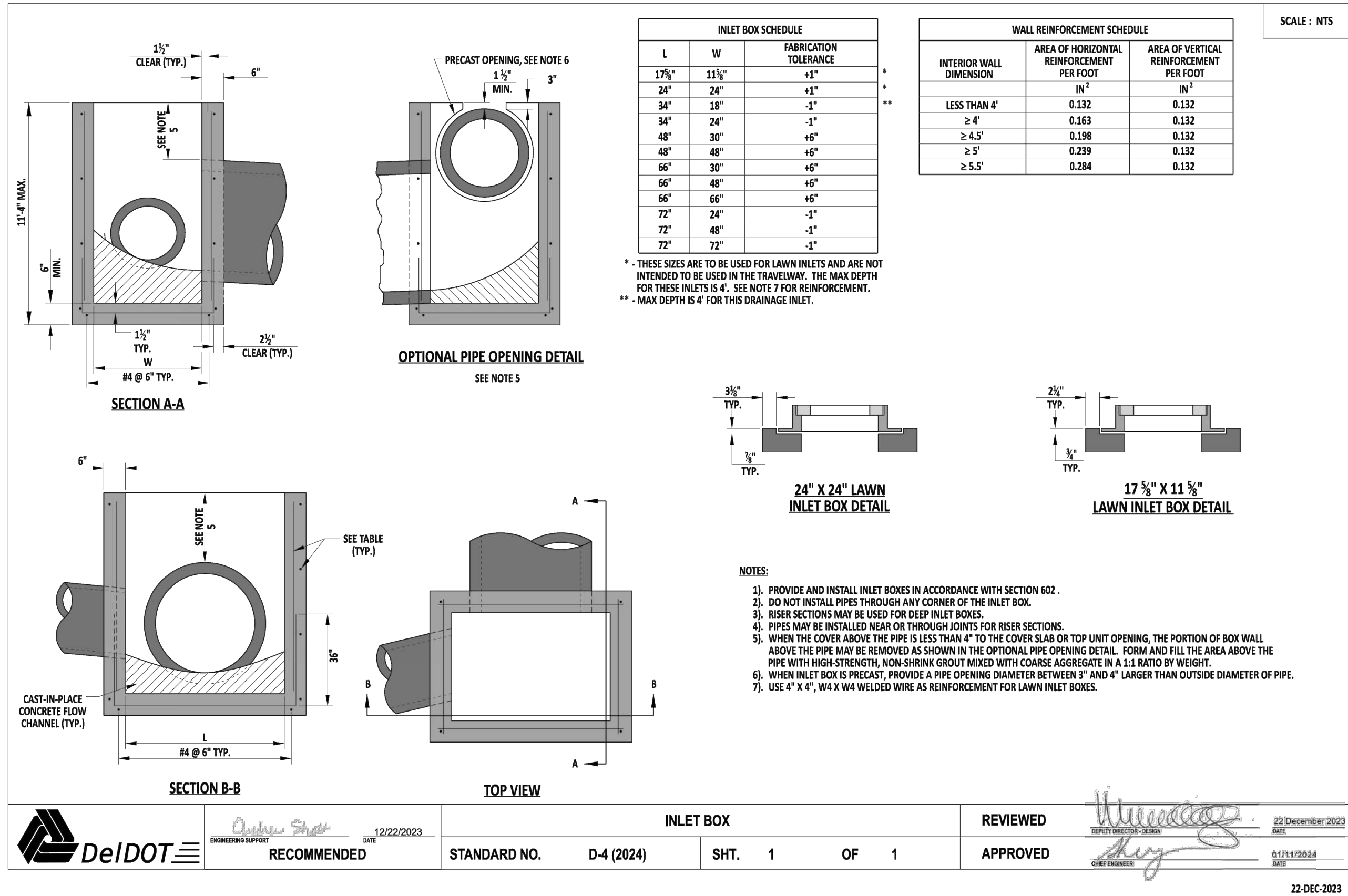


Section A-A (Opt.)

Construction Notes:

- Stone size - Use DE #3 stone.
- Length - As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum length would apply).
- Thickness - Not less than size (6) inches.
- Width - Ten (10) foot minimum, but not less than the full width at points where ingress or egress occurs.
- Geotextile - Type GS-1; placed over the entire area prior to placing of stone.
- 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.
- 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.
- 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.
- 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



DETAILS

FOR
NORTH PA AVE DRAINAGE IMPROVEMENTS
BALTIMORE HUNDRED SUSSEX COUNTY DELAWARE

Drafting: MD Check: JL
Design: MD Check: JL
SCALE: NTS
DATE: 2/10/26
KCI JOB #: 00008434
SHEET: C-105

Jennifer Bird

From: Groce, Kaylee (DNREC) <Kaylee.Groce@delaware.gov>
Sent: Friday, January 30, 2026 3:18 PM
To: Jennifer Bird
Cc: Wisniewski, Andrea (DNREC); Bobola, Rebecca (DNREC); Jones, Matthew R. (DNREC); Harvey, Heather (DNREC)
Subject: [External Email] Application Rejection-Town of Bethany
Attachments: Intake-and-Outfall-Structures.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

From IT@KCI.COM 410-316-7820 *** This is an External Email from outside of KCI.



This message needs your attention

- This is their first email to your company.

Report this Email or Mark as Safe

Powered by Mimecast

Good morning,

This office is in receipt of your application for the above referenced project. A preliminary review of the application indicated the following items are needed to accept the application. At this time, the application will be returned to you.

For your convenience, I have listed below the required item so that you may address the issues and resubmit for processing as a new application. Please include this email in your application re-submittal.

X Please provide a deed and survey if available.

X Please include a cross section of the proposed pipe replacement. This should be a side profile of the activity, scaled and showing the mean high water and mean low water lines.

X Please provide a letter naming the authorized entity with the ability to sign the application on behalf of the Town of Bethany (Brett Warner).

X Please fill out and submit the attached Appendix F. If there is any fill to be involved please also fill out appendix H.

X For the fees, there should be a \$250 fee for the application and \$85 for public notice. A \$250 fee was received, but not the \$85. Please include this with the resubmission.

X Is the rip-rap proposed or existing? If It is proposed, please fill out and include Appendices H and I.

X A cover letter explaining the activity to be undertaken would be greatly appreciated.

Upon receipt of the resubmitted application, additional information may be requested after a thorough review.

Thank you,



Kaylee Groce

Environmental Scientist II
Wetlands and Waterways Section



302-739-9943



kaylee.groce@delaware.gov



89 Kings Hwy SW, Dover DE 19901



<https://dnrec.delaware.gov/water/wetlands/permits/>



NEW Submit your application online using our Digital DNREC portal: <https://epermitting.dnrec.delaware.gov/signin>



ISO 9001:2015 CERTIFIED

ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS

936 Ridgebrook Road • Sparks, MD 21152 • Phone 410-316-7800 • Fax 410-316-7817

May 7, 2026

Ms. Kaylee Groce
Delaware Department of Natural Resources and Environmental Control
89 Kings Highway SW
Dover, DE 19901

RE: Application Rejection – Town of Bethany
Loop Canal North Pennsylvania Avenue Outlet SX

SUBJ: Response to Comments

Dear Ms. Groce:

KCI Technologies, Inc. (KCI) is in receipt of your comments dated January 30, 2026, for the above-mentioned project. Based on these comments, KCI offers the following point-by-point responses as described below.

Comment #1: Please provide a deed and survey if available.

Response: There is no deed for public right-of-way on state-owned land. Survey data collected is reflected on the plan.

Comment #2: Please include a cross section of the proposed pipe replacement. This should be a side profile of the activity, scaled and showing the mean high water and mean low water lines.

Response: A cross section of the proposed pipe replacement showing mean high water and mean low water has been included on the Erosion and Sediment Control Plan Set sheet C-105.

Comment #3: Please provide a letter naming the authorized entity with the ability to sign the application based on behalf of the Town of Bethany (Brett Warner).

Response: A letter is included with this submission.

Comment #4: Please fill out and submit the attached Appendix F. If there is any fill to be involved please also fill out Appendix H.

Response: Appendix F has been completed and included in this submittal. No fill is proposed, so Appendix H has not been completed.

Comment #5: *For the fees, there should be a \$250 fee for the application and \$85 for public notice. A \$250 was received, but not the \$85. Please include this with the resubmission.*

Response: As previously discussed, this is a Town project and permit fees are not applicable.

Comment #6: *Is the rip-rap proposed or existing? If it is proposed, please fill out and include Appendices H and I.*

Response: Riprap is not proposed in the loop canal.

Comment #7: *A cover letter explaining the activity to be undertaken would be greatly appreciated.*

Response: A cover letter explaining the activity to be undertaken has been included.

~~~~~  
Should you have any questions or require additional information, please do not hesitate to contact me at (410) 316-7959 or via email at [jennifer.bird@kci.com](mailto:jennifer.bird@kci.com).

Very truly yours,  
**KCI TECHNOLOGIES, INC.**



Jennifer Bird  
Practice Leader  
Natural Resources



ISO 9001:2015 CERTIFIED

ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS

936 Ridgebrook Road • Sparks, MD 21152 • Phone 410-316-7800 • Fax 410-316-7817

May 7, 2026

Ms. Kaylee Groce  
Delaware Department of Natural Resources and Environmental Control  
89 Kings Highway SW  
Dover, DE 19901

RE: Application Rejection – Town of Bethany  
Loop Canal North Pennsylvania Avenue Outlet SX

SUBJ: Response to Comments

Dear Ms. Groce:

KCI Technologies, Inc. (KCI) is in receipt of your comments dated January 30, 2026, for the above-mentioned project. Our response to your comments is attached.

The activity to be undertaken involves the replacement of the existing pipe extending into the loop canal. First, perimeter sediment controls and a stabilized construction entrance will be installed as shown on the plan. Then, a turbidity curtain will be installed in the loop canal followed by sheet piling as shown on the plan. Next, the two upstream storm drain inlets will be blocked and pumped to a dewatering bag as shown on the plan. Then, the existing storm drain inlet on the west side of first street will be replaced as shown on the plan. The water within the sheet piling will be drawn down and pumped into a dewatering bag so that the existing pipe extending into the loop canal can be accessed. This pipe will be removed and replaced as shown on the plan. Following installation of the new pipe in the loop canal, the erosion and sediment control devices and sheet piling will be removed.

Please review our response to comments and attachments and feel free to reach out with any questions. My contact information is (410) 316-7959 or [jennifer.bird@kci.com](mailto:jennifer.bird@kci.com).

Very truly yours,  
**KCI TECHNOLOGIES, INC.**

Jennifer Bird  
Practice Leader  
Natural Resources

# **ATTACHMENT 1**

## ***Erosion and Sediment Control Plan Set***

(See Separate Attachment)

## **ATTACHMENT 2**

### ***Stormwater Plan Set***

(See Separate Attachment)

## **ATTACHMENT 3**

*Letter with Authorized Entity*



## TOWN OF BETHANY BEACH

P.O. Box 109

214 GARFIELD PARKWAY

BETHANY BEACH, DE 19930

OFFICE (302) 539-8011

FAX (302) 539-8149

EMAIL: [admin@townofbethanybeach.com](mailto:admin@townofbethanybeach.com)

April 13, 2026

DNREC

Wetlands and Waterways Section

89 Kings Highway SW

Dover, DE 19901

To Whom It May Concern:

Brett J. Warner, Public Works Director with the Town of Bethany Beach, is the authorized entity associated with the North Pennsylvania Avenue drainage project. He has the right to sign the application on behalf of the Town.

If there are any further questions, do not hesitate to contact my office at 302-537-3771.

Sincerely,



Cliff Gravier  
Town Manager

## **ATTACHMENT 4**

### ***Appendix F***

**INTAKE OR OUTFALL STRUCTURES**

Please make sure answers to all of the questions in this appendix correspond to information on the application drawings.

1. How many feet will the intake or outfall structure(s) be placed channelward of the:

Tidal waters: mean high water line? 21 ft.  
mean low water line? 19 ft.

Non-tidal waters: ordinary high water line? NA ft.

2. What type of material(s) will be used to construct the intake or outfall structure(s)? Reinforced Concrete

3. What is the appropriate median stream flow rate at the:

intake site \_\_\_\_\_ cfs outfall site \_\_\_\_\_ cfs unknown Loop Channel is tidal with no/slow flow

4. What will be the daily rate of withdrawal at the intake site? NA gpd

5. What will be the intake velocity? NA fps

6. What will be the mesh size of the screen used on the intake structure?  
\_\_\_\_\_ inches \_\_\_\_\_ other (explain) NA

7. What will be the daily rate of return at the outfall site? NA gpd

8. Have you applied for the National Pollutant Discharge Elimination System (NPDES) permit for this project?  
\_\_\_\_\_ Yes X No If your answer is "No", contact the Surface Water Discharges Section, DNREC.

9. Will a splash apron be employed at the outfall site? \_\_\_\_\_ Yes X No

If your answer is "Yes" complete Appendix I.

If your answer is "No", explain your proposed method of preventing erosion.

10. How far will any associated structures for support or erosion control (e.g. wing walls, pile, bents, splash aprons, etc.) extend channelward of the: Temporary turbidity curtain and sheet piling

Tidal waters: mean high water line? 34 ft. mean low water line? 32 ft.

Non-tidal waters: ordinary high water line? NA ft.

11. How many square feet of any associated structures for support or erosion control will be located:

Channelward of mean high water? 779 sq. ft. In vegetated wetlands? \_\_\_\_\_ sq. ft.

12. Is there any dredging or fill associated with this project? \_\_\_\_\_ Yes X No

If yes, please complete the appropriate appendix.