



2401 Philadelphia Pike
Claymont, DE 19703
302.351.3421
FORESITEASSOCIATES.COM

August 31, 2023

Delaware Department of Natural Resources and Environmental Control
Attn. Ms. Julie R. Molina
Division of Water, Wetlands & Subaqueous Lands Section
89 Kings Highway
Dover, Delaware 19901

RE: Independence School Subaqueous Lands Permit Application

Dear Ms. Molina:

In June of 2022 we submitted a Subaqueous Lands Permit Application for this project. Due to the ongoing discussions of the project with the National Park Service, as a component of the Army Corps of Engineers application due to the project's inclusion in the White Clay Creek Wild and Scenic Rivers program, it was agreed the application should be withdrawn until discussions with the NPS concluded. Included with the returned application email were some comments summarizing the initial application and discussions. Below please find a narrative of those comments with the provided response in italics directly following the comment.

The application needs to be corrected to state the entity applying for the project. Is it the New Castle Conservation District or the property owner? If it is the NCCD, a letter from the property owner allowing the project to take place must be submitted with the application packet. If the applicant is Independence School, LLC, then they need to sign the signature page of the application.

The signature page has been updated with the Independence School as the Applicant.

Property Deed and Survey

The property deed has been included in the submission. The prior recorded plan for the property has been included in the submission in lieu of a site survey, which was outside the scope of the project due to the size of the parcel being comparable to the work being implemented.

Detail Latitude and Longitude coordinates in decimal degrees for the start and end points on the project plans.

Project start: Lat. N 39.7450" Lng. W 75.7153

Project end: Lat. N 39.7454 Lng. W 75.7148

The project plans appear to have been scanned and are unreadable. Please be sure to submit an original PDF of the plans. The appendix points to impacts being described within the project plans themselves but again the plans were unreadable. Ideally, the impacts should be detailed per type of structure. For example, a description of the portion stabilized with riprap and separately for the imbricated stone. Is the imbricated stone intended to be a vertical wall?

The prior wall has been removed from the project. The stone used within the project shall be a mix of round to sub-angular stones ranging in size from 24" boulders down to 3" cobble. The stones will be mixed throughout the project to achieve the desired result, i.e. anchoring log structures vs chink stones to secure anchor boulders, and thus are not separated out. The plans will be provided as clearly as possible, if something should not be clear, please contact us so we can expeditiously provide clarification on the component in question.

Please re-submit the application after the coordination with the National Park Service (which is resulting in modifications to the scope of the project) is finalized. Upon re-submittal, be sure to include documentation from the National Park Service on their approval of the project.

The approval provided to the ACOE has been included for reference.

While the issuance of NWP 27 does not need to be finalized prior to DNREC application submittal, the federal permitting path determines whether State Water Quality Certification (WQC) is already issued or not. If you are unsure of the applicability of a Nationwide Permit with WQC already issued, you may wish to request the pre-filing meeting for WQC whether or not it is required so you are not delayed by the 30-day waiting period after the pre-filing meeting request is made. I attached the JPP form if needed.

Thank you, at this time we have not received any indication that the project will not meet the requirements of the NWP 27 but will consult with DNREC immediately should we receive any comments implying it may not.

Please note, monitoring plans are routinely required for restoration projects. Upon further review of the application, this may be required.

Duly noted. The School will be visually monitoring the project as part of their maintenance regime for the first three years. This monitoring will be to ensure healthy plant establishment, limit invasive species intrusion, and prevent any large debris from destabilizing the newly restored stream banks.

Please let us know if you have any additional questions or need further clarification on any items noted above.

Thank you,

A handwritten signature in black ink, appearing to read "Andrew C. Hayes". The signature is fluid and cursive, with a long horizontal stroke at the end.

Andrew C. Hayes, PE RLA CERP



United States Department of the Interior



NATIONAL PARK SERVICE
Interior Region 1
North Atlantic-Appalachian
1234 Market Street, 20th Floor
Philadelphia, PA 19107

IN REPLY REFER TO:

July 14, 2023

Dave Caplan
Senior Staff Biologist/Applications Section II
Regulatory Branch
U.S. Army Corps of Engineers
Philadelphia District
1650 Arch Street
Philadelphia, Pennsylvania 19103

RE: Wild and Scenic Rivers Determination regarding NAP-2007-00225-46 Independence School (Pike Creek/White Clay Drainage) Stream Restoration, Newark, New Castle County, Delaware

Dear Mr. Caplan:

Thank you for your consultation about the project referenced above, which involves a Nationwide Permit (2007-00225-46) for stream restoration work on the White Clay Creek Wild and Scenic River in New Castle County Delaware. The applicant first contacted the National Park Service in March of 2022, and a range of consultation calls and field visits ensued. The final plan set *Independence School Stream Restoration Rev6* dated 060223 has been reviewed.

The above referenced project is located on a segment of the White Clay Creek Wild and Scenic River. One hundred and ninety-nine (199.0) miles of the White Clay Creek and its tributaries located in northern Delaware and southeast Pennsylvania were designated into the National Wild and Scenic River System under Public Law 106-357 on October 24, 2000 and Public Law 113-291 on December 19, 2014. The White Clay Creek Watershed was intentionally designated at the watershed level to include smaller tributaries throughout the region, as integral to the health of the whole system.

The National Park Service (NPS) is responsible for the long-term protection of the river and administering the Wild and Scenic Rivers Act. Pursuant to Section 7 (a), “*no department or agency of the United States shall assist by loan, grant, license or otherwise in the construction of any water resources project that would have a direct and adverse impact on the values for which such river was established.*” The NPS considers water resource projects to include dams, diversion projects, bridge, roadway and bank stabilization projects, involving construction in the bed and banks of the river, or within a ¼ mile from a named segment. This project is considered a water resource project and therefore reviewable under Section 7 of the Wild and Scenic Rivers Act.

The NPS has completed an evaluation and has determined that the proposed repairs ***will not have direct and adverse*** effects on the free-flowing condition, water quality and outstandingly remarkable values of the river, provided that all conditions noted in the plan set referenced above and listed below, are adhered to for the duration of the project.

Additional standard conditions of Wild and Scenic River projects include:

- Downstream flows shall be maintained at all times, with water from dewatering operations filtered to remove excessive sediments and discharged in a manner that prevents a release of turbid water into downstream areas.
- Any rip-rap above OHW and/or outside of the immediate stream channel should be choked, backfilled with topsoil, and seeded with native seed or combined with bio-engineering techniques such that the banks, when fully restored, have an appearance and function similar to the natural streambank.
- No hay bales shall be used for erosion and sediment controls.
- Erosion control matting used to stabilize all slopes shall be biodegradable. No plastic netting or welded joint poly-based matting shall be used.
- Non-invasive seed mixes shall be used to reestablish vegetation. No borrow, loam, or fill material shall contain invasive species.

Any changes to the proposed Projects as described, such as the plan set, special provisions, construction methods or schedule for in-stream work, will require consultation with the NPS before the work proceeds, and may also require additional Section 7 review/approvals.

Thank you for the opportunity to review this project. Please feel free to contact me if there are any questions regarding these comments at sarah_bursky@nps.gov.

Sincerely,



Sarah Bursky
Natural Resource Specialist, Wild and Scenic Rivers Program
National Park Service
Interior Region 1
Philadelphia PA

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?

<u> X </u>	Yes	BASIC APPLICATION
<u> X </u>	Yes	SIGNATURE PAGE (Page 3)
<u> X </u>	Yes	APPLICABLE APPENDICES
<u> X </u>	Yes	SCALED PLAN VIEW
<u> X </u>	Yes	SCALED CROSS-SECTION OR ELEVATION VIEW PLANS
<u> X </u>	Yes	VICINITY MAP
<u> X </u>	Yes	COPY OF THE PROPERTY DEED & SURVEY Record Minor Land Development Plan included
<u>N/A - DIGITAL</u>	Yes	THREE (3) COMPLETE COPIES OF THE APPLICATION PACKET
<u>SUBMISSION</u>		
<u>N/A - DIGITAL</u>	Yes	APPROPRIATE APPLICATION FEE & PUBLIC NOTICE FEE
<u>SUBMISSION</u>		(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: Independence School Inc.
 Mailing Address: 1300 Paper Mill Road
Newark, DE 19711

Authorized Agent: Kevin Donnelly
 Telephone #: 302.365.8970
 Fax #: 302.832.5060
 E-mail: kevin.donnelly@delaware.gov

2. Consultant's Name: Andrew C. Hayes
 Mailing Address: 2401 Philadelphia Pike
Claymont, DE 19720

Company Name: ForeSite Associates Inc.
 Telephone #: 302.314.1847
 Fax #: n/a
 E-mail: ach@foresiteassociates.com

3. Contractor's Name: _____
 Mailing Address: _____

Company Name: _____
 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 project purpose is restoration initiatives to stabilize portions of an actively eroding stream channel and reduce sediment loads on the watercourse. The project seeks to provide stable conveyance for areas receiving treatment.

6. Check each Appendix that is enclosed with this application:

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

Section 3: Project Location

7. Project Site Address: 1300 Paper Mill Road
Newark, DE 19711

County: N.C. Kent Sussex
 Site owner name (if different from applicant): Independence School Inc.
 Address of site owner: _____

8. Driving Directions: The Independence School is at the intersection of Paper Mill Road and Upper Pike Creek Road. The project is in the stream channel, a tributary to Pike Creek, at the front of the site parallel with Paper Mill Road.

(Attach a vicinity map identifying road names and the project location)

9. Tax Parcel ID Number: 080.300-0060

Subdivision Name: The Independence School

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

Section 3: Project Location (Continued)

10. Name of waterbody at Project Location: Unnamed tributary waterbody is a tributary to: Pike Creek

11. Is the waterbody: Tidal Non-tidal Waterbody width at mean low or ordinary high water average 4.5'

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:

The Independence School

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

13. Present Zoning: Agricultural Residential Commercial Industrial S - Suburban
 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):

see attached

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):

n/a

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

Matt Jones - WSLS Kristi Lieske - Coastal Ian Park - Fisheries
John Brundage - USACE Katie Kadlubar - F&W, Env. Review Mike Stangl, Fish and Wildlife

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? July 15, 2021

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):

unknown - at the time the school was built c.1983 the access road was installed through the tributary, in the current area of work, by way of a culvert; this culvert remains; a major land development plan occurred in the early 2000's for an additional school building that project is archived in the NCC Parcel details as permit number 20010836.

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

No Pending Issued Denied Date: August 30, 2023

Type of Permit: NWP 27 Federal Permit or ID #: CENAP-OP-R-2007-00225-46

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, Tim Costello, Head of School, hereby designate and authorize Kevin C. Donnelly
 (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: Kevin C. Donnelly Telephone #: 302-632-1202
 Mailing Address: New Castle Conservation District Fax #: 302-832-5060
2430 Old County Road E-mail: kevin.donnelly@delaware.gov
Newark, DE 19702

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.

Kevin C. Donnelly
 Agent's Signature

8/29/2023
 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.

Tim Costello
 Applicant's Signature

29 Aug 23
 Date

Tim Costello, Head of School
 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



Inspire. Dream. Achieve.

Steve Smailer
Director of Water Resources
DNREC
89 Kings Highway
Dover, DE 19901

9/12/23

Steve,
The Independence School Board of Trustees authorizes Tim Costello, Head of School, to act on behalf of the school in all matters including the signing of project plans and permit applications.

Regards,

Amelia Wyant
Board President

Independece School
DE Subaqueous Lands Permit Application; Adjacent Owners List

STNO	STNAME	SUFFIX	PROPCITY	PROPSTATE	PROPZIP	CNTCTLAST	OWNADDR	OWNADDR2	OWNCITY	OWNSTATE	OWNZIP
538	UPPER PIKE CREEK RD		NEWARK	DE	19711-	MCCAULEY GREGG L & DEBRA H	538 UPPER PIKE CR R		NEWARK	DE	19711
540	UPPER PIKE CREEK RD		NEWARK	DE	19711-	HERBER LUCILLE E &	MCCAULEY DEBRA H CO-TRUSTEES	540 UPPER PIKE CREEK RD	NEWARK	DE	19711
534	UPPER PIKE CREEK RD		NEWARK	DE	19711-	CICONTE ANTHONY V & RENEE	534 UPPER PIKE CREEK ROAD		NEWARK	DE	19711
107	BRIARCLIFF	CT	NEWARK	DE	19711-	ARCE-VIRREIRA JAVIER A & DE-ARCE MARIA C	107 BRIARCLIFF CT		NEWARK	DE	19711
105	BRIARCLIFF	CT	NEWARK	DE	19711-	STEWART SUSAN R	105 BRIARCLIFF CT		NEWARK	DE	19711
103	BRIARCLIFF	CT	NEWARK	DE	19711-	POTTS JR JOSEPH T	103 BRIARCLIFF CT		NEWARK	DE	19711
212	SLEEPY HOLLOW	CT	NEWARK	DE	19711-	HIRWE RUPAL	529 JUDGES CT		NEWARK	DE	19711
214	SLEEPY HOLLOW	CT	NEWARK	DE	19711-	BLANCO JOSE DEJESUS RAMOS	214 SLEEPY HOLLOW CT		NEWARK	DE	19711
216	SLEEPY HOLLOW	CT	NEWARK	DE	19711-	KILLI SANDHYA	216 SLEEPY HOLLOW CT		NEWARK	DE	19711
0	SLEEPY HOLLOW	CT	NEWARK	DE	19711-	RIDGE MAINTENANCE CORP	C/O MASTRIANA PROPERTY MANAGEMENT INC 5500 SKYLINE DR, SUITE 6		WILMINGTON	DE	19808
217	SLEEPY HOLLOW	CT	NEWARK	DE	19711-	MOORE ALBERT A & EMILY L & CRANDELL LISA ELAINE	217 SLEEPY HOLLOW COURT		NEWARK	DE	19711
215	SLEEPY HOLLOW	CT	NEWARK	DE	19711-	KIM JAE Y & MI J	215 SLEEPY HOLLOW CT		NEWARK	DE	19711
312	PLEASANT KNOLL	CT	NEWARK	DE	19711-	CATALANO KATHLEEN	312 PLEASANT KNOLL CT		NEWARK	DE	19711
314	PLEASANT KNOLL	CT	NEWARK	DE	19711-	FAGHRI ARDESHIR & KOUPAIE ELHAM MORTAZAVI	114 KNOXLYN FARM DR		KENNETT SQUARE PA		19348
316	PLEASANT KNOLL	CT	NEWARK	DE	19711-	MOORE GLENN A	316 PLEASANT KNOLL COURT		NEWARK	DE	19711
0	PLEASANT KNOLL	CT	NEWARK	DE	19711-	RIDGE MAINTENANCE CORP	C/O MASTRIANA PROPERTY MANAGEMENT INC 5500 SKYLINE DR, SUITE 6		WILMINGTON	DE	19808
317	PLEASANT KNOLL	CT	NEWARK	DE	19711-	TLC PROPERTIES - WC LLC	100 CAMERON LN		NORTH EAST	MD	21901
315	PLEASANT KNOLL	CT	NEWARK	DE	19711-	TEIXEIRA JANET F	315 PLEASANT KNOLL COURT		NEWARK	DE	19711
313	PLEASANT KNOLL	CT	NEWARK	DE	19711-	MCCORMICK GRACE J	313 PLEASANT KNOLL CT		NEWARK	DE	19711
108	BRIARCLIFF	CT	NEWARK	DE	19711-	RIDGE MAINTENANCE CORP	C/O MASTRIANA PROPERTY MANAGEMENT INC 5500 SKYLINE DR, SUITE 6		WILMINGTON	DE	19808
124	MONET	CIR	WILMINGTON	DE	19808-	HARRIS ADAM L & JULIE R	124 MONET CIR		WILMINGTON	DE	19808
126	MONET	CIR	WILMINGTON	DE	19808-	BARRETT SHARON K	126 MONET CIRCLE		WILMINGTON	DE	19808
128	MONET	CIR	WILMINGTON	DE	19808-	PHIPPS DEBORAH C TR	3525 TURTLE CREEK BLVD APT 19B		DALLAS	TX	75219-5514
130	MONET	CIR	WILMINGTON	DE	19808-	SNOW BRIANNE L	130 MONET CIRCLE		WILMINGTON	DE	19808
132	MONET	CIR	WILMINGTON	DE	19808-	MCDONALD ELISABETH A	132 MONET CIRCLE		WILMINGTON	DE	19808
0	SLOAN	CT	WILMINGTON	DE	19808-	LIMESTONE HILLS MAINTENANCE	C/O BC CONSULTING	4905 MERMAID BOULEVARD SUITE B	WILMINGTON	DE	19808
220	SLOAN	CT	WILMINGTON	DE	19808-	MYERS JOSHUA T & MINDY J	109 HART DR		AVONDALE	PA	19311
222	SLOAN	CT	WILMINGTON	DE	19808-	BARTRAM BRENT E & GLENNY D	222 SLOAN CT		WILMINGTON	DE	19808
224	SLOAN	CT	WILMINGTON	DE	19808-	BRADY PHYLLIS A	224 SLOAN CT		WILMINGTON	DE	19808
226	SLOAN	CT	WILMINGTON	DE	19808-	LAYNG MARIANNE B TRUST	112 ROCKLAND CI		WILMINGTON	DE	19803
228	SLOAN	CT	WILMINGTON	DE	19808-	BELL PERRY C & CATHERINE B	228 SLOAN CT	LIMESTONE HILLS	WILMINGTON	DE	19808
230	SLOAN	CT	WILMINGTON	DE	19808-	ABERNETHY WILLIAM C & JOAN MARY	230 SLOAN CT		WILMINGTON	DE	19808
232	SLOAN	CT	WILMINGTON	DE	19808-	TAYLOR JESSE & COLLURAFICI THERESA	232 SLOAN COURT		WILMINGTON	DE	19808
234	SLOAN	CT	WILMINGTON	DE	19808-	BERGER W ANDREW TRUSTEE	C/O AGATHA BERGER	4142 OGLETOWN STANTON RD UNIT 426	NEWARK	DE	19713
236	SLOAN	CT	WILMINGTON	DE	19808-	GREENWOOD ANDREA R	236 SLOAN CT		WILMINGTON	DE	19808
238	SLOAN	CT	WILMINGTON	DE	19808-	WITTMAYER DEBORAH A	238 SLOAN CT		WILMINGTON	DE	19808
240	SLOAN	CT	WILMINGTON	DE	19808-	DAVIS SYLVIA A	240 SLOAN CT		WILMINGTON	DE	19808
242	SLOAN	CT	WILMINGTON	DE	19808-	TURNER WILLIAM	120 DOE LANE		KENNETT SQUARE PA		19348
244	SLOAN	CT	WILMINGTON	DE	19808-	MORRISON DAVID	P O BOX 5564		WILMINGTON	DE	19808
246	SLOAN	CT	WILMINGTON	DE	19808-	MUKHERJEE DEBASISH & KAVITA	246 SLOAN COURT		WILMINGTON	DE	19808
248	SLOAN	CT	WILMINGTON	DE	19808-	BRADLEY MARY	248 SLOAN COURT		WILMINGTON	DE	19808
250	SLOAN	CT	WILMINGTON	DE	19808-	COX MATTHEW M	250 SLOAN COURT		WILMINGTON	DE	19808
252	SLOAN	CT	WILMINGTON	DE	19808-	HUMES GAIL OAKFORD & DAVID CURTIS	252 SLOAN COURT		WILMINGTON	DE	19808

Independence School
 DE Subaqueous Lands Permit Application; Adjacent Owners List

254 SLOAN	CT	WILMINGTON DE	19808-	TABIBIAN MARK STEPHEN	254 SLOAN CT		WILMINGTON	DE	19808
256 SLOAN	CT	WILMINGTON DE	19808-	COLON PHILIP & MARGARET	256 SLOAN CT		WILMINGTON	DE	19808-1124
258 SLOAN	CT	WILMINGTON DE	19808-	PETRUSKY KELSEY L	258 SLOAN CT		WILMINGTON	DE	19808
260 SLOAN	CT	WILMINGTON DE	19808-	WINCHESTER JESSICA A	260 SLOAN COURT		WILMINGTON	DE	19808
262 SLOAN	CT	WILMINGTON DE	19808-	COX BRENDA K	262 SLOAN CT		WILMINGTON	DE	19808
						4905 MERMAID BOULEVARD			
0 SLOAN	CT	WILMINGTON DE	19808-	LIMESTONE HILLS MAINTENANCE	C/O BC CONSULTING	SUITE B	WILMINGTON	DE	19808

CHANNEL MODIFICATIONS OR IMPOUNDMENT STRUCTURES (DAMS)

Please check applicable box(es) and complete all appropriate sections(s). Make sure answers to all of the questions in this appendix correspond to information on the application drawings

Section I. CHANNEL MODIFICATIONSSection II. IMPOUNDMENT STRUCTURES (DAMS)**I. CHANNEL MODIFICATIONS**

1. What are the dimensions of the existing channel to be modified relative to mean high water (for tidal areas only) or ordinary high water (for non-tidal areas only)?

360' length 3' depth 3.5' base width 5.5' top width

2. What will be the dimensions of the new or modified channel relative to mean high water (for tidal areas only) or ordinary high water (for non-tidal areas only)?

360' length 3' depth * base width * top width

*base and top width will vary; in most areas the existing bank will remain with reinforcements added to reduce toe erosion; in two locations along the channel the areas will be re-graded to connect the floodplain and have a bottom width of 3ft and a top width from 8ft -10ft

3. State type and approximate composition percentage of the existing stream bed (e.g. clay 10%, sand 10%, silt 45%, gravel 10%, etc.)

Silt Loam, 30% sand, 40% silt, 10% clay

4. State the type and approximate composition percentage of the new or modified stream bed?

The modified streambed will have a subgrade made from on-site borrow (see #3 above) and an increased gravel content to improve the hyporheic zone and reduce erosion.

5. What are the approximate normal discharge rate and drainage area of the existing water body.

2 yr. 116 cfs 250 acres
10yr. 271 cfs 100 yr. 500 cfs

6. What will be the approximate normal flow-rate and drainage area of the new or modified water body (for non-tidal areas only)?

2 yr. 116 cfs 250 acres As a restoration initiative this project proposes no change to the
10 yr. 271 cfs 100 yr. 500 cfs flow-rates within the drainage area

7. What will be the change (if any) in slope and cross-sectional area? The channel is currently incised. This project proposes to reduce bank slopes in two locations to a maximum of 33% with the average slope at 25%. The reduced bank slopes will increase the cross section area of the channel and re-connection to the floodplain.

8. What type of material(s) will be used to stabilize the banks of the new or modified channel (e.g. rip-rap, vegetation, bulkhead, etc.)? Complete additional Appendices as necessary.

Vegetation, rip rap, logs and stone will be used to stabilize the banks.

9. What will be the change in floodplain area upstream of the channel modification for a two year or ten year storm? Please indicate change in area on plans.

0 2 yr. 0 10 yr. There is no change proposed to the floodplain area upstream of the channel modification

II. IMPOUNDMENT STRUCTURES (DAMS) NOT APPLICABLE TO THIS PROJECT

1. What type(s) of material(s) will be used to construct the impoundment structure (e.g. earth, rock, concrete, etc.)?

2. How many cubic yards of material for the impoundment structure will be obtained from:
 - a. Upland sources? _____ cubic yards
 - b. Dredged material? _____ cubic yards
 - c. Other? (explain below) _____ cubic yards

3. What will be the dimensions of the impoundment structure relative to mean high water (for tidal areas only) or ordinary high water (for non-tidal areas only)?

4. What will be the impoundment's?

Storage capacity: _____ acre-feet
Surface area: _____ acres; _____ square feet

5. What is the approximate drainage area of the water body upstream of the proposed impoundment? _____ acres

6. Have you obtained the appropriate County Conservation District office approval for an erosion and sediment control plan for your project? _____ Yes _____ No _____ N/A

If your answer is "No", contact the County Conservation District.

7. What is the approximate discharge rate from the 2, 10, 100 year frequency storm prior to construction?
2 yr. _____ cfs
10 yr. _____ cfs
100 yr. _____ cfs

Rip-Rap Sills and Revetments

Please respond to each question. Questions left blank may result in the application being returned as incomplete. In addition, the answers to all of the questions in this Appendix must correspond accurately to the information on the plan and section view drawings for the project.

1. Will the project be:

- New Construction (un-stabilized shoreline)
 Repair or Replacement of an Existing Rip-Rap Structure or Rubble
 Repair or Replacement of an Existing Bulkhead
 (If repair or replacement, submit photographs of the entire existing structure).

2. How many linear feet of shoreline are proposed to be stabilized? 420

3. Is the project a: Standard rip-rap revetment Free-standing sill

The project length is 360' which includes 15' of E&S and culvert work; within this project length three areas along the reach will have bank stabilization methods implemented, the three areas total 210' with both sides stabilized for a total of 420'. The remaining areas of stream length within the project area will not have bank stabilization methods installed and will only have toe protection implemented; the length of toe protection only totals 135' with both sides having toe protection for a total of 270'.

4. Describe the existing shoreline:

The project is restoration of a portion of a perennial stream. Within the project limits the stream course is characterized as eroded banks with mowed lawn directly to the edge of the banks and a few culturally planted or early successional volunteer tree species maintained as specimen lawn trees.

5. What is the total number of cubic yards of rip-rap that will be used? 65

65 total cu. yds. of stone; the stream restoration will utilize rip rap, boulders, and cobble to provide stream stability, this is the total for all stone that will be used for the project within the existing and proposed OHW.

6. What is the number of cubic yards of rip-rap per running foot of shoreline? 0.09

(See page 4 for a guide to calculating total cubic yards and cubic yards per running foot).

65 cu. yds. / 690 ln. ft. of total shoreline = 0.09 cu. yds. total stone per running foot of total shoreline is the total for all stone that will be used for the project within the existing and proposed OHW.

7. What will be the average weight of the stone used for the:

Armor stone: 160 lb/cu.ft. minimum Core stone: _____

[If material other than stone, such as prefab geo-grid or other similar product is proposed, please describe here and include photographs or a brochure. The Department strongly discourages the use of broken concrete, cinderblocks or other materials that are less dense than stone, more apt to move off site due to currents or wave action, and/or are not aesthetically pleasing or in keeping with the natural environment.]

Describe:

This project will use several types of natural stone within the restoration and woody structures anticipated to be constructed from on-site salvaged materials; the details section of the included plan set provides further description on the nuances between the stone materials.

8. For Standard Revetments answer A–F, below: (for Sill projects, skip to Question #9)

A. How many linear feet will the structure extend channelward of:

Mean High Water: _____ Mean Low Water: _____

Ordinary High Water: 345 (for non-tidal waters)

B. How many square feet of the structure will be located:

Channelward of Mean High Water: _____ Channelward of Mean Low Water: _____

Channelward of Ordinary High Water: 2185 (for non-tidal waters)

On vegetated wetlands: _____ value includes channel bottom aggregates

C. Will the revetment be backfilled? Yes No

If yes, complete Appendix H and include it in your application.

D. Will filter cloth be used behind the rip-rap structure? Yes No

E. What is the average slope of the existing bank? 1.5 : 1

F. What is the proposed slope of the rip-rap revetment? Varies; In locations where banks are to remain as is or incur minimal disturbance the revetment will be used to fill the undercut stream toe. In areas where the channel is re-graded, the revetment will be at a 3:1 slope or less.
(See page 3 for a guide to calculating slopes).

9. Sill Projects: no freestanding sills proposed for this stream restoration project

A. What is the base width of the proposed structure: _____

B. What is the top width of the proposed structure: _____

C. How many square feet of the structure will be located:

Channelward of Mean High Water: _____ Channelward of Mean Low Water: _____

Channelward of Ordinary High Water: _____ (for non-tidal waters)

On vegetated wetlands: _____

D. What will be the average height of the structure: _____

E. How much of the structure (in inches) will extend vertically above:

Mean High Water: _____ Ordinary High Water: _____ (for non-tidal waters)

F. Are breaks or notches proposed in the sill to allow for greater flushing? Yes No

G. Will fill material be placed behind the sill? Yes No If yes, complete appropriate appendix.

H. Will wetland vegetation be planted behind the sill? Yes No

If yes, complete Appendix H and include it in your application.

10. Construction Techniques (Complete for both Revetment and Sill Projects):

A. Will any dredging be required? ___ Yes X No

If yes, please include appropriate dredging Appendix with your application).

B. Please describe the sequence of construction and any techniques that will be utilized to minimize adverse impacts on the aquatic environment, and to preserve existing vegetation (particularly woody vegetation) along the shoreline:

The project will use DE State approved erosion and sediment control measures to ensure the protection of vegetation within and downstream of the project limits. Within the project limits, high quality trees in good health will be protected with sensitive area proection installed at the dripline; see plans for trees to be preserved. A construction meeting will be held at the project start; perimeter erosion and sediment control and existing tree protection measures will be installed and inspected; upon approval of the perimeter and tree protection controls, the contractor will implement any remaining erosion and sediment control measures; trees to be removed will be felled; construction of the restoration efforts: regrading, rock revetments, and log structures will be implemented as can be completed in one day; at the end of each day the stream will be temporarily stabilized; upon completion of the restoration measures the area will be fine graded; permanent seed and plantings will be installed; upon seed establishment approval by the regulating project authority, all remaining erosion and sediment control devices will be removed; the project will be visually monitored for 3 years and treated as needed for animal deprecation, vegetation water stress, and large stream debris that could damage the recently stabilized construction.

CALCULATIONS

RUN = Base width of the structure (in feet) RISE = Vertical height of the structure (in feet)

I. How to calculate total cubic yards:

$$0.5 * RUN * RISE * \text{Linear feet of shoreline stabilized}/27 = \text{Total Cubic Yards}$$

II. How to calculate cubic yards per running foot of shoreline:

$$\text{Total \# Cubic Yards}/ \text{Linear feet of shoreline} = \text{Cubic yards per running foot}$$

III. How to calculate slope: Slope = RUN/RISE

EXAMPLE:

If we propose to stabilize 100 linear feet of shoreline with a rip-rap revetment that has a basewidth of 6 feet and a height of 3 feet:

$$0.5 * 6 * 3 * 100/27 = 33.33 \text{ Total Cubic Yards}$$

$$\text{II. } 33.33/ 100= 0.333 \text{ Cubic Yards per running foot}$$

$$\text{III. } 6/3= \text{Slope of 2}$$

FILL

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

1. How many linear feet will the fill extend channelward of the:

- a. Tidal waters: mean high water line? N/A ft.
mean low water line? N/A ft.
- b. Non-tidal waters: ordinary high water line? 105 ft. parallel to the shoreline

2. What is the area of fill that will be located:

- a. on subaqueous land (channelward of mean high water) 530 sq. ft.
- b. on vegetated wetlands? N/A sq. ft.

3. What is the source of the fill?

N/A Hauled in from upland sources: What is the source company/location/parcel number?

N/A Obtained from dredged material: Complete Dredging Appendix.

The fill for this project is balanced with the cut for in-situ site soil use only; with no imports anticipated for construction; should additional fill be required, the materials will come from an upland source not yet identified.

4. What is the total volume of fill? 47 cubic yards within OHW

- a. What is the total fill per running foot of shoreline? 0.45 cubic yards
45 cu. yds. fill / 105 ln. ft.

5. What method will be used to place the fill?

Conventional earth moving and compaction equipment

6. State the type and composition percentage of the fill material (e.g. sand 80%, silt 5%, clay 15%, etc.)

Silt Loam, 30% sand, 40% silt, 10% clay

7. How will the fill be retained? Complete appropriate appendix.

The fill is being retained through vegetative stabilization, rock and logs per plan locations.

8. What type of vegetation or ground cover will be provided for the filled area(s) to prevent soil erosion and help keep sediment from reaching State waters?

The plan set contains details and instructions to comply with the DNREC Erosion and Sediment Control requirements. Depending on the time of year a cover crop of either oats, rye, wheat, or millet will be used in conjunction with long term biodegradable erosion control matting. Additionally, depending on the location the areas will be seeded with lawn turf grass or native meadow species.

9. Describe the type(s) of structure(s) to be erected on the filled area (if any). Complete appropriate appendix. no structures will be erected on the fill within the OWM

Vegetative Stabilization

- Please make sure that all answers in this appendix correspond to information on the application drawing

1. Submit a brief description of the proposed activity

The project purpose is restoration initiatives to stabilize an actively eroding stream channel and reduce sediment loads on the watercourse. The project seeks to provide stable conveyance in the area of active erosion by way of re-grading, introducing grade control structures, and restoring a vegetated edge condition to the channel that is currently predominately mowed lawn.

2. Is grading of bank and/or placement of fill part of this project? Yes No
If yes complete Appendix H

3. Indicate the area of proposed planting that is channelward of the:

- a. Tidal Waters: mean high water line? _____ ft²
mean low water line? _____ ft²

- b. Non-tidal waters: ordinary high water line? 2,934 ft²

The area of planting located within the limits of the ordinary high water line of the stream channel includes the fill and stabilization of 530 sq. ft., the same area of fill noted on Appx. H and the additional area of the regraded stream course outside the channel bottom

4. What will the water depth of the plantings be relative to the: (provide the range if it varies)

- a. Tidal Waters: mean high water line? _____ f
mean low water line? _____ ft

- b. Non-tidal waters: ordinary high water line? 0-3 ft

The plantings will be above OHW during normal stream flow. During higher rainfall events, when the stream connects to the floodplain, the plantings will be inundated.

5. Provide the list of plant species that will be utilized.

Seed mix per availability from Pinelands Nursery

Carex lurida	Juncus effusus
Carex vulpinoidea	Lobelia cardinalis
Carex stricta	Lobelia siphilitica
Elymus virginicus	Mimulus ringens
Glyceria striata	Symphotrichum novae-angliae
Iris versicolor	Symphotrichum novi-belgii

Additional plug plants per availability

Ageratina altissima	Iris versicolor
Packera aurea	Carex lurida
Solidago flexicaulis	Carex amphibola
Polystichum acrostichoides	
Onoclea sensibilis	
Chelone glabra	

6. Describe the sequence of construction and planting.

A construction meeting will be held at the project start; perimeter erosion and sediment control measures will be installed and inspected; upon approval of the perimeter controls, the contractor will implement any remaining erosion and sediment control measures; trees to be removed will be felled; construction of the restoration efforts: regrading, rock revetments, and log structures will be implemented as can be completed in one day; at the end of each day the diversion will be removed from the channel; upon completion of the restoration measures the area will be fine graded; permanent seed and plantings will be installed; upon seed establishment approval by the regulating project authority, all remaining erosion and sediment control devices will be removed; the project will be visually monitored for 3 years per the Owner On-Going Maintenance Guidance on sheet 2 and treated as needed for animal depredation, vegetation water stress, and large stream debris that could damage the recently stabilized construction

7. Describe the maintenance and monitoring plan for the vegetation.

The Independence School will be responsible for the maintenance and monitoring of the vegetation. The maintenance and monitoring provisions are itemized in the Owner On-Going Maintenance Guidance on sheet 2. The area will be maintained as a riparian meadow to maintain sight distances between the school building and the playing fields. The meadow will be maintained through a mowing regime: year 1 no-mow within 3ft of the stream top of bank and mow other meadow areas every one to two months; year 2, mow once in late May, then no additional mowing for the year; for year 3 and in perpetuity the meadow should be mown per year 2 guidelines. The monitoring will be for invasive plant establishment, animal depredation, and stream channel stability. Invasive plants are to be controlled per DE guidelines and plants replaced as needed.

057715

BK 1352 PG 0289



Tax Parcel No. 08-030.00-060
Prepared by: Delaware Title &
Abstract Co.
P.O. Box 1470
Wilmington, DE
19899

DEED

THIS DEED, MADE THIS 16th DAY OF JUNE, in the year of our LORD One Thousand Nine Hundred and Ninety-Two

BETWEEN, The Independence School, Inc., a Delaware corporation, party of the first part;

A N D

THE STATE OF DELAWARE, party of the second part;

WITNESSETH, that the said party of the first part, for and in consideration of the sum of Five Thousand Four Hundred Sixty DOLLARS AND 00/100 (\$5,460.00) in lawful money of the United States of America, the receipt whereof is hereby acknowledged, hereby grants and conveys unto the said party of the second part;

PARCEL NO. 9-RA & 9-RB

ALL those two certain tracts, pieces or parcels of land situate in Mill Creek Hundred, New Castle County, State of Delaware, being portions of the right-of-way required for the reconstruction of a public road leading from Milford Crossroads towards Limestone Road, known as SR 72, the said tracts being parts of County Tax Parcel No. 08-030.00-060, and being more particularly bounded and described by reference to EXHIBIT A, annexed hereto and incorporated herein.

BEING part of the same lands and premises which Reston Corporation, a Delaware Corporation, did grant and convey by Deed dated March 14, 1987, of record in the Office of the Recorder of Deeds in and for New Castle County, Delaware in Deed Record 511, Page 114 unto The Independence School Inc., a Delaware corporation, in fee.

000000

92 JUN 23 2 1:57 PM

NCC 044 1333 JN2392 146

300 MC

52/ 103016

NCC 044 1333 JN2392 145 \$ 00 ST

**

BK 1352 PG 0290

ALSO BEING part of the same lands and premises which Reston Corporation, a Delaware Corporation, did grant and convey by Deed dated October 24, 1986, of record in the Office of the Recorder of Deeds in and for New Castle County, Delaware in Deed Record 451, Page 220 unto The Independence School, Inc., a Delaware Corporation, in fee.

ALSO BEING part of the same lands and premises which Martha J. Penn Brill, Widow of John L. Brill, did grant and convey by Deed dated January 15, 1980, of record in the Office of the Recorder of Deeds in and for New Castle County, Delaware in Deed Record 108, Page 277 unto The Independence School, Inc., a Delaware Corporation, in fee.

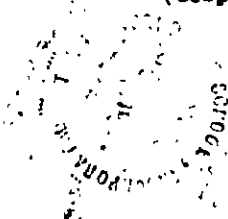
IN WITNESS WHEREOF, the said Independence School, Inc., a Delaware corporation, hath caused its name by William K. Schmitt, its President to be hereunto set, and the common and corporate seal of the said corporation to be hereunto affixed, duly attested by its Marsh W. Uebler Secretary, the day and year first above written.

The Independence School, Inc.

BY: William K. Schmitt
President

Attest: Marsh W. Uebler
Secretary

(Corporate Seal)



BK 1352PG0291

STATE OF DELAWARE:
188.
NEW CASTLE COUNTY:

BE IT REMEMBERED, that on this 16th day of JUNE, 1992 personally came before me, William K. Gethner, a Notary Public for the State of Delaware, William K. Gethner, President of The Independence School, Inc., a corporation existing under the laws of the State of Delaware, party to this Indenture, known to me personally to be such, and acknowledged this Indenture to be his act and deed and the act and deed of said corporation, that the signature of the President thereto is in his own proper handwriting and the seal affixed is the common and corporate seal of said corporation, and that his act of sealing, executing, acknowledging and delivering said Indenture was duly authorized by a resolution of the Board of Directors of said corporation.

GIVEN under my Hand and Seal of Office, the day and year aforesaid.

E. Alan Uebler
.....
Notary Public

Print name: E. ALAN UEBLER

My Commission expires: 1-16-93



Grantees Address:
Department of Transportation
Division of Highways
P.O. Box 778
Dover, DE 19903

ALL those two certain tracts, pieces or parcels of land situate in Mill Creek Hundred New Castle County, State of Delaware, being portions of the right-of-way required for the reconstruction of a public road leading from Milford Crossroads towards Limestone Road known as SR 72, the said tracts being parts of County Tax Parcel No. 08-030.00-060 and more particularly bounded and described as follows, to wit:

Parcel No. R-2A

BEGINNING at a point on the existing easterly right-of-way line of Road No. 295, Pike Creek Road (at 70 feet wide), the said point being located opposite Road No. 295 construction baseline station "B" 1+65.00 and 30.00 feet distant to the left, measured at a right angle to the said construction baseline, as shown and noted on right-of-way sheet nos. 9 and 12 of the plans for Department of Transportation, Division of Highways Contract No. 89-115-03;

THENCE from said point of BEGINNING with the said existing easterly right-of-way line, parallel with the said construction baseline and 30.00 feet distant, measured at a right angle thereto, North 20 degrees 34 minutes 56 seconds West, 75.48 feet to a point located opposite construction baseline station "B" 0+89.52 and 30.00 feet distant to the left, measured at a right angle to the said construction baseline, the said point being on the existing diagonal right-of-way line joining the said existing easterly right-of-way line of Pike Creek Road with the existing southerly right-of-way line of SR 72;

THENCE with the said existing diagonal right-of-way line, North 23 degrees 57 minutes 34 seconds East, 7.13 feet to a point located opposite construction baseline station "B" 0+84.44 and 35.00 feet distant to the left, measured at a right angle to the said construction baseline, the said point being on the proposed easterly right-of-way line of said Pike Creek Road;

THENCE with the said proposed easterly right-of-way line, the two (2) following courses and distances: (1) parallel with the said construction baseline and 35.00 feet distant, measured at a right angle thereto, South 20 degrees 34 minutes 56 seconds East, 80.56 feet to a point located opposite station "B" 1+65.00 and 35.00 feet distant, measured at a right angle to the said construction baseline; and (2) South 69 degrees 25 minutes 04 seconds West, 5.00 feet to first described point and place of BEGINNING.

CONTAINING within the said metes and bounds 390 square feet, (0.0090 acres) of land, be the same more or less.

BK 1352 PG 0293

Contract No. 89-115-03
The Independence School, Inc.
Parcel Nos. R-9A & R-9B
Page 2

Parcel No. R-9B

BEGINNING at a point formed by the intersection of the existing southerly right-of-way line of SR 72 (at 80 feet wide), the said point being located opposite SR 72 construction baseline station 9+79.36 and 40.00 feet distant to the right, measured at a right angle to the said construction baseline, as shown and noted on right-of-way sheet nos. 9, 10 & 12 of the plans for Department of Transportation, Division of Highways Contract No. 89-115-03;

THENCE from said point of **BEGINNING** with the said existing southerly right-of-way line, parallel with the said construction baseline and 40.00 feet distant, measured at a right angle thereto, North 68 degrees 30 minutes 04 seconds East, 1,020.64 feet to a point located opposite construction baseline station 20+00.00 and 40.00 feet distant to the right, measured at a right angle to the said construction baseline, the said point being on the proposed southerly right-of-way line of SR 72;

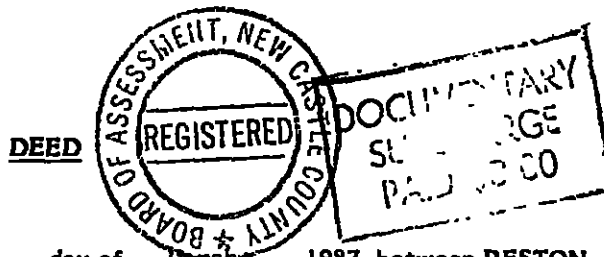
THENCE with the said proposed southerly right-of-way line, the following two (2) courses and distances: (1) South 62 degrees 47 minutes 26 seconds West, 100.50 feet to a point located opposite construction baseline station 19+00.00 and 50.00 feet distant to the right, measured at a right angle to the said construction baseline; and (2) parallel with the said construction baseline and 50.00 feet distant, measured at a right angle thereto, South 68 degrees 30 minutes 04 seconds West, 930.80 feet to a point located opposite station 9+69.20 and 50.00 feet distant to the right, measured at a right angle to the said construction baseline, the said point being on the existing diagonal right-of-way line joining the said existing southerly right-of-way line of SR 72 with the existing easterly right-of-way line of Road No. 295 (Pike Creek Road) (at 70' wide);

THENCE with the said existing diagonal right-of-way line, North 23 degrees 57 minutes 34 seconds East, 14.26 feet to first described point and place of **BEGINNING**.

CONTAINING within the said metes and bounds 9,757 square feet, (0.2240 acres) of land, be the same more or less.

Grantor:	Reston Corporation	Reston Corporation	Martha J. Fenn Brill
Date:	March 4, 1987	October 24, 1986	January 15, 1980
Record:	Volume 511, Page 114	Volume 451, Page 220	V, Volume 108, P. 277

0.752



THIS DEED made this fourth day of March, 1987, between RESTON CORPORATION, a corporation of the State of Delaware, party of the first part,

AND

THE INDEPENDENCE SCHOOL, INC., a corporation of the State of Delaware, party of the second part,

WITNESSETH, that the said party of the first part, for and in consideration of the sum of ONE HUNDRED FORTY-FIVE THOUSAND TWO HUNDRED SIXTY-SEVEN and 50/100 DOLLARS (\$145,267.50), lawful money of the United States of America, the receipt whereof is hereby acknowledged, hereby grants and conveys unto the said party of the second part,

ALL that certain lot, piece or parcel of land, situate in Mill Creek Hundred, New Castle County and State of Delaware, being Parcel No. B-2 (19.3690 acres, more or less), as shown on the Record Minor Subdivision Plan For Property of the BRILL ESTATE, dated February 2, 1987, prepared by Ramesh C. Batta Associates, P.A., Professional Land Surveyors, of Wilmington, Delaware, as said Plan is of record in the Office of the Recorder of Deeds in and for New Castle County, Delaware, in Microfilm No. 8528, and being more particularly bounded and described as follows, to-wit:

BEGINNING at a point on the southerly side of Curtis Mill Road, eighty feet wide, said point of Beginning being North sixty-one degrees, thirty minutes, no seconds East, one thousand one hundred two and thirty-seven one-hundredths feet from the northeasterly side of Upper Pike Creek Road; thence from the said point of Beginning along said side of Curtis Mill Road, North sixty-one degrees, thirty minutes, no seconds East, five hundred ninety-five feet to a point; thence by the four following courses and distances separating Parcel B1 from the lands herein being described: (1) South thirty degrees, fifty-three minutes, seventeen seconds East, two hundred feet to a point; (2) North sixty-one degrees, thirty minutes, no seconds East, two hundred feet to a point; (3) South thirty degrees, fifty-three minutes, seventeen seconds East, two hundred eighty-five feet to a point; and (4) South forty-two degrees, eleven minutes, fifty-one seconds East, five hundred thirty-two and eighty-nine one-hundredths feet to a point on line of lands now or formerly of Wilhelmina DuPont Ross; thence along said land of Wilhelmina DuPont Ross, South fifty-six degrees, twenty-nine minutes, thirty-seven seconds West, nine hundred forty-five feet to a point, a common corner for land herein being described and lands of The Independence School, Inc.; thence along the said land of The Independence School, Inc., North twenty-eight degrees, thirty minutes, no seconds West, one thousand eighty-four and seventy-eight one-hundredths feet to the point and place of Beginning.

BEING a part of the same lands and premises which Patrick J. Brill, et al., by Deed dated March 7, 1986, of record in the Office aforesaid, in Deed Book 347, Page 261, granted and conveyed unto Reston Corporation, a corporation of the State of Delaware, in fee.

Part of Parcel No. 08-030.00-016

Mailing Address:
The Independence School, Inc.
1300 Paper Mill Road
Newark, Delaware 19711

SP-905-36 MARC87 01 14

IN WITNESS WHEREOF the said corporation has caused its name to be hereunto set and the common and corporate seal to be hereunto affixed by its proper Officers, the day and year first above written.

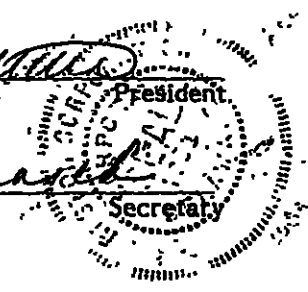
SEALED AND DELIVERED
IN THE PRESENCE OF:

RESTON CORPORATION;

Catherine M. Tripp
Catherine M. Tripp

By: *Gary M. Farrar*
Gary M. Farrar

Attest: *Rene [Signature]*



STATE OF DELAWARE)
NEW CASTLE COUNTY)

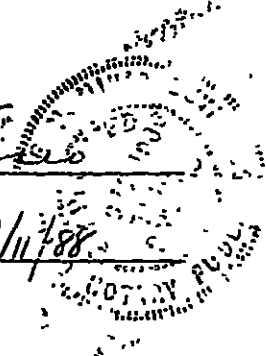
: SS.

BE IT REMEMBERED, that on this fourth day of March, 1987, personally came before me, the Subscriber, a Notary Public for the State and County aforesaid, Gary M. Farrar, President of Reston Corporation, a corporation existing under the laws of the State of Delaware, party to this Indenture, known to me personally to be such, and acknowledged this Indenture to be his act and deed, and the act and deed of said corporation, that the signature of the President thereto is in his own proper handwriting and the seal affixed is the common and corporate seal of said corporation, and that his act of sealing, executing, acknowledging and delivering said Indenture was duly authorized by a resolution of the Board of Directors of said corporation.

GIVEN under my hand and seal of Office the day and year aforesaid.

Catherine M. Tripp
Catherine M. Tripp
Notary Public

My Commission Expires: 2/11/88



REC'D FC... REC'D MAR - 4 1987 WILLIAM M. HOOLEY, Recorder

DATA COLUMN

- APPLICATION NUMBER: 2000-0102-S
- ZONING: (S) SUBURBAN
- TAX PARCEL NUMBER: 08-030.00-060 AND 08-030.00-016
- SOURCE OF TITLE: 1352-0289 AND 511-0114
- DATUM: N.G.S.
- THIS PLAN REPRESENTS A FIELD SURVEY BY LANDMARK ENGINEERING, INC. IN AUGUST 1999 AND IS BASED ON A RECORD MAJOR LAND DEVELOPMENT PLAN, "THE INDEPENDENCE SCHOOL", MICROFILM NO. 11425.
- PROJECT BENCHMARK: FINISHED FLOOR AT SOUTHEAST ENTRANCE OF EXISTING TWO STORY 28,757 S.F. BUILDING SHOWN ON THE PLAN.
- EXISTING BUILDING AREA = 78,048± S.F.
PROPOSED BUILDING ADDITION AREA = 1,485± S.F.
TOTAL GROSS SQUARE FOOTAGE = 79,533± S.F.
- LAND USE:
BUILDING COVERAGE 56,225± S.F. 1.29± AC. 1.78 %
PARKING & ACCESSWAYS 3,54± AC. 4.88 %
OPEN AREA 67.41± AC. 93.34 %
TOTAL 72.24± AC. 100 %
- PARKING REQUIRED:
57 CLASSROOMS X 2 SPACES PER CLASSROOM = 114 SPACES
2,410 G.F.A. OF OFFICE SPACE X 3.5 SPACES PER 1,000 G.F.A. = 8 SPACES
ASSEMBLY AREA 878 SEATS X 1 SPACE PER 4 SEATS X 0.75 = 165 SPACES
TOTAL PARKING REQUIRED = 287 SPACES
TOTAL EXISTING PARKING = 234 SPACES
DEFICIT: = 53 SPACES
TOTAL EXISTING BUILDINGS: 78,048 S.F.
TOTAL PROPOSED ADDITION: 1,485 S.F.
PERCENT OF CHANGE: 0.019
REQUIRED ADDITIONAL PARKING: 53 X 0.019 = 1 SPACE
PROPOSED CLASSROOM:
1 CLASSROOM X 2 SPACES PER CLASSROOM = 2 SPACES
PROPOSED OFFICES:
770 G.F.A. X 3.5 SPACES/1,000 G.F.A. = 3 SPACES
ADDITIONAL PARKING REQUIRED: = 6 SPACES

- THE CONDITION OF THE EXISTING PARKING AND LANDSCAPING IDENTIFIED ON THIS RECORD PLAN DOES NOT COMPLY WITH THE PARKING AND LANDSCAPING REGULATIONS IN EFFECT AT THE TIME OF RECORDATION OF THIS PLAN. THE PARKING AND LANDSCAPING MAY OR MAY NOT HAVE NON-COMPLYING STATUS UNDER THE PROVISIONS OF ARTICLE 8 OF THE UNIFIED DEVELOPMENT CODE. RECORDATION OF THIS PLAN DOES NOT CONSTITUTE VERIFICATION OF NON-COMPLYING STATUS. VERIFICATION CAN ONLY BE OBTAINED BY APPROVAL OF NEW CASTLE COUNTY.
- THE DEVELOPER SHALL PRESERVE ALL TREES ON THIS SITE EXCEPT WHERE NECESSARY TO CONSTRUCT BUILDINGS, PARKING, ACCESSWAYS, RECREATIONAL FACILITIES, DRAINAGE FACILITIES AND UTILITIES AND WHERE SELECTIVE THINNING OF EXISTING VEGETATION IS APPROVED. EXISTING PLANT MATERIALS DESIGNATED TO REMAIN ON THIS PLAN OR THE LANDSCAPE PLAN (IF SUCH PLAN IS A PART OF THIS PLAN) SHALL BE PRESERVED AND PROPERLY PROTECTED DURING CONSTRUCTION. IN THE CASE OF UTILITY RIGHTS-OF-WAY AND EASEMENTS ANY DISTURBED AREA SHALL BE REPLANTED SO AS TO ACHIEVE A RECURRENCE OF NATURAL VEGETATIVE COVER.
- THERE ARE NO NEW CONNECTIONS TO THE SEWER SYSTEM PROPOSED.
- EXPLORATORY SKETCH PLAN APPROVED: FEBRUARY 10, 2000.
- THE SITE IS NOT LOCATED WITHIN A CRITICAL NATURAL AREA.
- THE WETLAND BOUNDARIES DEPICTED ON THIS PLAN WERE DELINEATED IN ACCORDANCE WITH THE PROCEDURE SET FORTH IN THE FEDERAL MANUAL FOR IDENTIFYING AND DELINEATING JURISDICTIONAL WETLANDS DATED 1/10/89 OR AS LATER AMENDED. FOR A METES AND BOUNDS DESCRIPTION OF THE WETLANDS, SEE THE WETLANDS REPORT PREPARED BY WIK ASSOCIATES DATED JANUARY 7, 1992.
- THIS PLAN SUPERSEDES IN PART, THE RECORD MAJOR LAND DEVELOPMENT PLAN, THE INDEPENDENCE SCHOOL, RECORDED ON OCTOBER 15, 1992, IN THE OFFICE OF THE RECORDER OF DEEDS FOR NEW CASTLE COUNTY, DELAWARE, MICROFILM NO. 11425.
- ALL FIRE LANES, FIRE HYDRANTS, AND FIRE DEPARTMENT CONNECTIONS, SPRINKLERS, AND STANDPIPE CONNECTIONS SHALL BE MARKED IN ACCORDANCE WITH DELAWARE STATE FIRE PREVENTION REGULATIONS.
- INTENTIONALLY LEFT BLANK.
- FIRE HYDRANTS: PROPOSED (0)
EXISTING (3)
- MONUMENTS: EXISTING (10)
PROPOSED (0)
- NO DEBRIS WILL BE BURIED ON-SITE.
- ALL COMMON FACILITIES INCLUDING, BUT NOT LIMITED TO, PAVED AREAS, SIDEWALKS, CURBING, LANDSCAPING, OPEN SPACE, AND/OR DRAINAGE FACILITIES SHALL BE KEPT IN GOOD REPAIR AND MAINTAINED IN A SAFE AND SANITARY CONDITION IN ACCORDANCE WITH THE PROVISIONS OF DIVISION 27.300 OF THE UNIFIED DEVELOPMENT CODE.
- THIS SITE IS LOCATED IN A WATER RESOURCE PROTECTION AREA DISTRICT (COCKEYSVILLE FORMATION) AND IS SUBJECT TO ALL THE PROVISIONS OF DIVISION 10.380, SECTION 10.381 OF THE UNIFIED DEVELOPMENT CODE.
MAXIMUM IMPERVIOUS AREA BY CODE (636,164± S.F.) 20 %
EXISTING IMPERVIOUS AREA 209,100± S.F.
PROPOSED IMPERVIOUS AREA 1,485± S.F.
TOTAL (210,585± S.F.) 6.7 %
NO PUBLIC WELL WITHIN 300 LF. BY CODE.
NO PUBLIC WELLS EXIST ON-SITE.
- THIS SITE LIES ENTIRELY OR PARTIALLY WITHIN A SUBSIDENCE AREA AS DEFINED BY THE UNIFIED DEVELOPMENT CODE AND IS SUBJECT TO ALL THE SPECIFIC REQUIREMENTS CONTAINED THEREIN.
- THE "100 YEAR FULLY DEVELOPED FLOODLINE" OF THE PIKE CREEK WAS TAKEN FROM THE "FLOOD LEVEL DETERMINATION, PIKE CREEK PROJECT B-41", NEW CASTLE COUNTY PUBLIC WORKS 04/15/74. THE "100 YEAR FLOOD LINE" OF THE LOCAL STREAM WAS CALCULATED BY LANDMARK ENGINEERING 12/20/91.
- STORMWATER MANAGEMENT (QUALITY AND QUANTITY) IS TO BE ACCOMPLISHED BY TIEING PROPOSED ROOFTOP DRAINAGE AND PARKING TO THE EXISTING DNREC WETLANDS POND PROJECT.
- IF THE EXISTING PRIVATE WELL IS ABANDONED IN THE FUTURE, IT WILL BE ABANDONED IN ACCORDANCE WITH DNREC PROCEDURES.
- A LANDSCAPE PLAN PREPARED BY DESIGNS, ETC., LAST DATED _____ OR AS AMENDED APPROVED IN WRITING BY THE NEW CASTLE COUNTY DEPARTMENT OF LAND USE PLANNING DIVISION, IS HEREBY CONSIDERED A PART OF THE RECORD PLAN.
- AREA OF DISTURBANCE: 2,100 S.F.
- ALL IMPROVEMENTS REQUIRED BY THIS PLAN AND THE NEW CASTLE COUNTY CODE SHALL BE SUBJECT TO THE LAND DEVELOPMENT IMPROVEMENT AGREEMENT (LDIA), AND THE PERFORMANCE GUARANTEE INCORPORATED THEREIN. THE LDIA IS RECORDED IN THE RECORDER OF DEEDS IN AND FOR NEW CASTLE COUNTY ON 6-2-00 AT BOOK 2838 PAGE 192.
- ALL FUTURE CONSTRUCTION SHALL BE FULLY SPRINKLERED.

RECORD MINOR LAND DEVELOPMENT PLAN

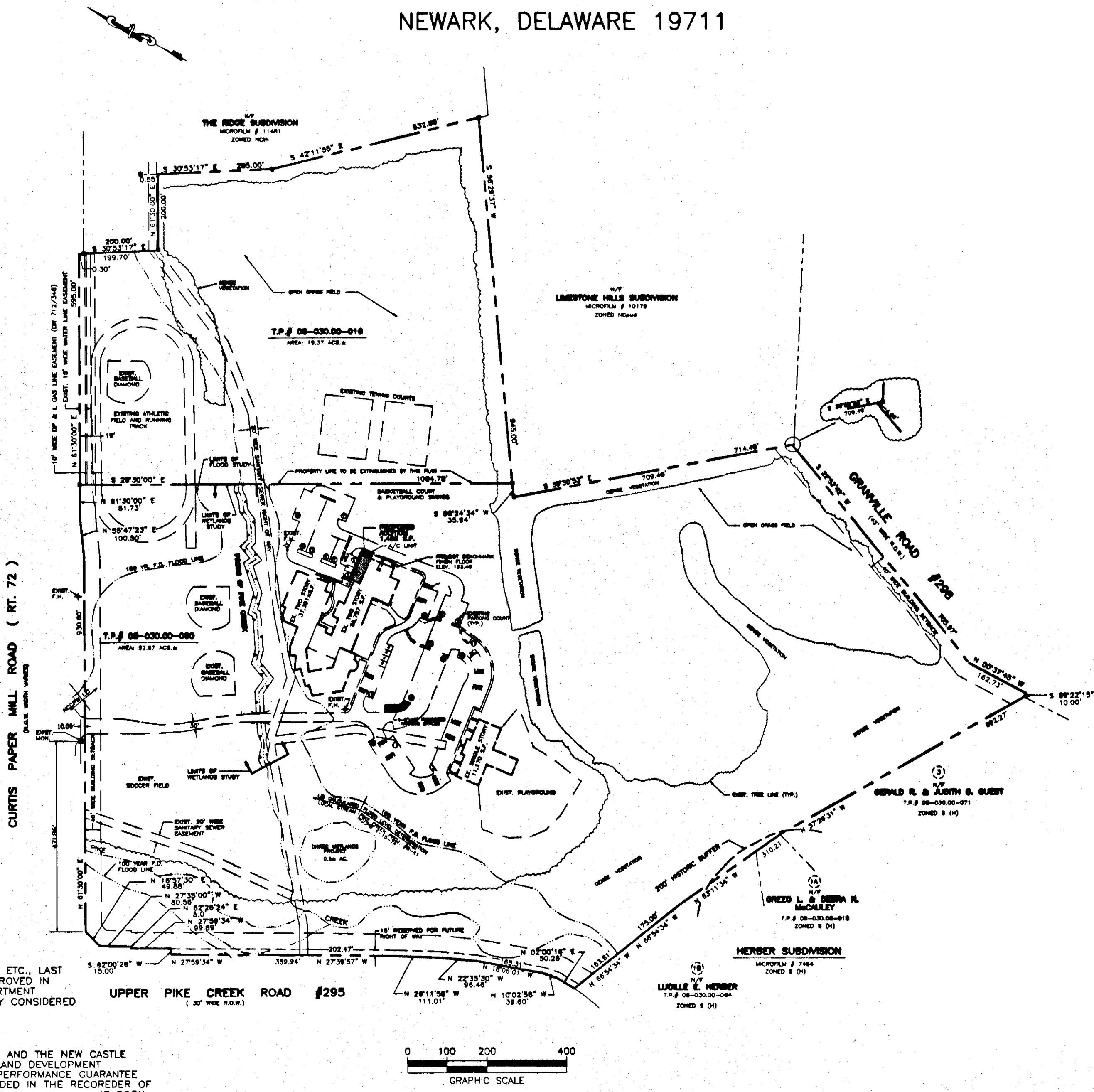
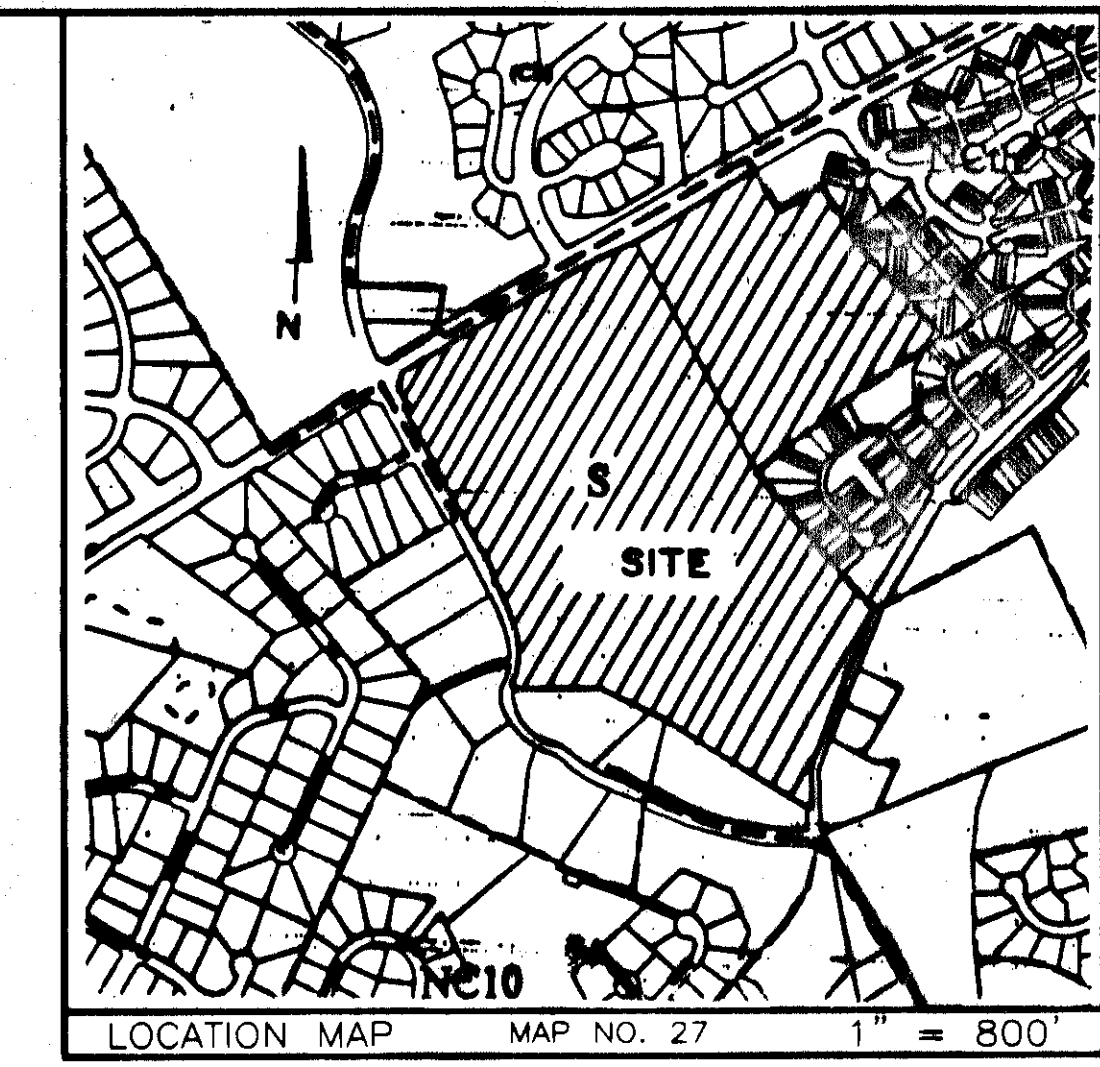
FOR

THE INDEPENDENCE SCHOOL

MILL CREEK HUNDRED - NEW CASTLE COUNTY DELAWARE

OWNER

THE INDEPENDENCE SCHOOL, INC.
1300 PAPER MILL ROAD
NEWARK, DELAWARE 19711



LEGEND

EXIST. TREE LINE	
EXIST. BUILDING	
EXIST. FIRE HYDRANT	
EXIST. MONUMENT	
PARKING COUNT	
PROPOSED ADDITION	
LIMIT OF DISTURBANCE	

CERTIFICATION OF PLAN ACCURACY

I, L. FRANKLIN BEERS, JR., HEREBY CERTIFY THAT I AM A PROFESSIONAL LAND SURVEYOR IN THE STATE OF DELAWARE, AND THAT THE PLAN SHOWN AND DESCRIBED HEREON, CONSISTING OF TWO (2) SHEETS, REPRESENTS A SURVEY MADE BY LANDMARK ENGINEERING, INC., AND IS TRUE AND CORRECT TO THE ACCURACY REQUIRED BY ACCEPTED SURVEYING STANDARDS AND PRACTICES AND BY THE NEW CASTLE COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS TO THE EXTENT THAT IT DESCRIBES THE BEARINGS AND DISTANCES OF SUBDIVIDING LANDS, AND THAT THE EXISTING MONUMENTS SHOWN HEREON ACTUALLY EXIST AND THAT THEIR POSITIONS ARE ACCURATELY SHOWN.

L. FRANKLIN BEERS, JR., PLS
DATE 5/17/2000

CERTIFICATION OF OWNERSHIP

I, _____, HEREBY CERTIFY THAT WE ARE THE OWNER OF THE PROPERTY WHICH IS SUBJECT OF THIS PLAN AND THAT THE LAND USE ACTION PROPOSED BY THIS PLAN IS MADE AT OUR DIRECTION AND THAT WE AUTHORIZE THIS PLAN TO BE RECORDED IN ACCORDANCE WITH THE REGULATIONS OF THE UDC.

SIGNATURE
DATE 5/17/2000

CERTIFICATION OF PLAN APPROVAL

APPROVED: 6/14/00 BY:
DATE GENERAL MANAGER

FOR DEPARTMENT OF LAND USE OF NEW CASTLE COUNTY,

APPROVED: 6/14/00 BY:
DATE GENERAL MANAGER

FOR COUNTY COUNCIL OF NEW CASTLE COUNTY,

RECORDED 6-15-00 IN THE OFFICE OF THE RECORDER OF DEEDS IN AND FOR NEW CASTLE COUNTY, STATE OF DELAWARE

MICROFILM NUMBER 14221

REVISIONS	CHECKED BY

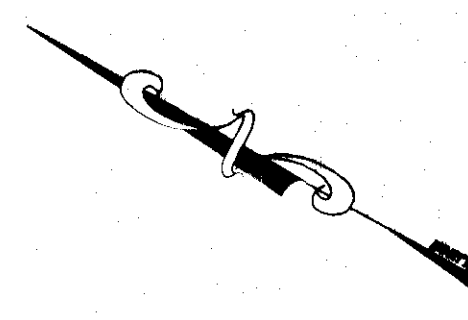
LANDMARK ENGINEERING
CIVIL AND SITE ENGINEERING SPECIALISTS
ONE CORPORATE COMMONS • SUITE 301 • NEW CASTLE, DELAWARE
PHONE - (302) 323-9377 • FAX - (302) 323-9461

SCALE: 1" = 200' DRAWN BY: R.J.S.

DESIGNED BY: R.L.S. CHECKED BY:
DATE: 2-24-00 FILE NO. 005 SHEET 1 of 2

14221

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND THE RULES AND REGULATIONS THEREOF.



N/F
THE RIDGE SUBDMISION
MICROFILM # 11481
ZONED NCth

N/F
LIMESTONE HILLS SUBDMISION
MICROFILM # 10179
ZONED NCpod

T.P.# 08-030.00-016
AREA: 19.37 ACS.±

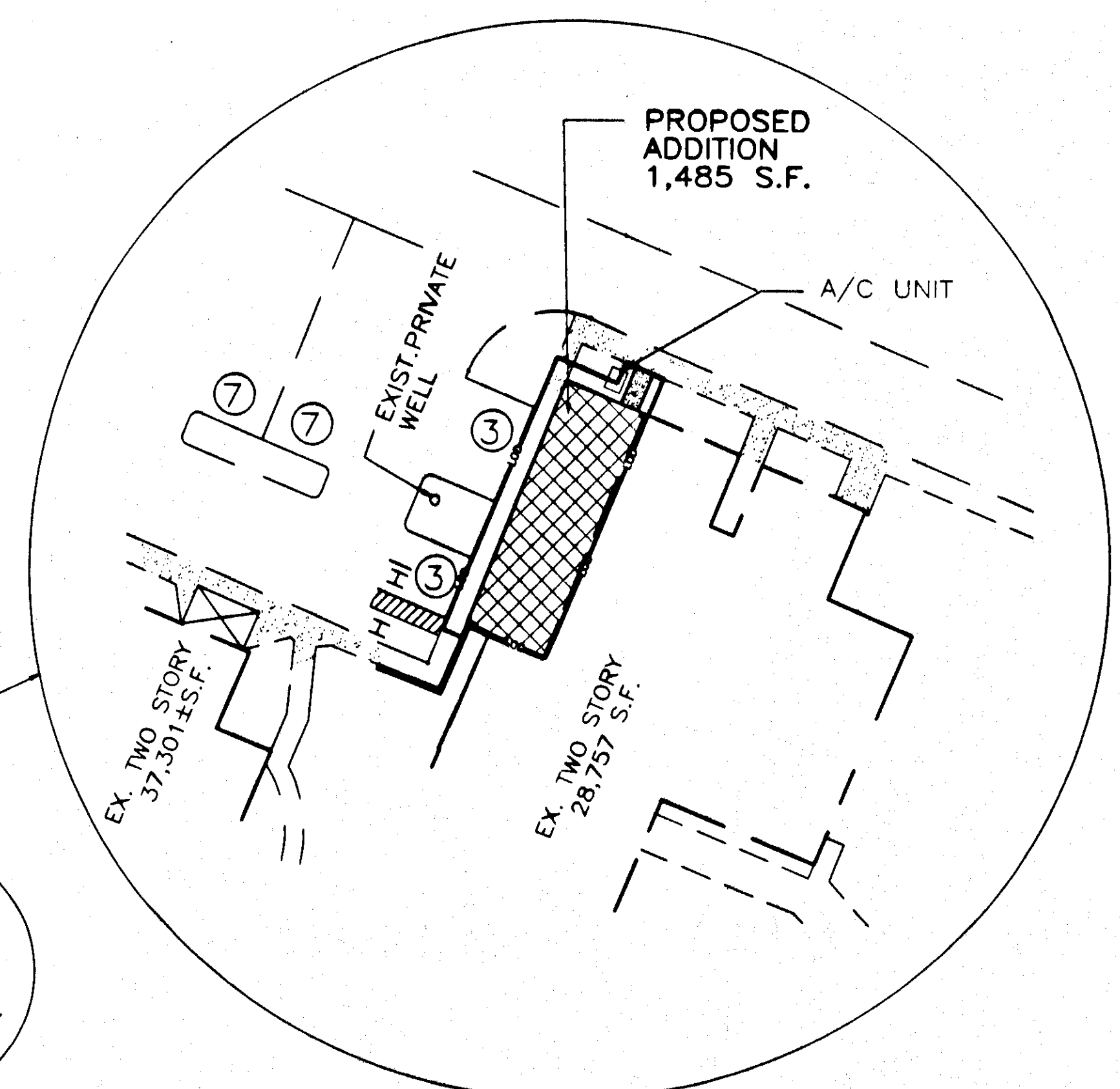
T.P.# 08-030.00-060
AREA: 52.87 ACS.±

N/F
GERALD R. & JUDITH C. GUEST
T.P.# 08-030.00-071
ZONED S (H)

N/F
GREGG L. & DEBRA H.
McCAULEY
T.P.# 08-030.00-018
ZONED S (H)

N/F
HERBER SUBDMISION
MICROFILM # 7464
ZONED S (H)

N/F
LUCILLE E. HERBER
T.P.# 08-030.00-064
ZONED S (H)



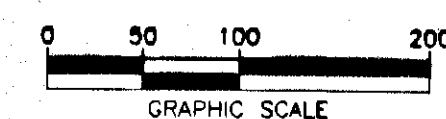
CURTIS PAPER MILL ROAD (RT. 72)
(R.O.W. WIDTH VARIES)

GRANVILLE ROAD #298
(65' WIDE R.O.W.)
40' WIDE BUILDING SETBACK

UPPER PIKE CREEK ROAD #295
(30' WIDE R.O.W.)

RECORD MINOR LAND DEVELOPMENT PLAN
FOR
THE INDEPENDENCE SCHOOL
MILL CREEK HUNDRED - NEW CASTLE COUNTY
DELAWARE

OWNER
THE INDEPENDENCE SCHOOL INC.
1300 PAPER MILL ROAD
NEWARK, DELAWARE 19711



REVISIONS	CHECKED BY

LANDMARK ENGINEERING
CIVIL AND SITE ENGINEERING SPECIALISTS
ONE CORPORATE COMMONS • SUITE 301 • NEW CASTLE, DELAWARE
PHONE - (302) 323-9377 • FAX - (302) 323-9481

SCALE: 1" = 100'	DRAWN BY: R.J.S.
DESIGNED BY: R.L.S.	CHECKED BY: L.F.P.
DATE: 2-24-00	COMM. NO. C 9
	NO. 00
	NO. 01
	NO. 02
	NO. 03
	NO. 04
	NO. 05
	NO. 06
	NO. 07
	NO. 08
	NO. 09
	NO. 10

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.

ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND THE RULES AND REGULATIONS THEREBY APPLICABLE

5/08
02/13-04

RECORD RESUBDIVISION PLAN

FOR

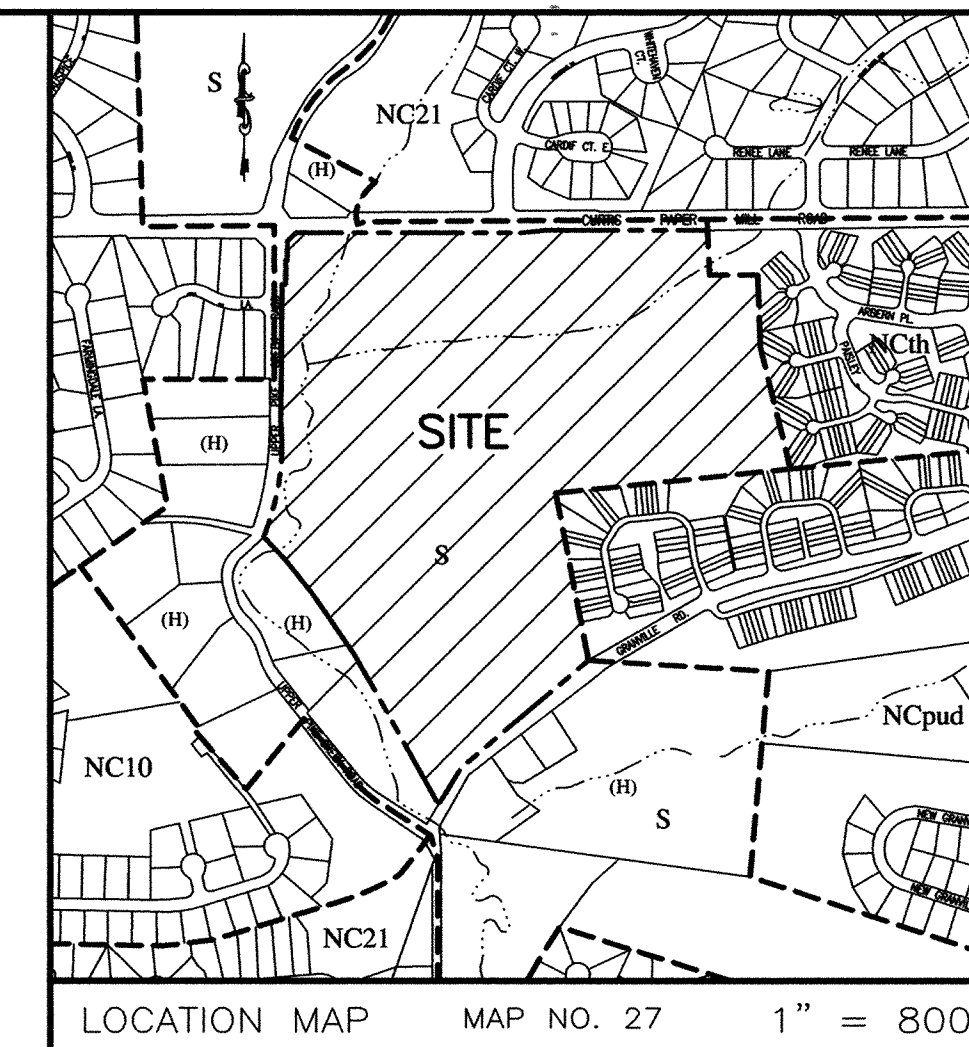
THE INDEPENDENCE SCHOOL

MILL CREEK HUNDRED - NEW CASTLE COUNTY

DELAWARE

OWNER

THE INDEPENDENCE SCHOOL, INC.
1300 PAPER MILL ROAD
NEWARK, DELAWARE 19711
PHONE 239-0330



LEGEND:

EXISTING TREE LINE	
EXISTING BRUSH LINE	
PROPERTY LINE	
EXISTING FIRE HYDRANT	
EXISTING BUILDING	
EXISTING PARKING COUNT	
LIMITS OF DISTURBANCE (LOD)	
PROPOSED CURB	
EXISTING CURB	
STEEP SLOPES (15-25%)	
STEEP SLOPES (> 25%)	
100 YEAR FLOODPLAIN	
EXISTING WETLANDS	

- PLAN DATA**
- TAX PARCEL NUMBER: 08-030.00-060
 - SOURCE OF TITLE: 1352-0289 AND 511-0114
 - EXISTING ZONING: S (SUBURBAN)
- BULK AREA RESTRICTIONS**
- STREET YARD SETBACK: 40'
SIDE YARD: 25'
REAR YARD: 40'
MIN. LOT AREA: 1 ACRE
MAX. BUILDING HEIGHT: 45'
PARKING SETBACK (STREET/OTHER): 20/10
- DATUM: NGS
 - GROSS AREA: 72.24± ACRES
 - WATER SUPPLY: ARTESIAN WATER COMPANY

WATER SUPPLY IS SUBJECT TO THE APPROVAL OF THE DELAWARE STATE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL AND THE DELAWARE DIVISION OF PUBLIC HEALTH.

7. SANITARY SEWER: (GRAVITY) NEW CASTLE COUNTY

SEWERAGE IS SUBJECT TO THE APPROVAL OF THE NEW CASTLE COUNTY DEPARTMENT OF SPECIAL SERVICES AT THE TIME OF APPROVAL OF THIS PLAN. SEWER CAPACITY EXISTED TO ACCOMMODATE THE ANTICIPATED FLOWS GENERATED BY THIS ADDITIONAL DEVELOPMENT. NEW CASTLE COUNTY HAS COMMITTED TO PROVIDE SEWER IN ACCORDANCE WITH THE LAND DEVELOPMENT IMPROVEMENT AGREEMENT FOR THIS DEVELOPMENT. THE OWNER OF THIS PROPERTY, HIS SUCCESSOR OR ASSIGNS, SHALL BE RESPONSIBLE FOR EXTENDING SEWER SERVICE TO EACH LOT SHOWN ON OR CREATED BY THIS PLAN.

SANITARY SEWER DATA:
NO ADDITIONAL FLOW IS PROPOSED BY THIS PLAN.

- TREE PRESERVATION: THE DEVELOPER SHALL PRESERVE ALL TREES ON THIS SITE EXCEPT WHERE NECESSARY TO CONSTRUCT BUILDINGS, ACCESSWAYS, AND UTILITIES, AND WHERE SELECTIVE THINNING OF EXISTING VEGETATION IS APPROVED. EXISTING PLANT MATERIALS DESIGNATED TO REMAIN ON THIS PLAN, OR THE LANDSCAPE PLAN SHALL BE PRESERVED AND PROPERLY PROTECTED DURING CONSTRUCTION. IN THE CASE OF UTILITY RIGHTS-OF-WAY AND EASEMENTS, ANY DISTURBED AREAS SHALL BE REPLANTED SO AS TO ACHIEVE A RECURRENCE OF NATURAL VEGETATIVE COVER.

20. MONUMENTS:
- EXISTING (10 PER M/F #14221)
 - PROPOSED (0)

- THIS SITE LIES ENTIRELY OR PARTIALLY WITHIN A SUBSIDENCE AREA AS DEFINED BY CHAPTER 40, SECTION 10.381 AND 22.110 OF THE NEW CASTLE COUNTY CODE AND IS SUBJECT TO ALL THE SPECIFIC REQUIREMENTS CONTAINED THEREIN. REFER TO "GEO-TECHNICAL EVALUATION PROPOSED BUILDING ADDITIONS & SITE IMPROVEMENTS THE INDEPENDENCE SCHOOL, DATED MARCH 2002, PREPARED BY DUFFIELD ASSOCIATES FOR SITE CONDITIONS & ANALYSIS. REFER TO SECTION 6.A&B FOR SITE WORK RECOMMENDATIONS & SPECIFICATIONS.
- THIS PLAN SUPERSEDES, IN PART, THE RECORD MAJOR LAND DEVELOPMENT PLAN FOR THE INDEPENDENCE SCHOOL DATED NOVEMBER 25, 2002 AND RECORDED FEBRUARY 18, 2003 IN THE OFFICE OF THE RECORDER OF DEEDS IN AND FOR NEW CASTLE COUNTY, STATE OF DELAWARE, ON INSTRUMENT 200303180034058

23. POSTAL ADDRESS: 1300 PAPER MILL ROAD

- COMMON FACILITIES: ALL COMMON FACILITIES INCLUDING, BUT NOT LIMITED TO, PAVED AREAS, SIDEWALK, CURBING, LANDSCAPING, OPEN SPACE, DRAINAGE AND STORMWATER MANAGEMENT FACILITIES SHALL BE KEPT IN GOOD REPAIR AND MAINTAINED IN A SAFE AND SANITARY CONDITION IN ACCORDANCE WITH THE PROVISIONS OF THE UNIFIED DEVELOPMENT CODE.

- A TRAFFIC OPERATIONAL ANALYSIS, DATED JUNE 2002, WAS DONE FOR THE RECENT SCHOOL EXPANSION BY LANDMARK ENGINEERING. DELDOT REVIEWED THE ANALYSIS, COMMENTING IN A LETTER DATED 8/22/2002.

- ENTRANCE FROM GRANVILLE ROAD CAN REMAIN IN PLACE AFTER THE PROJECT IS COMPLETE PROVIDED THAT IT BE GATED AND BE USED ONLY FOR CONSTRUCTION AND MAINTENANCE ACTIVITIES, OR DURING EMERGENCIES. IT IS NOT TO BE USED BY COMMUTERS TO THE SCHOOL, SCHOOL BUSES, OR STAFF AS A PERMANENT SECOND ENTRANCE.

- DEBRIS DISPOSAL: NO DEBRIS WILL BE BURIED OR DISPOSED OF ON THIS SITE.
- WATER RESOURCE PROTECTION: THIS PROPERTY IS LOCATED ENTIRELY WITHIN A COCKEYSVILLE FORMATION WATER RESOURCE PROTECTION AREA (OUTCROP). SEE WSPA MAP FOR NEW CASTLE COUNTY, DE, SHEET 1 OF 3, DATED 1993, REVISED 2001. MAXIMUM IMPERVIOUS AREA BY CODE - 629,355± SF. 20% TOTAL IMPERVIOUS AREA - 514,100± SF. 16.3% NO PUBLIC WELLS WITHIN 300 LF. BY CODE NO PUBLIC WELLS EXIST ON SITE
- THE 100 YEAR FLOOD LINE WAS COMPILED FROM A 1998 FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD STUDY, ALSO DELINEATED ON FIRM MAP NO. 10003C0130 G PANEL 130 OF 450 DATED OCTOBER 6, 2000. THE 100 YEAR FLOODLINE OF THE LOCAL STREAM WAS CALCULATED BY LANDMARK ENGINEERING, INC. INDEPENDENCE SCHOOL STORMWATER STUDIES DATED APRIL 2001.
- CRITICAL NATURAL AREAS: THE STATE INVENTORY OF CRITICAL NATURAL AREAS HAS BEEN EXAMINED AND NONE WERE FOUND TO EXIST ON THE SITE.
- TOPOGRAPHY NOTE: TOPOGRAPHIC INFORMATION WAS GENERATED BY AERIAL PHOTOGRAPHY AND FIELD VERIFIED BY LANDMARK ENGINEERING, INC. IN APRIL 2001. SITE BENCHMARK IS THE EXISTING FINISH FLOOR AT THE NORTHEAST ENTRANCE OF THE EXISTING TWO STORY BUILDING, ELEVATION 193.40 BASED ON THIS TOPOGRAPHY. THIS SITE CONTAINS BOTH PRECAUTIONARY AND PROHIBITIVE STEEP SLOPES DISTRICTS, WHICH ARE SHOWN ON THE PLAN.

- WETLANDS: THIS SITE WAS EVALUATED IN ACCORDANCE WITH THE PROCEDURES SET FORTH IN THE 1987 CORPS OF ENGINEERS WETLAND DELINEATION MANUAL (TECHNICAL REPORT Y-87-1), AND SUBSEQUENT PUBLIC NOTICES, TO IDENTIFY THE PRESENCE OF JURISDICTIONAL WETLANDS AND THE WETLANDS FOUND TO EXIST ON THE SITE. TOTALING IN AREA 9.01± ACRES OF LAND, ARE SHOWN ON THIS PLAN. SEE WETLAND REPORT PREPARED BY JAMES C. MCCALLEY, IV ENVIRONMENTAL CONSULTANTS, INC., DATED MAY 2001, REV. 9-26-02 FOR A METES AND BOUNDS DESCRIPTION OF THESE WETLANDS. NO WETLANDS DISTURBANCE IS PROPOSED BY THIS PLAN.

14. LAND DEVELOPMENT DATA:

EXISTING BUILDING COVERAGE:	122,000± SF	2.80± ACRES	3.9%
EXISTING PAVED AREA:		8.97± ACRES	12.3%
EXISTING STORMWATER MANAGEMENT (SWM) AREA:		1.86± ACRES	2.6%
PROPOSED PAVED AREA:		0.13± ACRES	0.2%
PROPOSED LANDSCAPE SURFACE AREA:		58.58± ACRES	81.0%
TOTAL SITE AREA:		72.24± ACRES	100%

TOTAL EXISTING BUILDING GROSS SQUARE FOOTAGE (PER INSTRUMENT NO. 200302180034058 PHASE I) 144,357 ± SF
TOTAL EXISTING BUILDING GROSS SQUARE FOOTAGE (PER INSTRUMENT NO. 200302180034058 PHASE II) 148,907 ± SF

- PARKING DATA (PER SECTION 4003.522, UDC) TYPICAL PARKING SPACES SHALL MEASURE 9' X 18'.

PROPOSED USE: GENERAL OFFICE

PARKING RATIONALE:
4,410 SF x 3.5 SPACES/1,000 GSF. = 16 SPACES

PROPOSED USE: SCHOOLS - ELEMENTARY

PARKING RATIONALE:
72 CLASSROOMS x 2 SPACES/CLASSROOM = 144 SPACES

PROPOSED USE: THEATER/ASSEMBLY

PARKING RATIONALE:
900 SEATS x 1 SPACE/4 PERMANENT SEATS x .75 = 169 SPACES

PROPOSED USE: ATHLETIC FIELDS

PARKING RATIONALE:
4 FIELDS x 15 SPACES/FIELD = 60 SPACES

PARKING SPACES REQUIRED 389 SPACES
TOTAL PARKING SPACES PROVIDED 329 SPACES

HANDICAP PARKING:
REQUIRED - 8
PROVIDED - 14

TOTAL PARKING REQUIRED:
PDNA = 229 SPACES
UDC = 389 SPACES
PROVIDED PAVED AND GRASSED OVERFLOW = 455 SPACES (441 STANDARD, 14 HANDICAP)

(THE PARKING DEMAND NEEDS ANALYSIS (PDNA) HAS BEEN APPROVED BY THE NEW CASTLE COUNTY DEPARTMENT OF LAND USE PER INSTRUMENT No. 200302180034058)

- FIRE PROTECTION: ALL FIRE LANES, FIRE HYDRANTS, SPRINKLERS, STANDPIPE CONNECTIONS AND FIRE EXITS SHALL BE MARKED AND PROTECTED IN ACCORDANCE WITH THE STATE OF DELAWARE FIRE REGULATIONS. SEE THE FIRE MARSHALL RECORD-TYPE PLAN FOR THE SPECIFIC FIRE PROTECTION REQUIREMENTS ON THIS SITE.

- FIRE HYDRANTS
- F.H. (4) EXISTING
 - F.H. (0) PROPOSED

- ENTRANCE/EXIT FACILITIES SHALL CONFORM TO STATE OF DELAWARE DIVISION OF HIGHWAY STANDARDS AND SHALL BE SUBJECT TO THEIR APPROVAL. THE DEVELOPER IS REQUIRED TO OBTAIN AN ENTRANCE PERMIT FROM THE DELDOT NORTH DISTRICT PERMIT OFFICE.

- DRAINAGE, EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT SHALL COMPLY WITH THE NEW CASTLE COUNTY DRAINAGE CODE AND THE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL'S DELAWARE SEDIMENT AND STORMWATER REGULATIONS AND THE DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK.

CERTIFICATION OF PLAN ACCURACY (INTERIOR ONLY)

I, BRUCE J. TEASE, HEREBY CERTIFY THAT I AM A REGISTERED PROFESSIONAL ENGINEER WITH A BACKGROUND IN CIVIL ENGINEERING IN THE STATE OF DELAWARE AND THAT ALL OF THE INFORMATION ON THIS PLAN OTHER THAN THE PERIMETER BOUNDARY, IS TRUE AND CORRECT TO THE ACCURACY REQUIRED BY ACCEPTED SURVEYING STANDARDS AND PRACTICES AND BY THE NEW CASTLE COUNTY UNIFIED DEVELOPMENT CODE.

Bruce J. Tease
REGISTERED PROFESSIONAL ENGINEER
WITH A BACKGROUND IN CIVIL ENGINEERING
DATE: 5/3/04

CERTIFICATION OF OWNERSHIP

I, Robert Mark HEREBY CERTIFY THAT THE INDEPENDENCE SCHOOL, INC. IS THE OWNER OF THE PROPERTY WHICH IS SUBJECT OF THIS PLAN AND THAT THE LAND USE ACTION PROPOSED BY THIS PLAN IS MADE AT ITS DIRECTION AND THAT IT AUTHORIZES THIS PLAN TO BE RECORDED IN ACCORDANCE WITH THE REGULATIONS OF THE NEW CASTLE COUNTY UNIFIED DEVELOPMENT CODE.

Robert Mark
DATE: 5/1/04

CERTIFICATION OF PLAN APPROVAL

APPROVED: 5/1/04 BY: *Charles L. Behl*
DATE GENERAL MANAGER

FOR DEPARTMENT OF LAND USE OF NEW CASTLE COUNTY

APPROVED: 5/1/04 BY: *Charles L. Behl*
DATE GENERAL MANAGER

FOR COUNTY COUNCIL OF NEW CASTLE COUNTY

CERTIFICATION OF PERIMETER ACCURACY

THE ACCURACY OF THE PERIMETER WAS CERTIFIED BY L. FRANKLIN BEERS, JR. ON THE RECORD MINOR LAND DEVELOPMENT PLAN "THE INDEPENDENCE SCHOOL" RECORDED JUNE 15, 2000 ON MICROFILM NO. 14221. THERE IS NO CHANGE IN THIS PLAN RELATIVE TO THAT PERIMETER.

THE PURPOSE OF THIS PLAN IS TO CONSTRUCT A SIXTEEN FOOT WIDE ONE WAY ROAD CONNECTING THE EXISTING NORTHEAST PARKING LOT WITH THE ENTRANCE DRIVE.

APPLICATION NO. 2003-0868(S)
RECORD
RESUBDIVISION PLAN

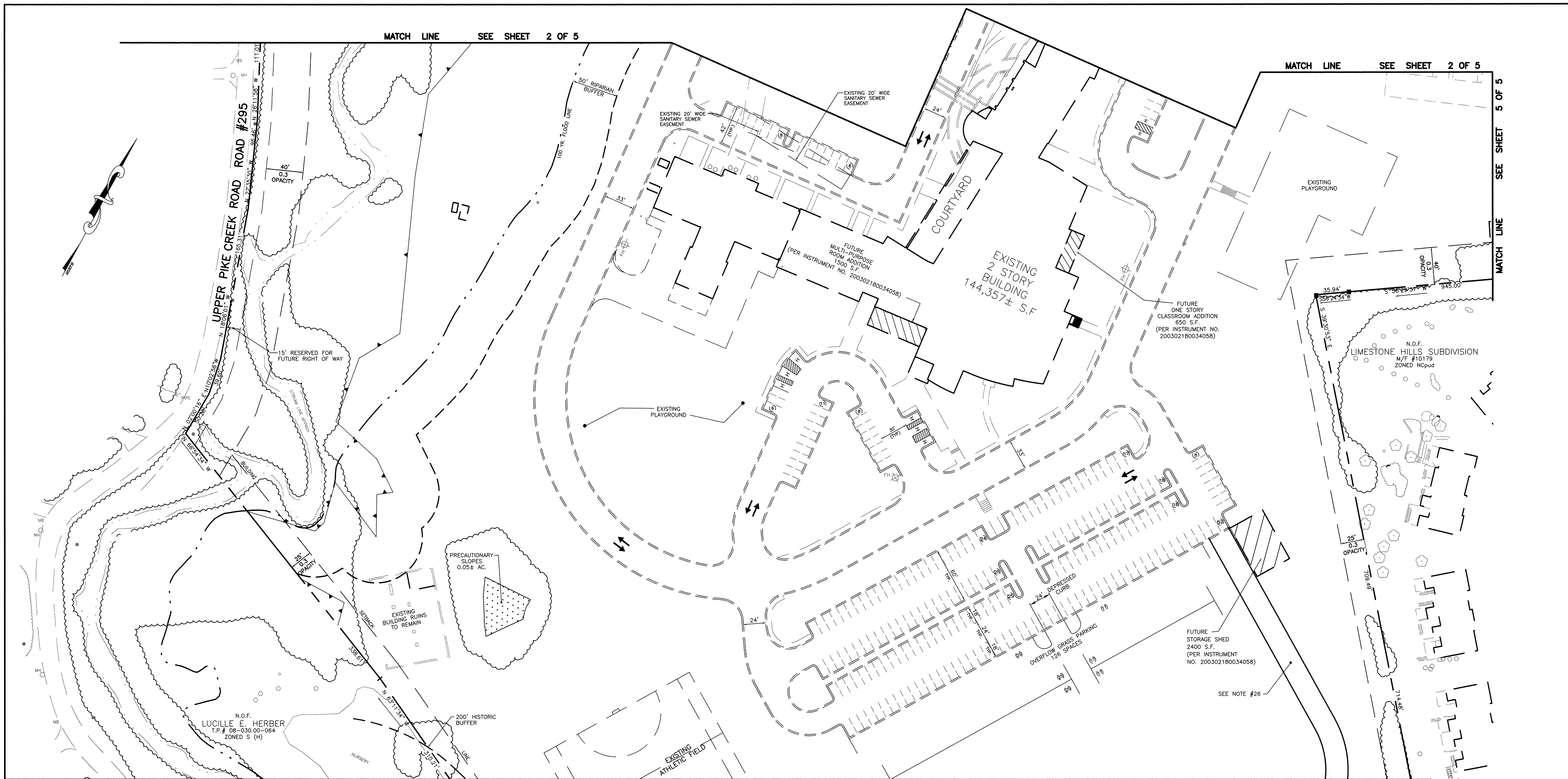
FOR
THE INDEPENDENCE SCHOOL
MILL CREEK HUNDRED - NEW CASTLE COUNTY
DELAWARE

OWNER
THE INDEPENDENCE SCHOOL, INC.
1300 PAPER MILL ROAD
NEWARK, DELAWARE 19711
PHONE 239-0330

20040511-0052283
Pages: 5 F: \$56.00
05/11/04 03:11:17 PM
T20040040482
Michael E. Kozikowski
New Castle Recorder MINOR

REVISIONS	CHECKED BY	 CIVIL AND SITE ENGINEERING SPECIALISTS ONE CORPORATE COMMONS • SUITE 301 • NEW CASTLE, DELAWARE PHONE - (302) 323-9377 • FAX - (302) 323-9461
SCALE: 1" = 200'	DRAWN BY: E.R.F./T.W.F.	0 100 200 400 GRAPHIC SCALE
DESIGNED BY: M.K.B.	CHECKED BY: RLS.	
DATE: 10-22-03	COMM. NO. C 931-2	FILE NO. 089
		SHEET NO. 1 of 5

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND THE RULES AND REGULATIONS THEREOF APPURTENANT



MATCH LINE SEE SHEET 2 OF 5

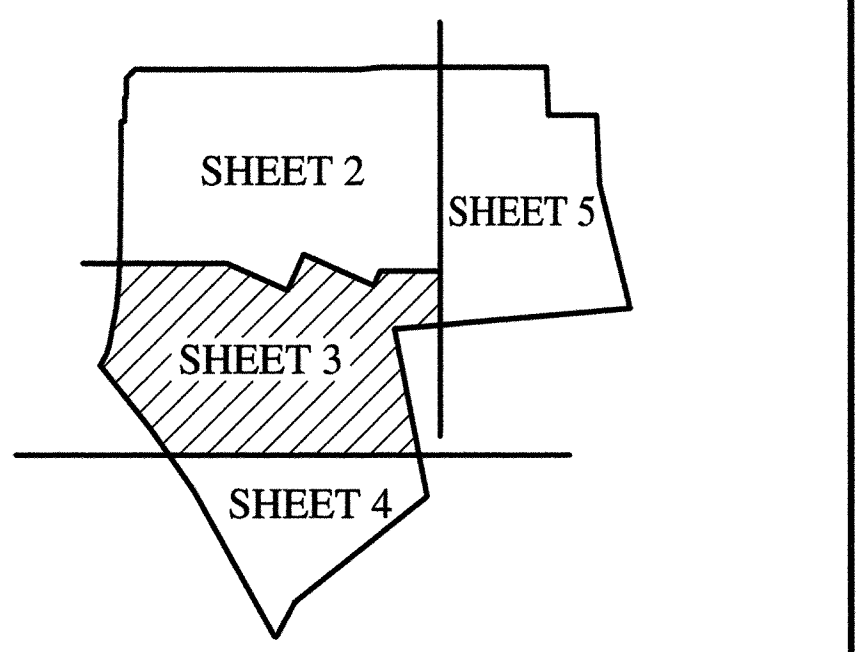
MATCH LINE SEE SHEET 2 OF 5

MATCH LINE SEE SHEET 4 OF 5

APPLICATION NO. 2003-0868(S)

**RECORD
RESUBDIVISION PLAN
FOR
THE INDEPENDENCE SCHOOL
MILL CREEK HUNDRED - NEW CASTLE COUNTY
DELAWARE**

OWNER
THE INDEPENDENCE SCHOOL, INC.
1300 PAPER MILL ROAD
NEWARK, DELAWARE 19711
PHONE 239-0330



KEY MAP 1"=800'

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND THE RULES AND REGULATIONS THEREOF APPROPRIATE.

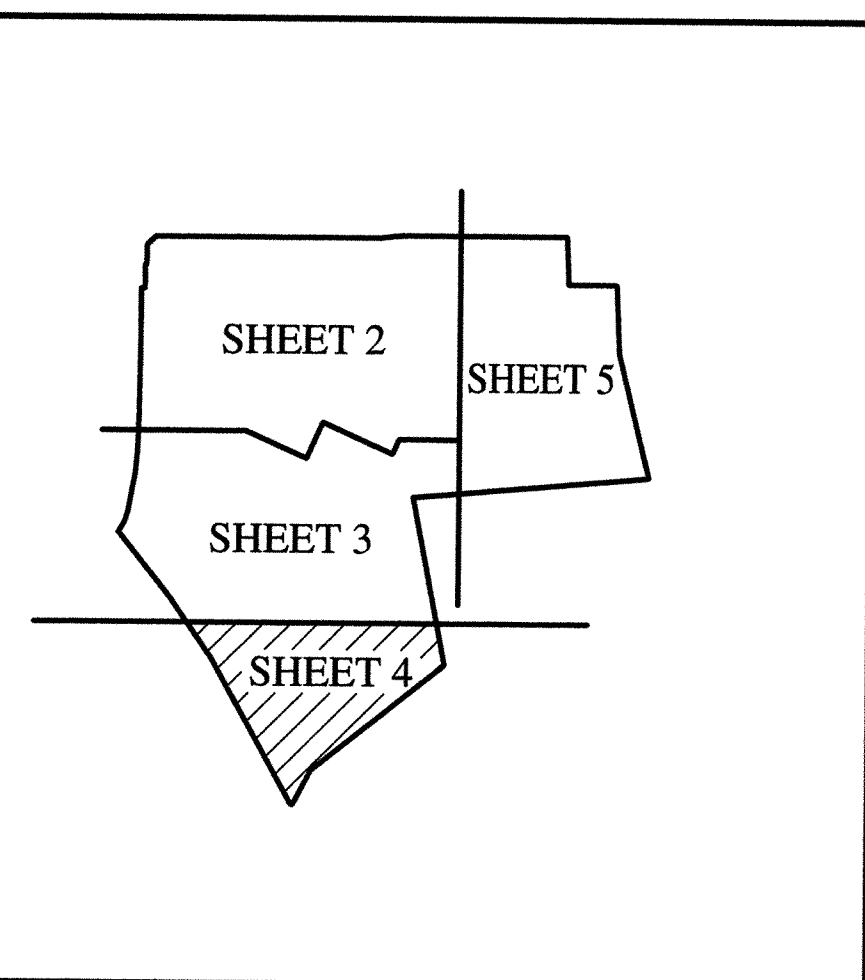
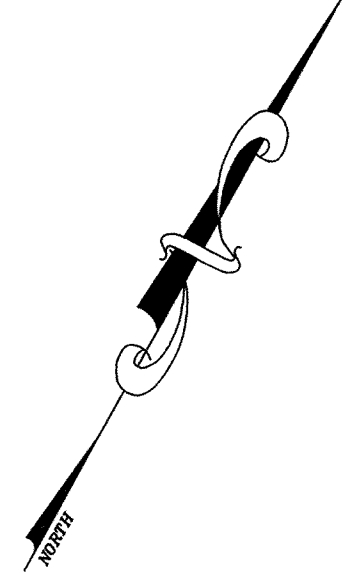
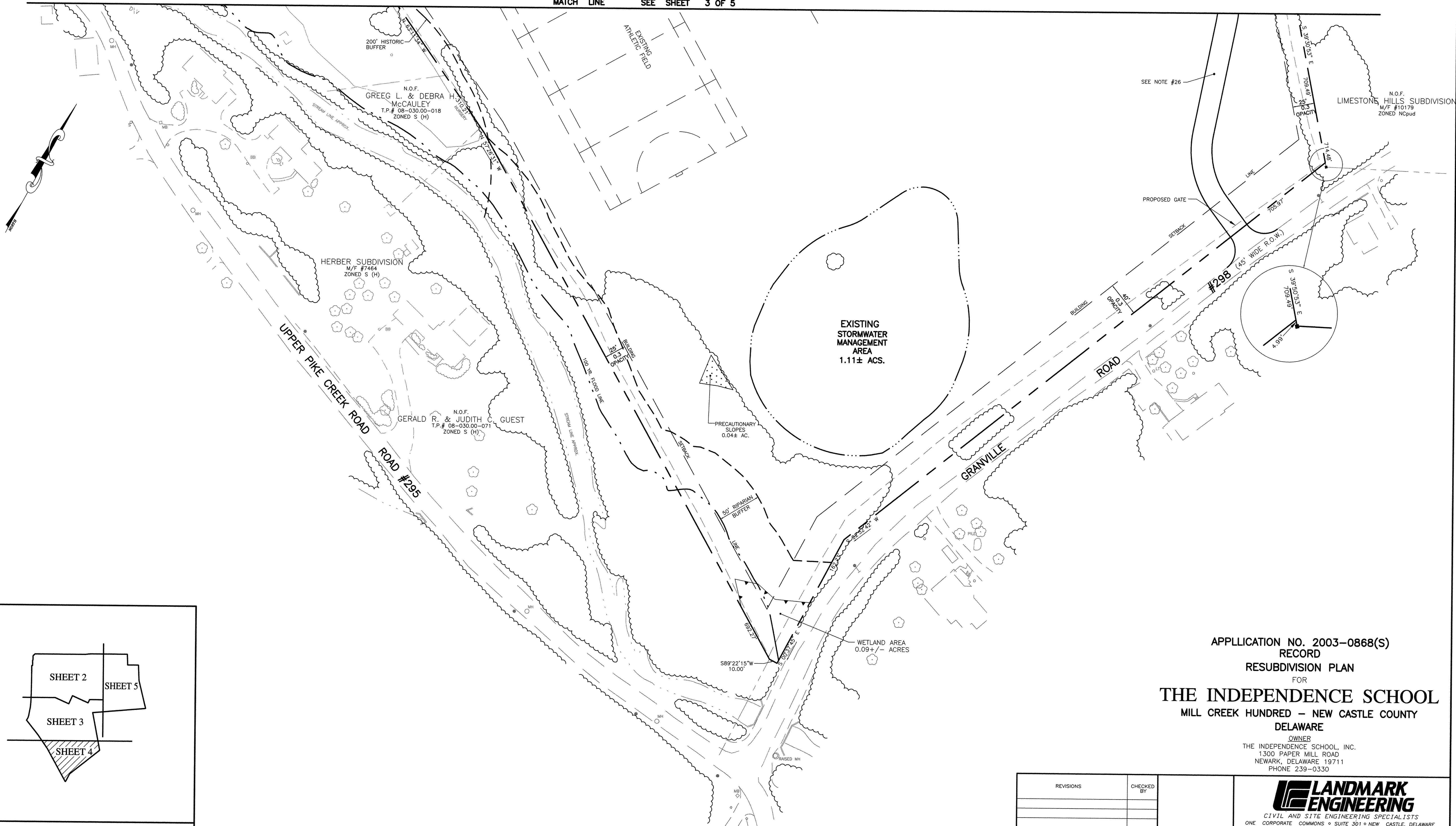
REVISIONS	CHECKED BY

LANDMARK ENGINEERING
CIVIL AND SITE ENGINEERING SPECIALISTS
ONE CORPORATE COMMONS • SUITE 301 • NEW CASTLE, DELAWARE
PHONE - (302) 323-9377 • FAX - (302) 323-9461

0 25 50 100
GRAPHIC SCALE

SCALE: 1" = 50' DRAWN BY: TWF./E.R.F.
DESIGNED BY: M.K.B. CHECKED BY: RLS. DRAWING NAME: RECRESUB-3.DWG
DATE: 10-22-03 COMM. NO.: C 931-2 FILE NO.: 091 SHEET NO.: 3 of 5

MATCH LINE SEE SHEET 3 OF 5



KEY MAP 1"=800'

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.

ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND THE RULES AND REGULATIONS THEREOF APPLICABLE.

APPLICATION NO. 2003-0868(S)
RECORD
RESUBDIVISION PLAN
FOR
THE INDEPENDENCE SCHOOL
MILL CREEK HUNDRED - NEW CASTLE COUNTY
DELAWARE

OWNER
THE INDEPENDENCE SCHOOL, INC.
1300 PAPER MILL ROAD
NEWARK, DELAWARE 19711
PHONE 239-0330

REVISIONS	CHECKED BY

LANDMARK ENGINEERING
CIVIL AND SITE ENGINEERING SPECIALISTS
ONE CORPORATE COMMONS SUITE 301 NEW CASTLE, DELAWARE
PHONE - (302) 323-9377 FAX - (302) 323-9461

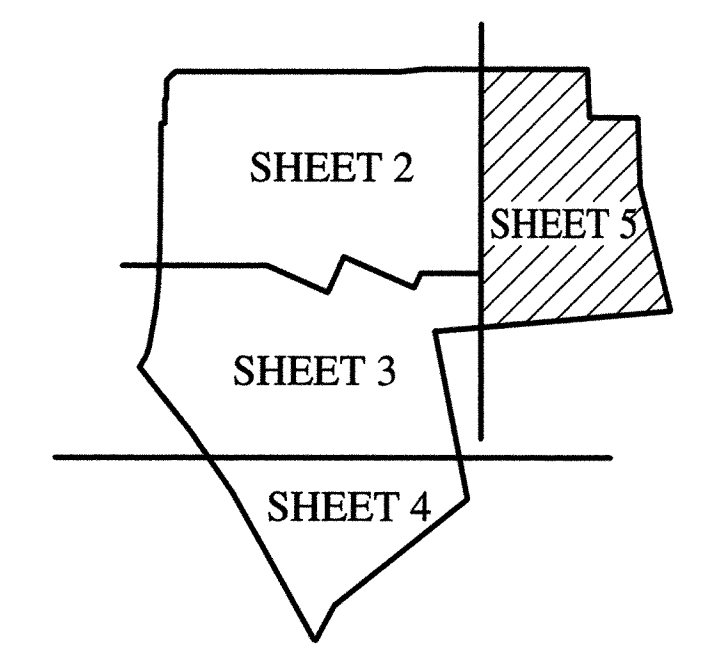
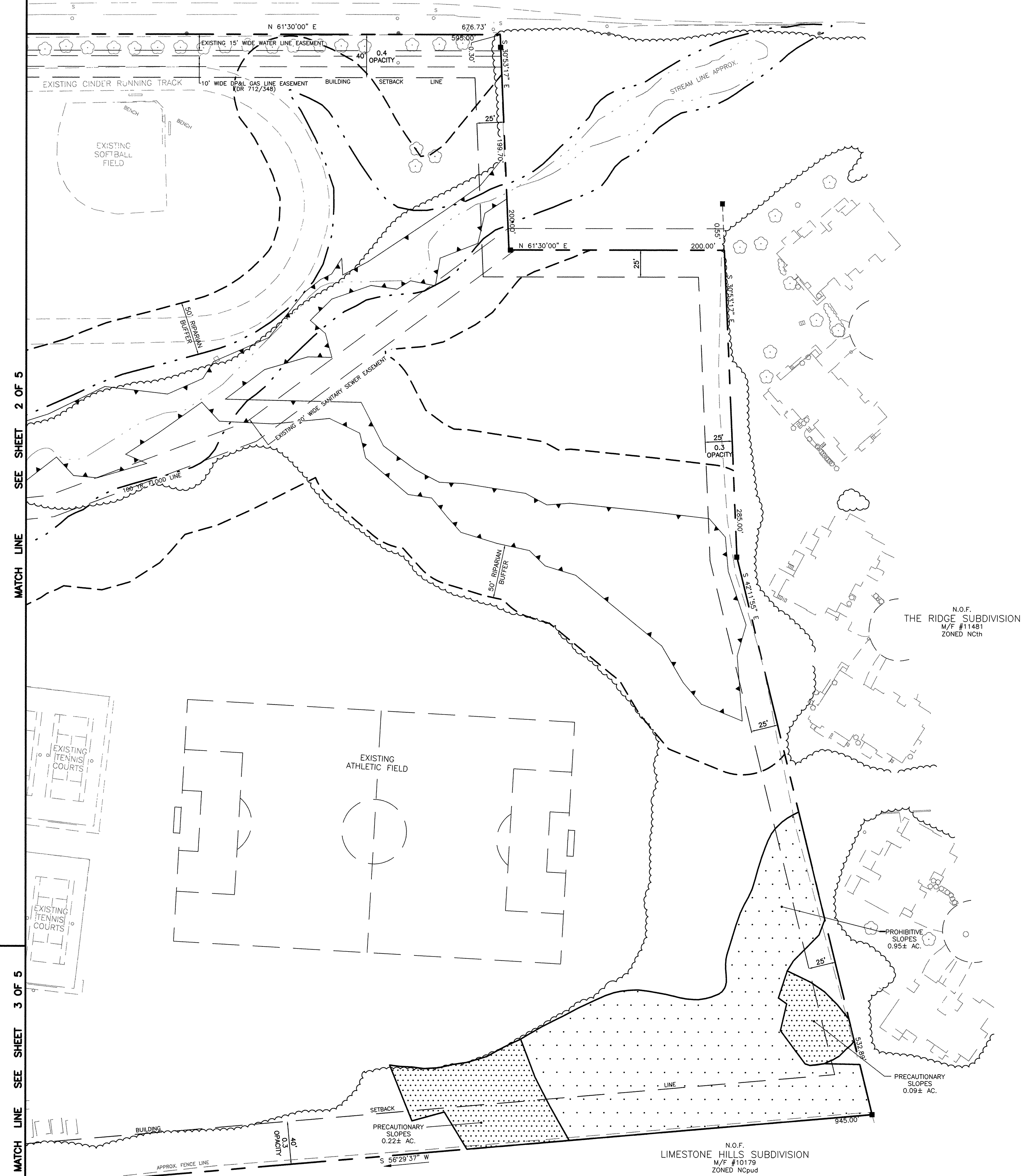
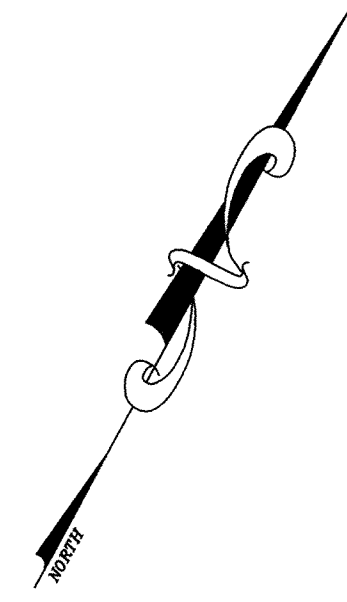
0 25 50 100
GRAPHIC SCALE

SCALE: 1" = 50' DRAWN BY: TWF./E.R.F.

DESIGNED BY: M.K.B.	CHECKED BY: RLS.	DRAWING NAME: RECRESUB-4.DWG
DATE: 10-22-03	COMM. NO. C 931-2	FILE NO. 092 SHEET NO. 4 of 5

©2003 LANDMARK ENGINEERING, INC.

CURTIS PAPER MILL ROAD (RT. 72) (R.O.W. WIDTH VARIES)



KEY MAP 1"=800'

APPLICATION NO. 2003-0868(S)
 RECORD
 RESUBDIVISION PLAN
 FOR
THE INDEPENDENCE SCHOOL
 MILL CREEK HUNDRED - NEW CASTLE COUNTY
 DELAWARE
 OWNER
 THE INDEPENDENCE SCHOOL, INC.
 1300 PAPER MILL ROAD
 NEWARK, DELAWARE 19711
 PHONE 239-0330

REVISIONS	CHECKED BY

LANDMARK ENGINEERING
 CIVIL AND SITE ENGINEERING SPECIALISTS
 ONE CORPORATE COMMONS • SUITE 301 • NEW CASTLE, DELAWARE
 PHONE - (302) 323-9377 • FAX - (302) 323-9461

0 25 50 100
 GRAPHIC SCALE

SCALE: 1" = 50' DRAWN BY: TWF./E.R.F.
 DESIGNED BY: M.K.B. CHECKED BY: RLS. DRAWING NAME: RECRESUB-5.DWG
 DATE: 10-22-03 COMM. NO. C 931-2 FILE NO. 093 SHEET NO. 5 of 5

©2003 LANDMARK ENGINEERING, INC.

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
 ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND THE RULES AND REGULATIONS THEREOF APPLICABLE.

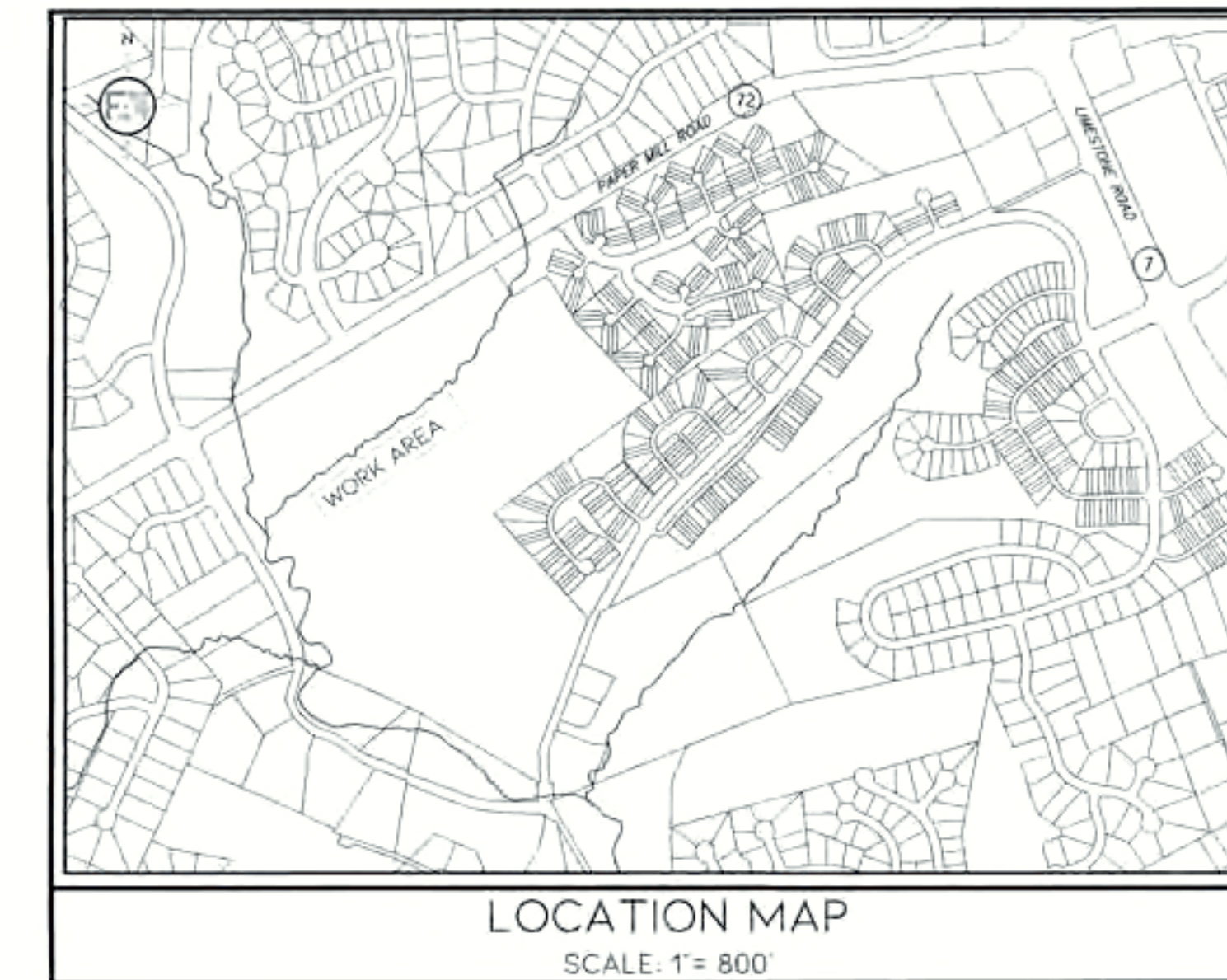
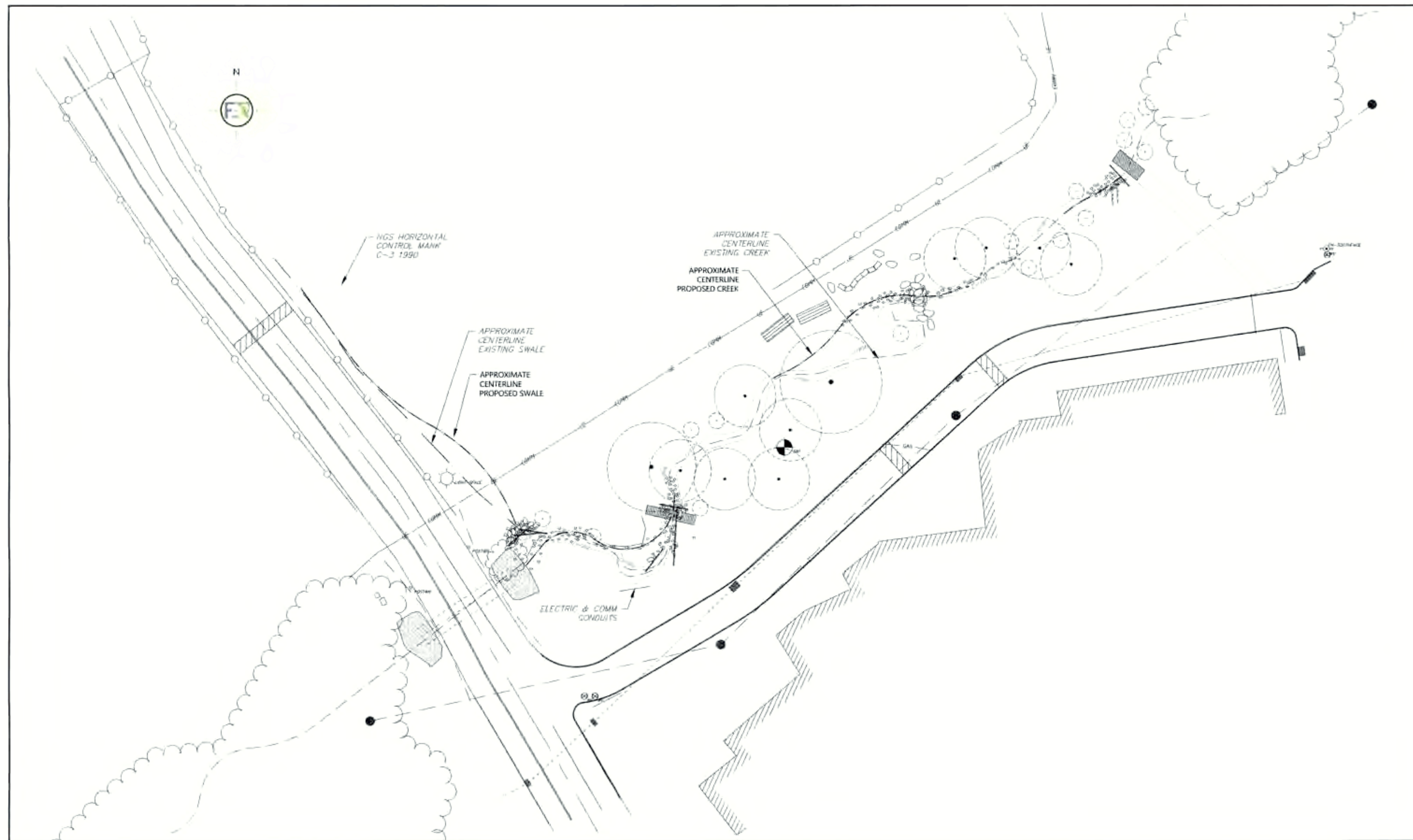
STREAM RESTORATION AT THE INDEPENDENCE SCHOOL



- CIVIL ENGINEERING
- LANDSCAPE ARCHITECTURE
- ECOLOGICAL RESTORATION

FORESITE ASSOCIATES INC.

PHONE: 302.351.3421
INFO@FORESITEASSOCIATES.COM



PLAN INDEX

- 1 INDEX SHEET
- 2 NOTES AND LEGEND
- 3 EROSION & SEDIMENT PLAN
- 4 EROSION & SEDIMENT DETAILS
- 5 EROSION & SEDIMENT DETAILS
- 6 EROSION & SEDIMENT DETAILS
- 7 EROSION & SEDIMENT DETAILS
- 8 EROSION & SEDIMENT DETAILS
- 9 CONSTRUCTION PLAN
- 10 CONSTRUCTION PROFILE
- 11 CONSTRUCTION SECTIONS
- 12 CONSTRUCTION DETAILS
- 13 CONSTRUCTION DETAILS
- 14 CONSTRUCTION DETAILS
- 15 LANDSCAPE PLAN

**INDEPENDENCE SCHOOL
STREAM RESTORATION PLAN**
NEW CASTLE CONSERVATION DISTRICT
 2430 OLD COUNTRY ROAD, NEWARK, DE 19702

#	REVISION TO DETAIL SHEET 13 & 14	DATE
4	REVISION TO DETAIL SHEET 13 & 14	05/03/23
5	SPOT ELEVATION UPDATES SHEET 9	05/03/23
5	PER COMMENTS-NPS&SPACE	04/04/23
4	ISSUED FOR PERMITTING	04/04/23
3	PER NPS COMMENTS	02/14/23
2	ISSUED FOR PERMITTING	02/02/23
1	ISSUED FOR CLIENT REVIEW	01/05/23
#	COMMENT	DATE

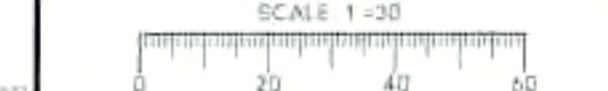


INDEX

INDEPENDENCE SCHOOL
STREAM RESTORATION

1411 CREEK HUNDRED NEWARK, DELAWARE
NEW CASTLE COUNTY

DATE: 06/28/23	PROJECT # 07101
SURVEYED BY: N/A	SHEET: 1
CREATED BY: ODS	1 OF 15
DRAWN BY: ODS	
CHECKED BY: ACH	



CERTIFICATE OF OWNER

I CERTIFY THAT ALL LAND CLEARING, CONSTRUCTION AND DEVELOPMENT SHALL 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 ON-SITE REVIEWS, AND I UNDERSTAND MY RESPONSIBILITIES UNDER THE NPDES CONSTRUCTION GENERAL PERMIT, AS REFERENCED ON THIS COVER SHEET.

J. L.
REPRESENTATIVE - THE INDEPENDENCE SCHOOL

29 AUG 23
DATE

CERTIFICATE OF ACCURACY

I, ANDREW C. HAYES, PE RLA CERP, 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.

Andrew C. Hayes
ANDREW C. HAYES, PE RLA CERP
DE LICENSE NO. 13286
2 July 2023

GENERAL NOTES:

1. THIS PLAN PROVIDES DESIGN DRAWINGS FOR STREAM RESTORATION INITIATIVES FOR AN UNNAMED TRIBUTARY LOCATED ON THE GROUNDS OF THE INDEPENDENCE SCHOOL IN NEWARK, DE. THE STREAM RESTORATION IS FOR A LENGTH OF APPROXIMATELY 360 LINEAL FEET FROM THE CULVERT AT THE SCHOOL ENTRY DRIVE UPSTREAM TO THE THIRD EXISTING PEDESTRIAN BRIDGE.
2. THESE PLANS ARE BASED UPON THE STREAM CONDITIONS OBSERVED/SURVEYED ON 04/20/2020. BECAUSE STREAM SYSTEMS ARE DYNAMIC AND EROSION IS LIKELY TO CONTINUE TO OCCUR AFTER THIS DATE, THE CONDITIONS AT THE TIME OF CONSTRUCTION MAY VARY FROM THOSE SHOWN ON THESE PLANS. ADJUSTMENTS TO THE DESIGN SHALL BE MADE IN THE FIELD UNDER THE DESIGN PROFESSIONAL'S SUPERVISION AS NEEDED TO ADDRESS SITE CONDITION CHANGES.
3. FLOOD PLAIN: ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP NO. 1000300130L, EFFECTIVE JANUARY 22, 2020 THIS PROJECT IS NOT LOCATED WITHIN AREAS OF ZONE AE OF THE 100 YEAR FLOOD PLAIN. NOTE, IT IS RECOMMENDED PER THIS PLAN, THE DOWNSTREAM END OF THE CULVERTS BE CLEARED OF SEDIMENT BUILD UP, ACCORDING TO MAP 1000300130L, THE AE ZONE BEGINS AT THE DOWNSTREAM END OF THE CULVERT.
4. ACCORDING TO A WETLAND DELINEATION BY FORESITE ASSOCIATES IN APRIL OF 2022, THERE ARE NON-WETLANDS WATERS (A PERENNIAL STREAM) WITHIN THE PROJECT AREA'S LIMIT OF DISTURBANCE, BUT NO 404 WETLANDS. OTHER WETLAND AND NON-WETLANDS WATERS BEYOND THE LIMITS OF THE PROJECTS LIMIT OF DISTURBANCE MAY EXIST ON THE PROPERTY.
5. PER THE NEW CASTLE COUNTY GIS DATA VIEWER, HTTPS://ARC.GIS/DC/50, THE PROJECT IS LOCATED WITHIN THE COCKEYSVILLE OUTCROP WATER RESOURCE PROTECTION AREA.
6. THIS SITE IS NOT LOCATED IN A CRITICAL NATURAL AREA.
7. EXISTING UTILITIES ARE SHOWN BASED ON VISUAL INFORMATION OBSERVED (SUCH AS THE GRODED AREA EXPOSING A UTILITY LINE). IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE UTILITY COMPANIES INVOLVED IN ORDER TO SECURE THE MOST ACCURATE INFORMATION AVAILABLE AS TO UTILITY LOCATIONS AND ELEVATIONS. THERE ARE PRIVATE AND PUBLIC UTILITIES IN THE VICINITY OF THIS PROJECT.
8. NO CONSTRUCTION AROUND OR ADJACENT TO UTILITIES SHALL BEGIN WITHOUT NOTIFYING THEIR

- OWNERS AT LEAST 48 HOURS IN ADVANCE. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE AND ANY DAMAGE DONE TO THEM SHALL BE IMMEDIATELY AND COMPLETELY REPAIRED AT THE CONTRACTOR'S EXPENSE.
- BEFORE ANY WORK TAKES PLACE, THE CONTRACTOR SHALL CALL MISS UTILITY AT 811 OR 1.800.285.8888 AT LEAST 48 HOURS PRIOR TO CONSTRUCTION, TO HAVE ALL EXISTING UTILITIES MARKED ON SITE. THERE ARE PRIVATE UTILITIES ON THIS SITE THAT MAY REQUIRE THE SERVICES OF A PRIVATE UTILITY LOCATING FIRM, AS PART OF THE CONTRACTOR'S SCOPE OF WORK, PRIVATE UTILITIES SHALL BE MARKED WITHIN THE LIMITS OF THE LOD.
- ALL MACHINERY TO BE PRESSURE WASHED PRIOR TO ENTERING PROJECT SITE; SPECIAL ATTENTION SHOULD BE GIVEN TO TRACKS AND UNDERCARRIAGE THAT CAN CONTAIN INVASIVE SEED, SUCH AS PHRAGMITES. MACHINERY TO BE REVIEWED AND CLEANLINESS APPROVED BY NCCD OR NCCD REPRESENTATIVE. EQUIPMENT FOUND TO HAVE UNSATISFACTORY AMOUNTS OF SOIL, DEBRIS, ETC. WILL NEED TO BE REMOVED FROM THE SITE.
- EXISTING CONDITIONS SHOWN ARE BASED ON FIELD SURVEYING PERFORMED BY FORESITE ASSOCIATES INC. ON APRIL 20,2020.
- THE LIMIT OF DISTURBANCE FOR EXCAVATION AND GRADING WORK PROPOSED BY THIS PLAN IS APPROXIMATELY 0.98 ACRES.
- THE OWNER SHALL BE FAMILIAR WITH AND COMPLY WITH ALL ASPECTS OF THE NPDES CONSTRUCTION GENERAL PERMIT ASSOCIATED WITH THE PROJECT, INCLUDING, BUT NOT LIMITED TO, PERFORMING WEEKLY SITE INSPECTIONS DURING CONSTRUCTION AND AFTER RAIN EVENTS, AND MAINTAINING WRITTEN LOGS OF THESE INSPECTIONS.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD-CHECK AND VERIFY PROPOSED CLEARANCES, DIMENSIONS AND EXISTING CONDITIONS. REPORT ANY DISCREPANCIES TO THE DESIGNER & OWNER'S REPRESENTATIVE FOR DIRECTION BEFORE PROCEEDING WITH WORK. FIELD REVISIONS SHALL REQUIRE PRIOR DESIGN REVIEW AND WRITTEN CONFIRMATION FROM THE OWNER'S REPRESENTATIVE. WORK STARTED WITHOUT NOTIFICATION OF AND CONFIRMATION FROM THE OWNER'S REPRESENTATIVE WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND WILL

- BE CORRECTED BY HIM/HER WITHOUT ADDITIONAL COMPENSATION.
- PERFORM ALL WORK IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS, WHERE DISCREPANCIES OCCUR AND WHERE THERE ARE CONFLICTS OR OMISSIONS IN THE DRAWINGS AND APPLICATIONS, THE CONTRACTOR SHALL NOTIFY THE DESIGNER & OWNER'S REPRESENTATIVE IMMEDIATELY AND REFRAIN FROM STARTING AND COMPLETING SUCH WORK, OR DEFERRED WORK, UNTIL TOLD BY THE OWNER'S REPRESENTATIVE TO PROCEED.
- PROTECTION BARRIER SHALL BE INSTALLED AROUND ALL TREES MARKED BY THE DESIGN TEAM AND APPROVED BY THE OWNER'S REPRESENTATIVE, PRIOR TO THE START OF CONSTRUCTION. CONTRACTOR MUST HAVE WRITTEN APPROVAL THAT ALL TREES ARE MARKED AND WORK MAY BEGIN. SHOULD ANY TREES BE DAMAGED OR WORK BEGUN PRIOR TO THIS APPROVAL, REPAIRS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND REPLACED PER OWNER'S REPRESENTATIVE DIRECTION.
- THE TREE PROTECTION BARRIER SHALL BE PLACED AT OR EXTERIOR OF THE DRIP-LINE OF THE TREE, UNLESS OTHERWISE NOTED OR APPROVED BY THE OWNER'S REPRESENTATIVE.
- THERE SHALL BE NO STORAGE OF MATERIALS OR SUPPLIES OF ANY KIND WITHIN THE AREA OF THE PROTECTION BARRIERS, CONCRETE AND CEMENT MATERIALS, BLOCK, STONE, SAND, AND SOIL SHALL NOT BE PLACED WITHIN THE DRIP- LINE OF THE TREES.
- FUEL STORAGE SHALL NOT BE PERMITTED WITHIN 50 FEET OF ANY TREE TO BE PRESERVED. REFUELING, SERVICING AND MAINTENANCE OF EQUIPMENT AND MACHINERY SHALL NOT BE PERMITTED WITHIN 50 FEET OF ANY WATERWAY, WATERBODY, AND/OR TREE TO BE PRESERVED.
- DEBRIS AND WASTE FROM THE CONSTRUCTION OR OTHER ACTIVITIES SHALL NOT BE PERMITTED WITHIN THE PROTECTED AREAS. WASHDOWN OF CONCRETE OR CEMENT HANDLING EQUIPMENT (IF REQUIRED), IN PARTICULAR, SHALL NOT BE PERMITTED WITHIN 150 FEET OF WATERWAYS, WATERBODIES AND/OR TREES TO BE PRESERVED.
- ANY DAMAGES OR INJURIES TO TREES TO BE PRESERVED SHOULD BE REPORTED TO THE OWNER'S REPRESENTATIVE AS SOON AS POSSIBLE. SEVERED ROOTS SHALL BE PRUNED CLEANLY TO HEALTHY

- TISSUE, USING PROPER PRUNING TOOLS. BROKEN BRANCHES OR LIMBS SHALL BE PRUNED ACCORDING TO INTERNATIONAL SOCIETY OF ARBORICULTURE PRUNING GUIDELINES AND ANSI-300 PRUNING STANDARDS. THE OWNER RETAINS THE RIGHT TO CONSULT A CERTIFIED ARBORIST AT THE CONTRACTOR'S EXPENSE.
- NO PRUNING OF THE TREE CANOPIES AND BRANCHES IS TO BE DONE TO PROVIDE CLEARANCES FOR THE CONSTRUCTION EQUIPMENT WITHOUT EXPLICIT WRITTEN PERMISSION FOR EACH TREE REQUIRING PRUNING. ALERT OWNER'S REPRESENTATIVE IF PRUNING IS NECESSARY.
- NO DEBRIS IS TO BE BURIED ON SITE.
- POTENTIAL NURSERIES FOR SOURCING OF NATIVE PLANT MATERIALS INCLUDE, BUT ARE NOT LIMITED TO:
 - PINELANDS NURSERY & SUPPLY
523 ISLAND ROAD
COLUMBUS, NJ 08022
 - EDGE OF THE WOODS NATIVE PLANT NURSERY LLC
2415 ROUTE 100
OREFELD, PA 18069
 - NORTH CREEK NURSERIES
LANDENBERG, PENNSYLVANIA 19350
 - FRIST CONSERVATION SEEDS, INC.
8884 MERCER PIKE
MEADVILLE PA 16335
 - CTORARO NATIVE PLANT NURSERY
6126 STREET ROAD
KIRKWOOD, PA 17536

SITE DATA

PROJECT CONTACT: NEW CASTLE CONSERVATION DISTRICT
2430 OLD COUNTRY ROAD
NEWARK, DE 19702
302.832.3100

SITE ADDRESS: THE INDEPENDENCE SCHOOL
1300 PAPER MILL ROAD
NEWARK, DE 19711

TAX MAP PARCEL NO.: 08-030-00-060

HORIZONTAL DATUM: NAD 83
VERTICAL DATUM: NAVD 88
PROJECT BENCH MARK(S): NGS DISK 'C-3 1990', ELEV. 177.13

PURPOSE OF PLAN: **STREAM RESTORATION**



- CIVIL ENGINEERING
- LANDSCAPE ARCHITECTURE
- ECOLOGICAL RESTORATION

FORESITE ASSOCIATES INC.
2401 PHILADELPHIA PIKE
CLAYMONT, DE 19703
PHONE: 302.351.3421
INFO@FORESITEASSOCIATES.COM

GENERAL CONSTRUCTION NOTES:

1. ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM TO THE DELAWARE DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", AUGUST 2016, SECTION 911-PLANTINGS, EXCEPT AS NOTED IN THESE PLANS. FOR ALL INSTANCES IN THIS SECTION OF THE SPECIFICATIONS THAT REFERENCE "THE ENGINEER", THE TERM SHALL BE SUBSTITUTED WITH "PROPERTY OWNER / OWNER'S REPRESENTATIVE". THE SPECIFICATIONS CAN BE ACCESSED ONLINE FREE OF CHARGE. NOTE THIS DOCUMENT REFERENCES THE AMERICAN ASSOCIATION OF NURSERMEN: AMERICAN STANDARD FOR NURSERY STOCK, LATEST EDITION, WHICH SHALL ALSO BE CONSIDERED PART OF THESE SPECIFICATIONS.
2. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THEREOF APPLICABLE. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
3. CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK. THEY WILL BE SOLELY RESPONSIBLE FOR THE MEASUREMENTS, METHODS, TECHNIQUES, PROCEDURES, AND SEQUENCE OF CONSTRUCTION.
4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAKE THEMSELVES THOROUGHLY FAMILIAR WITH THE MOST RECENT REVISION OR AMENDMENTS TO ALL DOCUMENTS REFERENCED IN THESE NOTES.
5. THE CONTRACTOR SHALL AT ALL TIMES PROTECT AGAINST SEDIMENT OR DEBRIS LADEN RUNOFF OR WIND FROM LEAVING THE SITE. PERIMETER CONTROLS (WHEN CALLED FOR) SHOULD BE

- CHECKED DAILY AND ADJUSTED AND/OR REPAIRED TO FULLY CONTAIN AND CONTROL SEDIMENTATION ON THE SITE. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT HAS REACHED HALF OF THE EFFECTIVE CAPACITY OF THE CONTROL. IN ADDITION, THE CONTRACTOR MUST NOT ADJUST OR REPAIR MEASURES IN TIMES OF ADVERSE WEATHER CONDITIONS, OR AS DIRECTED BY THE NCCD.
- SOILS / SOIL MIXTURES : THIS PROJECT UTILIZES IN-SITU SOILS, ONLY AMENDMENTS NOTED ARE TO BE ADDED UNLESS APPROVED BY THE OWNER'S REPRESENTATIVE. AMENDMENTS NOT TO BE USED INCLUDE, BUT ARE NOT LIMITED TO, PEAT, HUMUS, AND LEAF MULCH.
- FERTILIZER :
 - a. PLANT FERTILIZER SHALL CONSIST OF COMMERCIALY AVAILABLE PRODUCTS AND SHALL BE MATERIALS SOLD AS "ORGANIC" OR "NATURAL" FERTILIZERS. PRODUCT NUTRIENT CONTENT SHALL BE IDENTIFIED IN THE STANDARD FORM OF NITROGEN (N), PHOSPHOROUS (P) AND POTASSIUM (K) RATIOS. THE MINIMUM AVAILABLE NUTRIENT CONTENT SHALL BE 6-2-4, UNLESS OTHERWISE DIRECTED BY THE OWNER / OWNER'S REPRESENTATIVE.
- WATER :
 - a. APPLY WATER BY OPEN-END HOSE SUPPLIED BY GRAVITY OR LOW PRESSURE PUMP/PRESSURE NOT TO EXCEED 10 PSI). APPLY WATER AT A RATE SO THAT THE WATER DOES NOT COMPLETELY RUN-OFF AND WILL THOROUGHLY SOAK AND PERCOLATE INTO THE SOIL IN THE PLANTING PIT. PERFORM WATERING WITHIN 1 CALENDAR DAY IF SITE CONDITIONS REQUIRE WATER TO SAVE THE HEALTH OF THE PLANTS. COMMERCIAL TREE WATERING BAGS OR OTHER CONTAINERS THAT WILL ALLOW A SLOW DISPENSING OF WATER OVER A PERIOD OF TIME EQUAL TO THE DESIRED AMOUNT OF WATER TO BE PROVIDED AT EACH PLANT CAN BE SUBMITTED FOR USE AND APPROVED BY THIS OPERATION.
 - b. WATER SMALLER TYPE PERENNIAL OR HERBACEOUS PLANTS SUCH AS BULBS, TUBERS,

- RHIZOMES, PLUGS, STARTER PLANTS, SEEDLINGS AND SMALL TRANSPLANTS WITH 2-GALLONS OF WATER PER PLANT PER WATERING CYCLE.
- WATER THE PLANTS ON A 7 TO 10 DAY CYCLE BASED ON A NATURAL RAINFALL CONDITION OF LESS THAN 1-INCH OF RAINFALL PER WEEK, OR WHEN TEMPERATURES AND HUMIDITY REMAIN GREATER THAN 90 DEGREES FOR A PERIOD OF ONE WEEK. DO NOT WATER IF SOIL CONDITIONS ARE DETERMINED TO BE SATURATED. DO NOT WATER AT OR ONTO THE TRUNK OR STEMS OF THE PLANT.
- PROVIDE A WATERING SCHEDULE, SOURCE OF WATER, AND LIST OF WATERING EQUIPMENT TO BE USED FOR APPROVAL AT LEAST 30 DAYS PRIOR TO FIRST WATERING ON SITE. IF WATERING METHODOLOGIES CHANGE AT ANYTIME DURING THE PROJECT DURATION OR DURING ESTABLISHMENT PERIOD DOCUMENTATION MUST BE PROVIDED.
- PLANTING :
 - a. ALL STOCK MUST BE HEALTHY AND VIGOROUS AND BE FREE OF DAMAGE FROM DISEASE, MISHANDLING OR POOR PRUNING. PLANTS THAT HAVE EVIDENCE OF STRESS, DISEASE, DIEBACK OR MISHANDLING WILL BE REJECTED.
 - b. PLANT MATERIALS MUST BE SELECTED FROM CERTIFIED NURSERIES THAT HAVE BEEN INSPECTED BY STATE AND/OR FEDERAL AGENCIES. NURSERY INSPECTION CERTIFICATES SHALL BE FURNISHED TO DMREC UPON REQUEST.
 - c. ALL PLANT MATERIAL MUST BE GROWN IN CONDITIONS SIMILAR TO THE USDA HARDINESS ZONE OF DELAWARE AND OF LOCAL ECOTYPE TO THE PROJECT SITE.
 - d. PLANT MATERIAL COLLECTED FROM THE "WILD" IS PROHIBITED.
 - e. EACH PLANT OR SAME-SPECIES GROUP OF PLANTS SHIPPED TO THE JOB SITE MUST BE CLEARLY LABELED WITH ITS SCIENTIFIC NAME AND COMMON NAME. THE CONTRACTOR IS RESPONSIBLE TO CHECK TO SEE THAT THE PLANTS ARE CORRECTLY LABELED. THE

- CONTRACTOR IS PROHIBITED TO ADD, ALTER OR REMOVE LABELS UNTIL AFTER INSTALLATION AND APPROVAL BY THE OWNER / OWNER'S REPRESENTATIVE. THE CONTRACTOR WILL NOT BE PAID FOR MATERIAL THAT IS IMPROPERLY LABELED OR FOR MATERIAL ON WHICH THE CONTRACTOR HAS ALTERED OR REMOVED THE LABELS.
- CONTRACTOR SHALL PROVIDE AN AS-BUILT RED-LINED PLAN NOTING ANY DEVIATIONS/SUBSTITUTIONS FROM THE APPROVED PLAN(S).
- PLANT ESTABLISHMENT :
 - a. THE PERIOD OF ESTABLISHMENT AND REPLACEMENT WILL BEGIN FROM THE DOCUMENTED DATE OF ACCEPTANCE OF THE ENTIRE PROJECT BY THE OWNER. OBTAIN WRITTEN CONCURRENCE ON THE VERIFIED DATE OF PLANTING COMPLETION FROM THE OWNER / OWNER'S REPRESENTATIVE.
 - b. THE LANDSCAPE CONTRACTOR IS TO GUARANTEE PLANT MATERIAL, WATERING, AND GENERAL CARE FOR PLANTS FOR ONE YEAR FROM PROJECT ACCEPTANCE.
 - c. MONITOR THE CONDITION OF THE PLANTS AND INITIATE ALL HORTICULTURAL PRACTICES NECESSARY TO MAINTAIN THE PLANTS IN A HEALTHY CONDITION DURING THE PERIOD OF ESTABLISHMENT.
 - d. PROTECT PLANTS FROM WILDLIFE DEPREDAATION; DEER PROTECTION SHALL BE PROVIDED FOR ALL WOODY SPECIES.
- THE CONTRACTOR SHALL TAKE ALL MEASURES NECESSARY TO KEEP THE WORK AREA IN A CLEAN, NEAT CONDITION.

LEGEND

EXISTING FEATURES

- UNDERGROUND ELECTRIC
- FENCE
- ROAD CENTERLINE
- ROADWAY STRIPING
- GUARDRAIL
- 360' --- --- --- CONTOUR MAJOR
- 361' --- --- --- CONTOUR MINOR
- OHWM --- --- --- ORDINARY HIGH WATER MARK
- STREAM
- EDGE OF PAVEMENT
- TREE
- TREE LINE (ESTIMATE FROM AERIAL IMAGE)
- SHRUB LINE (ESTIMATE FROM AERIAL IMAGE)
- PIPE (UNDERGROUND)
- MANHOLE
- BUILDING
- ASPHALT PAVING
- RIP RAP
- x 361' ELEVATION POINT
- SOIL BORING

PROPOSED FEATURES

- STREAM
- TRANSITION COBBLE 6'-18"
SEE CONSTRUCTION DETAILS
- ANCHOR STONE 18'-36"
SEE CONSTRUCTION DETAILS
- MIXED ANGULAR AND ROUND STONES
SEE CONSTRUCTION DETAILS
- HARDWOOD SALVAGED TIMBERS
SEE CONSTRUCTION DETAILS
- IMBRICATE SEAT WALL BOULDER
- EXISTING TREE TO BE REMOVED
- INTERLOCKING CONCRETE PAVER
- RIP RAP
- BOULDER COBBLE STREAM
BED STONE POOL
- BOULDER COBBLE STREAM
BED STONE CHANNEL
- STREAM TOE STABILIZATION
- 360' --- --- --- CONTOUR MAJOR
- 361' --- --- --- CONTOUR MINOR
- 1000'00" --- --- --- LIMIT OF DISTURBANCE DELINEATED
WITH SILT FENCE
- 1000'00" --- --- --- LIMIT OF DISTURBANCE DELINEATED
WITH COMPOST FILTER LOGGED
- 3' --- --- --- INLET PROTECTION TYPE-3
- STABILIZED CONSTRUCTION
ENTRANCE
- 5'00" --- --- --- STONE CULVERT INLET PROTECTION
- SENSITIVE AREA OF PROTECTION
*IN AREAS WHERE SAP ABUTS STREAM
BANK USE CAUTION TO NOT DESTABILIZE
EXISTING BANKS, CONTACT OWNER'S
REPRESENTATIVE AS NEEDED

OWNER ON-GOING MAINTENANCE GUIDANCE:

- YEAR 1: INSTALLATION TO 365 DAYS FOLLOWING THE FINAL PROJECT PAYMENT, WILL BE THE MOST CRITICAL TIME TO MONITOR THE RESTORATION WORK. THE / A DESIGN CONSULTANT SHOULD BE CONTACTED AT ANY TIME SHOULD THE OWNER OR MAINTENANCE TEAM HAVE LANDSCAPE CARE QUESTIONS OR CONCERNS. THE INSTALLATION CONTRACTOR SHALL PROVIDE A 1-YEAR WARRANTY ON PLANT MATERIAL.
- DURING DROUGHT AND LOW RAINFALL AMOUNTS FOR THE SPRING, SUMMER, AND FALL SEASONS CHECK PLANT HEALTH FOR WATER STRESS. FOR THE FIRST YEAR THE CONTRACTOR IS EXPECTED TO WARRANTY THE PLANTS UNLESS OTHER ARRANGEMENTS WERE AGREED UPON DURING CONSTRUCTION. THE MAINTENANCE TEAM CAN CALL THE CONTRACTOR AND MAKE THEM AWARE OF THE PLANT STRESS AND/OR THEY CAN WATER THE LANDSCAPE BY RUMPING AND SPRAYING WATER FROM THE STREAM CHANNEL. MEADOW LANDSCAPES SHOULD NOT BE PROVIDED WITH SUPPLEMENTAL WATER.
- MONITOR THE LANDSCAPE FOR ANIMAL DEPREDAATION. GESE AND DEER ARE FREQUENT VISITORS TO NEW LANDSCAPES IN THE NEW CASTLE COUNTY AREA. BOTH CAN KILL YOUNG LANDSCAPE PLANTS THROUGH INGESTION, REMOVAL FROM SOIL, AND BARK RUBBING. PROTECTION FENCING AND OTHER MEASURES SHOULD REMAIN INTACT DURING THE FIRST YEAR AND SHOULD BE CHECKED FOR BREACHES. A COPY OF THE AS-BUILT PLANTING PLAN (PLANT INCLUDING ANY SUBSTITUTIONS MADE DURING CONSTRUCTION) SHOULD REMAIN WITH THE LANDSCAPE MAINTENANCE TEAM TO IDENTIFY PLANTS TO REPAIR.
- INVASIVE AND UNWANTED WEEDS SHOULD BE REMOVED IMMEDIATELY BY APPROPRIATE TECHNIQUES. ANNUAL WEEDS / INVASIVES CAN BE TREATED WITH HAND PULLING. PERENNIAL WEEDS / INVASIVES CAN BE TREATED WITH AQUATIC SAFE HERBICIDES. COMMON ANNUALS INCLUDE BUT ARE NOT LIMITED TO: STILT GRASS, LESSER CELENDINE, GARLIC MUSTARD. COMMON PERENNIAL INCLUDE, BUT ARE NOT LIMITED TO: THISTLE, JAPANESE KNOTWEED (AT AQUATIC MARGINS), PURPLE LOOSTRIFE. CONTACT THE DESIGN TEAM AND/OR THE COOPERATIVE EXTENSION OFFICE AT THE UNIVERSITY OF DELAWARE FOR ASSISTANCE IN IDENTIFICATION AND TREATMENT OF UNKNOWN PLANTS.
- MOWING - MOWING IS AN EFFECTIVE MANAGEMENT IN TRADITIONAL LAWN LANDSCAPES. WHEN ADAPTING MOWING STRATEGIES TO NATURAL LANDSCAPES TRADITIONAL TECHNIQUES REQUIRE MODIFICATIONS. MEADOW LANDSCAPES IN YEAR 1 CAN BE MOWED IN LATE WINTER.
- THE STREAM CHANNEL SHOULD BE CHECKED FREQUENTLY AND LARGE DEBRIS OR TRASH REMOVED FROM THE CHANNEL. OVER TIME WOODY DEBRIS IS BENEFICIAL TO A STREAM HABITAT, HOWEVER AFTER INITIAL INSTALLATION THE NEWLY GRADED BANK SLOPE MAY BE MORE PRONE TO DAMAGE FROM

- LARGE DEBRIS.
 - a. DURING WINTER MONTHS IF TRUNK GUARDS WERE INSTALLED FOR TREE INSTALLATIONS, REMOVE SNOW PACK FROM AROUND TRUNKS AND LOOSEN COLLAR BASE IF AIRFLOW IS CONSTRICTED AROUND ROOT FLARE. TRUNK GUARDS ARE AN EFFECTIVE MEASURE AGAINST DEER RUBBING, HOWEVER IF NOT MONITORED THEY CAN PROMOTE TRUNK ROT AT THE ROOT CROWN AND IMPAIR TREE HEALTH AND LONGEVITY.
 - b. PRIOR TO THE END OF YEAR ONE, THE OWNER SHOULD SCHEDULE A WALK THROUGH WITH THE CONTRACTOR TO IDENTIFY ANY PLANT MATERIAL NEEDING REPLACEMENTS PRIOR TO THE END OF THE 1 YEAR WARRANTY PERIOD.
- YEAR 2: YEAR TWO IS A CRITICAL YEAR TO GET AHEAD OF ANY PROBLEMATIC CONDITIONS OBSERVED IN YEAR ONE, I.E. HIGH GOOSE DEPREDAATION OR INVASIVE PLANT PRESSURE.
 - a. MONITOR ANY WARRANTEE PLANT REPLACEMENTS FOR ENVIRONMENTAL STRESSES SUCH AS LACK OF WATER AND SPOT TREAT.
 - b. WATER ALL PLANT MATERIAL, EXCEPT MEADOW PLANTINGS, IF EXCESSIVE DROUGHT CONDITIONS OCCUR.
 - c. MONITOR FOR ANIMAL DEPREDAATION AND REPLACE BREACHES IN PROTECTION MEASURES. PROTECTION MEASURES SHOULD REMAIN UP UNTIL THE END OF YEAR 3.
 - d. MONITOR AND SPOT TREAT INVASIVE AND UNWANTED WEEDS.
 - e. MOW MEADOW AND STREAM BANK HERBACEOUS LANDSCAPES ONCE IN LATE WINTER. MOWING DURING THIS TIME FRAME IN DELAWARE IS USUALLY OPTIMAL FOR PROTECTING GROUND NESTING BIRDS AND YOUNG MEADOW PLANTINGS HAVE NOT EMERGED TO BEYOND THE PREFERRED MOW HEIGHT OF 6". NO ADDITIONAL MOWING OF THE MEADOWS SHOULD OCCUR UNTIL THE FOLLOWING SPRING FOR HABITAT VALUE.
 - f. MONITOR THE STREAM FOR OVERALL HEALTH AND ESTABLISHMENT. DURING YEAR 2 THE CHANNEL SHOULD BE ABLE TO RESPOND TO NATURAL DEBRIS, HOWEVER IF UNUSUAL FLOOD PATTERNS OR BANK FALLURES ARE OBSERVED DUE TO THE PRESENCE OF LARGE WOODY DEBRIS THE DEBRIS SHOULD BE REMOVED. IF SEVERE CONTACT THE / A DESIGN PROFESSIONAL. HUMAN TRASH SHOULD BE REMOVED FROM THE STREAM CHANNEL.

- YEAR 3: ALTHOUGH LANDSCAPE MAINTENANCE IN NATURAL AREAS IS PERPETUAL DUE TO HUMAN INDUCED PRESSURES, BY YEAR 3 NEW LANDSCAPES ARE GENERALLY THOUGHT TO HAVE MATURED ENOUGH TO REQUIRE REGULAR MAINTENANCE.
 - a. MONITOR THE LANDSCAPE MONTHLY FOR INVASIVE PLANT PRESSURE. IF PROBLEMATIC WEEDS WERE IDENTIFIED IN PRIOR YEARS, ADDITIONAL SCOUTING MAY BE REQUIRED BASED ON THE SPECIFIC PHENOLOGY OF THAT WEED.
 - b. AT THE END OF YEAR THREE ANIMAL DEPREDAATION PROTECTION MEASURES CAN BE REMOVED IF NO VISIBLE BROWSE IS OBSERVED; SHOULD DEER BE PRESENT IN THE RESTORATION AREA, NEW DEER PROTECTIONS SHOULD BE INSTALLED ON TREES UNTIL THEY REACH 6' DIAMETER.
 - c. SHRUBS AND TREES SHOULD BE PRUNED AS NEEDED TO REMOVE DEAD, DAMAGED, OR DISEASED LIMBS UTILIZING INDUSTRY BEST PRACTICES.
 - d. REMOVE / REPLACE DEAD / DYING PLANTINGS, AS LANDSCAPES MATURE PAST YEAR 3 DETERMINE IF THE DEAD OR DECLINING PLANT PROVIDES HABITAT VALUE PRIOR TO REMOVAL.
 - e. MOWING OF MEADOW STREAM BANK HERBACEOUS LANDSCAPES SHOULD CONTINUE IN PERPETUITY PER THE GUIDELINES FOR YEAR 2; ADDITIONAL SEEDING CAN BE INITIATED TO PROMOTE DESIRABLE SPECIES.
 - f. THE STREAM CORRIDOR SHOULD BE MONITORED OCCASIONALLY FOR STABILITY AND TRASH SHOULD BE REMOVED REGULARLY.

INDEPENDENCE SCHOOL
STREAM RESTORATION PLAN

NEW CASTLE CONSERVATION DISTRICT
2430 OLD COUNTRY ROAD, NEWARK, DE 19702

#	COMMENT	BY	DATE
6	REVISION TO DETAIL 5 SHEET 13 & SPOT ELEVATION UPDATES SHEET 9	DD8	05.30.23
5	PER COMMENTS-NPS&USACE	DD8	05.06.23
4	ISSUED FOR PERMITTING	DD8	04.04.23
3	PER NPS COMMENTS	DD8	03.16.23
2	ISSUED FOR PERMITTING	DD8	11.02.21
1	ISSUED FOR CLIENT REVIEW	DD8	11.23.20



NOTES & LEGEND

INDEPENDENCE SCHOOL
STREAM RESTORATION

MILL CREEK HUNDRED NEW CASTLE COUNTY		NEWARK DELAWARE	
DATE:	06.26.20	PROJECT #:	07101
SURVEYED BY:	DD8	SHEET:	2
CREATED BY:	DD8		
DRAWN BY:	DD8		
CHECKED BY:	ACH		2 OF 15
SCALE: 1"=30'			
0 20 40 60			

E & S NOTES

1. A PRE-CONSTRUCTION MEETING MUST BE HELD PRIOR TO COMMENCING CONSTRUCTION. CONTACT DNREC OR THE NEW CASTLE CONSERVATION DISTRICT. FAILURE TO DO SO CONSTITUTES A VIOLATION OF THE APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLAN.
2. NCCD MUST BE NOTIFIED IN WRITING FIVE (5) DAYS PRIOR TO COMMENCING WITH CONSTRUCTION. FAILURE TO DO SO CONSTITUTES A VIOLATION OF THE APPROVED PLAN.
3. REVIEW AND APPROVAL OF THIS PLAN SHALL NOT RELIEVE THE CONTRACTOR FROM HIS OR HER RESPONSIBILITIES FOR COMPLIANCE WITH THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS, NOR SHALL IT RELIEVE THE CONTRACTOR FROM ERRORS OR OMISSIONS ON THE PLAN. THE OWNER / OWNER'S REPRESENTATIVE SHALL BE RESPONSIBLE FOR ACQUIRING ANY AND ALL AGREEMENTS, EASEMENTS, ETC. NECESSARY TO COMPLY WITH ALL APPLICABLE REGULATIONS, CODES, STANDARDS, GUIDELINES AND POLICIES. ANY DEVIATION FROM THE APPROVED PLANS REQUIRES WRITTEN APPROVAL FROM THE OWNER'S REPRESENTATIVE AND DESIGNER.
4. UNLESS OTHERWISE AUTHORIZED IN WRITING BY THE OWNER'S REPRESENTATIVE AND/OR DESIGNER, ALL WORK MUST BE DONE IN ACCORDANCE WITH THESE PLANS.
5. 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.
6. FOLLOWING SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED FOR ALL PERIMETER CONTROLS, SOIL STOCKPILES, AND ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE WITHIN 14 CALENDAR DAYS UNLESS MORE RESTRICTIVE FEDERAL REQUIREMENTS APPLY.
7. ALL PROPOSED EROSION AND SEDIMENT CONTROLS WILL BE INSTALLED IN ACCORDANCE WITH THE DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK LATEST EDITION. WHERE THIS PLAN CONFLICTS WITH SAID

8. REGULATIONS, THE CONTRACTOR SHALL NOTIFY THE DESIGNER PRIOR TO IMPLEMENTING THE WORK/PRACTICE. 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 SHALL BE APPROVED BY THE DNREC WELL PERMITTING BRANCH AS REQUIRED.
9. APPROVED S&S PLANS EXPIRE FIVE (5) YEARS FROM THE DATE OF PLAN APPROVAL.
10. POST CONSTRUCTION VERIFICATION DOCUMENTS, WHEN REQUIRED, ARE TO BE SUBMITTED TO DNREC OR THE DELEGATED AGENCY WITHIN 60 DAYS OF STORMWATER MANAGEMENT FACILITY COMPLETION.
11. 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.
12. THE OWNER SHALL BE FAMILIAR WITH AND COMPLY WITH ALL ASPECTS OF THE NPDES CONSTRUCTION GENERAL PERMIT ASSOCIATED WITH THE PROJECT, INCLUDING, BUT NOT LIMITED TO, PERFORMING WEEKLY SITE INSPECTIONS DURING CONSTRUCTION AND AFTER RAIN EVENTS, AND MAINTAINING WRITTEN LOGS OF THESE INSPECTIONS.
13. BEST AVAILABLE TECHNOLOGY (BAT) SHALL BE EMPLOYED TO MANAGE TURBID DISCHARGES IN ACCORDANCE WITH REQUIREMENTS OF 7, DEL. C. CH 60, REGULATIONS GOVERNING THE CONTROL OF WATER POLLUTION, SECTION 9.1.02, KNOWN AS SPECIAL CONDITIONS FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES, AND DEPARTMENT POLICIES, PROCEDURES, AND GUIDANCE.
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 NCCD TO VERIFY THAT THE PERMANENT OR TEMPORARY STABILIZATION HAS BEEN

15. COMPLETED IN ACCORDANCE WITH THE APPROVED PLAN. THE NCCD MAY REQUIRE ADDITIONAL SOIL TESTING AND REAPPLICATION OF PERMANENT OR TEMPORARY STABILIZATION IN ACCORDANCE WITH SPECIFICATIONS PROVIDED IN THE DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK, OR ALTERNATIVE MEASURES THAT PROVIDE FUNCTIONAL EQUIVALENCY.
16. DNREC AND NEW CASTLE CONSERVATION DISTRICT PERSONNEL SHALL HAVE THE RIGHT TO CONDUCT ON-SITE INSPECTIONS OF LAND DISTURBING ACTIVITIES.
17. ALL PERIMETER CONTROLS INCLUDING TREE PROTECTION, MUST BE INSTALLED, STABILIZED, INSPECTED BY THE CCR OR CONSERVATION DISTRICT INSPECTOR, AND APPROVED BY NCCD PRIOR TO BULK GRADING, BUILDING PERMIT ISSUANCE, OR ANY UTILITY INSTALLATION ON NONRESIDENTIAL PROJECTS. THE CCR OR INSPECTOR IS REQUIRED TO SUBMIT A REPORT VERIFYING THAT THE PERIMETER CONTROLS HAVE BEEN INSTALLED CORRECTLY AND ARE FUNCTIONING PROPERLY. PRIOR TO THIS PER-BULK INSPECTION NO DISTURBANCE OR ON-SITE OTHER THAN THOSE AREAS NECESSARY TO ESTABLISH THE PERIMETER EROSION AND SEDIMENT CONTROLS. INSTALL THE PERIMETER CONTROLS PURSUANT TO THIS PLAN. ALL PERIMETER SEDIMENT CONTROLS, INCLUDING SOIL STOCKPILES, SHALL BE VEGETATIVELY STABILIZED.
18. THE CCR OR INSPECTOR IS RESPONSIBLE TO REPORT THE CONDITIONS OF SITE WORK AS COMPARED TO THE LATEST APPROVED SEDIMENT AND STORMWATER PLAN. ANY DEVIATION FROM THE APPROVED PLANS REQUIRES WRITTEN APPROVAL FROM DNREC OR THE DELEGATED AGENCY.
19. THE CCR OR INSPECTOR WILL BE RESPONSIBLE FOR WEEKLY EROSION AND SEDIMENT CONTROL INSPECTIONS. THE CCR SHALL CONTACT, IN WRITING, NEW CASTLE CONSERVATION DISTRICT TO CONSIDER ANY REQUEST TO

20. DEVIATE FROM THE REQUIRED FREQUENCY OF INSPECTIONS. APPROVAL OF SUCH A REQUEST SHALL BE AT THE DISCRETION OF DNREC OR THE DELEGATED AGENCY.
21. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED PERIODICALLY AND AFTER EACH RAINFALL. MAINTENANCE MUST BE PERFORMED AFTER EACH INSPECTION AS NECESSARY. ANY ERODED AREAS SHALL BE STABILIZED AND ANY ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF ACCORDING TO THE PRE-CONSTRUCTION PLAN AND/OR AS DIRECTED BY THE DESIGNER. SEDIMENT THAT ACCUMULATES IN THE AREA OF WORK IS A PROJECT GOAL AND THIS MAY NOT NEED TO BE REMOVED.
22. ALL INSPECTION REPORTS FROM BOTH THE CCR (IF REQUIRED) AND THE CONSERVATION DISTRICT/INSPECTOR SHALL BE ELECTRONICALLY SUBMITTED WEEKLY TO ALL PARTIES INCLUDED ON THE CONSTRUCTION INFORMATION SHEET. THESE REPORTS SHALL INCLUDE A DATE BY WHICH ALL DEFICIENCIES MUST BE RESOLVED. FAILURE TO RESOLVE THE DEFICIENCIES INDICATED ON THE INSPECTION REPORT BY THE GIVEN DATE MAY RESULT IN ENFORCEMENT ACTION CONSIDERED APPROPRIATE BY THE DEPARTMENT.
23. THE NCCD ENGINEER/EAS INSPECTOR MUST BE NOTIFIED 48 HOURS PRIOR TO ALL ELEMENTS OF SITE WORK WHICH REQUIRE INSPECTION. FAILURE TO PROVIDE THE APPROPRIATE NOTIFICATION MAY RESULT IN THE CONTRACTOR EXCAVATING SUFFICIENT MATERIAL TO VERIFY CONSTRUCTION IN ACCORDANCE WITH THE APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLAN.
24. SHOULD QUESTIONS ARISE REGARDING THE MAINTENANCE OF EROSION AND SEDIMENT CONTROL PRACTICES, THE SITE CONTRACTOR SHALL CONTACT THE NEW CASTLE CONSERVATION DISTRICT AND THE CONSULTING ENGINEER EXPEDITIOUSLY FOR TECHNICAL ASSISTANCE.

25. UPON RECEIPT OF TWO CONSECUTIVE UNSATISFACTORY CCR (IF REQUIRED) AND/OR DNREC OR THE NCCD EROSION AND SEDIMENT CONTROL INSPECTION REPORTS, THE SITE MAY BE ISSUED A STOP WORK ORDER AND A SHOW CAUSE HEARING SCHEDULED.
26. THE APPROVED S&S PLAN INCORPORATES POLLUTION PREVENTION PRACTICES LISTED UNDER STANDARDS AND SPECIFICATIONS FOR CONSTRUCTION SITE POLLUTION PREVENTION IN THE DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK, DATED APRIL 2019 AND ITS REVISIONS.
27. IT SHALL BE THE OWNER'S RESPONSIBILITY TO REPAIR AND STABILIZE EROSION AND SEDIMENT CONTROLS AND STORMWATER MANAGEMENT PRACTICES DURING CONSTRUCTION, INCLUDING AREAS DISTURBED BY UTILITY COMPANIES.
28. IT SHALL BE THE OWNER'S RESPONSIBILITY TO INSPECT AND PERFORM MAINTENANCE AND/OR REPAIRS OF THE STORMWATER MANAGEMENT PRACTICES, IF ANY, AFTER CONSTRUCTION.

E&S SEQUENCE OF CONSTRUCTION

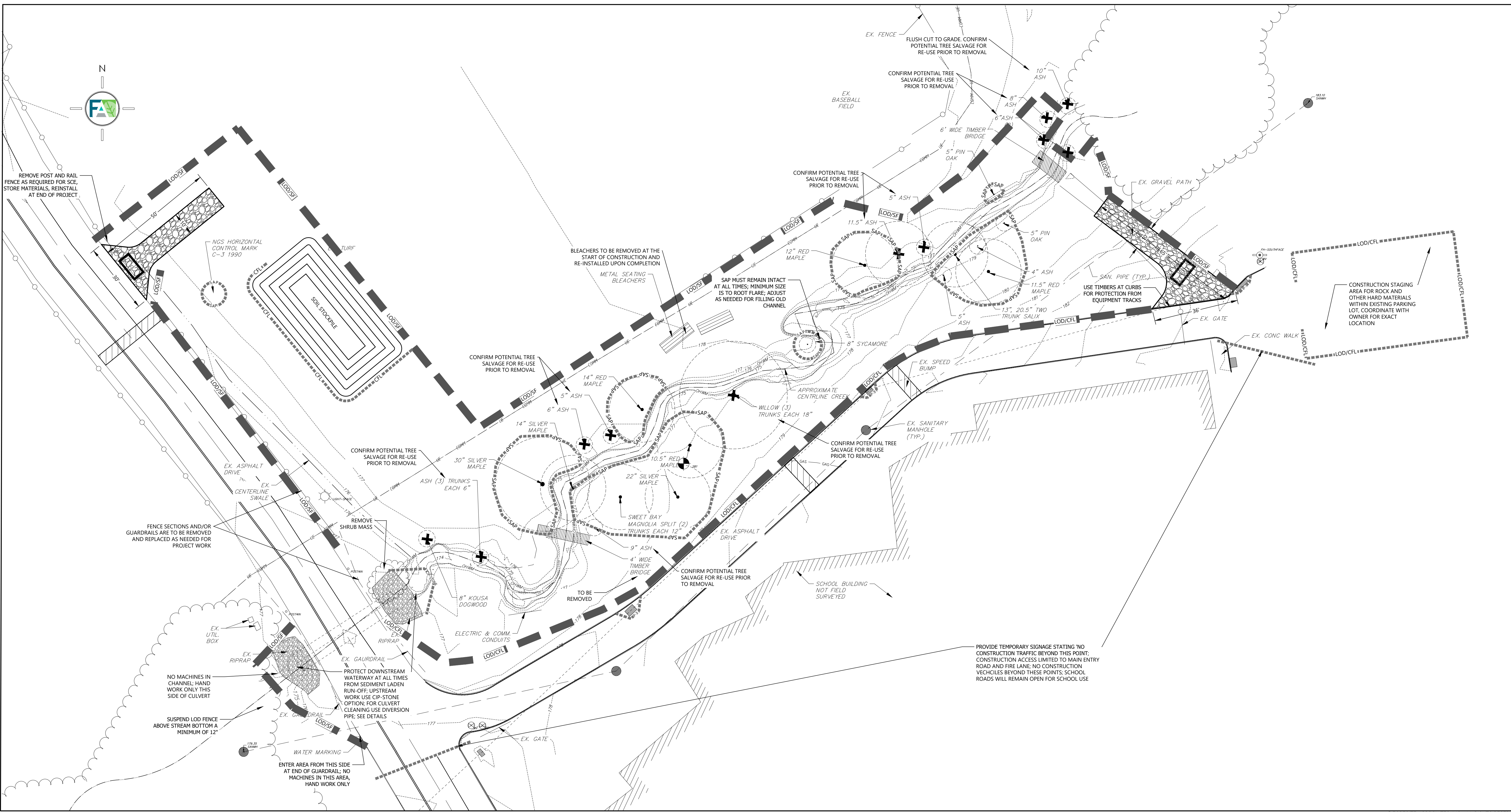
1. NOTIFY NEW CASTLE CONSERVATION DISTRICT IN WRITING AT LEAST FIVE (5) DAYS PRIOR TO THE START OF CONSTRUCTION. FAILURE TO DO SO CONSTITUTES A VIOLATION OF THE APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLAN.
2. PRIOR TO ANY CLEARING, INSTALLATION OF SEDIMENT CONTROL MEASURES, OR GRADING, SCHEDULE AND CONDUCT A PRE-CONSTRUCTION MEETING WITH THE NCCD AND PROJECT DESIGN LEAD. THE LANDOWNER/DEVELOPER REPRESENTATIVE, SITE CONTRACTOR, AND CERTIFIED CONSTRUCTION REVIEWER ARE REQUIRED TO BE IN ATTENDANCE AT THE PRE-CONSTRUCTION MEETING; THE SITE DESIGNER IS RECOMMENDED TO ATTEND.
3. ALL MACHINERY TO BE PRESSURE WASHED PRIOR TO ENTERING PROJECT SITE; SPECIAL ATTENTION SHOULD BE GIVEN TO TRACKS AND UNDERCARRIAGE THAT CAN CONTAIN INVASIVE SEED, SUCH AS PHRAGMITES. MACHINERY TO BE REVIEWED AND CLEANLINESS APPROVED BY THE NCCD PRIOR TO BEING UNLOADED. EQUIPMENT FOUND TO HAVE UNSATISFACTORY AMOUNTS OF SOIL, DEBRIS, ETC. WILL NOT BE ALLOWED ON SITE AND ANY

4. TIME LOSS TO CONSTRUCTION WILL BE AT THE CONTRACTOR'S EXPENSE.
5. TREE PROTECTION SHALL BE IN PLACE PRIOR TO ANY ACTIVITY ON THE SITE. CONTRACTOR IS RESPONSIBLE FOR TREATMENT AND/OR REPLACEMENT OF ANY TREES DEEMED DAMAGE DURING CONSTRUCTION BY THE OWNER OR OWNER'S DELEGATED REPRESENTATIVE; AT THE DISCRETION OF OWNER / OWNER'S REPRESENTATIVE, A CERTIFIED ARBORIST MAY BE CONTRACTED TO PROVIDE TREATMENT RECOMMENDATIONS; THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL CONSULTATION AND TREATMENT COSTS DUE TO DAMAGE OF MATURE TREES AS DETERMINED BY THE OWNER / OWNER'S REPRESENTATIVE.
6. INSTALL THE STABILIZED CONSTRUCTION ENTRANCE(S) AS INDICATED ON THE PLAN, FOLLOWED BY THE PERIMETER CONTROLS (I.E. BERRIS, SILT FENCE, COMPOST LOGS) AND INLET PROTECTION ON ANY EXISTING INLETS. MARK THE LIMITS OF SENSITIVE AREAS AND OTHER SECTIONS THAT ARE NOT TO BE DISTURBED WITH A PHYSICAL BARRIER (WHEN SHOWN ON THE PLAN). ONLY CLEAR AREAS THAT ARE REQUIRED TO INSTALL THE PERIMETER

7. CONTROLS (AS NEEDED).
8. SCHEDULE A PERIMETER CONTROL REVIEW WITH NEW CASTLE CONSERVATION DISTRICT.
9. ALL PERIMETER CONTROLS ARE TO BE REVIEWED BY NEW CASTLE CONSERVATION DISTRICT AND APPROVED PRIOR TO PROCEEDING WITH FURTHER SITE DISTURBANCE OR CONSTRUCTION.
10. THE CONTRACTOR SHALL 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 SHALL 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.
11. CLEAR AND GRUB REMAINING AREAS WITHIN THE LIMITS OF DISTURBANCE.
12. COMPLETE BULK GRADING.
13. STOCKPILE EXCAVATED SUBSOILS WHEN REQUIRED. STOCKPILES SHALL BE SURROUNDED WITH A PERIMETER CONTROL, LOCATED ON LAND WITH A LOW SLOPE, AND STABILIZED ONCE INACTIVE.
14. COMPLETE GRADE CONTROL AND TREE PROTECTION.
15. FINE GRADE ALL AREAS INTENDED TO RECEIVE PERMANENT STABILIZATION MEASURES WITH COMPACTED TOPSOIL RECOVERED FROM THE SITE.
16. IN AREAS TO BE TURF, PROVIDE TEMPORARY AND PERMANENT SEEDING AS SPECIFIED AND STRAW MULCH OR OTHER APPROVED TEMPORARY MULCH.
17. INSTALL EROSION CONTROL MATTING AS SPECIFIED. RESEED AREAS DISTURBED FROM EROSION CONTROL MATTING INSTALLATION.
18. INSTALL PLANTING MATERIAL AS SPECIFIED ON THE LANDSCAPE PLAN.
19. THE EROSION AND SEDIMENT CONTROL DEVICES SHOULD BE REMOVED ONLY AFTER WORK IN

20. AN AREA HAS BEEN COMPLETED AND STABILIZED, WITH WRITTEN APPROVAL FROM THE NCCD. COORDINATE THE INSPECTION, AND AFTER THE WRITTEN APPROVAL, REMOVE THE REMAINING CONSTRUCTION SITE CONTROLS.
21. ALL SITE STABILIZATION, INCLUDING BUT NOT LIMITED TO SEEDING, IS TO BE IN PLACE, INSPECTED, AND APPROVED PRIOR TO REMOVAL OF SILT FENCING AND OTHER PERIMETER CONTROLS. ALSO, ANY AREAS DISTURBED BY SILT FENCE REMOVAL ARE TO BE IMMEDIATELY STABILIZED.
22. 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.

23. CONSTRUCTION STAGING AREA FOR ROCK AND OTHER HARD MATERIALS WITHIN EXISTING PARKING LOT. COORDINATE WITH OWNER FOR EXACT LOCATION.



FORESITE ASSOCIATES

- CIVIL ENGINEERING
- LANDSCAPE ARCHITECTURE
- ECOLOGICAL RESTORATION

FORESITE ASSOCIATES INC.
2401 PHILADELPHIA PIKE
CLAYMONT, DE 19703
PHONE: 302.351.3421
INFO@FORESITEASSOCIATES.COM

**INDEPENDENCE SCHOOL
STREAM RESTORATION PLAN**

NEW CASTLE CONSERVATION DISTRICT
2430 OLD COUNTRY ROAD, NEWARK, DE 19702

6	REVISION TO DETAIL 5 SHEET 13 & SPOT ELEVATION UPDATES SHEET 9	DDG	05.30.23
5	PER COMMENTS-NPS&USACE	DDG	05.06.23
4	ISSUED FOR PERMITTING	DDG	04.04.23
3	PER NPS COMMENTS	DDG	03.16.23
2	ISSUED FOR PERMITTING	DDG	11.02.21
1	ISSUED FOR CLIENT REVIEW	DDG	11.23.20
#	COMMENT	DDG	03/14/20

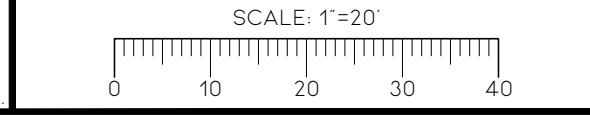
FORESITE ASSOCIATES

SEAL

EROSION & SEDIMENT CONTROL PLAN

**INDEPENDENCE SCHOOL
STREAM RESTORATION**

MILL CREEK HUNDRED NEW CASTLE COUNTY	NEWARK DELAWARE
DATE: 06.26.20	PROJECT #: 07101
SURVEYED BY: DDS	SHEET: 3
CREATED BY: DDS	3 OF 15
DRAWN BY: DDS	
CHECKED BY: ACH	



© FORESITE ASSOCIATES, INC. ALL RIGHTS RESERVED.

Standard Detail & Specifications
Construction Site Waste Mgt & Spill Control

DATA TO BE PROVIDED
Volume of Potential Pollution
Height of containment
Area of containment
Volume of containment

CONSULT PROJECT DESIGNER AT PRE-CONSTRUCTION MEETING

Labels: Fuel Tank, Double layer plastic sheeting, or approved equal, Min. 9" compost log or DE# 3 Stone berm, Spill containment Area.

Scale as required per compost log manufacturer guidelines

Source: Delaware ESC Handbook
Symbol:
Detail No. **DE-ESC-3.6.1**
Sheet 1 of 5
Effective FEB 2019

Standard Detail & Specifications
Construction Site Waste Mgt & Spill Control

Pollution Prevention - Spill Prevention

- Fueling should only take place in signed designated areas, away from downstream drainage facilities and watercourses.
- Fueling must be with nozzles equipped with automatic shut-off to control drips. Do not top off.
- Protect the areas where equipment or vehicles are being repaired, maintained, fueled or parked from storm water run-on and runoff.
- Use barriers such as berms to prevent storm water run-on and runoff, and to contain spills.
- Place a "Fueling Area" sign next to each fueling area.
- Store hazardous materials such as fuel, solvents, oil and chemicals in secondary containment.
- Inspect vehicles and equipment for leaks on each day of use. Repair fluid and oil leaks immediately.
- Absorbent spill clean-up materials and spill kits must be available in fueling areas and on fuel trucks.
- If fueling is to take place at night, make sure the fueling area is sufficiently illuminated.
- Properly dispose of used oil, fluids, lubricants and spill clean-up materials.

CLEAN UP SPILLS

- If it is safe to do so, immediately contain and clean up any chemical and/or hazardous material spills.
- Properly dispose of used oil, fluids, lubricants and spill clean-up materials.
- Do not bury spills or wash them down with water.

LEAKS AND DRIPS

- Use drip pans or absorbent pads at all times. Place under and around leaky equipment.
- Do not allow oil, grease, fuel or chemicals to drip onto the ground.
- Have spill kits and clean up material on-site.
- Repair leaky equipment promptly or remove problem vehicles and equipment from the site. Clean up contaminated soil immediately.
- Store contaminated waste in sealed containers constructed of suitable material. Label these containers properly.
- Clean up all spills and leaks. Promptly dispose of waste and spent clean up materials.

Source: Delaware ESC Handbook
Symbol:
Detail No. **DE-ESC-3.6.1**
Sheet 2 of 5
Effective FEB 2019

Standard Detail & Specifications
Construction Site Waste Mgt & Spill Control

Notes:
The Construction Site Pollution Prevention Plan should include the following elements:

- Material Inventory**
Document the storage and use of the following materials:
 - Concrete
 - Detergents
 - Paints (enamel and latex)
 - Cleaning solvents
 - Pesticides
 - Wood scraps
 - Fertilizers
 - Petroleum based products
- Good housekeeping practices**
 - Store only enough product required to do the job.
 - All materials shall be stored in a neat, orderly manner in their original labeled containers and covered.
 - Substances shall not be mixed.
 - When possible, all of a product shall be used up prior to disposal of the container.
 - Manufacturers' instructions for disposal shall be strictly adhered to.
 - The site foreman shall designate someone to inspect all BMPs daily.
- Waste management practices**
 - All waste materials shall be collected and stored in securely lidded dumpsters in a location that does not drain to a waterbody.
 - Waste materials shall be salvaged and/or recycled whenever possible.
 - 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: Adapted from USEPA Pub. 840-B-92-002
Symbol:
Detail No. **DE-ESC-3.6.1**
Sheet 3 of 5
Effective FEB 2019

Standard Detail & Specifications
Construction Site Waste Mgt & Spill Control

Notes (cont.)

- Trash shall be disposed of in accordance with all applicable Delaware laws.
- Trash cans shall be placed at all lunch spots and littering is strictly prohibited. Recycle bins shall be placed near the construction trailer.
- If fertilizer bags can not be stored in a weather-proof location, they shall be kept on a pallet and covered with plastic sheeting which is overlapped and anchored.

4. Equipment maintenance practices

- If possible, equipment should be taken to off-site commercial facilities for washing and maintenance.
- If performed on-site, vehicles shall be washed with high-pressure water spray without detergents in an area contained by an impervious berm.
- Drip pans shall be used for all equipment maintenance.
- Equipment shall be inspected for leaks on a daily basis.
- Washout from concrete trucks shall be disposed of in a temporary pit for hardening and proper disposal.
- Fuel nozzles shall be equipped with automatic shut-off valves.

5. Spill prevention practices

- Potential spill areas shall be identified and contained in covered areas with no connection to the storm drain system.
- Warning signs shall be posted in hazardous material storage areas.
- Preventive maintenance shall be performed on all tanks, valves, pumps, pipes and other equipment as necessary.
- Low or non-toxic substances shall be prioritized for use.

Source: Adapted from USEPA Pub. 840-B-92-002
Symbol:
Detail No. **DE-ESC-3.6.1**
Sheet 4 of 5
Effective FEB 2019

1/4 CONSTRUCTION SITE WASTE MANAGEMENT NOTES

1/4 CONSTRUCTION SITE WASTE MANAGEMENT NOTES

1/4 CONSTRUCTION SITE WASTE MANAGEMENT NOTES

1/4 CONSTRUCTION SITE WASTE MANAGEMENT NOTES

Standard Detail & Specifications
Construction Site Waste Mgt & Spill Control

Notes (cont.)

- Contact information for reporting spills through the DNREC 24-Hour Toll Free Number shall be prominently posted.

6. Education

- Best management practices for construction site pollution control shall be a part of regular progress meetings.
- Information regarding waste management, equipment maintenance and spill prevention shall 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: Adapted from USEPA Pub. 840-B-92-002
Symbol:
Detail No. **DE-ESC-3.6.1**
Sheet 5 of 5
Effective FEB 2019

Standard Detail & Specifications
Sensitive Area Protection

Labels: Drip line, Protective device, Limit of disturbance, Proposed grading, 5' Min.

*5' min. setback applies to all sensitive areas covered by this specification.

Location of Sensitive Area Protection

Labels: Drip line, Snow fence, Board fence, Cord fence, Plastic fence

Methods of Sensitive Area Protection

Source: Adapted from VA ESC Handbook
Symbol: **SAP**
Detail No. **DE-ESC-3.7.2**
Sheet 1 of 3
Effective FEB 2019

Standard Detail & Specifications
Sensitive Area Protection

Construction Notes:

Fencing shall be installed at the extents of all sensitive areas. For trees, the fencing shall be installed outside the dripline (mature canopy) and at no time within 5 feet of the trunk. Personnel must be instructed to honor protective devices. The devices described are suggested only, and are not intended to exclude the use of other devices which will protect the trees to be retained. If silt fence is to be used for demarcation purposes, appropriate signage shall be provided a minimum of every 20 feet denoting the area as a sensitive area protection zone.

Materials:

- Snow Fence - Standard 40-inch high snow fence shall be placed at the limits of clearing or construction on standard steel posts set 6 feet apart.
- Board Fence - Board fencing consisting of 4-inch square posts set securely in the ground and protruding at least 4 feet above the ground shall be placed at the limits of clearing with a minimum of two horizontal boards between posts. For tree protection, if it is not practical to erect a fence at the drip line, construct a triangular fence nearer the trunk. The limits of clearing will still be located at the drip line, since the root zone within the drip line will still require protection.
- Plastic Fencing - 40-inch high "international orange" plastic (polyethylene) web fencing secured to conventional metal "T" or "U" posts driven to a minimum depth of 18 inches on 6-foot minimum centers shall be installed at the limits of clearing. The fence should have the following minimum physical qualities:

a. Tensile yield:	Average 2,000 lbs. per 4-foot width (ASTM D638)
b. Ultimate tensile yield:	Average 2,900 lbs. per 4-foot width (ASTM D638)
c. Elongation at break (%):	Greater than 1000% (ASTM D638)
d. Chemical resistance:	Inert to most chemicals and acids

Source: Adapted from VA ESC Handbook
Symbol: **SAP**
Detail No. **DE-ESC-3.7.2**
Sheet 2 of 3
Effective FEB 2019

Standard Detail & Specifications
Sensitive Area Protection

- Cord Fence - Posts with a minimum size of 2 inches square or 2 inches in diameter set securely in the ground and protruding at least 4 feet above the ground shall be placed at the limits of clearing with two rows of cord 1/4-inch or thicker at least 2 feet apart running between posts with strips of colored surveyor's flagging tied securely to the string at intervals no greater than 3 feet.
- Earth Berms - Temporary earth berms shall be constructed according to specifications for a Temporary Earth Dike with the base of the berm on the sensitive area side located along the limits of clearing. Earth berms may not be used for this purpose if their presence will conflict with drainage patterns.
- Trunk Armoring (Tree Protection Only) - As a last resort, a tree trunk can be armored with burlap wrapping and 2-inch studs wired vertically no more than 2 inches apart to a height of 5 feet encircling the trunk. If this alternative is used, the root zone within the drip line will still require protection. Nothing should ever be nailed to a tree.

Maintenance:

Fencing and armoring devices shall be in place before any excavation or grading is begun, shall be kept in good repair for the duration of construction activities, and shall be the last items removed during the final cleanup after the completion of the project.

Source: Adapted from VA ESC Handbook
Symbol: **SAP**
Detail No. **DE-ESC-3.7.2**
Sheet 3 of 3
Effective FEB 2019

1/4 CONSTRUCTION SITE WASTE MANAGEMENT NOTES

2/4 SENSITIVE AREA PROTECTION NOTES

2/4 SENSITIVE AREA PROTECTION NOTES

2/4 SENSITIVE AREA PROTECTION NOTES

6	REVISION TO DETAIL 5 SHEET 13 & 14	009 05.30.23
5	SPOT ELEVATION UPDATES SHEET 9	009 05.06.23
4	PER COMMENTS-NPS&USACE	009 04.04.23
3	ISSUED FOR PERMITTING	009 02.14.23
2	PER NPS COMMENTS	009 02.14.23
1	ISSUED FOR PERMITTING	009 11.02.21
1	ISSUED FOR CLIENT REVIEW	009 11.23.20
#	COMMENT	BY DATE

FORESITE ASSOCIATES

REGISTERED PROFESSIONAL ENGINEER
STATE OF DELAWARE
No. 2546
25th Nov 2013

SEAL

EROSION & SEDIMENT CONTROL DETAILS

INDEPENDENCE SCHOOL
STREAM RESTORATION

MILL CREEK HUNDRED NEW CASTLE COUNTY NEWARK DELAWARE

DATE: 06.26.20 PROJECT #: 07101

SURVEYED BY: N/A SHEET: 4

CREATED BY: DDS
DRAWN BY: AZ
CHECKED BY: ACH

4 OF 15

Standard Detail & Specifications

Dust Control

Temporary Methods:

- Mulches - See DE-ESC-3.4.5, Standard Detail and Specifications for Mulching.
- Vegetative cover - See DE-ESC-3.4.3, Std. Detail and Specifications for Vegetative Stabilization.
- 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

- 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.

- Sprinkling - Sprinkle site with water until the surface is moist. Repeat as needed.

- 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.

- 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.

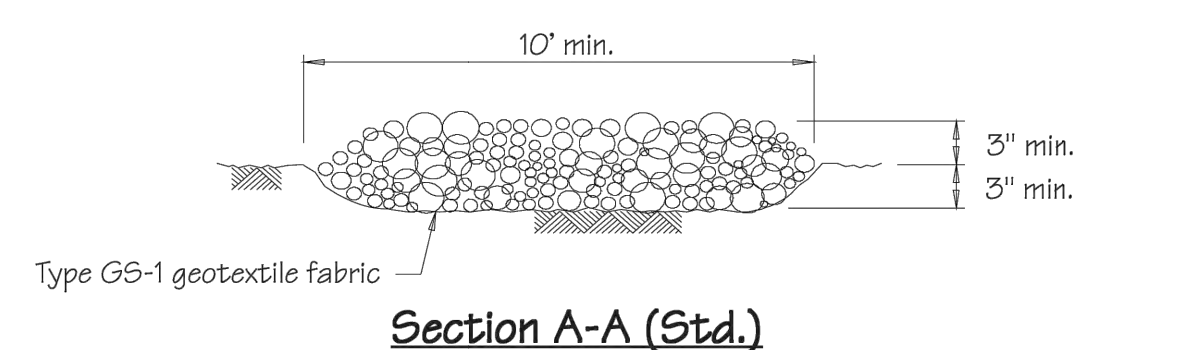
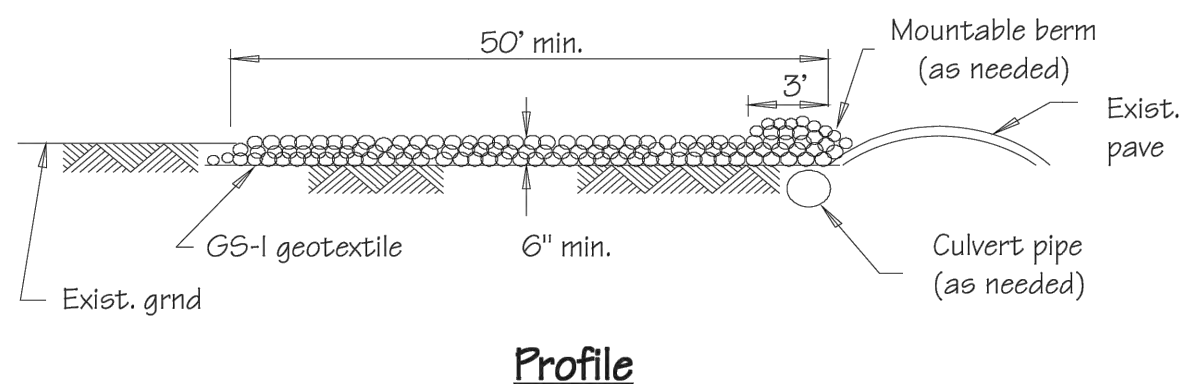
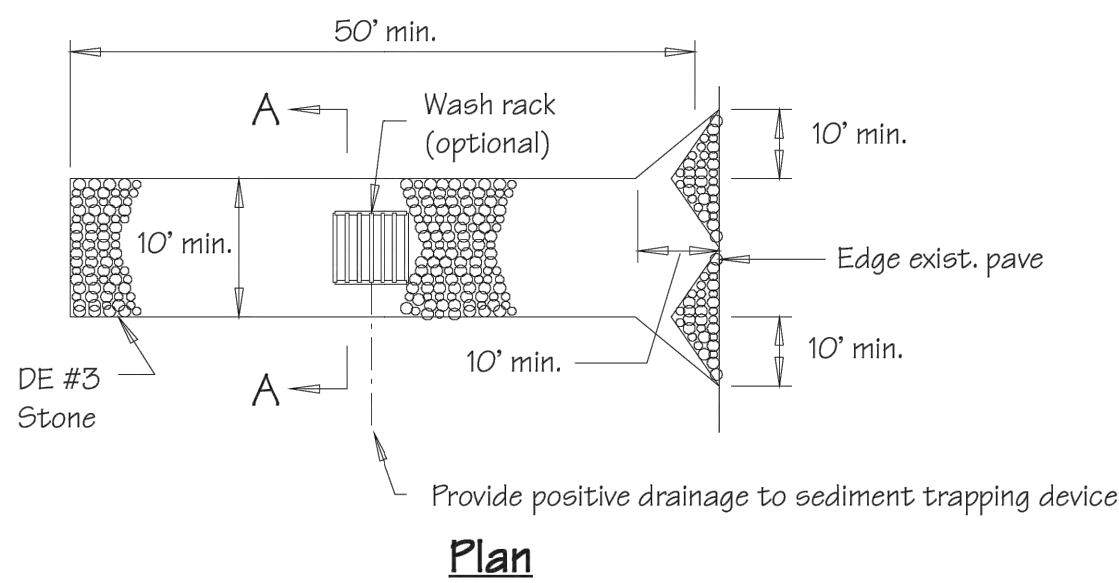
Permanent Methods:

- Vegetative cover - See DE-ESC-3.4.3, Std. Detail and Specifications for Vegetative Stabilization.
- 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 FEB 2019

Standard Detail & Specifications

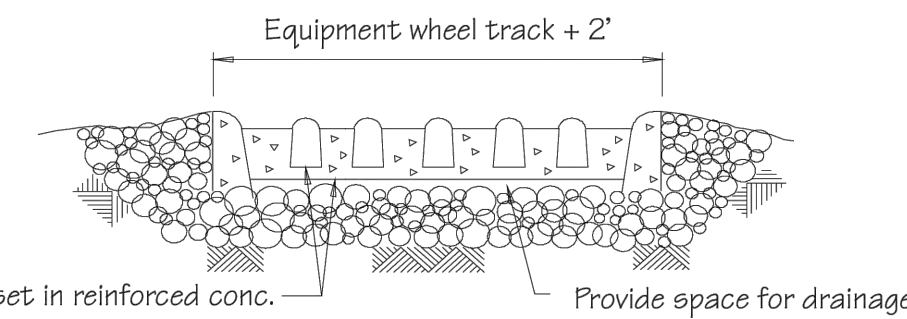
Stabilized Construct. Entrance



Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	SCE	DE-ESC-3.4.7 Sheet 1 of 2 Effective FEB 2019

Standard Detail & Specifications

Stabilized Construct. Entrance

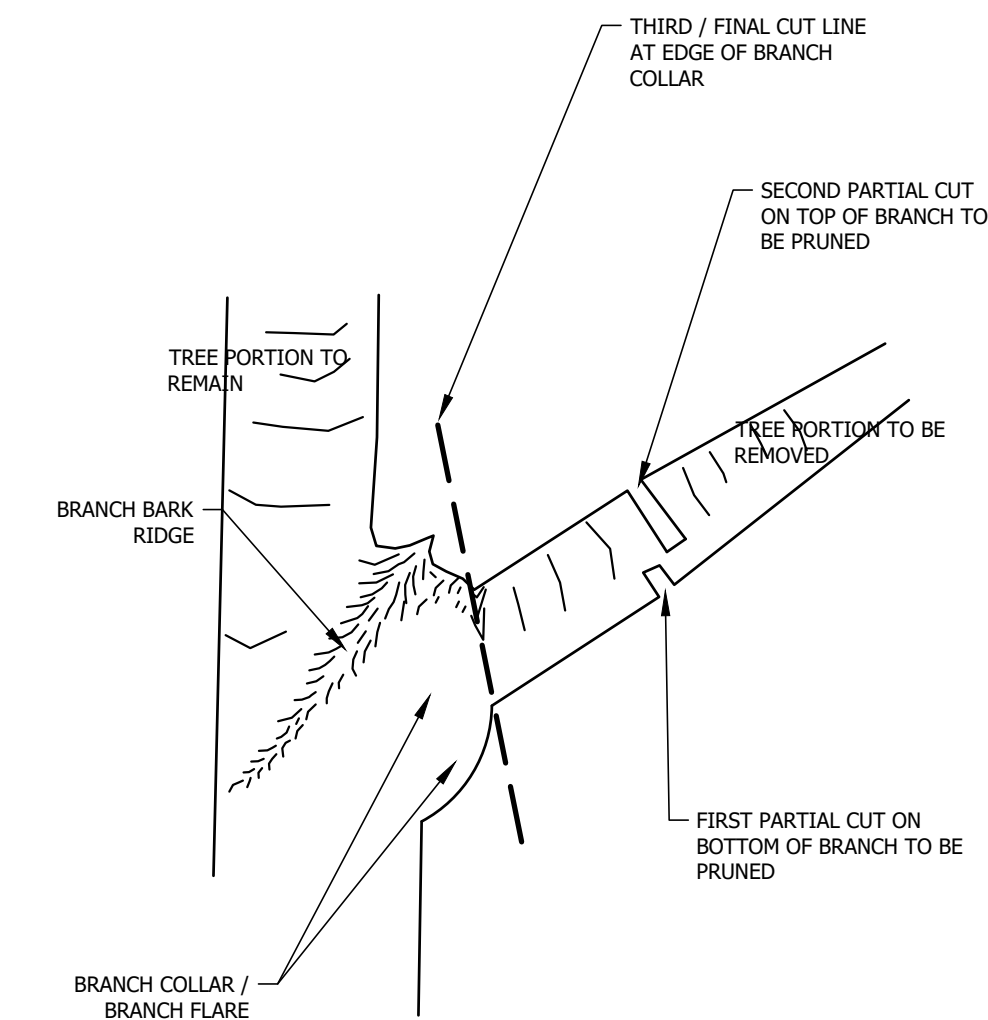


Metal bars set in reinforced conc. (traffic bearing grates, timber mats or other approved equiv. may be substituted)

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 of points where ingress or egress occurs.
 - Geotextile - Type G5-1; 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 FEB 2019



- DECIDUOUS TREE BRANCH PRUNING**
- ALL BRANCHES TO BE CUT TO BE APPROVED BY OWNER OR DESIGN PROFESSIONAL PRIOR TO CUTTING; FAILURE TO NOTIFY WILL BE SEEN AS DAMAGE TO EXISTING VEGETATION AND REPAIRS WILL BE MADE AT THE CONTRACTORS EXPENSE AT THE DISCRETION OF THE OWNER AND/OR DESIGN PROFESSIONAL.
 - USE ONLY SHARP DISINFECTED TOOLS; CLEAN AFTER EVERY CUT
 - MAKE CUTS AS CLOSE TO THE BRANCH COLLAR AS POSSIBLE WITHOUT INJURY / CUTTING TO BRANCH COLLAR
 - DO NOT CUT BEHIND BRANCH BARK RIDGE
 - CONSULT A CERTIFIED ARBORIST AS REQUIRED
 - FOLLOW INDUSTRY STANDARDS AND GUIDELINES PER THE AMERICAN ASSOCIATION OF NURSERYMAN LATEST EDITION

1 DUST CONTROL NOTES

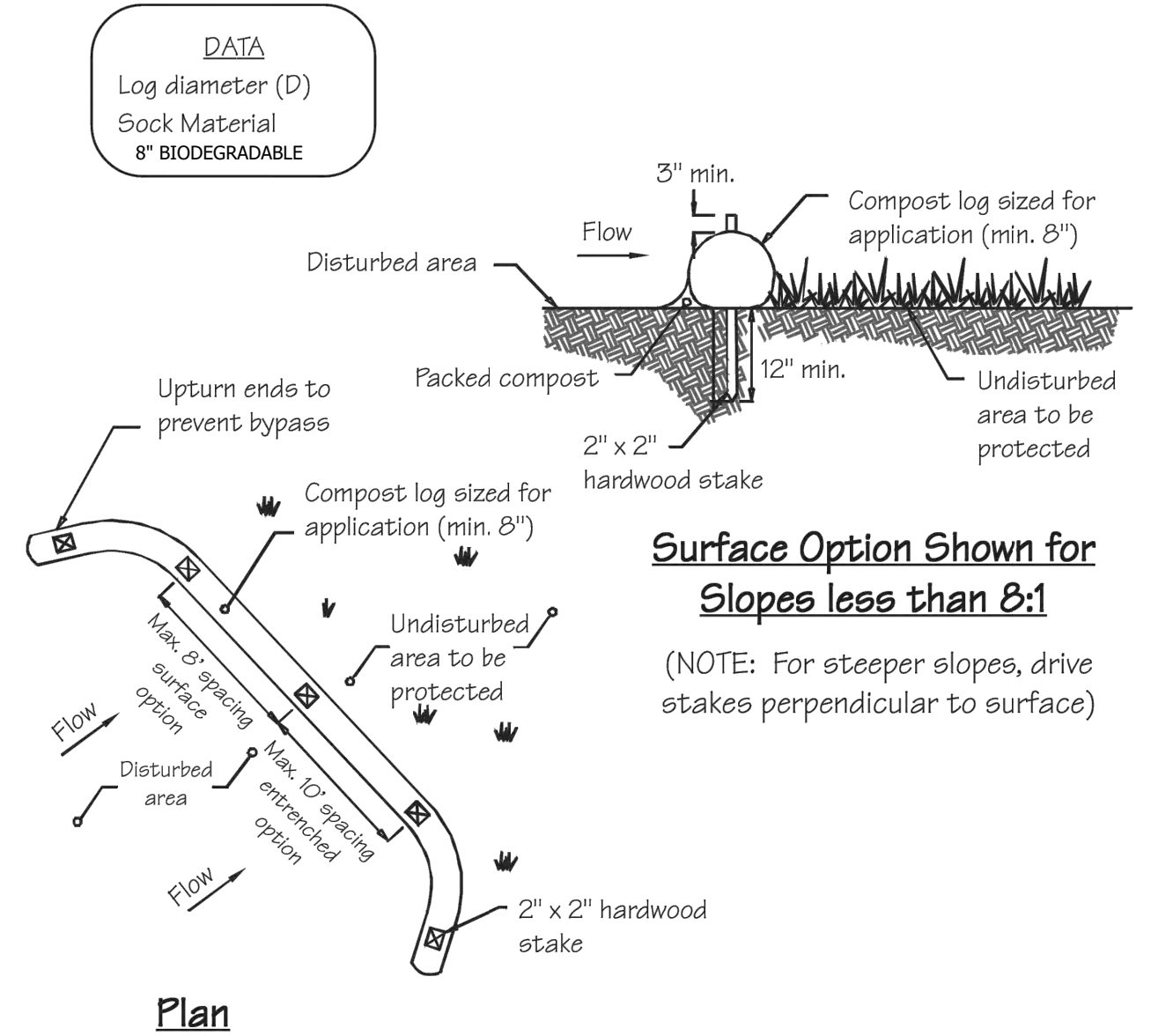
2 STABILIZED CONSTRUCTION ENTRANCE

2 STABILIZED CONSTRUCTION ENTRANCE

3 BRANCH PRUNING ENLARGEMENT NTS

Standard Detail & Specifications

Compost Filter Log



Source:	Symbol:	Detail No.
Adapted from MD Sids & Specs for ESC & Filtrexx™ International	CFL	DE-ESC-3.1.7 Sheet 1 of 2 Effective FEB 2019

Standard Detail & Specifications

Compost Filter Log

Construction Notes:

- Prior to installation, clear bedding area of obstructions including rocks or debris larger than 1 inch and fill in any sharp depression areas.
- If socks are prepared on-site, fill the sock fabric with a pneumatic blower so that the logs are rigid and do not deform. Terminate at the desired length.
- For trenched applications, excavate 2 to 4 inches below grade along the width and length of the compost filter log.
- 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.
- For untrenched applications, blow or hand pack soil, mulch, or compost on the upslope side of the log, filling the bottom void area.
- 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.
- 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.
- Remove accumulated sediment when it has reached half of the effective height of the log.
- 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.

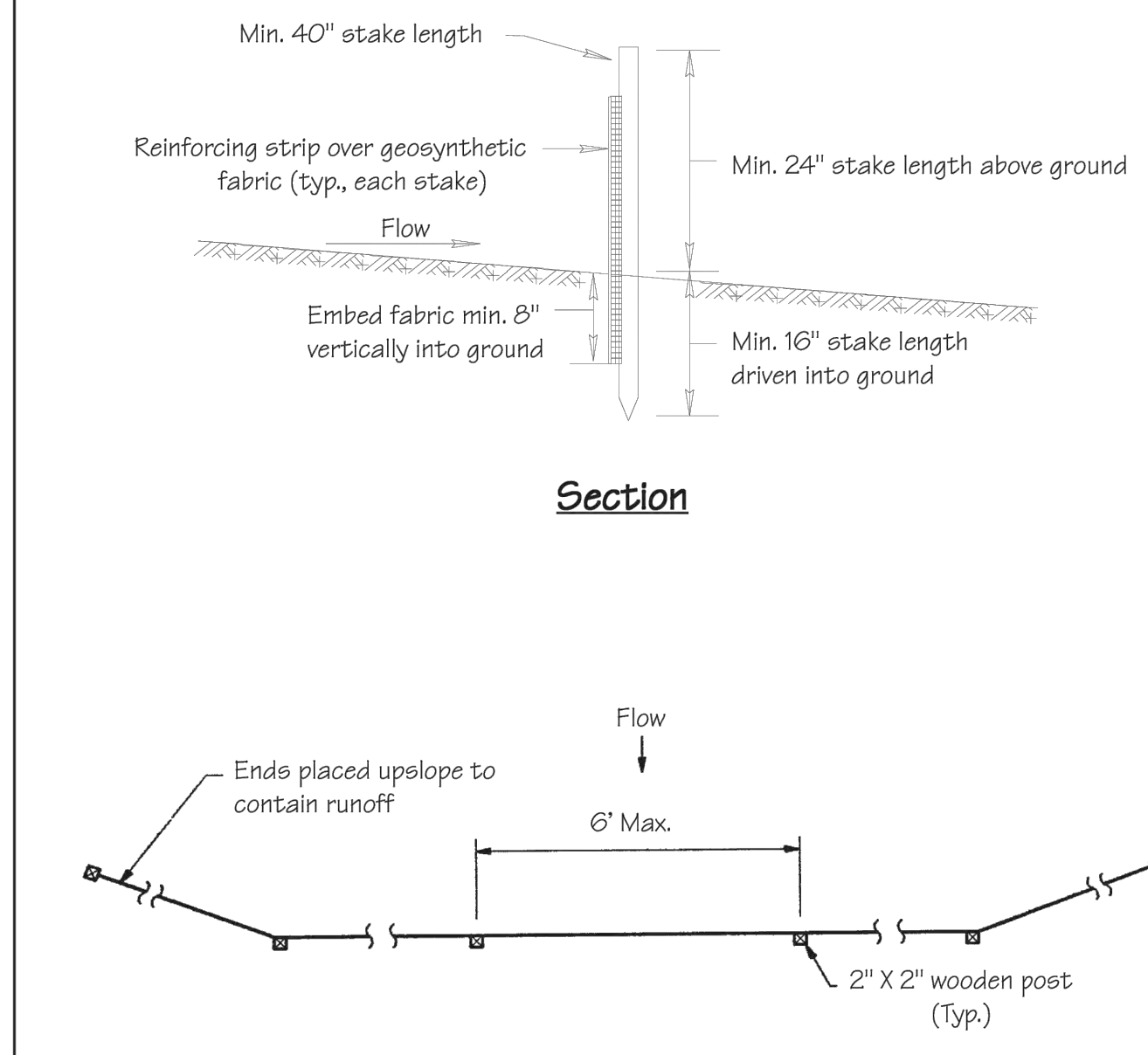
Source:	Symbol:	Detail No.
Adapted from MD Sids & Specs for ESC & Filtrexx™ International	CFL	DE-ESC-3.1.7 Sheet 2 of 2 Effective FEB 2019

4 COMPOST FILTER LOG

4 COMPOST FILTER LOG NOTES

Standard Detail & Specifications

Silt Fence

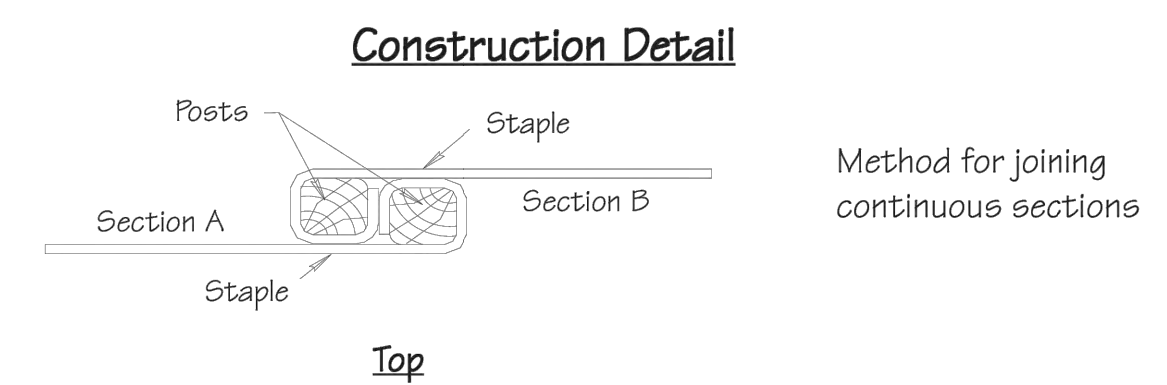


Source:	Symbol:	Detail No.
Adapted from MD Sids. & Specs. for ESC	SF	DE-ESC-3.1.2.1 Sheet 1 of 2 Effective FEB 2019

5 SILT FENCE

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-1
- Reinforcing strip: Wooden lath or plastic strip

Source:	Symbol:	Detail No.
Adapted from MD Sids. & Specs. for ESC	SF	DE-ESC-3.1.2.1 Sheet 2 of 2 Effective FEB 2019

5 SILT FENCE NOTES

**INDEPENDENCE SCHOOL
STREAM RESTORATION PLAN**

NEW CASTLE CONSERVATION DISTRICT
2430 OLD COUNTRY ROAD, NEWARK, DE 19702

6	REVISION TO DETAIL 5 SHEET 13 & 14	DOS	05/30/23
5	SPOT ELEVATION UPDATES SHEET 9	DOS	05/09/23
5	PER COMMENTS-NPS&USACE	DOS	04/04/23
4	ISSUED FOR PERMITTING	DOS	04/04/23
3	PER NPS COMMENTS	DOS	07/14/23
2	ISSUED FOR PERMITTING	DOS	12/09/21
1	ISSUED FOR CLIENT REVIEW	DOS	11/23/20
#	COMMENT	BY	DATE

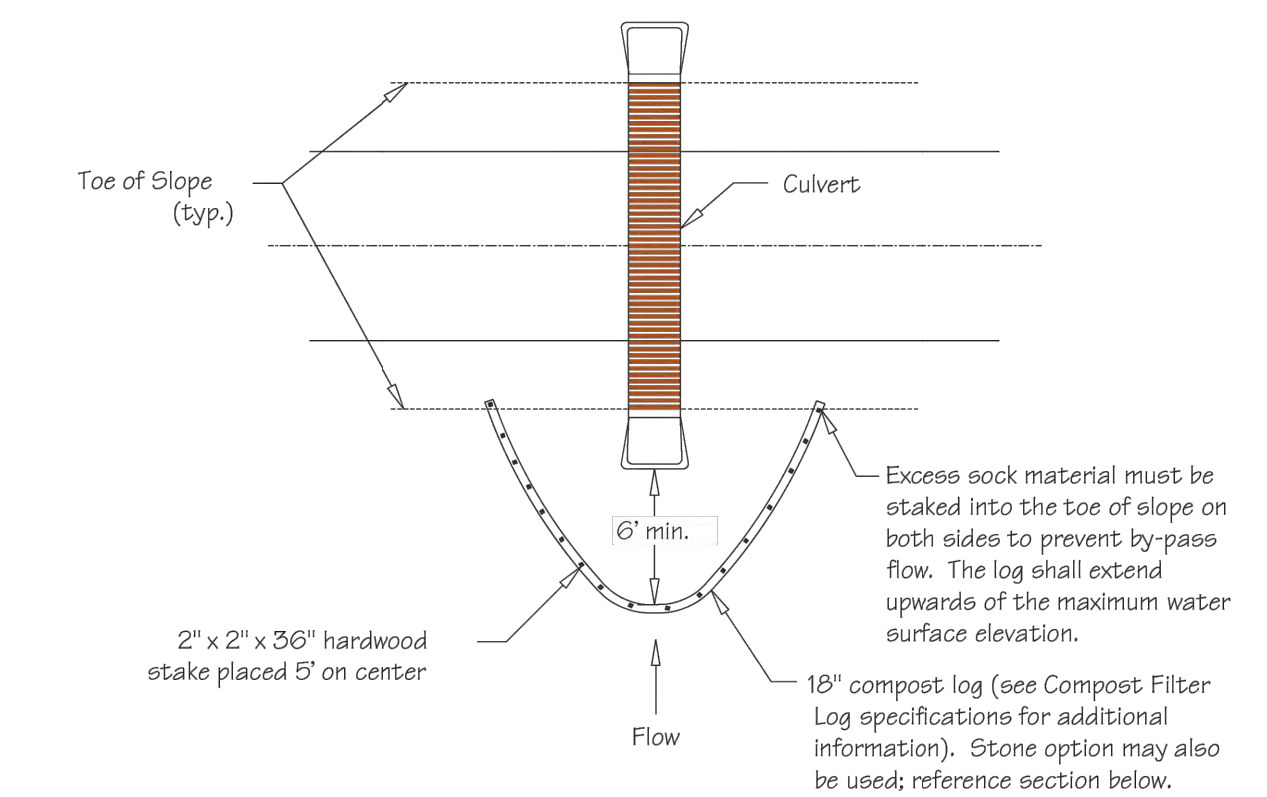


EROSION & SEDIMENT CONTROL DETAILS

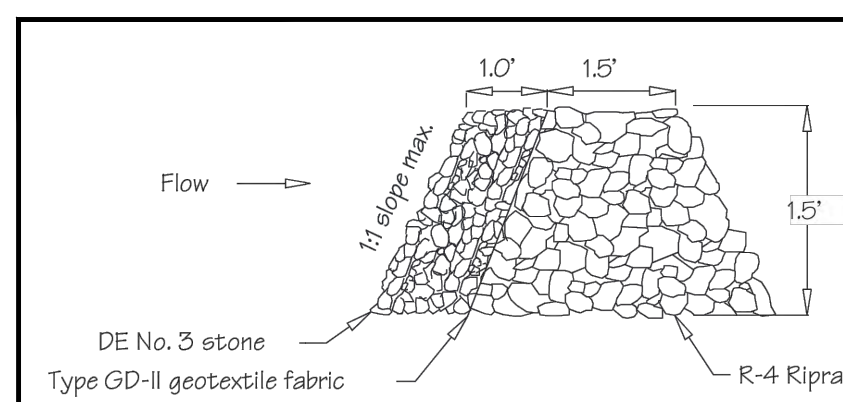
INDEPENDENCE SCHOOL STREAM RESTORATION

MILL CREEK HUNDRED NEW CASTLE COUNTY	NEWARK DELAWARE
DATE: 04/26/20	PROJECT #: 07191
SURVEYED BY: NVA	SHEET: 5
CREATED BY: DOS	5 OF 15
DRAWN BY: AZ	
CHECKED BY: ACH	

Standard Detail & Specifications
Culvert Inlet Protection



Plan View - Compost Log Option



Section View - Stone Option

Source: Adapted from VA ESC Handbook & Filrexx TM International	Symbol: CIP	Detail No. DE-ESC-3.1.6 Sheet 1 of 2
---	-----------------------	---

Effective February 2019

Standard Detail & Specifications
Culvert Inlet Protection

Construction Notes

- Compost logs shall be designed and installed in accordance with the Standard Detail and Specifications for Compost Logs (DE-ES-3.1.7).
- If compost logs can not be installed properly or flow conditions exceed the design capabilities of the compost logs, the stone option shall be employed. Additional filtration may be provided by using a Type GD-II geotextile incorporated into the design as an option.
- Placement of the compost log or stone barrier should be in a "horseshoe" shape and provide a minimum of 6 feet of clearance from the culvert inlet.

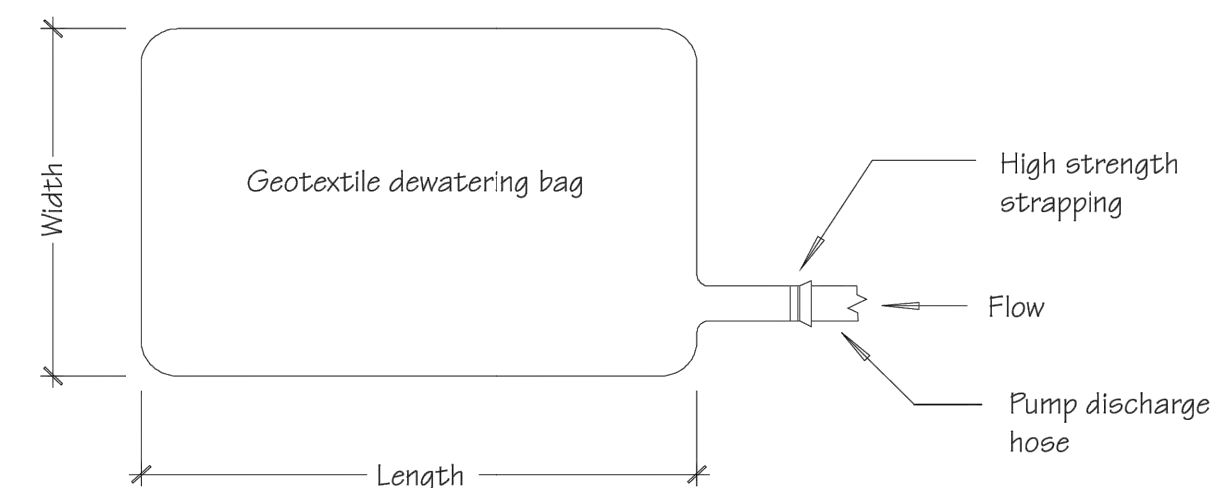
Materials

- Stakes: 2" x 2" x 36" hardwood.
- Compost media: See requirements in Standard Detail and Specifications for Compost Logs (DE-ES-3.1.7).
- Filter sock: See requirements in Standard Detail and Specifications for Compost Logs (DE-ES-3.1.7).
- Geotextile: Type GD-II for stone/riprap option.
- Stone: DE No. 3 for stone/riprap option.
- Riprap: R-6 for stone/riprap option.

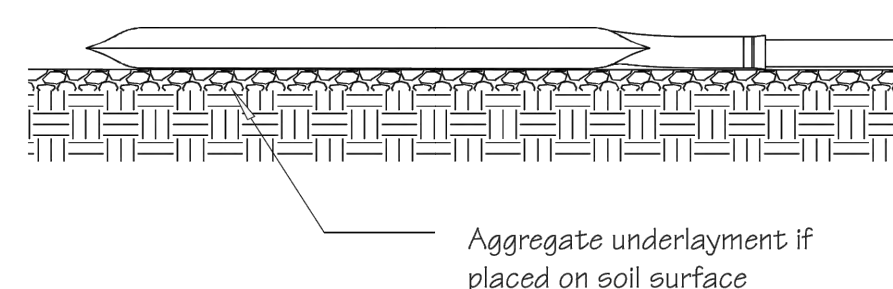
Source: Adapted from VA ESC Handbook & Filrexx TM International	Symbol: CIP	Detail No. DE-ESC-3.1.6 Sheet 2 of 2
---	-----------------------	---

Effective February 2019

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: Adapted from ACF Products, Inc.	Symbol: GB	Detail No. DE-ESC-3.2.1.2 Sheet 1 of 2 Effective FEB 2019
--	----------------------	---

2 GEOTEXTILE DEWATERING BAG

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:
- | Type | TEST METHOD | TEST RESULT |
|------------|-------------|-------------|
| Heavy duty | ASTM D-4884 | 100 lb / in |
- 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: Adapted from ACF Products, Inc.	Symbol: GB	Detail No. DE-ESC-3.2.1.2 Sheet 2 of 2 Effective FEB 2019
--	----------------------	---

2 GEOTEXTILE DEWATERING BAG NOTES

1 CULVERT INLET PROTECTION
6 STONE OPTION

1 CULVERT INLET PROTECTION
6 STONE OPTION

DIVERSION PIPE - GENERAL NOTES

- DUE TO THE LARGE UPSTREAM WATERSHED A PUMP AROUND PRACTICE IS NOT FEASIBLE TO MEET CODE REQUIREMENTS AND THE PIPE DIVERSION METHOD MUST BE UTILIZED AND REMOVED AT THE END OF EACH DAY DURING WET WEATHER DAYS WITH GREATER THAN 3 INCHES OF BASE FLOW CONDITIONS. THE PIPE DIVERSION METHOD IS ALSO MORE AQUATIC WILDLIFE FRIENDLY.
- DETAILS HAVE BEEN PROVIDED PER THE CURRENT DNRDC ESC MANUAL AS WELL AS THE 2003 VIRGINIA MANUAL. INSTALLATION SHALL FOLLOW THE DNRDC MANUAL AS APPLICABLE TO THE DESIGN, THE VIRGINIA DETAIL IS BEING INCLUDED AS AN ADDITIONAL REFERENCE AS IT MORE ACCURATELY DEPICTS THIS SITE PROJECT AS IT IS NOT A UTILITY CROSSING AS ILLUSTRATED IN THE DNRDC MANUAL.
- SET PIPE FOR POSITIVE DRAINAGE.
- FOR AREAS WHERE THE PIPE DIVERSION NEEDS TO BE OUTSIDE OF THE WORK AREA CONSULT THE DESIGN TEAM AS NEEDED FOR ADDITIONAL GUIDANCE ON PIPE CONNECTIONS.
- BARRIERS SHALL BE BASE FLOW PLUS 1' OF FREEBOARD AND A MINIMUM OF 2' HIGH.
- BARRIER SHOULD BE MONITORED FOR LEAKAGE AND REPAIRED AS NECESSARY.
- IN-STREAM BARRIER LOCATION SHOULD EXTEND BEYOND (UPSTREAM AND DOWNSTREAM) AREA TO BE DISTURBED SO ITS PLACEMENT DOES NOT INTERFERE WITH IN-STREAM CONSTRUCTION.
- REMOVE ALL LARGE DEBRIS LOCATED WITHIN THE FOUNDATION OF THE BARRIER TO ENSURE PROPER SEALING AND REDUCE LEAKAGE THROUGH THE DIKE.
- MALLEABLE MATERIAL, SUCH AS SAND, SHOULD BE USED TO FILL BARRIER BAGS.
- DUE TO STABILITY ISSUES, EQUIPMENT CANNOT BE DRIVEN OVER PIPES. IF THERE IS A POSSIBILITY OF THE PIPES BEING DRIVEN OVER BY CONSTRUCTION EQUIPMENT CONSULT DESIGN ENGINEER FOR ALTERNATIVE ROUTE.
- PLAN WORK DAY ACCORDINGLY FOR REMOVAL AND INSTALLATION AT THE END OF EACH WET WEATHER WORK DAY, CONSULT THE DESIGN TEAM AS NECESSARY FOR ADDITIONAL GUIDANCE.

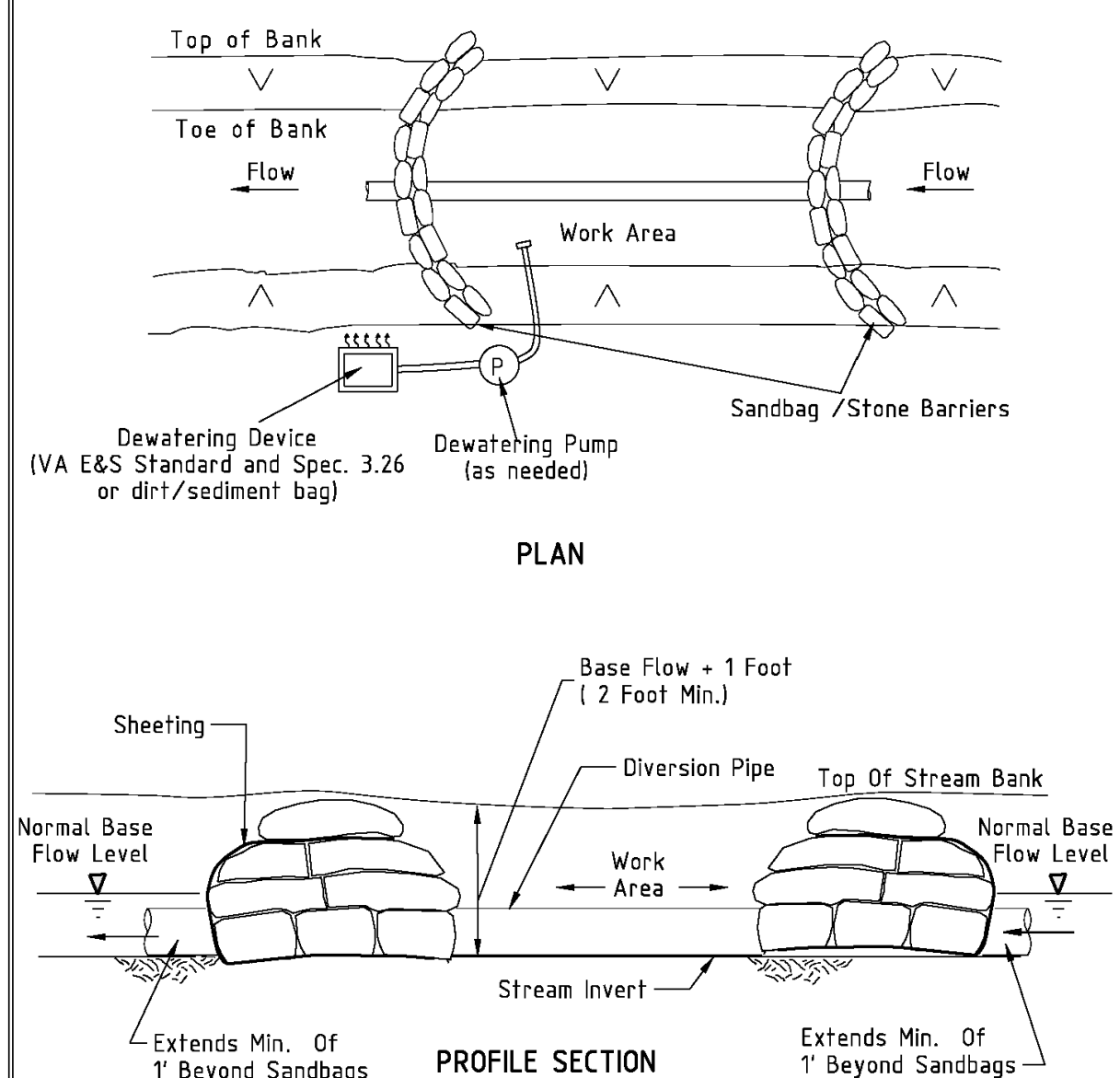
DIVERSION PIPE - MATERIAL NOTES

- PIPE SIZE SHALL BE MIN 24" DIAMETER. THE PIPE SIZE WILL NOT MEET THE DESIGN CRITERIA PER CODE REQUIREMENT AND MUST ONLY BE USED DURING ACTIVE WORK HOURS AND REMOVED AT THE END OF EACH DAY AND IF UNEXPECTED WEATHER OCCURS AND THE WORK DAY ENDS EARLIER THAN ANTICIPATED. THE STREAM CHANNEL MUST BE LEFT OPEN FOR FREE CHANNEL FLOW AT THE END OF EVERY WET WEATHER WORK DAY, NO EXCEPTIONS.
- HIGH DENSITY POLYETHYLENE PIPE (HDPE) OR EQUIVALENT OF APPROPRIATE THICKNESS AND DIAMETER TO ACCOMPLISH DIVERSION OF STREAM FLOW. THE PIPE SHALL EXTEND A MINIMUM OF ONE FOOT BEYOND THE UPSTREAM AND DOWNSTREAM TOES OF THE BARRIERS.
- BARRIER BAGS MAY BE FILLED ON SITE OR PRE-FILLED AND MADE OF BURLAP OR POLYPROPYLENE MATERIALS WHICH ARE RESISTANT TO ULTRA-VIOLET RADIATION, TEARING, AND PUNCTURE AND SHOULD BE WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE OF THE FILL MATERIAL (I.E. SAND, FINE GRAVEL, ETC.).
- USE SHEETING AS NECESSARY TO PREVENT UPSTREAM BARRIER LEAKAGE. PLACE SHEETING ON UPSTREAM SIDE OF BARRIER. USE SEAMLESS POLYETHYLENE PLASTIC SHEETING WITH A MINIMUM 4-MIL THICKNESS IMPERVIOUS AND RESISTANT TO PUNCTURE, TEARING AND ULTRAVIOLET DEGRADATION OR EQUIVALENT.
- IF PROPERLY SET AND THE SYSTEM IS BEING USED DURING DRY WEATHER, PUMPING EQUIPMENT SHOULD NOT BE REQUIRED. IF NEEDED, SET UP TEMPORARY LOW FLOW PUMP. PUMP OUTFLOW VELOCITY SHALL DISCHARGE AT A STABLE RATE. IN WET WEATHER CONDITIONS AND/OR HIGH SEDIMENT DISPOSITION OCCURRENCES A GEOTEXTILE DEWATERING BAG MAY BE REQUIRED, SEE EROSION AND SEDIMENT CONTROL DETAILS. AT NO POINT SHOULD DIVERSION CREATED SEDIMENT LADEN WATER BE PERMITTED TO DISCHARGE DOWN STREAM.

DIVERSION PIPE - INSTALLATION

- DETERMINE LENGTH OF WORK AREA - LENGTH SHALL NOT EXCEED THAT WHICH CAN BE COMPLETED IN ONE WORKING DAY.
- SET PIPE INVERT ELEVATION AT NORMAL STREAM GRADE; IF REQUIRED USE FABRIC, STONE, AND/OR REMOVE LARGE OBJECTS TO CREATE SETTING BED FOR PIPE WITH POSITIVE DRAINAGE DOWNSTREAM.
- INSTALL UPSTREAM BARRIER AND ENSURE PROPER FLOW THROUGH PIPE WITH NO LEAKS IN SYSTEM;
- DEWATER WORK AREA IF NEEDED;
- SET DOWNSTREAM BARRIER;
- COMPLETE IN-STREAM CONSTRUCTION PRACTICES;
- REMOVE UPSTREAM BARRIER;
- REMOVE PIPE;
- REMOVE ANY SEDIMENT THAT MAY HAVE GENERATED ALONG THE DOWNSTREAM BARRIER;
- CONFIRM WORK AREA IS STABILIZED;
- REMOVE DOWNSTREAM BARRIER.

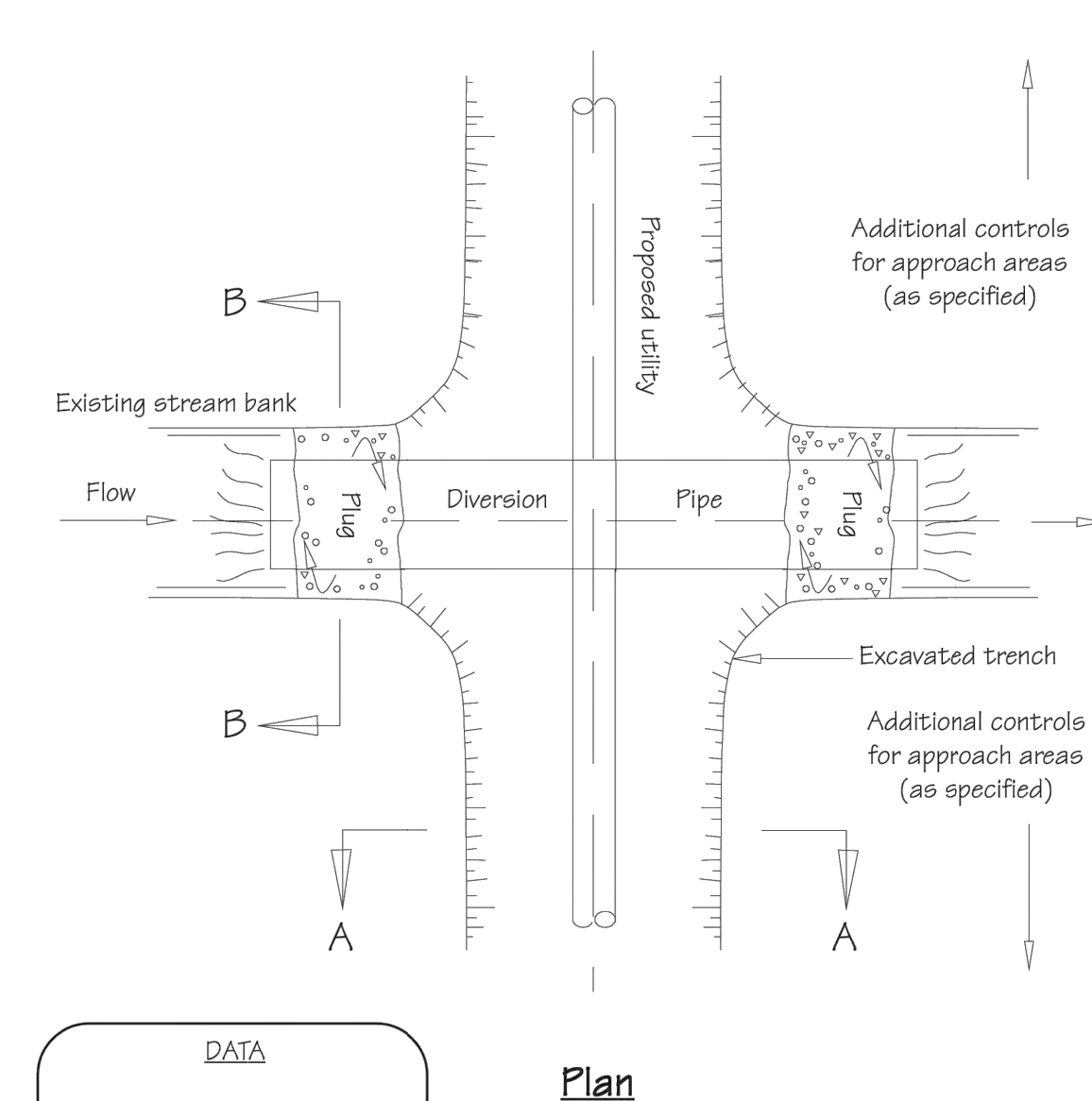
The Virginia Stream Restoration & Stabilization Best Management Practices Guide
DETAIL 5.3: DIVERSION PIPE



Adapted From Maryland's Waterway Construction Guidelines
TEMPORARY IN-STREAM CONSTRUCTION MEASURES
DECEMBER 2003
VIRGINIA DEPARTMENT OF CONSERVATION RECREATION

3 TEMPORARY INSTREAM PROTECTION
6 DIVERSION PIPE

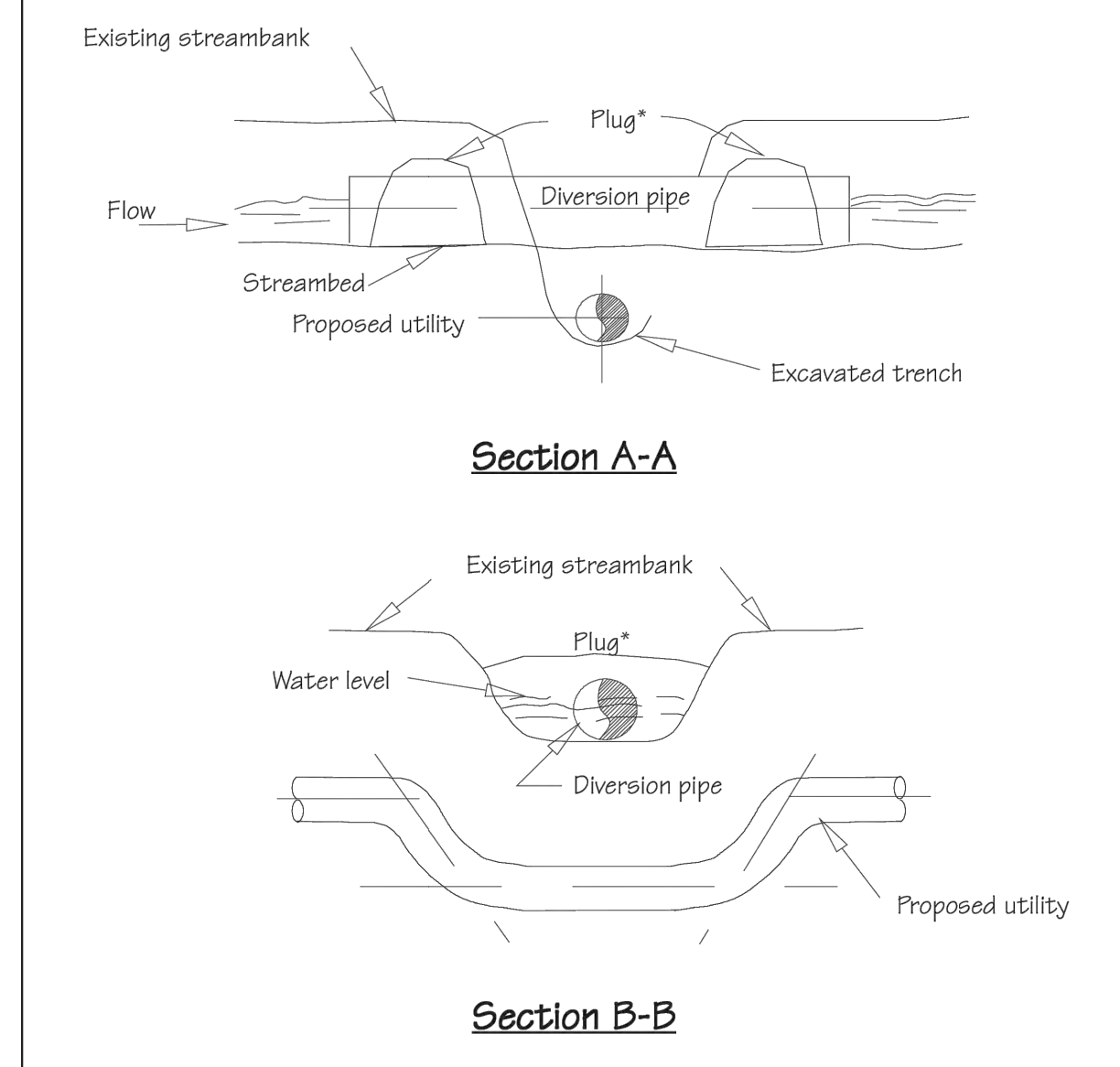
Standard Detail & Specifications
Utility Crossing Diversion Pipe



Source: Adapted from VA ESC Handbook	Symbol: DP	Detail No. DE-ESC-3.5.2.1 Sheet 1 of 3
---	----------------------	---

Effective February 2019

Standard Detail & Specifications
Utility Crossing Diversion Pipe



Source: Adapted from VA ESC Handbook	Symbol: DP	Detail No. DE-ESC-3.5.2.1 Sheet 2 of 3
---	----------------------	---

Effective February 2019

Standard Detail & Specifications
Utility Crossing Diversion Pipe

Construction Notes:

- Pipe diversion shall be operational prior to start of in-stream construction.
- Controls for approach areas shall be provided in accordance with the approved plan.
- All materials used must be adequate to withstand expected hydraulic and equipment loads.
- Pipe shall be of adequate size to convey the normal water channel flow and shall be installed in the stream bed across the proposed utility trench centerline.
- Impervious plug shall be placed near each end of pipe so as to dam off the channel flow and force it into the diversion pipe.
- Water trapped between the plugs shall be pumped to an approved dewatering practice prior to excavation of the utility trench.
- Once the diversion pipe has been made operational and checked for water tightness, excavation of the utility trench may begin. Installation of the utility shall proceed in a timely manner so as to minimize in-stream construction.
- Once the utility has been installed, trench shall be backfilled and stabilized in accordance with the approved plan.
- Diversion pipe shall remain in-place until stream bed and banks have been stabilized.

This practice limited to streams less than 10' wide; in-stream construction periods shall be less than 72 hours.

Source: Adapted from VA ESC Handbook	Symbol: DP	Detail No. DE-ESC-3.5.2.1 Sheet 3 of 3
---	----------------------	---

Effective February 2019

READ ALL NOTES AND FOUR DETAILS ABOVE FOR TEMPORARY IN-STREAM CONSTRUCTION MEASURES. CONSULT DESIGN ENGINEER FOR PROJECT SPECIFIC ALTERATIONS TO MEET CODE COMPLIANCE FOR EACH SECTION OF STREAM REACH CONSTRUCTION. EACH SECTION OF STREAM REACH CONSTRUCTION SHALL BE DETERMINED BY THE CONTRACTOR BASED ON THE LENGTH OF WORK THAT CAN BE COMPLETED IN ONE DAY, EXCEPT FOR DRY WEATHER LOW FLOW CONDITIONS WITH LESS THAN 3 INCHES OF BASE FLOW. ALL IN-STREAM CONTROL MEASURES MUST BE REMOVED AT THE END OF EACH WORK DAY AND RE-SET THE BEGINNING OF THE NEXT.

6	REVISION TO DETAIL 5 SHEET 13 &	DD5 05.30.23
	SPOT ELEVATION UPDATES SHEET 9	
5	PER COMMENTS-NPS&USACE	DD5 05.06.23
4	ISSUED FOR PERMITTING	DD5 04.04.23
3	PER NPS COMMENTS	DD5 02.14.23
2	ISSUED FOR PERMITTING	DD5 12.02.21
1	ISSUED FOR CLIENT REVIEW	DD5 11.23.20
#	COMMENT	BY DATE

EROSION & SEDIMENT CONTROL DETAILS

INDEPENDENCE SCHOOL
STREAM RESTORATION

MILL CREEK HUNDRED NEW CASTLE COUNTY	NEWARK DELAWARE
DATE: 06.26.20	PROJECT #: 07101
SURVEYED BY: N/A	SHEET: 6 OF 15
CREATED BY: DD5	
DRAWN BY: AZ	
CHECKED BY: ACH	

Standard Detail & Specifications
Inlet Protection - Type 3

Plan View - Concrete Block Option

- Sand bag or concrete block to secure end to curb (as needed)
- Curb opening
- 2' min. taper spacing (typ.)
- Concrete blocks used to keep log in place in front of grate as needed (lack of topcoat may be sufficient to keep the log in place)
- 8" min. compost filter log or alternate media

Isometric View - Wire Mesh Option

- Welded wire mesh, min. opening 1" x 2"
- 4" min. overhang
- 1" min. opening
- Strapping to secure wire mesh to the log (also strap around grate if applicable)

Source: Adapted from Fillrexx™ International	Symbol: IP-3	Detail No. DE-ESC-3.1.5.3 Sheet 1 of 3
--	------------------------	---

Effective February 2019

1
7 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: Adapted from Fillrexx™ International	Symbol: IP-3	Detail No. DE-ESC-3.1.5.3 Sheet 2 of 3
--	------------------------	---

Effective February 2019

1
7 INLET PROTECTION
TYPE 3

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: Adapted from Fillrexx™ International	Symbol: IP-3	Detail No. DE-ESC-3.1.5.3 Sheet 3 of 3
--	------------------------	---

Effective February 2019

1
7 INLET PROTECTION
TYPE 3

Standard Detail & Specifications
Soil Stockpile

Plan

- Stockpile entrance to be located on upslope side
- 3' separation (min.)
- Perimeter control (i.e. silt fence)

Section A-A

- Max. height 20' (10' on residential lot) unless local requirements more restrictive
- Stabilize per Temporary Stabilization specifications
- 1 max.
- 2
- Install perimeter control per specification

Source: Adapted from Colorado Urban Storm Drainage Criteria Manual, Vol 3	Symbol: SP	Detail No. DE-ESC-3.7.3 Sheet 1 of 2 Effective FEB 2019
--	----------------------	---

2
7 SOIL STOCKPILING

Standard Detail & Specifications
Soil Stockpile

Construction Notes:

- 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.
- Secure the perimeter of the stockpile with an approved erosion and sediment control perimeter device.
- 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.

ADDITIONAL NCC REQUIREMENTS:

- Temporary vegetative stabilization shall be completed within seven (7) calendar days of the formation of the stockpile.
- For any period of inactivity longer than thirty (30) calendar days, the stockpile shall be stabilized with permanent vegetation and maintained in such a manner so that the stockpile is mowable (maximum slope 3:1).

Source: Adapted from Colorado Urban Storm Drainage Criteria Manual, Vol 3	Symbol: SP	Detail No. DE-ESC-3.7.3 Sheet 2 of 2 Effective FEB 2019
--	----------------------	---

2
7 SOIL STOCKPILING
NOTES

Standard Detail & Specifications
Topsoiling

Construction Notes:

- 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.

 - Grading - Grades on the areas to be topsoiled which have been previously established shall be maintained.
 - 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.
 - 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.
- 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: USDA - NRCS	Symbol: IP-3	Detail No. DE-ESC-3.4.1 Sheet 1 of 2 Effective FEB 2019
------------------------	------------------------	---

3
7 TOPSOILING
NOTES

Standard Detail & Specifications
Topsoiling

Construction Notes (cont.)

- 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 sterilants or chemicals used for weed control until sufficient time has elapsed to permit dissipation of toxic materials.
- 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: USDA - NRCS	Symbol: IP-3	Detail No. DE-ESC-3.4.1 Sheet 2 of 2 Effective FEB 2019
------------------------	------------------------	---

3
7 TOPSOILING
NOTES

6	REVISION TO DETAIL 5 SHEET 13 &	005
	SPOT ELEVATION UPDATES SHEET 9	05.30.23
5	PER COMMENTS-NPS&USACE	005
		05.06.23
4	ISSUED FOR PERMITTING	005
		04.04.23
3	PER NPS COMMENTS	005
		02.16.23
2	ISSUED FOR PERMITTING	005
		11.02.21
1	ISSUED FOR CLIENT REVIEW	005
		11.23.20
#	COMMENT	BY DATE

FORESITE ASSOCIATES

PROFESSIONAL SEAL
25 June 2023
C. E. J.

EROSION & SEDIMENT CONTROL DETAILS

INDEPENDENCE SCHOOL
STREAM RESTORATION

MILL CREEK HUNDRED NEW CASTLE COUNTY NEWARK DELAWARE

DATE: 06.26.20	PROJECT #: 07101
SURVEYED BY: N/A	SHEET: 7
CREATED BY: DDS	
DRAWN BY: AZ	
CHECKED BY: ACH	7 OF 15

Standard Detail & Specifications Vegetative Stabilization



TEMPORARY SEEDING BY RATES, DEPTHS AND DATES										
Mix #	Species ⁶	Seeding Rate	Optimum Seeding Dates ¹							Planting Depth ³
			Coastal Plain			Piedmont		All ¹		
1	Barley	125 4	G	A	O	O	A	O		1-2 inches
2	Oats MARCH 1- APRIL 30	125 4	O	A	A	O	A	A		2-3" sandy soils
3	Rye	125 4	U	A	O	O	A	A		1-2 inches
4	Perennial Ryegrass	125 4	O	A	O	O	A	O		2-3" sandy soils
5	Annual Ryegrass AUGUST 1- OCTOBER 30	125 4	O	A	O	O	A	O		1-2" sandy soils
6	Winter Wheat NOVEMBER 1 - FEBRUARY 28	125 4	O	A	O	O	A	O		1-2 inches
7	Festulolida MAY 1 - JULY 31	30 PLS 0.7	O							1-2" sandy soils
8	PERM MIRE	ZUPLS 0.5	U							1-2" sandy soils

- Winter seeding requires 3 tons per acre of straw mulch for proper stabilization.
- May be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
- Applicable on slopes 3:1 or less.
- Apply ~~50 pounds per acre of Annual Ryegrass may be added to 1/2 the seeding rate of any of the above species.~~
- Use varieties currently recommended for Delaware. Contact a County Extension Office for information.
- Warm season grasses such as Millet or Weeping Lovegrass 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 FEB 2019

1
8 VEGETATIVE STABILIZATION NOTES NOT TO SCALE

Standard Detail & Specifications Vegetative Stabilization



PERMANENT SEEDING AND SEEDING DATES										
Mix No.	Certified Seed ²	Seeding Rate ¹	Optimum Seeding Dates ²							Remarks
			Coastal Plain			Piedmont		All ¹		
1	Tall Fescue Weeping Lovegrass	140 0.23	A	O	A	O	A	O	A	Add 100 lbs./ac. Winter Rye Good erosion control mix. Tolerant of low fertility soils. Lowgerass very difficult to mow. Germinates only in hot weather.
2	Dormant Sheep Fescue Common Lespedeza ³ Incultated	30 0.69 30 0.69 15 0.36	A	O	A	A	O	A	A	Good erosion control mix. Tolerant of low fertility soils. Good wildlife cover and food.
3	Tall Fescue (Turf-type) or Strong Creeping Red Fescue or Perennial Ryegrass plus Flatpea ⁴	50 1.15 50 1.15 15 0.34	O	A	O	O	A	O	A	Add 100 lbs./ac. Winter Rye Good erosion control mix. Tall Fescue for droughty conditions. Creeping Red Fescue for heavy shade. Flatpea to suppress weeds/vegetation.
4	Strong Creeping Red Fescue Kentucky Bluegrass Redtop plus White Clover ⁵	100 2.3 70 1.61 50 1.15 3 0.07	O	A	O	O	A	O	A	Add 100 lbs./ac. Winter Rye Suitable waterway mix. Canada Bluegrass more drought tolerant. Use Redtop for increased drought tolerance.
5	Swinggrass or Coastal Panicgrass Big Bluestem Little Bluestem Cadian Grass	10 0.23 70 1.61 5 0.11 5 0.11	U							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	O	O	A	O	A	Managed file strip for nutrient uptake.
7	Tall Fescue Ky. Bluegrass (Blend) Perennial Ryegrass	150 3.5 20 0.46 20 0.46	O	A	O	O	A	O	A	Three cultivars of Kentucky Bluegrass. Traffic tolerant.
8	Big Bluestem Indian Grass ⁷ Little Bluestem Creeping Red Fescue plus one of: Partridge Pea Bash Clover Wild Indigo Shady Tick-Trail	10 0.23 8 0.18 3 0.09 5 0.11 3 0.07 3 0.07 2 0.05	O	A	O	O	A	O	A	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 FEB 2019

1
8 VEGETATIVE STABILIZATION NOTES NOT TO SCALE

Standard Detail & Specifications Vegetative Stabilization



PERMANENT SEEDING AND SEEDING DATES (cont.)										
Mix No.	Certified Seed ²	Seeding Rate ¹	Optimum Seeding Dates ²							Remarks
			Coastal Plain			Piedmont		All ¹		
9	Redtop Creeping Bentgrass Sheep Fescue Rough Bluegrass	75 1.72 30 0.69 45 1	O	A	O	O	A	O	A	Add 100 lbs./ac. Winter Rye Quick stabilization of disturbed sites and waterways.
10	Reed Canarygrass ⁸	10 0.23	A							Good erosion control, wildlife cover and wetland revegetation.
Residential Lawns										
11	Tall Fescue Perennial Ryegrass Kentucky Bluegrass Blend	100 2.3 25 0.57 30 0.69	O	A	O	O	A	O	A	High value, high maintenance, light traffic, irrigation necessary. Well drained soils, full sun.
12	Tall Fescue Perennial Ryegrass Sheep Fescue	100 2.3 25 0.57 25 0.57	O	A	O	O	A	O	A	Moderate value, low maintenance, traffic tolerant.
13	Creeping Red Fescue Chewings Fescue Rough Bluegrass Kentucky Bluegrass	50 1.15 50 1.15 20 0.4 20 0.4	O	A	O	O	A	O	A	Shade tolerant, moderate traffic tolerance, moderate maintenance.
14	Creeping Red Fescue Rough Bluegrass or Chewings Fescue	50 1.15 90 2.1	O	A	O	O	A	O	A	Shade tolerant, moisture tolerant.
15	PC-1 Tall Fescue	150 3.5	O	A	O	O	A	O	A	Monoculture, but performs well alone in lawns. Discouraged.

- When hydroseeding is the chosen method of application, the total rate of seed should be increased by 25%.
- 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.
- 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 Section 1, Chapter 24, Title 3 of the Delaware Code.
- Cool season species may be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
- All leguminous seed must be inoculated.
- Warm season grass mix and Reed Canary Grass cannot be mowed more than 4 times per year.
- 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 FEB 2019

1
8 VEGETATIVE STABILIZATION NOTES NOT TO SCALE

Standard Detail & Specifications Vegetative Stabilization



Construction Notes:

- Site Preparation
 - Prior to seeding, install needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, grassed waterways, and sediment basins.
 - Final grading and shaping is not necessary for temporary seedings.
- Seedbed Preparation

It is important to prepare a good seedbed to insure 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.

- Soil Amendments
 - 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.
 - 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.

- Seeding
 - 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.
 - Apply seed uniformly with a broadcast seeder, drill, cultipacker seeder or hydroseeder. All seed will be applied at the recommended rate and planting depth.
 - 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.
- 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 FEB 2019

1
8 VEGETATIVE STABILIZATION NOTES NOT TO SCALE

Standard Detail & Specifications Mulching



- Materials and Amounts
 - 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.
 - 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).
 - Hydraulically applied mulch - The following conditions apply to hydraulically applied mulch:
 - Definitions:
 - 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.
 - 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.
 - 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.
 - Refer to Figure 3.4.5a for conditions and limitations of use for each of the above categories of hydraulic mulch.
 - 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.
 - Hydraulic mulches shall be applied with a viable seed and at manufacturer's recommended rates. Increased rates may be necessary based on site conditions.
 - Hydraulically applied mulches and additives shall be mixed according to manufacturers recommendations.
 - 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 & Filtrax™ International		DE-ESC-3.4.5 Sheet 1 of 3 Effective FEB 2019

2
8 MULCHING NOTES NOT TO SCALE

Standard Detail & Specifications Mulching

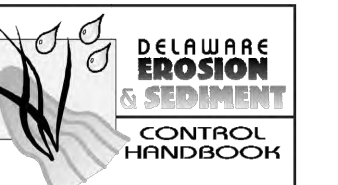


- Anchoring mulch - Mulch must be anchored immediately to minimize loss by wind or water. This may be done by one of the following methods, depending upon size of area, erosion hazard, and cost.
 - Crimping - A crimper is a tractor drawn implement designed to punch and anchor mulch into the top two (2) 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.
 - 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 clear marks running across the slope.
 - 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.
 - 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.
 - Nettles - Synthetic or organic nettles may be used to secure straw mulch. Install and secure according to the manufacturers recommendations.
- 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.

Source:	Symbol:	Detail No.
Delaware ESC Handbook & Filtrax™ International		DE-ESC-3.4.5 Sheet 2 of 3 Effective FEB 2019

2
8 MULCHING NOTES NOT TO SCALE

Standard Detail & Specifications Mulching



Percent Sluff Less than 2%	Type of Mulch / App. Rate ¹	MULCHING MATERIAL SELECTION GUIDE					
		Dec. 1 to Feb. 28(29)	March 1 to May 31	June 1 to Aug. 31	Sept. 1 to Nov. 30		
Less than 2%	Wood Fiber @ 2000 lb/ac. min.	OK	OK	OK	OK	OK	OK
	Wood Fiber @ 3000 lb/ac. min.	OK	OK	OK	OK	OK	OK
2% to 8.5%	BFM @ 2000 lb/ac. min.	OK	OK	OK	OK	OK	OK
	BFM @ 3000 lb/ac. min.	OK	OK	OK	OK	OK	OK
8.5% to 10.5%	Wood Fiber @ 2500 lb/ac. min.	OK	OK	OK	OK	OK	OK
	Wood Fiber @ 3500 lb/ac. min.	OK	OK	OK	OK	OK	OK
10.5% to 24.5%	Wood Fiber @ 2500-3000 lb/ac. min.	OK	OK	OK	OK	OK	OK
	Wood Fiber @ 3500-4000 lb/ac. min.	OK	OK	OK	OK	OK	OK
25% to 33%	BFM @ 2500-3000 lb/ac. min.	OK	OK	OK	OK	OK	OK
	BFM @ 3500-4000 lb/ac. min.	OK	OK	OK	OK	OK	OK
33% and up	Wood Fiber @ 3500-4000 lb/ac. min.	OK	OK	OK	OK	OK	OK
	Wood Fiber @ 4000-4500 lb/ac. min.	OK	OK	OK	OK	OK	OK

Source:	Symbol:	Detail No.
Delaware ESC Handbook & Filtrax™ International		DE-ESC-3.4.5 Sheet 3 of 3 Effective FEB 2019

2
8 MULCHING NOTES NOT TO SCALE

GEOTEXTILE SELECTION TABLE

TYPE	EXAMPLE PRODUCTS
GS-I	MIRAFI 600X
	AMOCO 2006
	GEOTEX 315ST
GD-I	MIRAFI 100X
	GEOTEX 915SC
GD-II	MIRAFI FW402
	AMOCO 4535
GD-III	SILT SACK HIGH FLOW
	DANDY BAG II
GD-IV	ULTRA-DRAIN GUARD
	DIRTBAG 53/55
	DANDY DEWATERING BAG
	TERRATEX N08/N10

3
8 GEOTEXTILE SELECTION TABLE NOT TO SCALE



CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
ECOLOGICAL RESTORATION

FORESITE ASSOCIATES INC.
2401 PHILADELPHIA PIKE
CLAYMONT, DE 19703
PHONE: 302.351.3421
INFO@FORESITEASSOCIATES.COM

INDEPENDENCE SCHOOL STREAM RESTORATION PLAN

NEW CASTLE CONSERVATION DISTRICT
2430 OLD COUNTRY ROAD, NEWARK, DE 19702

4	REVISION TO DETAIL 5 SHEET 13 & SPOT ELEVATION UPDATES SHEET 9	009 05.30.23
5	PER COMMENTS-NPS&USACE	009 05.06.23
4	ISSUED FOR PERMITTING	009 04.04.23
3	PER NPS COMMENTS	009 03.16.23
2	ISSUED FOR PERMITTING	009 11.02.21
1	ISSUED FOR CLIENT REVIEW	009 11.23.20
#	COMMENT	REV DATE



EROSION & SEDIMENT CONTROL DETAILS

INDEPENDENCE SCHOOL STREAM RESTORATION

MILL CREEK HUNDRED NEW CASTLE COUNTY	NEWARK DELAWARE
DATE: 06.26.20	PROJECT #: 07101
SURVEYED BY: DJS	SHEET: 8
CREATED BY: AZ	8 OF 15
DRAWN BY: AZ	
CHECKED BY: ACH	

CONSTRUCTION NOTES

1. STABILIZE DOWNSTREAM WORK AREA:
 - 1.1. SEE EROSION AND SEDIMENT CONTROL PLAN
 - 1.2. PROJECT WORK IS IN AN ACTIVE STREAM COURSE AND EROSION AND SEDIMENT CONTROLS MUST BE IN PLACE TO CAPTURE LOOSE SEDIMENT PRIOR TO ENTERING THE DOWNSTREAM WATERWAY.
 - 1.3. REMOVE ACCUMULATED SEDIMENT/EARTH COVERING EXISTING GROUTED RIP RAP. DO NOT DISTURB NATURAL STREAM CHANNEL AT DOWNSTREAM END OF CULVERTS.
 - 1.4. FOR ALL FOLLOWING NOTES REFERENCE THE DETAILS ON SHEET 12-14 FOR ADDITIONAL INFORMATION.
2. INSTALL LOG SILL #2 AT UPSTREAM END OF PROJECT AREA
 - 2.1. USE SALVAGED HARDWOOD TREES FROM PROJECT AREA.
 - 2.2. DUE TO THE IRREGULARITY OF NATURAL MATERIALS, THE CONTRACTOR IS RESPONSIBLE FOR MEASURING AND EXCAVATING TO MEET DESIGN ELEVATION; INSTALLATION ASSUMES A MINIMUM 11" DIAMETER FOOTER LOG BURIED BELOW STREAMBED TO MEET TOP OF SILL DESIGN ELEVATION AT STREAMBED.
 - 2.3. PER DETAIL, OFFSET SILL LOG OVER FOOTER LOG TO PRODUCE UNDERWATER "FISH SHELF"; THE OFFSET SHOULD BE A MAXIMUM OF 1/4 THE SILL DBH, I.E. IF THE SILL LOG IS AN 12" DBH HARDWOOD, ONLY 3 INCHES SHOULD OVERHANG THE FOOTER LOG.
 - 2.4. FOOTER LOG TO BE ONE LOG; SILL LOG MAY BE SMALLER. TO ACHIEVE ADEQUATE OVERHANG FOR FISH SHELF IF USING SMALLER THAN 12" DBH SILL LOGS, CONSULT DESIGN TEAM PRIOR TO INSTALLATION; INADEQUATE FISH SHELF DEPTH WILL NOT BE ACCEPTABLE.
 - 2.5. ANCHOR BOULDERS ARE TO BE SECURELY SET INTO GRADE WHERE ANCHOR BOULDERS BECOME EXPOSED AT STREAM EDGE. USE COBBLE STONES TO FILL GAPS BETWEEN LOG AND BOULDERS. UPSTREAM EDGES TO BE SEALED FROM WATER SEEPAGE BEHIND THE LOG SILL STRUCTURE. AT THE UPSTREAM FACE WHERE GAPS WILL NATURALLY OCCUR IN THE FORMATION DUE TO THE IRREGULAR NATURE OF NATURAL MATERIALS, INSTALL COMPACTED BACKFILL CONSISTING OF 40% #3 STONE 40% COURSE RIVER GRAVEL AND 20% COBBLESTONES; HAND CHINK PIECES INTO GAPS AS NECESSARY AND THEN TAMP STONE INTO GAPS BETWEEN BOULDERS FOR TIGHT FIT. BACKFILL UPSTREAM EDGE OVER STONES WITH A MINIMUM OF 12" OF CLAY BORROW.
 - 2.6. INSTALL DOUBLE LAYER COIR FABRIC ON UPSTREAM FACE OF CLAY BACKFILL PER DETAIL.
3. LOG SILL #1 POOL
 - 3.1. EXCAVATE A MINIMUM OF 8" BELOW BOTTOM OF POOL DESIGN ELEVATIONS
 - 3.2. INSTALL 8" MINIMUM DEPTH OF MIXED BED AND TRANSITION COBBLE STONE
 - 3.3. INSTALL ANCHOR BOULDER(S) AT DOWNSTREAM EDGE OF POOL; ANCHOR STONE TO BE SECURELY SET INTO GRADE WITH APPROXIMATELY 2/3 OF THE STONE HEIGHT BELOW THE STREAM BED
 - 3.4. CHINK TRANSITION COBBLE AND BED COBBLE IN GAPS BETWEEN ANCHOR STONE SO THAT A CHANNEL SPANNING WIDTH OF MIXED BOULDER COBBLE IS AT DOWNSTREAM END OF POOL.
4. ROOT WADS
 - 4.1. ROOT WADS ARE TO BE SET IN THE NATURAL CURVATURE OF THE EXISTING STREAM BANK JUST DOWNSTREAM OF THE UPSTREAM LOG SILL AT THE END OF THE PROJECT AREA; DETERMINE LOCATION AT PRE-CONSTRUCTION MEETING WITH OWNERS / OWNER'S REPRESENTATIVE AND DESIGN TEAM.

- 4.2. NUMBER OF ROOT WADS WILL VARY FROM PLAN VIEW AND ARE FOR ILLUSTRATION ONLY; DETERMINE TREES TO BE SALVAGED FOR ROOT WAD USE AT THE PRE-CONSTRUCTION MEETING AND CONSULT DESIGN TEAM FOR SETTING DURING INSTALLATION.
- 4.3. INSTALL ROOT WADS PER DETAIL; FOOTER LOGS TO BE SECURELY SET IN STREAM TOE PROTECTION.
- 4.4. PACK SOIL / CLAY BORROW AND COBBLESTONE AS NECESSARY TO CREATE TIGHT FIT BETWEEN ROOT WAD AND FOOTER LOG. TAMP AS NEEDED SO NO GAPS ARE PRESENT.
- 4.5. USE ANCHOR BOULDERS AT GRADE TO TRANSITION UPLAND SLOPE TO ROOT WAD TO PREVENT SLIPPAGE INTO WAD ROOT FINGERS.
5. INSTALL STREAM BOULDER PATH:
 - 5.1. PATH IS LARGE SUB-ANGULAR ANCHOR BOULDERS WITH A MINIMUM SIZE OF 24" x 24" x 18". SET AS RAISED STEPPING STONE PATH TRAVERSING CHANNEL. BOULDERS WILL BE IN THE CHANNEL AND CONTINUE UP THE SIDE SLOPES. THE INSTALLATION WILL BE SIMILAR TO A ROCK VANE BUT WATER CAN MOVE BETWEEN THE STONES AND IT SHOULD NOT FORCE 6" OR LESS OF BASE FLOW ABOVE IT; SEE DETAIL'S SHEET 13.
 - 5.2. THERE ARE TO BE NO GEOTEXTILE OR OTHER INORGANIC MATERIALS BESIDES STONE, GRAVEL, AND SANDS FOR CONSTRUCTION OF THE PATH.
 - 5.3. INSTALL OVER SMOOTH PREPARED SUBGRADE, COMPACTION 90% STANDARD PROCTOR DENSITY. ANY OVER EXCAVATION IS TO BE BACKFILLED WITH CLAY MATERIAL. GRADED AGGREGATE BASE COURSE MAY BE USED AS A LEVELING COURSE TO ACHIEVE DESIGN SLOPES AND ELEVATIONS NOTED.
 - 5.4. PLACE FLATTEST SIDE OF BOULDER FACING UP FOR STEPPING SURFACE. ADJUST DEPTH OF BOULDERS VERTICALLY AS NEEDED TO KEEP TOP SURFACE WITHIN 3" - 6" OF ADJACENT BOULDER FOR A SOMEWHAT EVEN WALKING SURFACE. IDEAL BOULDER HEIGHT TO BE 1/3 BURIED, 1/3 WITHIN CHANNEL, 1/3 ABOVE CHANNEL.
 - 5.5. ANCHOR BOULDERS WITH COBBLE AND CHINK STONES ON DOWNSTREAM AND UPSTREAM END.
6. FLOODPLAIN SHELF
 - 6.1. AREAS FOR THE STREAM TO FLOOD AND INCREASE AQUATIC HABITAT HAVE BEEN DESIGNED INTO THE PROJECT.
 - 6.2. THESE AREAS SHOULD BE TREATED WITH THE SAME INSTALLATION AS THE PRIMARY STREAM BED.
 - 6.3. THE FLOODPLAIN SHELF AND STREAMBED WILL REMAIN UNDER BASE FLOW CONDITIONS DURING NORMAL WEATHER. A SMALL BERM HAS BEEN DESIGNED BETWEEN THE TWO. SEE PLAN ELEVATIONS.
7. INSTALL PLANTINGS IN BERM PER LANDSCAPE PLAN.
8. INSTALL LOG SILL #2 IN MIDDLE OF PROJECT AREA
 - 8.1. THIS STRUCTURE IS BEING IMPLEMENTED TO ASSIST WITH GRADE CONTROL AND IN RE-DIRECTING STREAM FLOWS AWAY FROM THE EXISTING EROSION EXPOSED COMMUNICATIONS AND ELECTRIC LINE.
 - 8.2. PRIVATE UTILITIES ARE LOCATED IN THE VICINITY OF THIS WORK. THE CONTRACTOR SHALL UTILIZE THE SERVICES OF A PRIVATE UTILITY LOCATING CONSULTANT TO MARK THE LOCATION OF EXISTING UTILITIES. CONTRACTOR IS RESPONSIBLE FOR ADJUSTING CONSTRUCTION METHODS AS NEEDED TO AVOID DAMAGE TO THE KNOWN UTILITIES IN THIS AREA. DUE TO THE EXISTING EROSION FORCES

- FROM THE TIME THIS PLAN WAS WRITTEN TO WHEN IT IS IMPLEMENTED, IF THE CONTRACTOR SUGGESTS DESIGN CHANGES TO STREAM CONSTRUCTION, THE DESIGN TEAM MUST BE CONTACTED AND PLAN MARK-UPS PROVIDED TO THE CONTRACTOR. CONSTRUCTION CHANGES NOT APPROVED BY THE DESIGN TEAM WILL BE A VIOLATION OF THIS PLAN AND ANY CHANGES PERMITTED TO BRING THE CONSTRUCTION INTO COMPLIANCE WITH THE DESIGN ELEVATIONS AND REQUIREMENTS WILL BE AT THE CONTRACTOR'S COST.
- 7.3. USE SALVAGED HARDWOOD TREES FROM PROJECT AREA WHERE FEASIBLE
 - 7.4. DUE TO THE IRREGULARITY OF NATURAL MATERIALS, THE CONTRACTOR IS RESPONSIBLE FOR MEASURING AND EXCAVATING TO MEET DESIGN ELEVATION; INSTALLATION ASSUMES A MINIMUM 11" DIAMETER FOOTER LOG BURIED BELOW STREAMBED TO MEET TOP OF SILL DESIGN ELEVATION AT STREAMBED.
 - 7.5. PER DETAIL, OFFSET SILL LOG OVER FOOTER LOG TO PRODUCE UNDERWATER "FISH SHELF"; THE OFFSET SHOULD BE A MAXIMUM OF 1/4 THE SILL DBH, I.E. IF THE SILL LOG IS AN 12" DBH HARDWOOD, ONLY 3 INCHES SHOULD OVERHANG THE FOOTER LOG.
 - 7.6. FOOTER LOGS TO BE ONE LOG; SILL LOG MAY BE SMALLER. TO ACHIEVE ADEQUATE OVERHANG FOR FISH SHELF IF USING SMALLER THAN 12" DBH SILL LOGS, CONSULT DESIGN TEAM PRIOR TO INSTALLATION; INADEQUATE FISH SHELF DEPTH WILL NOT BE ACCEPTABLE.
 - 7.7. INSTALL LOG VANES PER DETAIL; THE LOWEST ELEVATION VANE WILL BE ANCHORED INTO SILL SYSTEM. SEE PLAN GRADES.
 - 7.8. VANE ANGLE IS TO DIRECT FLOWS FROM FUTURE EROSION IN THE DIRECTION OF THE EXISTING UTILITIES; ANGLES ILLUSTRATED MAY NO LONGER BE ACCURATE DUE TO CONTINUED EROSION SINCE PLAN PREPARATION; REVIEW ANGLES AT PRE-CONSTRUCTION MEETING AND CONTACT OWNER'S REPRESENTATIVE / DESIGN TEAM DURING CONSTRUCTION FOR REVIEW.
 - 7.9. ANCHOR BOULDERS ARE TO BE SECURELY SET INTO GRADE WHERE ANCHOR BOULDERS BECOME EXPOSED AT STREAM EDGE. USE COBBLE STONES TO FILL GAPS BETWEEN LOG AND BOULDERS. UPSTREAM EDGES TO BE SEALED FROM WATER SEEPAGE BEHIND THE LOG SILL STRUCTURE. AT THE UPSTREAM FACE WHERE GAPS WILL NATURALLY OCCUR IN THE FORMATION DUE TO THE IRREGULAR NATURE OF NATURAL MATERIALS, INSTALL COMPACTED BACKFILL CONSISTING OF 40% #3 STONE 40% COURSE RIVER GRAVEL AND 20% COBBLESTONES; HAND CHINK PIECES INTO GAPS AS NECESSARY AND THEN TAMP STONE INTO GAPS BETWEEN BOULDERS FOR TIGHT FIT. BACKFILL UPSTREAM EDGE OVER STONES WITH A MINIMUM OF 12" OF CLAY BORROW.
 - 7.11. INSTALL DOUBLE LAYER COIR FABRIC ON UPSTREAM FACE OF CLAY BACKFILL PER DETAIL.
 8. LOG SILL #2 POOL
 - 8.1. EXCAVATE A MINIMUM OF 8" BELOW BOTTOM OF POOL DESIGN ELEVATIONS
 - 8.2. INSTALL 8" MINIMUM DEPTH OF MIXED BED AND TRANSITION COBBLE STONE
 - 8.3. INSTALL ANCHOR BOULDER(S) AT DOWNSTREAM EDGE OF POOL; ANCHOR STONE TO BE SECURELY SET INTO GRADE WITH APPROXIMATELY 2/3 OF THE STONE HEIGHT BELOW THE STREAM BED
 - 8.4. CHINK TRANSITION COBBLE AND BED COBBLE IN GAPS BETWEEN ANCHOR STONE SO THAT A CHANNEL SPANNING WIDTH OF MIXED BOULDER COBBLE IS AT DOWNSTREAM END OF POOL.
 9. MAPLE TREE EROSION:
 - 9.1. CONSULT OWNER'S REPRESENTATIVE / DESIGN TEAM IF THE TREE IS LEANING INTO THE STREAM

- COURSE OR MORE THAN 1/3 OF THE ROOT BASE IS EXPOSED, CONSTITUTING A POTENTIAL FALL HAZARD.
- 9.2. IF THE TREE ROOT STRUCTURE IS STILL INTACT, PROCEED WITH ROCK PACK PER DETAIL.
 - 9.3. PROPOSED GRADING IS ASSUMED ON PLAN AND THE SPACE UNDER THE TREE SHOULD BE FILLED TO THE NATURAL STREAM TOE GRADE AND ALIGN WITH THE DIRECTLY ADJACENT UPSTREAM AREAS OF EXISTING CONDITIONS AND THE DIRECTLY ADJACENT DOWNSTREAM AREAS WHERE STREAM RESTORATION MODIFICATIONS HAVE BEEN IMPLEMENTED.
 - 9.4. USE COBBLE STONES WITH COURSE GRAVEL, CLAY BORROW, AND IN-SITU SOILS, TO CREATE TIGHT SEAL BETWEEN JOINTS.
 10. INSTALL LOG SILL #3 WHERE ROADSIDE SWALE MEETS STREAM COURSE
 - 10.1. USE SALVAGED HARDWOOD TREES FROM PROJECT AREA.
 - 10.2. DUE TO THE IRREGULARITY OF NATURAL MATERIALS, THE CONTRACTOR IS RESPONSIBLE FOR MEASURING AND EXCAVATING TO MEET DESIGN ELEVATION; INSTALLATION ASSUMES A MINIMUM 11" DIAMETER FOOTER LOG BURIED BELOW STREAMBED TO MEET TOP OF SILL DESIGN ELEVATION AT STREAMBED.
 - 10.3. GRADE SLOPE FROM SWALE TO POOL TO APPROXIMATE 2:1 WITH BANKS REINFORCED WITH BOULDER AND TRANSITION COBBLE.
 - 10.4. ANCHOR FOOTER LOGS AND LOG SILLS WITHIN THIS BOULDER MATRIX PER PLAN GRADES.
 - 10.5. UPON COMPLETION, THE SYSTEM WILL BE A BOULDER / COBBLE ENFORCED SLOPE WITH SILL AND FOOTER LOGS EMBEDDED INTO THE BANK AND THROUGH THE BOULDERS. THE SILL LOG PLACED AT EL. 174.00 SHALL RUN PERPENDICULAR TO THE SWALE TO FORM A TRADITIONAL SILL INSTALLATION; THE TWO LOWER SILL LOGS WILL BE UNDER BASE FLOW AT ALL TIMES AND SHALL BE EMBEDDED IN AN IRREGULAR PATTERN TO PROVIDE VARIED AQUATIC HABITAT. ANGLES OF UNDERWATER SILLS ARE APPROXIMATED ON PLAN AND ARE TO BE DETERMINED ON SITE WITH THE OWNER'S REPRESENTATIVE AND DESIGN TEAM BASED ON ACTUAL BANK CONDITIONS.
 - 10.6. PER DETAIL, OFFSET TOP SILL LOG OVER FOOTER LOG TO PRODUCE UNDERWATER "FISH SHELF"; THE OFFSET SHOULD BE A MAXIMUM OF 1/4 THE SILL DBH, I.E. IF THE SILL LOG IS AN 12" DBH HARDWOOD, ONLY 3 INCHES SHOULD OVERHANG THE FOOTER LOG.
 - 10.7. FOOTER LOG TO BE ONE LOG; SILL LOG MAY BE SMALLER. TO ACHIEVE ADEQUATE OVERHANG FOR FISH SHELF IF USING SMALLER THAN 12" DBH SILL LOGS, CONSULT DESIGN TEAM PRIOR TO INSTALLATION; INADEQUATE FISH SHELF DEPTH WILL NOT BE ACCEPTABLE.
 - 10.8. ANCHOR BOULDERS ARE TO BE SECURELY SET INTO GRADE WHERE ANCHOR BOULDERS BECOME EXPOSED AT STREAM EDGE. USE COBBLE STONES TO FILL GAPS BETWEEN LOG AND BOULDERS. UPSTREAM EDGES FOR THE TOP SILL LOG AT EL. 174.00 ARE TO BE SEALED FROM WATER SEEPAGE BEHIND THE LOG SILL STRUCTURE. AT THE UPSTREAM FACE WHERE GAPS WILL NATURALLY OCCUR IN THE FORMATION DUE TO THE IRREGULAR NATURE OF NATURAL MATERIALS, INSTALL COMPACTED BACKFILL CONSISTING OF 40% #3 STONE 40% COURSE RIVER GRAVEL AND 20% COBBLESTONES; HAND CHINK PIECES INTO GAPS AS NECESSARY AND THEN TAMP STONE INTO GAPS BETWEEN BOULDERS FOR TIGHT FIT. BACKFILL UPSTREAM EDGE OVER STONES WITH A MINIMUM OF 12" OF CLAY BORROW.
 - 10.10. INSTALL DOUBLE LAYER COIR FABRIC ON UPSTREAM FACE OF CLAY BACKFILL PER DETAIL.

11. LOG SILL #3 POOL
 - 11.1. EXCAVATE A MINIMUM OF 8" BELOW BOTTOM OF POOL DESIGN ELEVATIONS
 - 11.2. INSTALL 8" MINIMUM DEPTH OF MIXED BED AND TRANSITION COBBLE STONE.
12. BANK STABILIZATION:
 - 12.1. ALL AREAS OF GRADING WITHIN THE WORK AREA HAVING A SLOPE GREATER THAN OR EQUAL TO 5:1 AND ALL AREAS BELOW THE TOP OF STREAM BANK WITH THE EXCEPTION OF THE STREAM BED (BOTTOM) THAT ARE NOT OTHERWISE COVERED BY A ROCK BASED TREATMENT SHALL GET EROSION CONTROL MATTING.
 - 12.2. EROSION CONTROL MATTING INSTALLATION IS TO BE PER THE DETAILS IN THE APPROVED PLAN. MATTING IS TO BE INSTALLED ON A SMOOTH AND EVEN SURFACE AND KEVED IN BEHIND RESTORATION STRUCTURES WHERE IT MEETS THEM AND IN AN ANCHOR TRENCH AT THE TOP OF BANK.
 - 12.3. AREAS WHERE PLANTINGS ARE MADE THROUGH THE MATTING ARE TO BE CAREFULLY CLOSED AROUND THE PLANT AND SECURED WITH SOD STAPLES ON EACH SIDE OF THE PLANT.
13. RIP RAP TOE
 - 13.1. INSTALL RIP RAP TOE PROTECTION AT THE LOCATIONS SHOWN ON THE PLAN AND PER THE PLAN DETAIL.
 - 13.2. EXTEND PROTECTION TO THE FACE OF A LOG SILL VANE, ROOT WAD, OR OTHER STRUCTURE WHERE IT IS SHOWN TO MEET THEM ON THE PLAN. HAND PLACE ROCKS MEETING ADJACENT TREATMENT TO FORM A MINIMAL GAP. USE LARGEST STONE SIZE AT JUNCTION AND CHINK WITH SMALLER STONES.
14. STREAM BED RESTORATION:
 - 14.1. IN AREAS OF RESTORATION TREATMENTS THE DISTURBED STREAMBED WILL BE RESTORED USING A NATURAL COBBLE BOULDER MATRIX AS NOTED IN THE DETAILS FOR VARIED BOULDER COBBLE ROCK SEQUENCE.
 - 14.2. COBBLE WILL BE SET IN THE STREAM BED AS NOTED WITH THE SIZE VARYING AS THE STONES APPROACH AND REcede FROM THE PROPOSED RESTORATION TREATMENT, I.E. SILL, VANE, POOL, ETC.
 - 14.3. EXCAVATE A MINIMUM OF 8" AND INSTALL STONE PER DETAIL.
 15. IMBRICATE ROCK SEAT WALL
 - 15.1. UPON COMPLETION OF RESTORATION WORK, INSTALL STONE SEAT WALL PER DETAIL.



- CIVIL ENGINEERING
 - LANDSCAPE ARCHITECTURE
 - ECOLOGICAL RESTORATION

FORESITE ASSOCIATES INC.
 2401 PHILADELPHIA PIKE
 CLAYMONT, DE 19703
 PHONE: 302.351.3421
 INFO@FORESITEASSOCIATES.COM

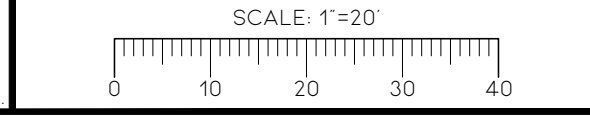
**INDEPENDENCE SCHOOL
 STREAM RESTORATION PLAN**
NEW CASTLE CONSERVATION DISTRICT
 2430 OLD COUNTRY ROAD, NEWARK, DE 19702

#	COMMENT	BY	DATE
6	REVISION TO DETAIL 5 SHEET 13 & SPOT ELEVATION UPDATES SHEET 9	DDG	05.30.23
5	PER COMMENTS-NPS&USACE	DDG	05.06.23
4	ISSUED FOR PERMITTING	DDG	04.04.23
3	PER NPS COMMENTS	DDG	03.16.23
2	ISSUED FOR PERMITTING	DDG	11.02.21
1	ISSUED FOR CLIENT REVIEW	DDG	11.23.20

CONSTRUCTION PLAN

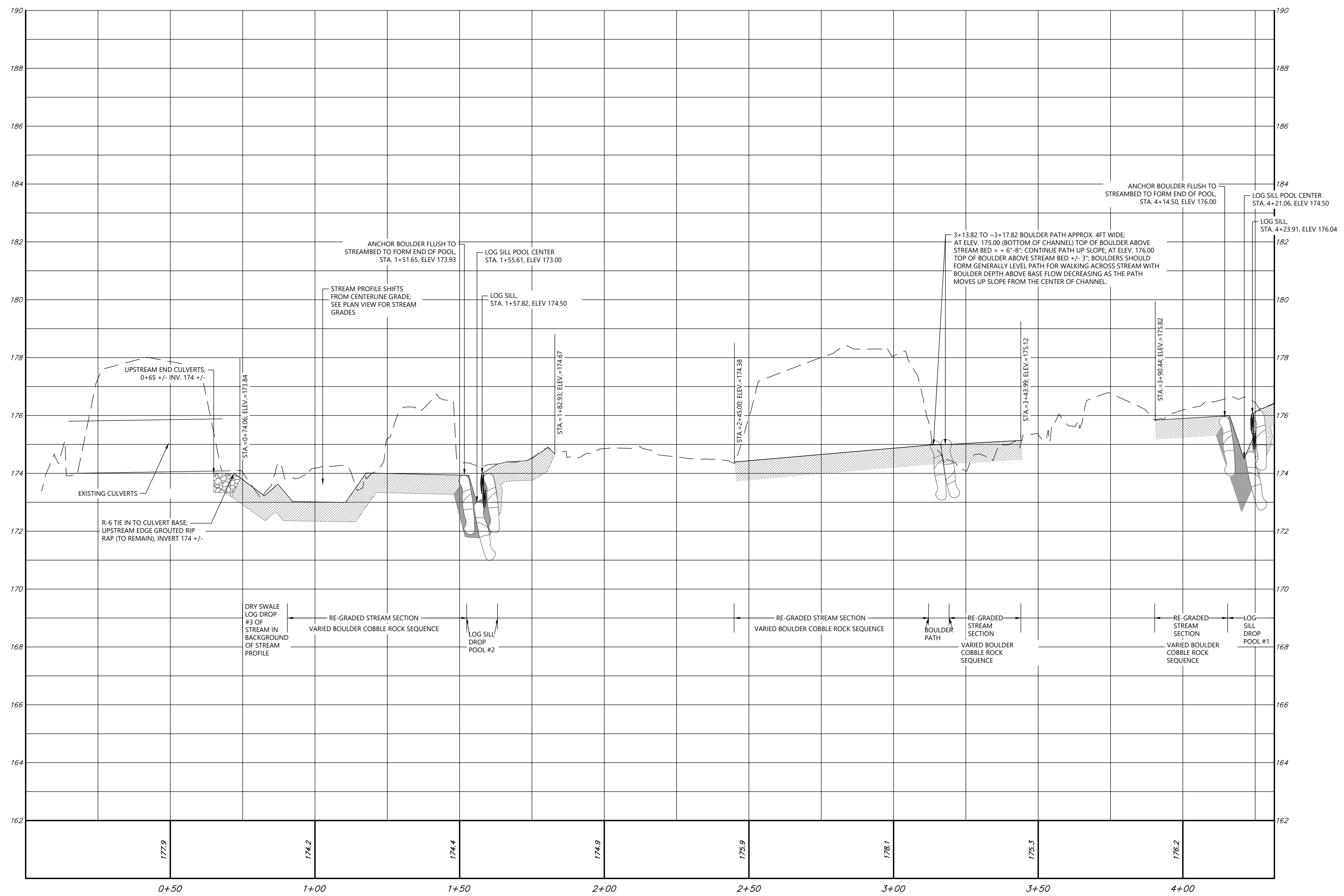
**INDEPENDENCE SCHOOL
 STREAM RESTORATION**

MILL CREEK HUNDRED NEW CASTLE COUNTY	NEWARK DELAWARE
DATE: 06.26.20	PROJECT #: 07101
SURVEYED BY: N/A	SHEET: 9
CREATED BY: DDG	9 OF 15
DRAWN BY: DDG	
CHECKED BY: ACH	



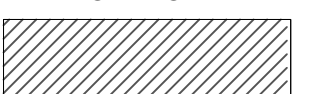


**INDEPENDENCE SCHOOL
STREAM RESTORATION PLAN**

NEW CASTLE CONSERVATION DISTRICT
2430 OLD COUNTRY ROAD, NEWARK, DE 19702



PROFILE VIEW: CL STREAM
HORZ. SCALE: 1"=20'
VERT. SCALE: 1"= 2'

 RIP RAP FOR CULVERT TIE IN
 POOL ENERGY DISSIPATION SYSTEM DOWNSTREAM OF SILL STRUCTURES; SEE DETAIL SHEETS
 STREAM BED MATERIAL; SEE DETAIL SHEETS

#	COMMENT	BY	DATE
6	REVISION TO DETAIL 5 SHEET 13 & SPOT ELEVATION UPDATES SHEET 9	DDS	05/30/23
5	PER COMMENTS-NPS&USACE	DDS	05/06/23
4	ISSUED FOR PERMITTING	DDS	04/04/23
3	PER NPS COMMENTS	DDS	03/16/23
2	ISSUED FOR PERMITTING	DDS	11/02/21
1	ISSUED FOR CLIENT REVIEW	DDS	11/23/20

 FORESITE ASSOCIATES
 SEAL

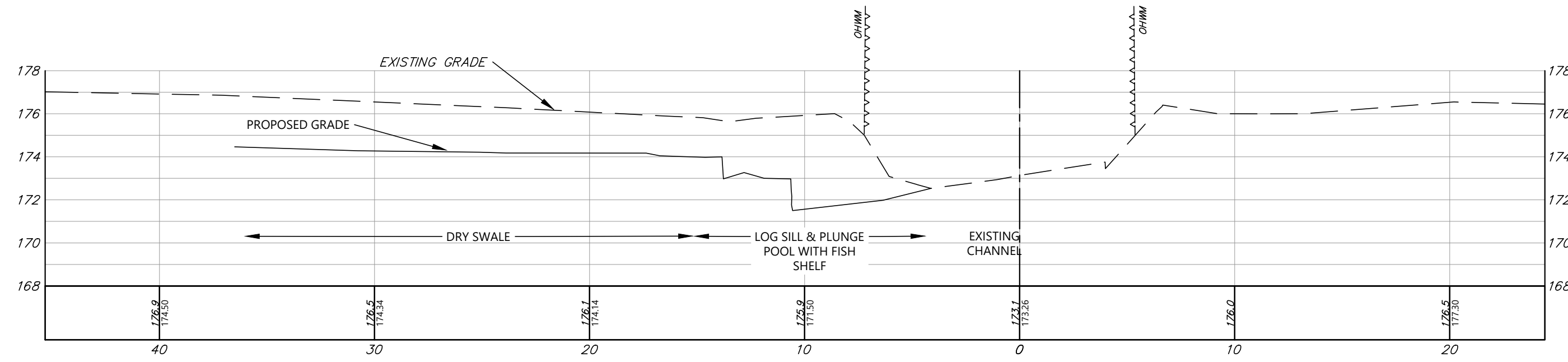
STREAM PROFILE

INDEPENDENCE SCHOOL
STREAM RESTORATION

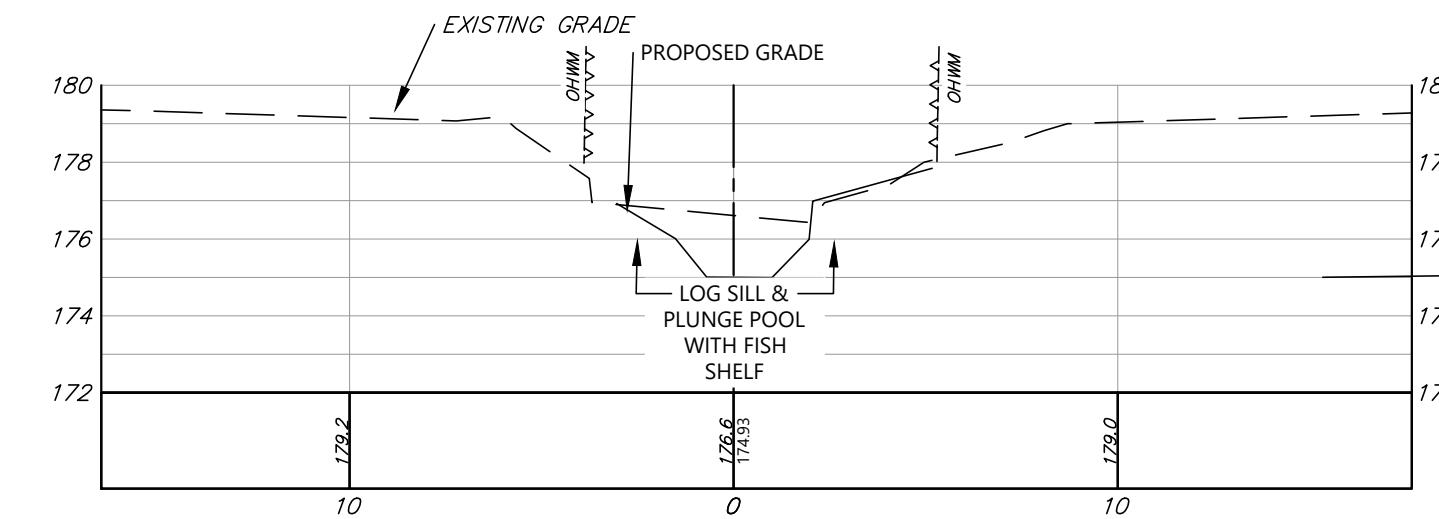
MILL CREEK HUNDRED NEW CASTLE COUNTY		NEWARK DELAWARE	
DATE: 06.26.20	PROJECT #: 07101	SHEET: 10	
SURVEYED BY: N/A	10 OF 15		
CREATED BY: DDS	SCALE: AS NOTED		
DRAWN BY: DDS			
CHECKED BY: ACH			

**INDEPENDENCE SCHOOL
STREAM RESTORATION PLAN**

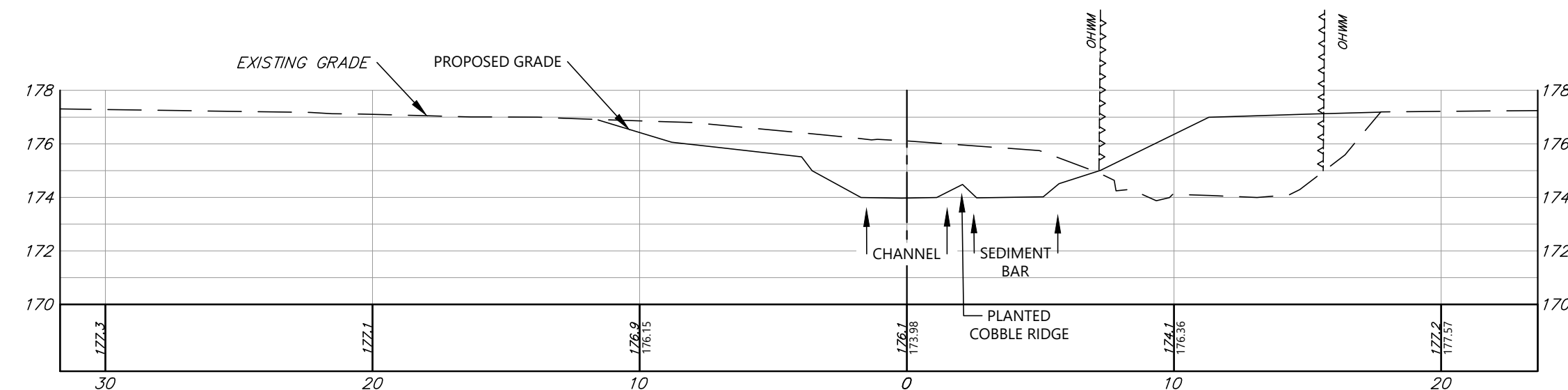
NEW CASTLE CONSERVATION DISTRICT
 2430 OLD COUNTRY ROAD, NEWARK, DE 19702



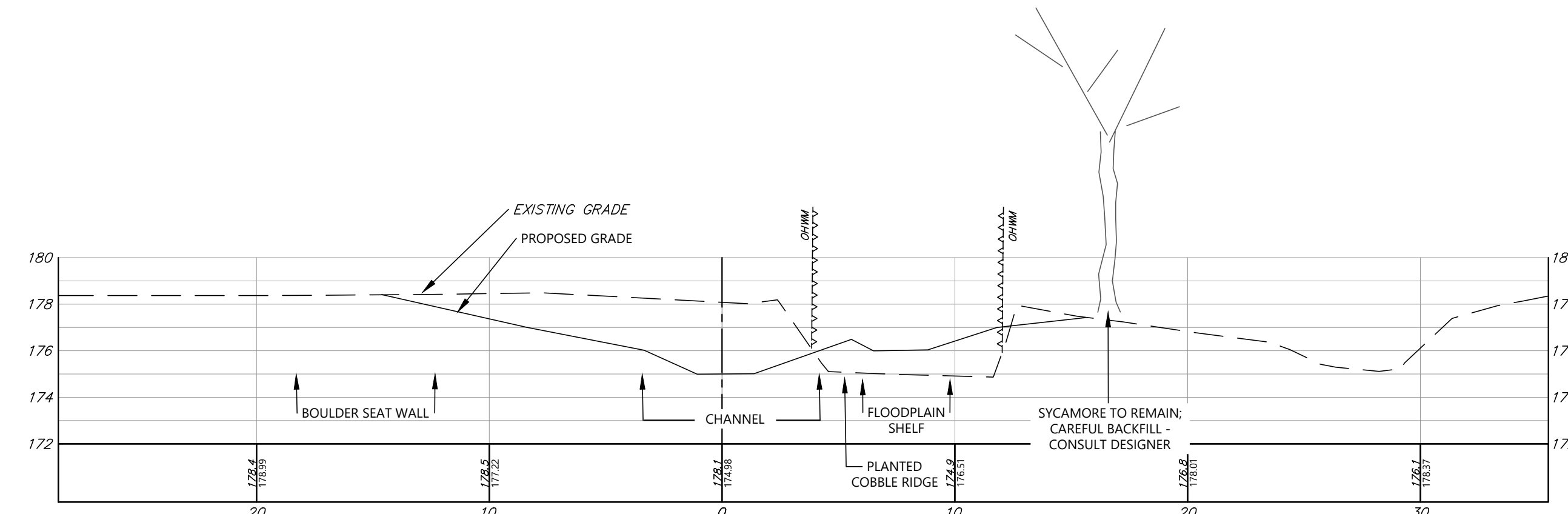
SECTION VIEW 1: CL STREAM
STA. 0+82
HORZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 20'



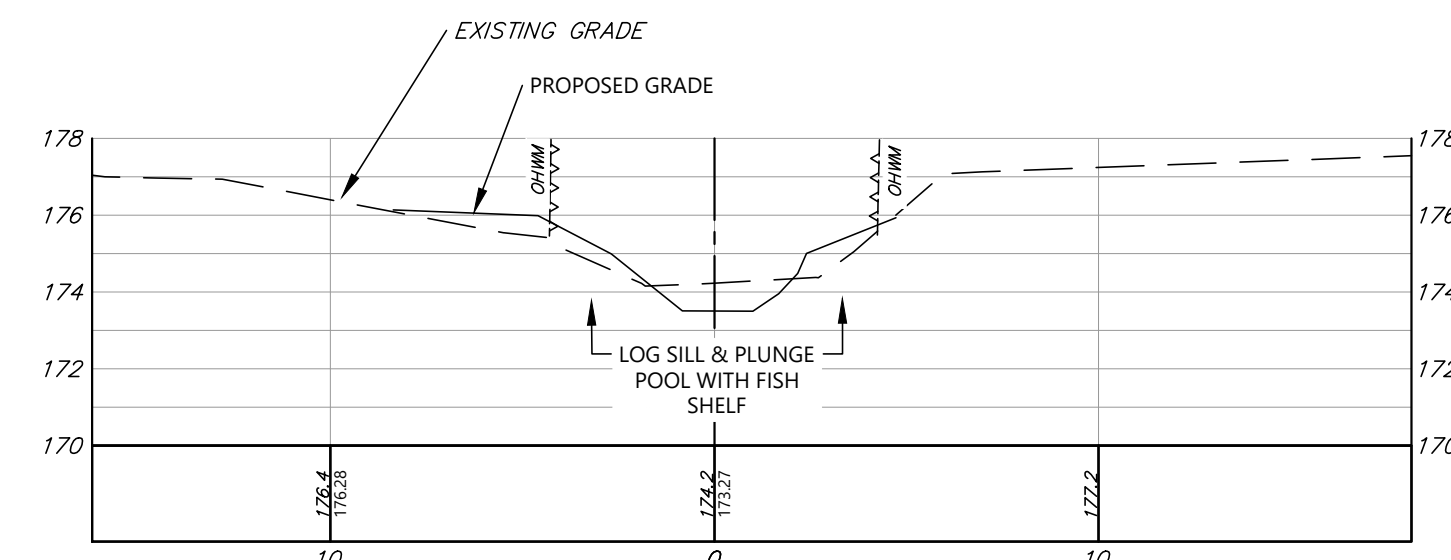
SECTION VIEW 5: CL STREAM
STA. 4+22
HORZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 20'



SECTION VIEW 2: CL STREAM
STA. 1+29
HORZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 20'



SECTION VIEW 4: CL STREAM
STA. 3+00
HORZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 20'



SECTION VIEW 3: CL STREAM
STA. 1+57
HORZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 20'

#	COMMENT	BY	DATE
6	REVISION TO DETAIL 5 SHEET 13 & SPOT ELEVATION UPDATES SHEET 9	DDS	05.30.23
5	PER COMMENTS-NPS&USACE	DDS	05.06.23
4	ISSUED FOR PERMITTING	DDS	04.04.23
3	PER NPS COMMENTS	DDS	03.16.23
2	ISSUED FOR PERMITTING	DDS	11.02.21
1	ISSUED FOR CLIENT REVIEW	DDS	11.23.20



STREAM CROSSING SECTIONS

**INDEPENDENCE SCHOOL
STREAM RESTORATION**

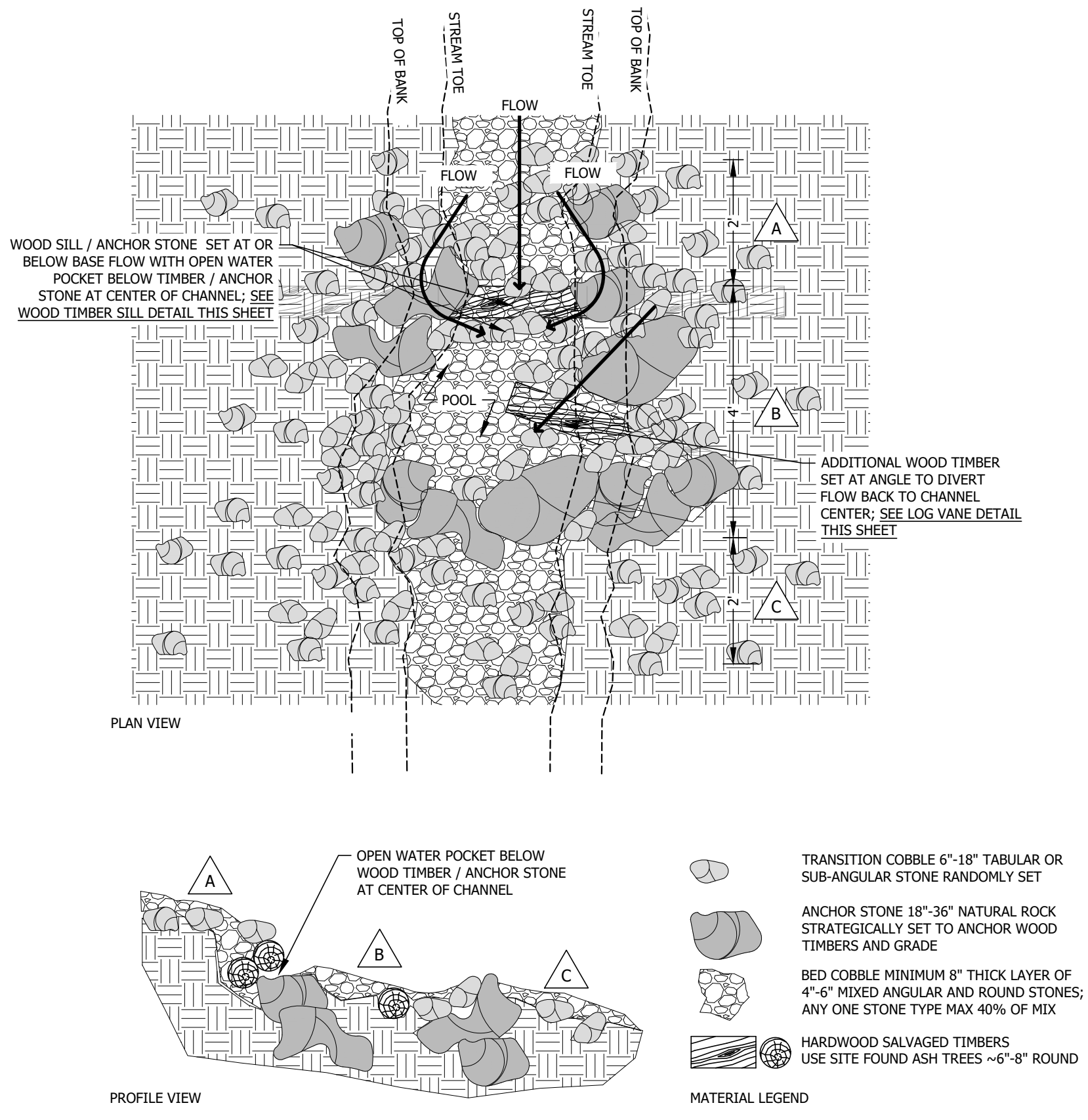
MILL CREEK HUNDRED NEW CASTLE COUNTY NEWARK DELAWARE

DATE: 06.26.20	PROJECT #: 07101
SURVEYED BY: N/A	SHEET: 11
CREATED BY: DDS	11 OF 15
DRAWN BY: DDS	
CHECKED BY: ACH	

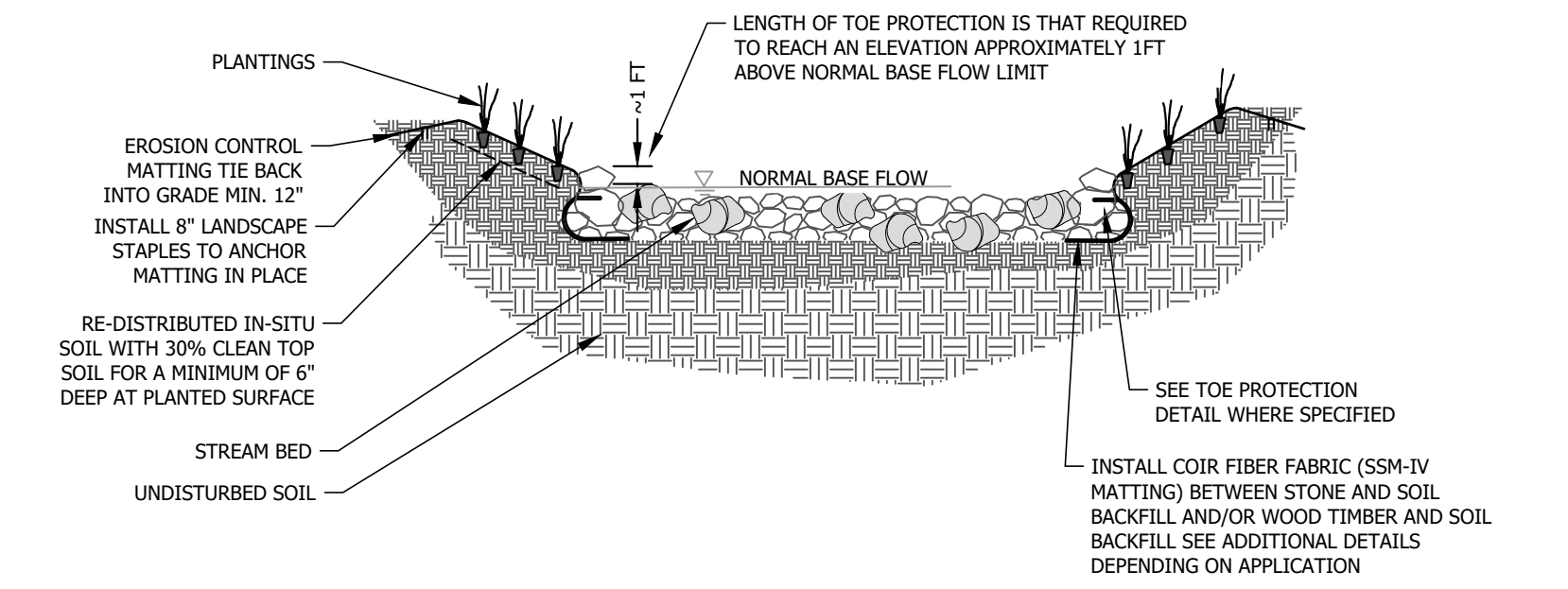
SCALE:
AS NOTED

INDEPENDENCE SCHOOL
STREAM RESTORATION PLAN

NEW CASTLE CONSERVATION DISTRICT
2430 OLD COUNTRY ROAD, NEWARK, DE 19702

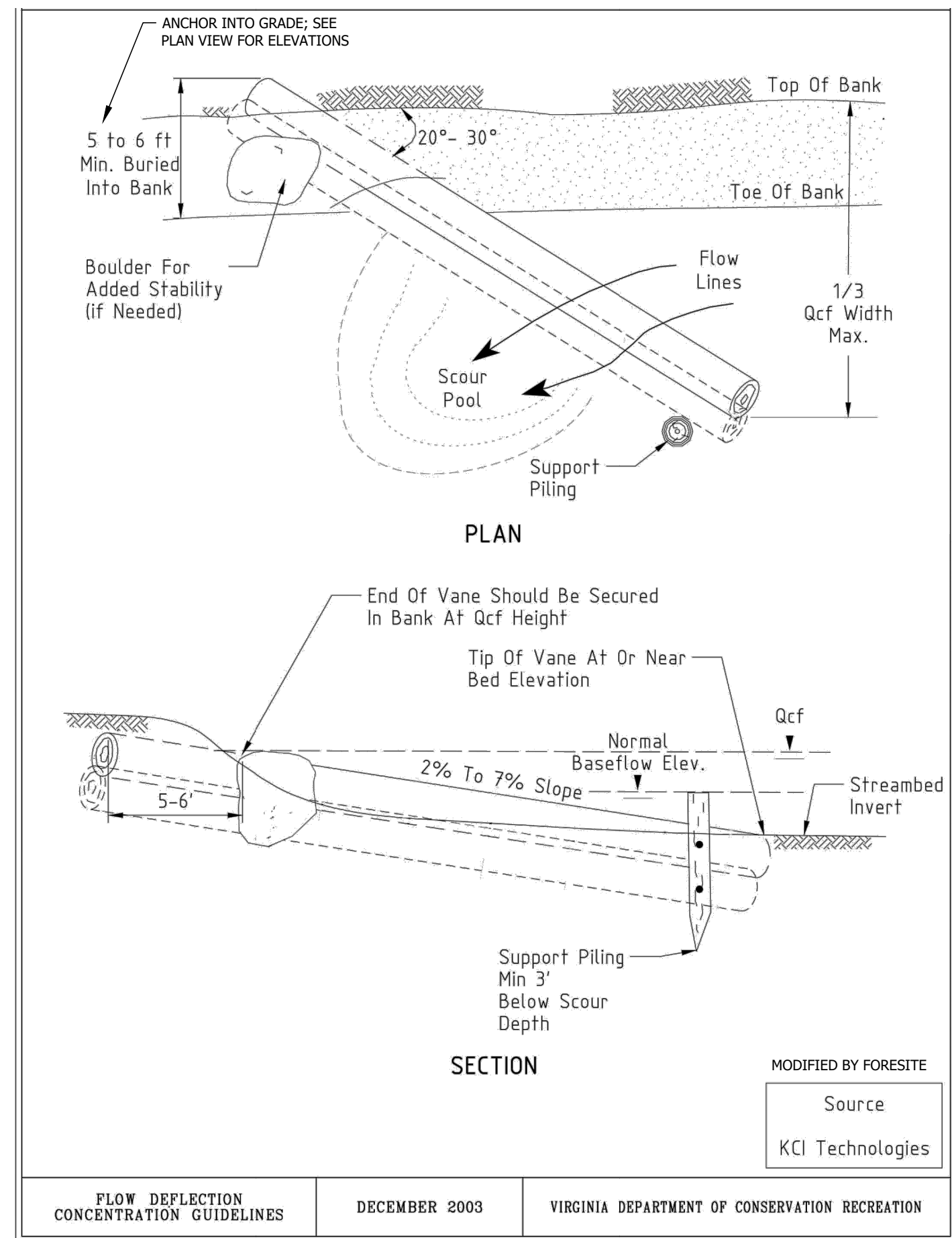


- WOOD SILL / ANCHOR STONE SET AT OR BELOW BASE FLOW WITH OPEN WATER POCKET BELOW TIMBER / ANCHOR STONE AT CENTER OF CHANNEL. SEE WOOD TIMBER SILL DETAIL THIS SHEET.**
- ADDITIONAL WOOD TIMBER SET AT ANGLE TO DIVERT FLOW BACK TO CHANNEL CENTER. SEE LOG VANE DETAIL THIS SHEET.**
- OPEN WATER POCKET BELOW WOOD TIMBER / ANCHOR STONE AT CENTER OF CHANNEL.**
- MATERIAL LEGEND:**
- TRANSITION COBBLE 6"-18" TABULAR OR SUB-ANGULAR STONE RANDOMLY SET
 - ANCHOR STONE 18"-36" NATURAL ROCK STRATEGICALLY SET TO ANCHOR WOOD TIMBERS AND GRADE
 - BED COBBLE MINIMUM 8" THICK LAYER OF 4"-6" MIXED ANGULAR AND ROUND STONES; ANY ONE STONE TYPE MAX 40% OF MIX
 - HARDWOOD SALVAGED TIMBERS USE SITE FOUND ASH TREES ~6"-8" ROUND
- VARIED BOULDER COBBLE ROCK SEQUENCE NOTES:**
- ROCK SEQUENCE STRUCTURES ARE DESIGNED FOR GRADE CONTROL WITH AN AVERAGE SLOPE OF 4:1 WITHIN CHANNEL. WOOD TIMBERS FOR SILL DROP STRUCTURES ARE INTEGRATED WITHIN SOME ROCK SEQUENCES. SEE PLAN AND WOOD SILL NOTES FOR REFERENCE AS APPLICABLE.
 - EXCAVATION AND COBBLE AND/OR TIMBER SETTING TO MEET DESIGN ELEVATIONS ARE THE RESPONSIBILITY OF THE CONTRACTOR. IT IS STRONGLY RECOMMENDED THE CONTRACTOR MEASURE AND SURVEY THE SEQUENCE AND TIMBER SILL AS APPLICABLE AT EVERY STAGE OF CONSTRUCTION TO ENSURE FINAL GRADES ARE MET. IF FINAL GRADES ARE NOT WITHIN 0.2' OF THE DESIGN ELEVATION, IT WILL BE AT THE CONTRACTOR'S COST TO RE-SET AND RE-STABILIZE AT THE DIRECTION OF THE DESIGN TEAM.
 - EXCAVATE A MINIMUM OF 14" BELOW DESIGN ELEVATIONS TO SET MATERIALS.
 - FOR SIDE SLOPES GREATER THAN 2:1 ANCHOR WITH MIXED 12-24" ANGULAR AND ROUND STONE AND TAMP COMPACT TO CHINK STONES IN PLACE.
 - SEE LEGEND DESCRIPTIONS FOR STONE SIZING AND SHAPE; NO RED, WHITE, LIMESTONE, SHALESTONE, OR SANDSTONE TO BE USED. MATERIALS LIST TO BE APPROVED IN WRITING BY OWNER / OWNER REPRESENTATIVE.
 - ONCE STONE IS INSTALLED TO DESIGN ELEVATIONS BEGIN CHANNEL SETTING. TO SET THE STONE IN PLACE (WORKING IN 3 INCH LIFTS IF APPLICABLE) WASH IN EXISTING CHANNEL MATERIALS WITH SAND AT A 1:1 RATIO. CONTINUE WASHING IN SUBSTRATE TO FILL POUR SPACE UNTIL THERE IS NO MATERIAL SETTLING. WHEN THE CONSTRUCTION IS OPENED UP TO NATURAL STREAM FLOW, THE FLOW SHOULD BE ON THE SURFACE OF THE NEW STREAM BED MATERIAL. IF SUBSTANTIAL SUBSURFACE FLOW OCCURS AND/OR STONE MIGRATES IMMEDIATELY AFTER CONSTRUCTION, CONSULT DESIGN ENGINEER.
 - INSTALL EROSION CONTROL MATTING ANCHORED BACK INTO GRADE AT BOTH THE TOP AND BOTTOM OF BANK SLOPE PER E&S DETAILS. IN LOCATIONS OF ROCK TOE INSTALLATIONS OVERLAP, INTERLOCK AND STAPLE COIR MATTING AND LANDSCAPE FABRIC.
 - INSTALL PLANTS PER LANDSCAPE PLAN



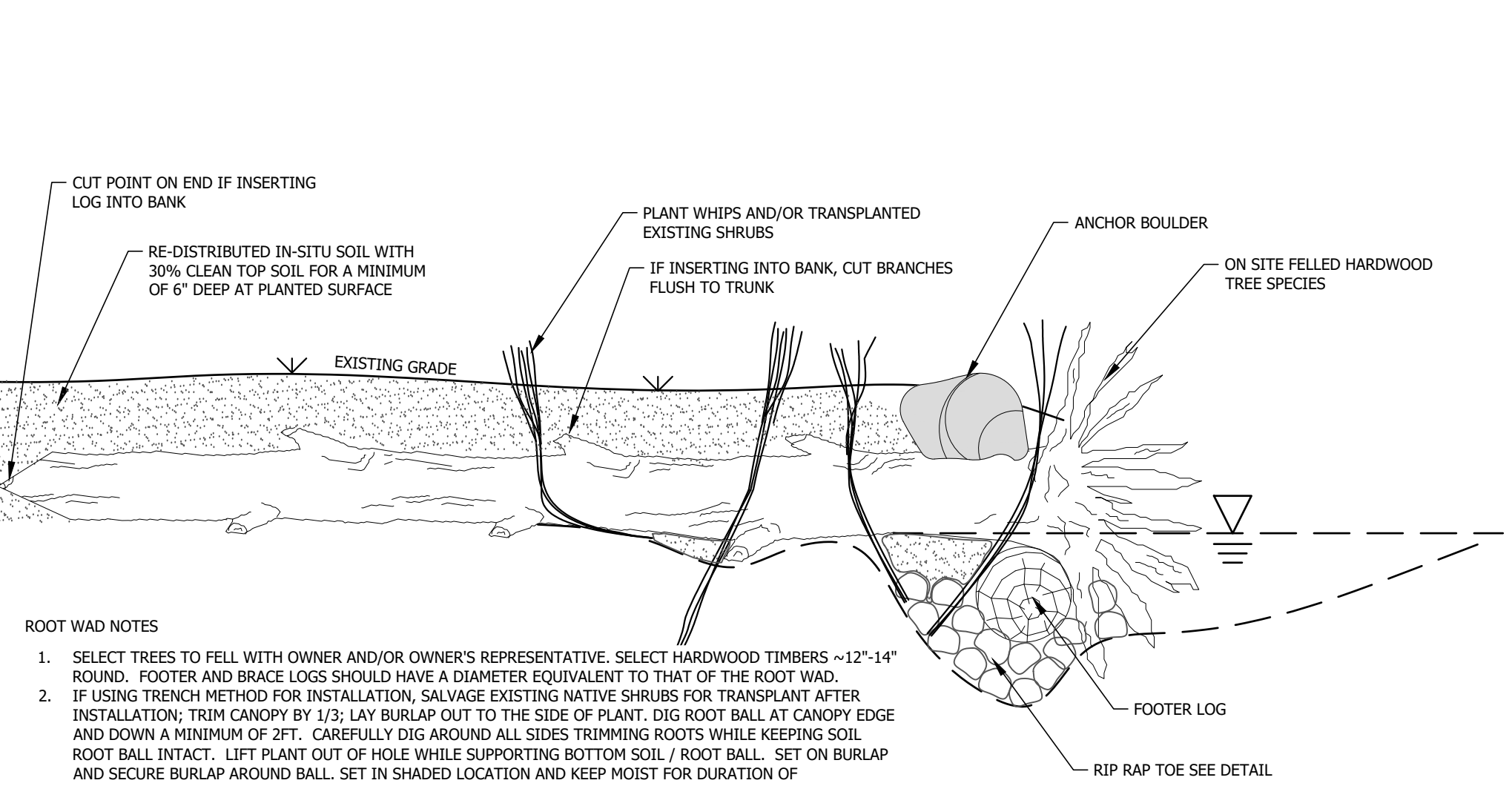
- VARIED BOULDER COBBLE ROCK SEQUENCE NOTES:**
- ROCK SEQUENCE STRUCTURES ARE DESIGNED FOR GRADE CONTROL WITH AN AVERAGE SLOPE OF 4:1 WITHIN CHANNEL. WOOD TIMBERS FOR SILL DROP STRUCTURES ARE INTEGRATED WITHIN SOME ROCK SEQUENCES. SEE PLAN AND WOOD SILL NOTES FOR REFERENCE AS APPLICABLE.
 - EXCAVATION AND COBBLE AND/OR TIMBER SETTING TO MEET DESIGN ELEVATIONS ARE THE RESPONSIBILITY OF THE CONTRACTOR. IT IS STRONGLY RECOMMENDED THE CONTRACTOR MEASURE AND SURVEY THE SEQUENCE AND TIMBER SILL AS APPLICABLE AT EVERY STAGE OF CONSTRUCTION TO ENSURE FINAL GRADES ARE MET. IF FINAL GRADES ARE NOT WITHIN 0.2' OF THE DESIGN ELEVATION, IT WILL BE AT THE CONTRACTOR'S COST TO RE-SET AND RE-STABILIZE AT THE DIRECTION OF THE DESIGN TEAM.
 - EXCAVATE A MINIMUM OF 14" BELOW DESIGN ELEVATIONS TO SET MATERIALS.
 - FOR SIDE SLOPES GREATER THAN 2:1 ANCHOR WITH MIXED 12-24" ANGULAR AND ROUND STONE AND TAMP COMPACT TO CHINK STONES IN PLACE.
 - SEE LEGEND DESCRIPTIONS FOR STONE SIZING AND SHAPE; NO RED, WHITE, LIMESTONE, SHALESTONE, OR SANDSTONE TO BE USED. MATERIALS LIST TO BE APPROVED IN WRITING BY OWNER / OWNER REPRESENTATIVE.
 - ONCE STONE IS INSTALLED TO DESIGN ELEVATIONS BEGIN CHANNEL SETTING. TO SET THE STONE IN PLACE (WORKING IN 3 INCH LIFTS IF APPLICABLE) WASH IN EXISTING CHANNEL MATERIALS WITH SAND AT A 1:1 RATIO. CONTINUE WASHING IN SUBSTRATE TO FILL POUR SPACE UNTIL THERE IS NO MATERIAL SETTLING. WHEN THE CONSTRUCTION IS OPENED UP TO NATURAL STREAM FLOW, THE FLOW SHOULD BE ON THE SURFACE OF THE NEW STREAM BED MATERIAL. IF SUBSTANTIAL SUBSURFACE FLOW OCCURS AND/OR STONE MIGRATES IMMEDIATELY AFTER CONSTRUCTION, CONSULT DESIGN ENGINEER.
 - INSTALL EROSION CONTROL MATTING ANCHORED BACK INTO GRADE AT BOTH THE TOP AND BOTTOM OF BANK SLOPE PER E&S DETAILS. IN LOCATIONS OF ROCK TOE INSTALLATIONS OVERLAP, INTERLOCK AND STAPLE COIR MATTING AND LANDSCAPE FABRIC.
 - INSTALL PLANTS PER LANDSCAPE PLAN

1 **12** VARIED BOULDER COBBLE ROCK SEQUENCE TYPICAL PLAN & SECTION N.T.S.



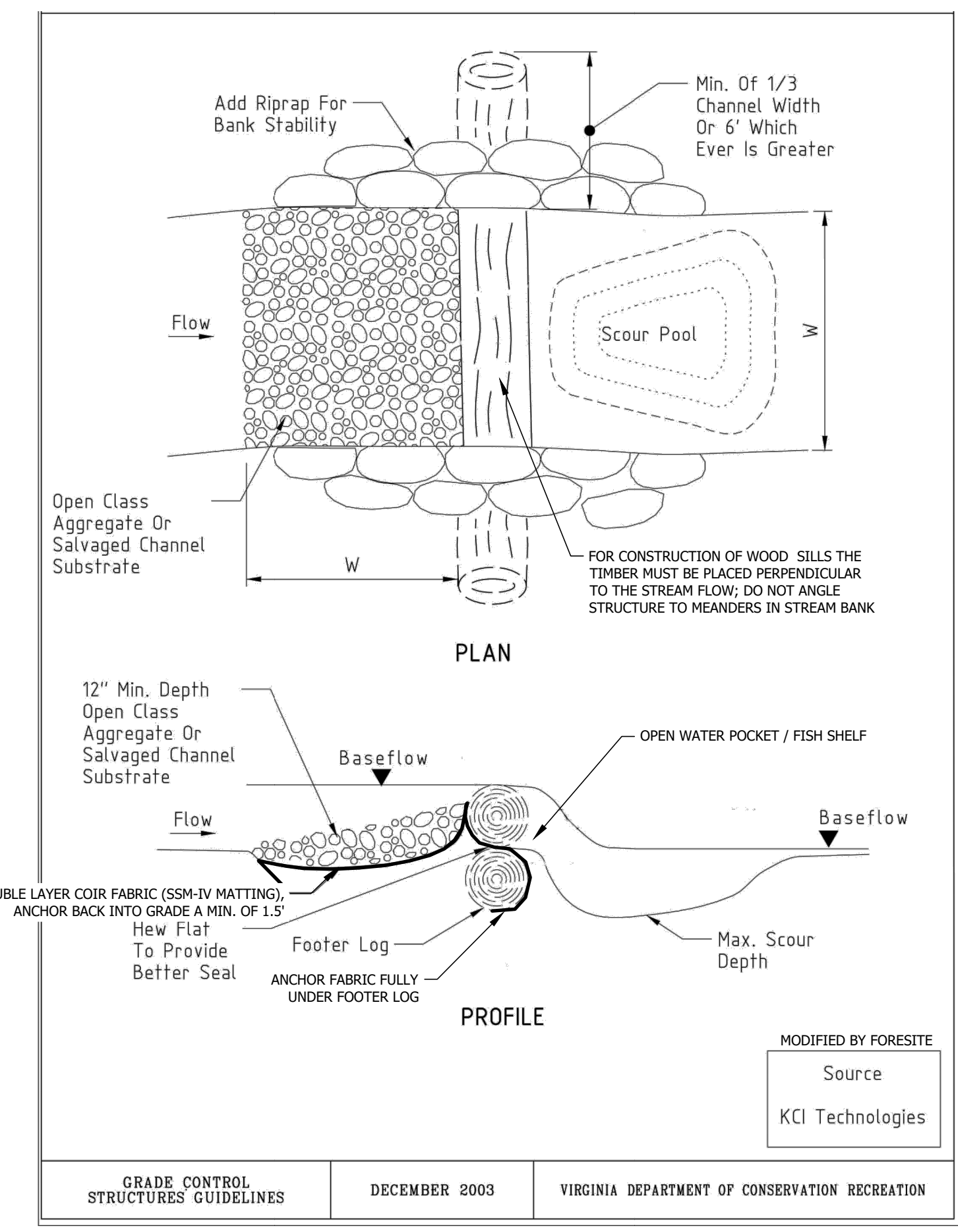
- LOG VANE NOTES:**
- SELECT TREES TO FELL WITH OWNER AND/OR OWNER'S REPRESENTATIVE. SELECT HARDWOOD TIMBERS ~8"-14" ROUND.
 - ANGLE VANES 20 TO 30 DEGREES FROM THE UPSTREAM BANK. THE BANK-END OF THE VANE SHOULD BE AT THE BANKFULL ELEVATION AND THE TIP OF THE VANE SHOULD BE PARTIALLY EMBEDDED IN THE STREAMBED SUCH THAT IT IS SUBMERGED EVEN DURING LOW FLOWS. THE VANE SHOULD BE PLACED AT A VERTICAL ANGLE OF 3% TO 7%.
 - EXTEND VANES A MAXIMUM OF 1/3 OF THE CHANNEL WIDTH.
 - WHEN INSTALLING VANES, THE BANK END OF THE STRUCTURE SHOULD BE FIRMLY ANCHORED A MINIMUM OF 5 TO 6 FEET INTO THE SLOPE.
 - POSITION ANCHOR BOULDERS ON THE DOWNSTREAM FACE OF THE VANES TO PROVIDE FURTHER STABILITY.
 - NO WIRES, REBAR, OR OTHER NON ORGANIC MATERIAL TO BE USED TO SECURE LOGS. UTILIZE COIR FABRIC, TAMPED COBBLE AND SAND MIXTURE, AND ANCHOR BOULDERS TO SECURE VANES IN PLACE.

2 **12** LOG VANE TYPICAL SECTION N.T.S.

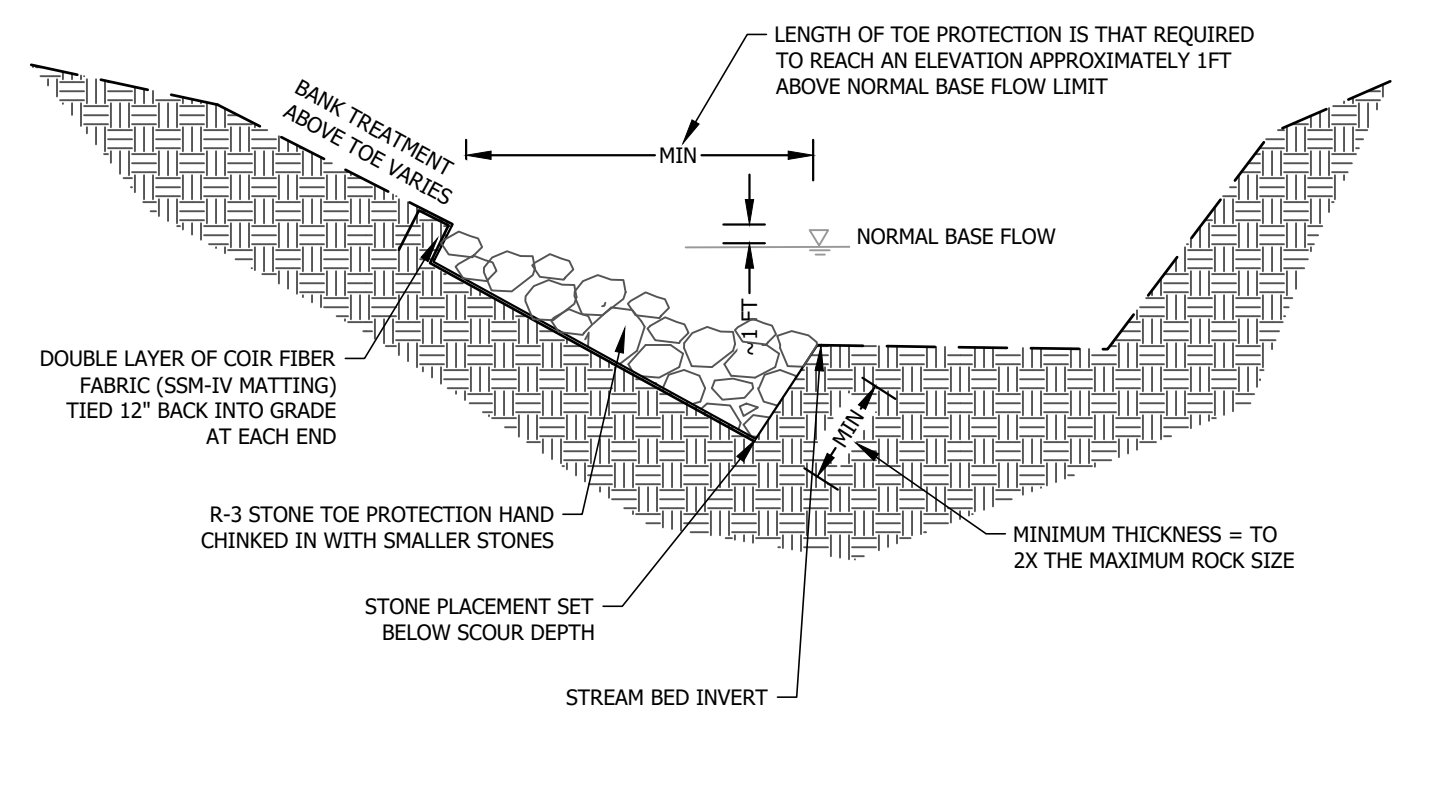


- ROOT WAD NOTES:**
- SELECT TREES TO FELL WITH OWNER AND/OR OWNER'S REPRESENTATIVE. SELECT HARDWOOD TIMBERS ~12"-14" ROUND. FOOTER AND BRACE LOGS SHOULD HAVE A DIAMETER EQUIVALENT TO THAT OF THE ROOT WAD.
 - IF USING TRENCH METHOD FOR INSTALLATION, SALVAGE EXISTING NATIVE SHRUBS FOR TRANSPLANT AFTER INSTALLATION. TRIM CANOPY BY 1/3; LAY BURLAP OUT TO THE SIDE OF PLANT. DIG ROOT BALL AT CANOPY EDGE AND DOWN A MINIMUM OF 2FT. CAREFULLY DIG AROUND ALL SIDES TRIMMING ROOTS WHILE KEEPING SOIL ROOT BALL INTACT. LIFT PLANT OUT OF HOLE WHILE SUPPORTING BOTTOM SOIL / ROOT BALL. SET ON BURLAP AND SECURE BURLAP AROUND BALL. SET IN SHADED LOCATION AND KEEP MOIST FOR DURATION OF CONSTRUCTION.
 - INSTALL RIP RAP TOE PER DETAIL.
 - INSTALL FOOTER LOG RUN PARALLEL TO BANK. INCORPORATE / PACK ROCK TOE TO SECURE FOOTER LOG. FOOTER LOG SHOULD BE TRIMMED OF ALL SIDE BRANCHES PRIOR TO SETTING.
 - FOOTER LOGS SHOULD BE POSITIONED IN THE TRENCH BELOW THE STREAM INVERT SUCH THAT EACH UPSTREAM LOG IS SHINGLED OVER ITS DOWNSTREAM NEIGHBOR.
 - POSITION ROOT WADS IN TRENCHES SUCH THAT THE ROOT MASS OF THE TRUNK SITS LEVEL WITH THE CUT END OF THE STUMP. THE ROOT MASS SHOULD BE ORIENTED PERPENDICULARLY TO THE DIRECTION OF FLOW. AN ANGLE OF 30 TO 60 DEGREES TO THE CHANNEL CENTER LINE IS USUALLY ADEQUATE. SUBSEQUENT ROOT WADS SHOULD BE SPACED SUCH THAT THE BANK IS SHIELDED FROM FLOWS DEFLECTED BY ADJACENT UPSTREAM ROOT WADS. NOTE AS AN ALTERNATIVE TO TRENCHING, WADS CAN BE INSERTED INTO BANK WITH APPROPRIATE MACHINERY; CONSULT DESIGN TEAM FOR ANGLE PRIOR TO INSERTING, IF THIS IS THE PREFERRED CONTRACTOR METHOD.
 - EXCAVATE GRADE AS NEEDED TO SET TREES WITH TRUNK RESTING ON FOOTER LOG AND ROOT WAD EXTENDING TO STREAM BED.
 - PACK ROCK TOE IN GAPS BETWEEN WAD AND FOOTER LOG FOR SECURE SET UNDER BASE FLOW.
 - BACKFILL BANK; ONLY ROOT WAD SHOULD BE VISIBLE. TREE TRUNK SHOULD NOT BE VISIBLE.
 - RE-INSTALL TRANSPLANTED SHRUBS AND INCORPORATE LIVE STAKES / TREE WHIPS PER PLANTING PLAN.

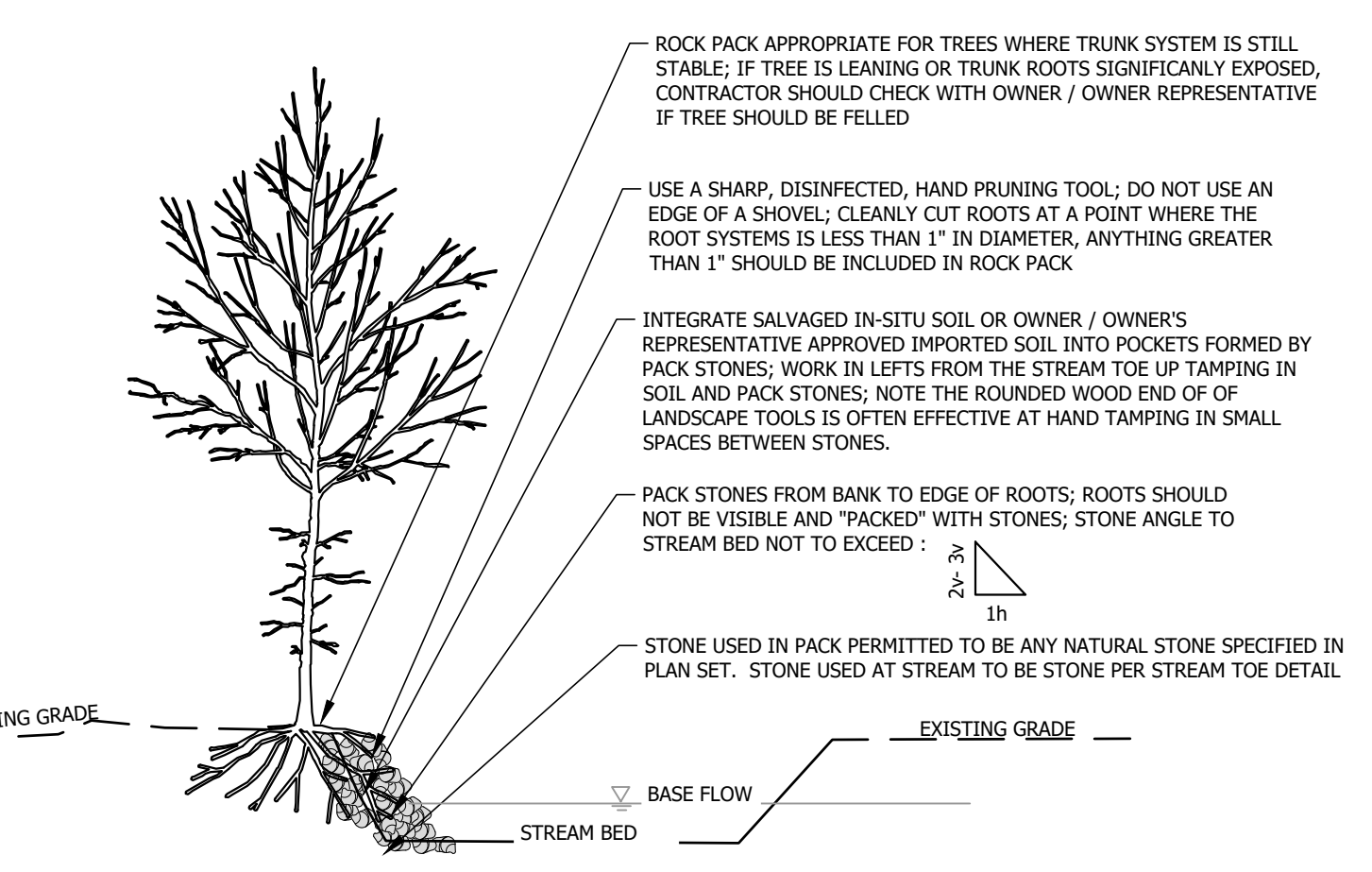
3 **12** ROOT WAD TYPICAL SECTION N.T.S.



4 **12** WOOD TIMBER SILL TYPICAL SECTION AND PLAN N.T.S.



5 **12** RIP RAP TOE TYPICAL SECTION N.T.S.



6 **12** ROCK PACK TYPICAL SECTION N.T.S.

#	REVISION	DATE
6	REVISION TO DETAIL 5 SHEET 13 & SPOT ELEVATION UPDATES SHEET 9	05/05/2023
5	PER COMMENTS-NPS&USACE	05/05/2023
4	ISSUED FOR PERMITTING	04/04/23
3	PER NPS COMMENTS	07/14/23
2	ISSUED FOR PERMITTING	05/11/2021
1	ISSUED FOR CLIENT REVIEW	11/23/20
#	COMMENT	BY DATE

FORESITE ASSOCIATES

REGISTERED PROFESSIONAL ENGINEER
REGISTERED PROFESSIONAL LANDSCAPE ARCHITECT

DATE: 2 June 2023

SEAL

CONSTRUCTION DETAILS

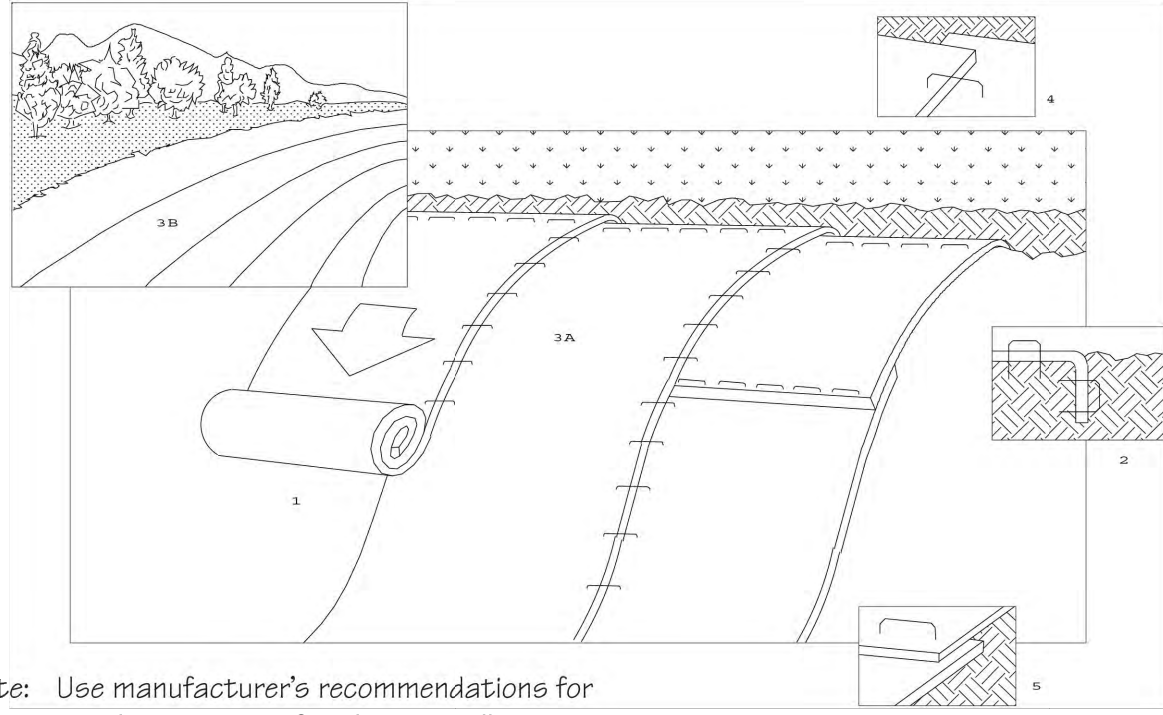
INDEPENDENCE SCHOOL
STREAM RESTORATION

MILL CREEK HUNDRED NEW CASTLE COUNTY NEWARK DELAWARE

DATE: 06.26.20	PROJECT #: 07101
SURVEYED BY: N/A	SHEET: 12 OF 15
CREATED BY: DJS	
DRAWN BY: AZ	
CHECKED BY: ACH	

Standard Detail & Specifications
Stabilization Matting - Slope

TO BE USED IN ANY RE-GRADED AREAS NOT SUBJECT TO CONCENTRATED FLOW, I.E. CHANNEL OR SWALE



Note: Use manufacturer's recommendations for stapling patterns for slope installations.

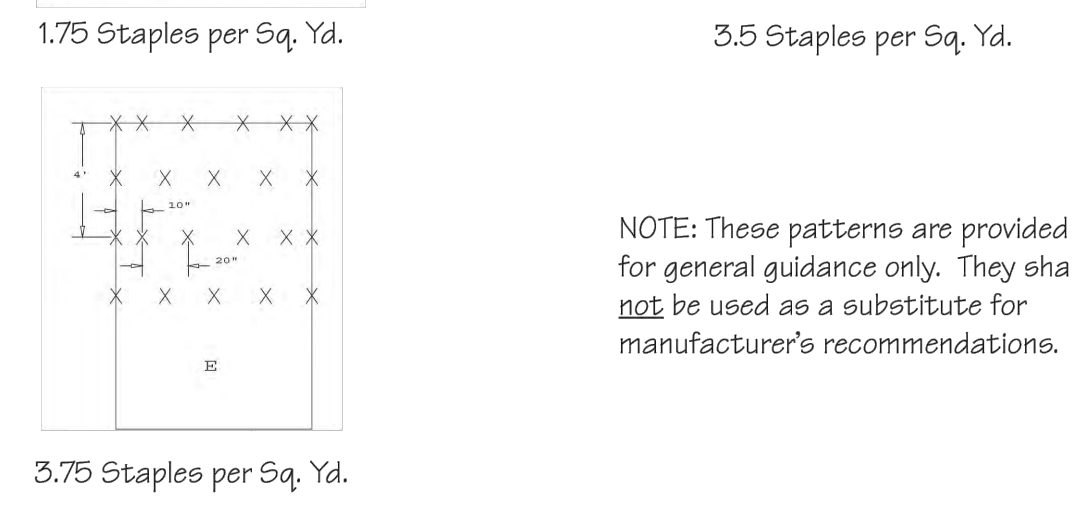
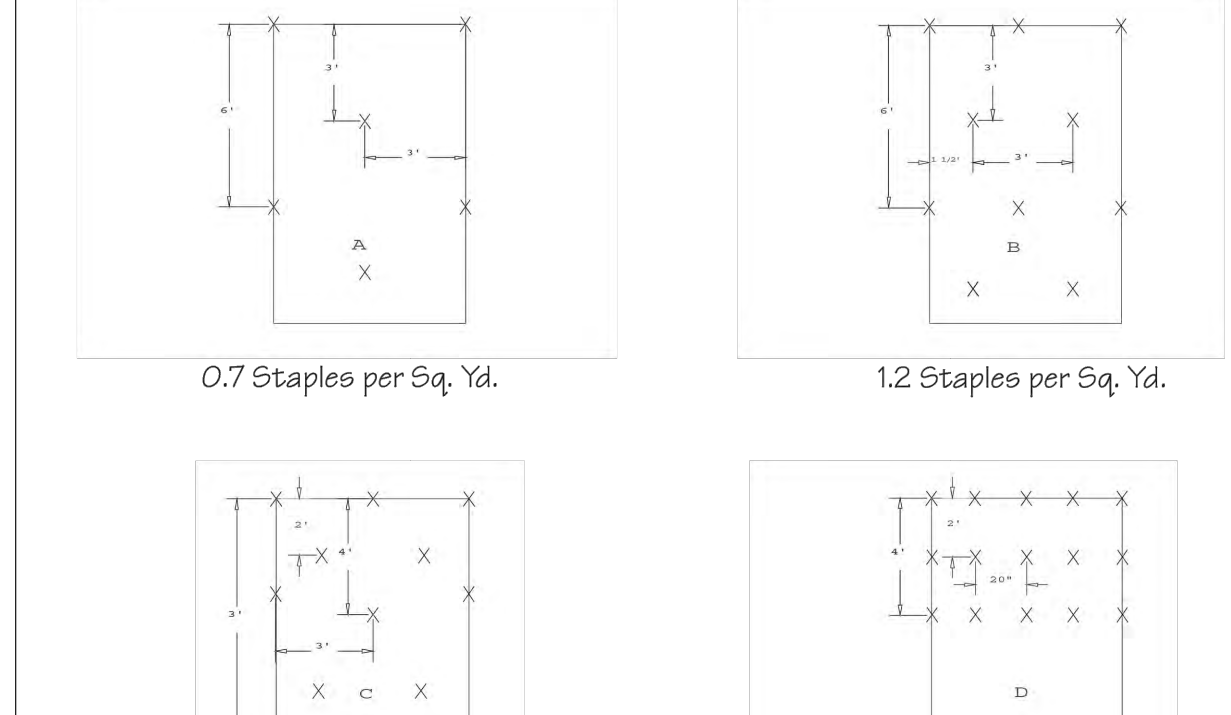
Perspective

Construction Notes:

1. Prepare soil before installing matting, including application of lime, fertilizer, and seed.
2. Begin at the top of the slope by anchoring the mat in a 6" deep X 6" wide trench. Backfill and compact trench after stapling.
3. Roll the mats (A) down or (B) horizontally across the slope.
4. The edges of parallel mats must be stapled with approx. 2" overlap.
5. When mats must be spliced down the slope, place mats end over end (shingle style) with approx. 4" overlap. Staple through overlapped area, approx. 12" apart.

Source:	Symbol:	Detail No.
Adapted from North American Green, Inc.	SM-S	DE-ESC-3.4.6.1 Sheet 1 of 2 Effective FEB 2019

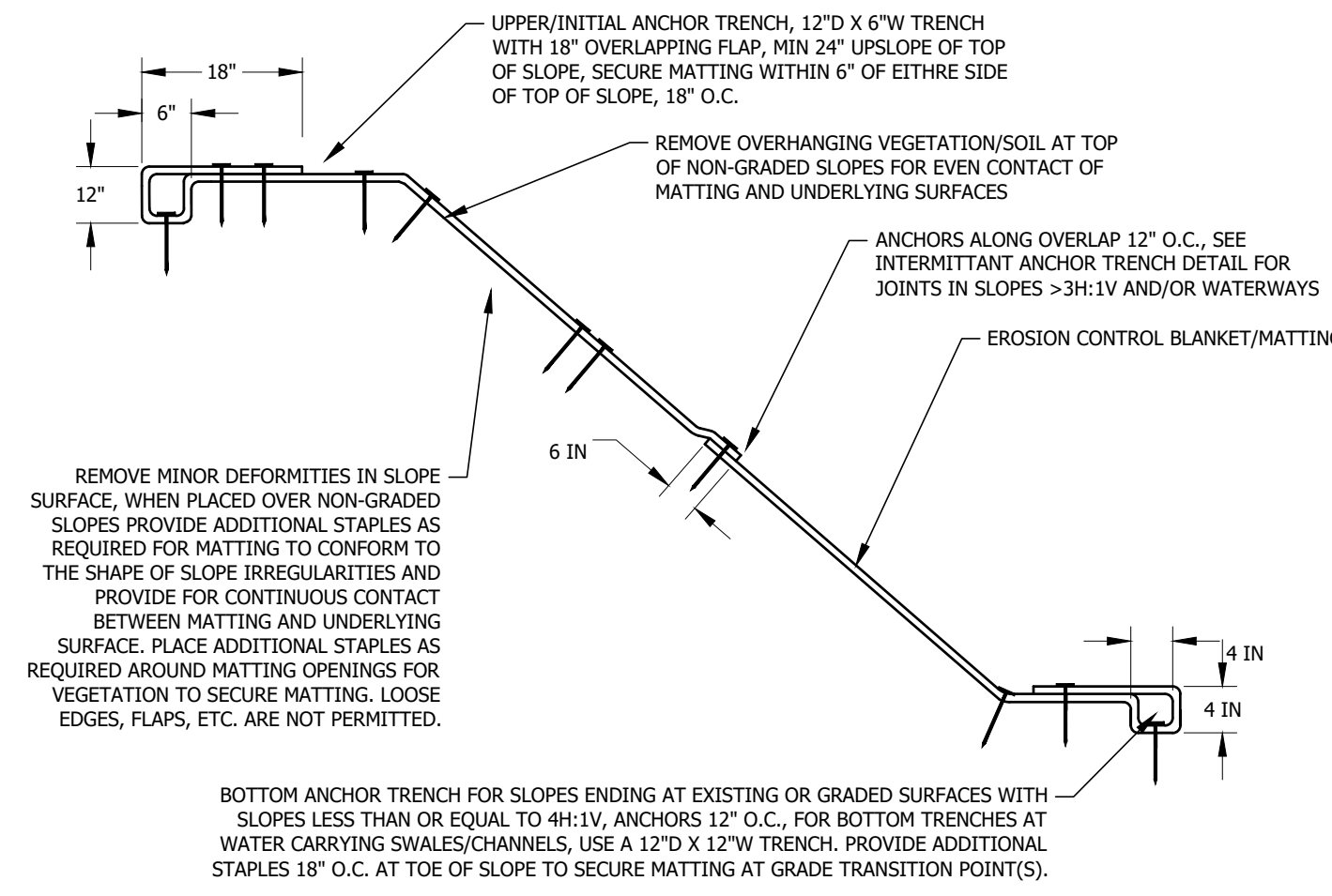
Standard Detail & Specifications
Stabilization Matting - Slope



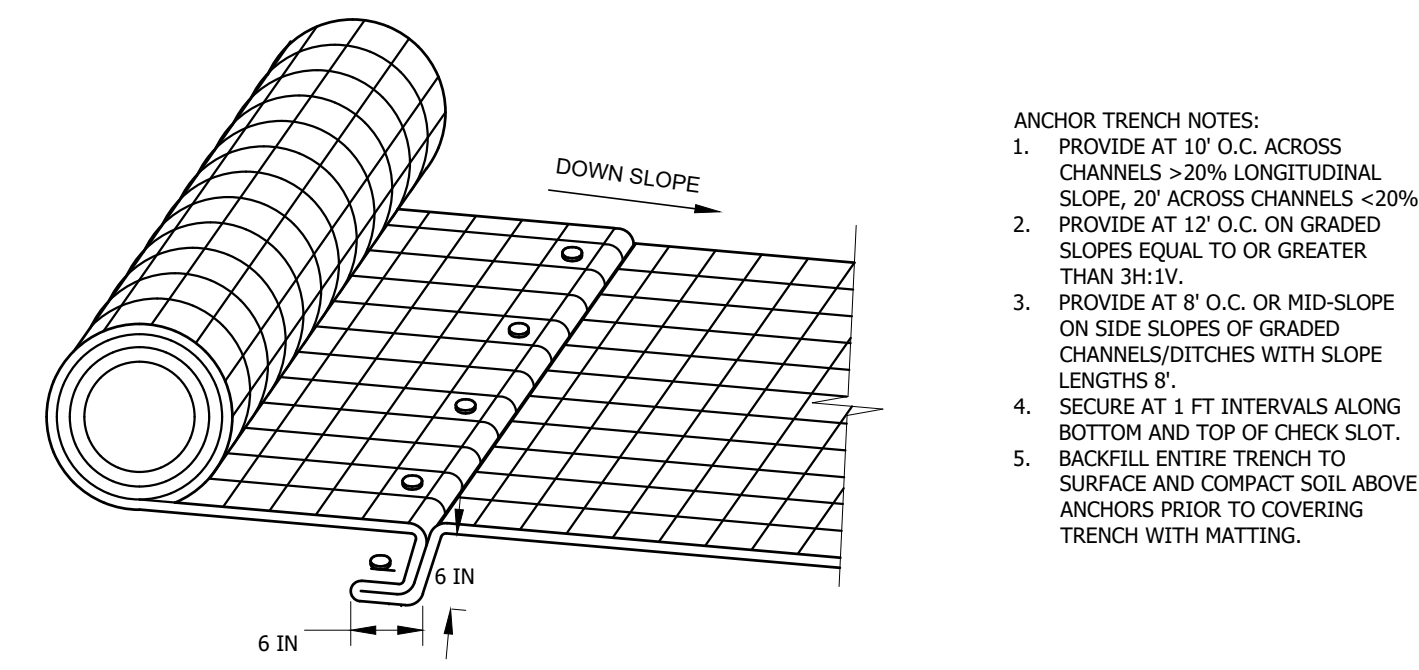
NOTE: These patterns are provided for general guidance only. They shall not be used as a substitute for manufacturer's recommendations.

Stapling Patterns

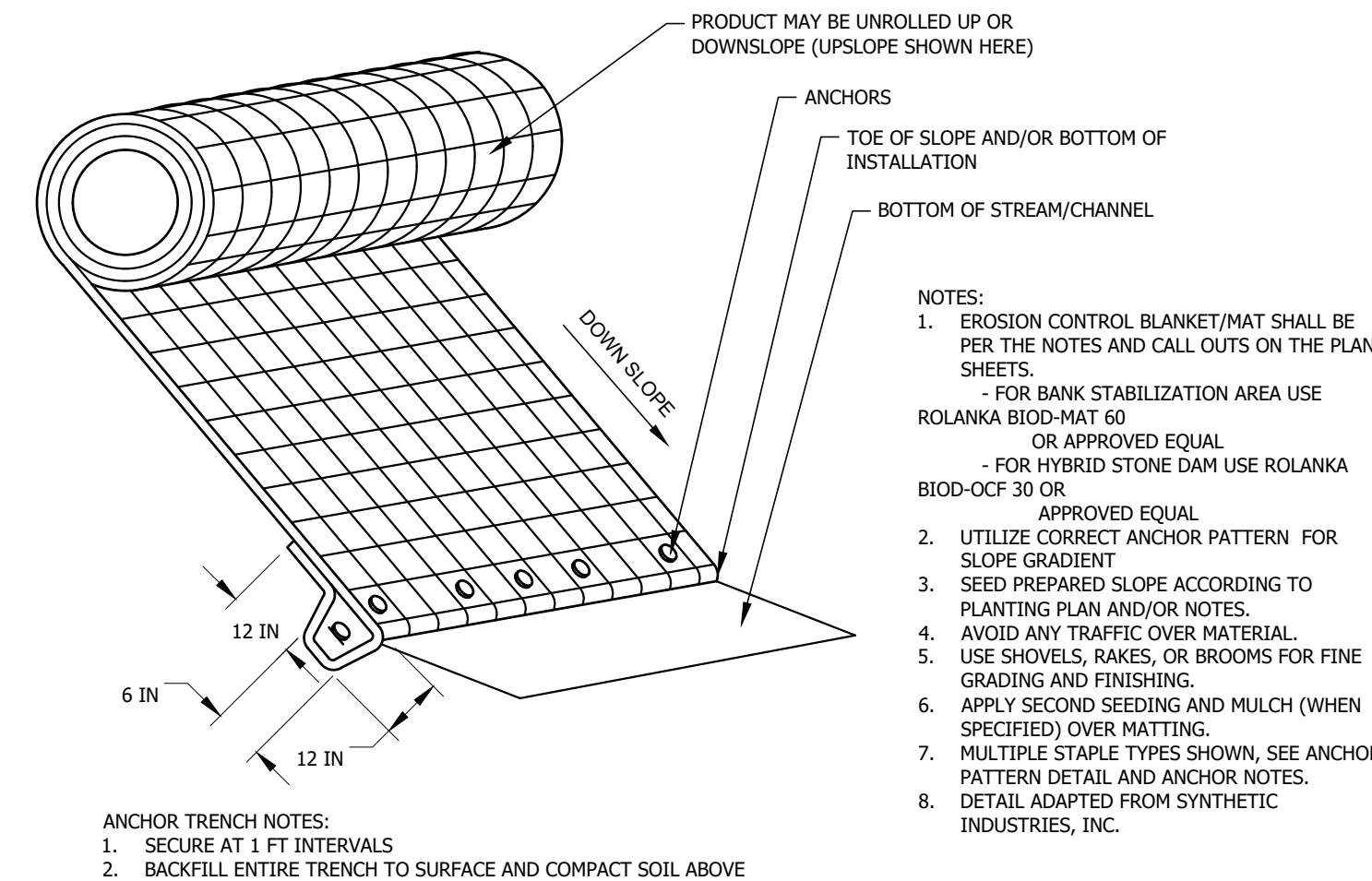
Source:	Symbol:	Detail No.
Adapted from North American Green, Inc.	SM-S	DE-ESC-3.4.6.1 Sheet 2 of 2 Effective February 2019



2 **13** **MATting**
TYPICAL SECTION N.T.S.



4 **13** **INTERMITTENT CHECK SLOT (MATting)**
TYPICAL SECTION N.T.S.



3 **13** **BOTTOM/TERMINAL ANCHOR TRENCH (MATting)**
TYPICAL SECTION N.T.S.

ANCHOR TRENCH NOTES:
1. SECURE AT 1 FT INTERVALS
2. BACKFILL ENTIRE TRENCH TO SURFACE AND COMPACT SOIL ABOVE ANCHORS PRIOR TO COVERING TRENCH WITH MATTING.

ANCHOR TRENCH NOTES:
1. PROVIDE AT 10' O.C. ACROSS CHANNELS >20% LONGITUDINAL SLOPE, 20' ACROSS CHANNELS <20%.
2. PROVIDE AT 12' O.C. ON GRADED SLOPES EQUAL TO OR GREATER THAN 3H:1V.
3. PROVIDE AT 8' O.C. OR MID-SLOPE ON SIDE SLOPES OF GRADED CHANNELS/DITCHES WITH SLOPE LENGTHS 8'.
4. SECURE AT 1 FT INTERVALS ALONG BOTTOM AND TOP OF CHECK SLOT.
5. BACKFILL ENTIRE TRENCH TO SURFACE AND COMPACT SOIL ABOVE ANCHORS PRIOR TO COVERING TRENCH WITH MATTING.

1 **13** **STABILIZATION MATTING - SLOPE**
STAPLE PATTERNS NOT TO SCALE

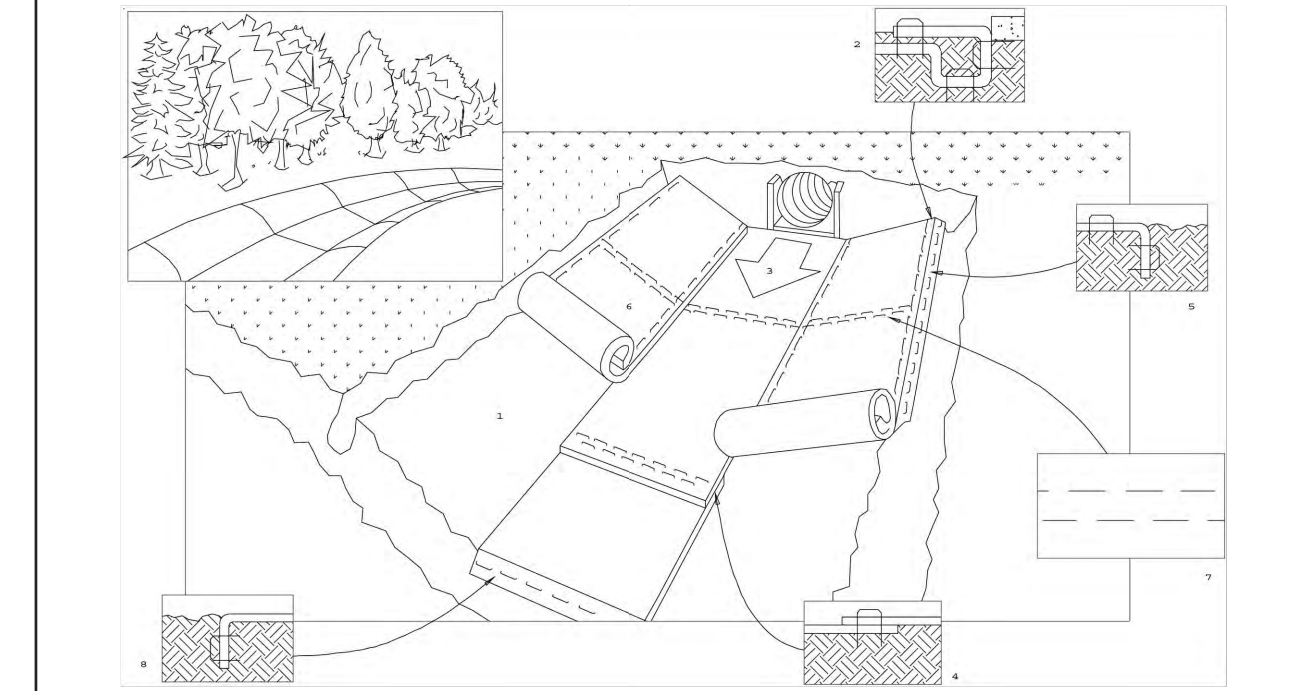


INFORMAL BOULDER PATH
1. SEE CONSTRUCTION NOTE 5 SHEET 9.
2. THIS PATH IS TO BE A NATURALISTIC, INFORMAL STEPPING STONE PATH AND NOT A SOLID STRUCTURE.
3. IMAGE ABOVE IS OF A NATURAL CREEK SYSTEM TO ILLUSTRATE DESIGN INTENT DESCRIBED IN NOTE 5 SHEET 9.
4. PER CIRCLE ON IMAGE, BOULDERS ARE TO BE RANDOMLY SET IN A LOOSE PATH FORMATION; NOTE ROCKS IN IMAGE FORM A NEAR CONTINUOUS CONNECTION BETWEEN THE STREAM BANKS.
5. IN THIS IMAGE SOME STONES ARE UNDER WATER.
6. BOULDERS ARE TO BE PARTIALLY BURIED AND PARTIALLY VISIBLE ABOVE LOW FLOW CONDITIONS. IF WORKING DURING HIGHER FLOW CONDITIONS CONTACT OWNER / OWNER'S REPRESENTATIVE FOR STONE SURFACE TO BE VISIBLE ABOVE WATER SURFACE.
7. PER ARROW ON IMAGE BOULDERS ARE TO CONTINUE UP BANK AND STOP APPROXIMATELY IN AREA ILLUSTRATED ON PLAN.

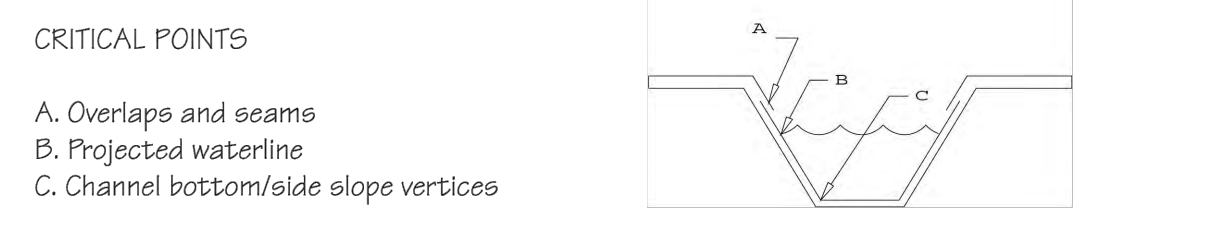
5 **13** **BOULDER PATH**
NOT TO SCALE

Standard Detail & Specifications
Stabilization Matting - Channel

TO BE USED IN ROADSIDE SWALE AND STREAM CHANNEL



Perspective



Note: Horizontal staple spacing should be altered if necessary to allow staples to secure the critical points along the channel surface.

Use manufacturer's recommendations for stapling patterns for channel installations.

Source:	Symbol:	Detail No.
Adapted from North American Green, Inc.	SM-C	DE-ESC-3.4.6.2 Sheet 1 of 3 Effective FEB 2019

6 **13** **STABILIZATION MATTING - CHANNEL**
TO BE USED IN ROADSIDE SWALE AND STREAM CHANNEL NOT TO SCALE

Standard Detail & Specifications
Stabilization Matting - Channel

TO BE USED IN ROADSIDE SWALE AND STREAM CHANNEL

Construction Notes:

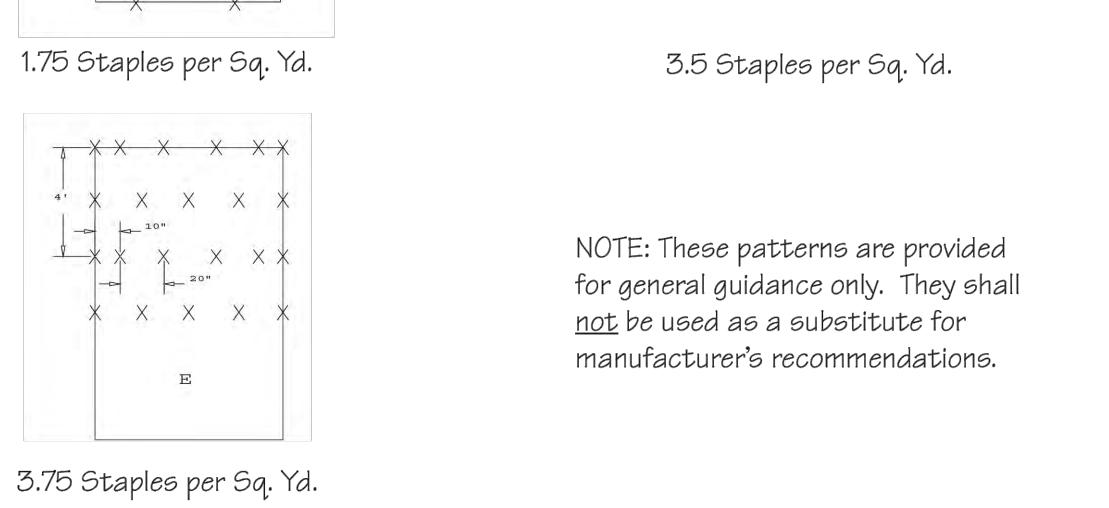
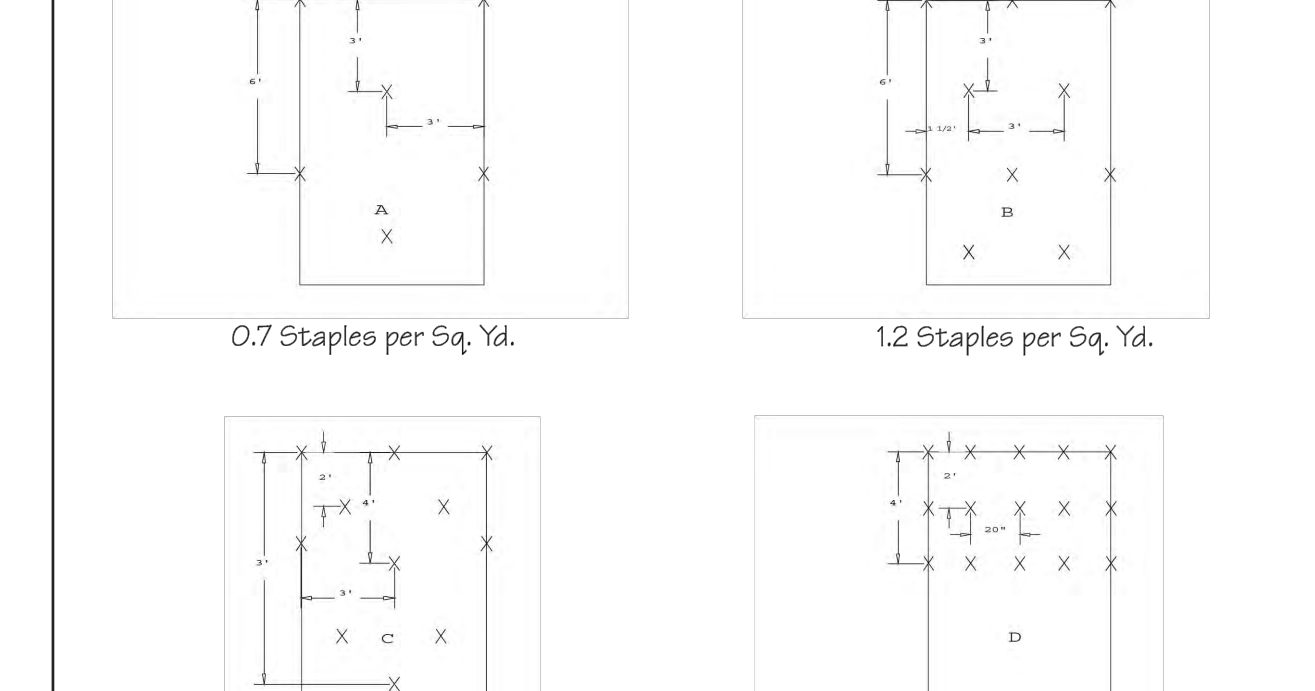
1. Prepare soil before installing matting, including application of lime, fertilizer, and seed.
2. Begin at the top of the channel by anchoring the mat in a 6" deep X 6" wide trench. Backfill and compact the trench after stapling.
3. Roll center mat in direction of water flow on bottom of channel.
4. Place mats end over end (shingle style) with a 6" overlap, use a double row of staggered staples 4" apart to secure mats.
5. Full length edge of mats at top of side slopes must be anchored in 6" deep X 6" wide trench; backfill and compact the trench after stapling.
6. Mats on side slopes must be overlapped 4" over the center mat and stapled.
7. In high flow channel applications, a staple check slot is recommended at 30 to 40 foot intervals. Use a row of staples 4" apart over entire width of the channel. Place a second row 4" below the first row in a staggered pattern.
8. The terminal end of the mats must be anchored in a 6" X 6" wide trench. Backfill and compact the trench after stapling.

Source:	Symbol:	Detail No.
Adapted from North American Green, Inc.	SM-C	DE-ESC-3.4.6.2 Sheet 2 of 3 Effective FEB 2019

6 **13** **STABILIZATION MATTING - CHANNEL**
NOT TO SCALE

Standard Detail & Specifications
Stabilization Matting - Channel

TO BE USED IN ROADSIDE SWALE AND STREAM CHANNEL



Stapling Patterns

NOTE: These patterns are provided for general guidance only. They shall not be used as a substitute for manufacturer's recommendations.

Source:	Symbol:	Detail No.
Adapted from North American Green, Inc.	SM-C	DE-ESC-3.4.6.2 Sheet 3 of 3 Effective FEB 2019

6 **13** **STABILIZATION MATTING - CHANNEL**
NOT TO SCALE

INDEPENDENCE SCHOOL
STREAM RESTORATION PLAN

NEW CASTLE CONSERVATION DISTRICT
2430 OLD COUNTRY ROAD, NEWARK, DE 19702

#	REVISION TO DETAIL 5 SHEET 13 & SPOT ELEVATION UPDATES SHEET 9	009 05.30.23
5	PER COMMENTS-NPS&USACE	009 05.06.23
4	ISSUED FOR PERMITTING	009 04.04.23
3	PER NPS COMMENTS	009 02.14.23
2	ISSUED FOR PERMITTING	009 11.02.21
1	ISSUED FOR CLIENT REVIEW	009 11.23.20
#	COMMENT	BY DATE

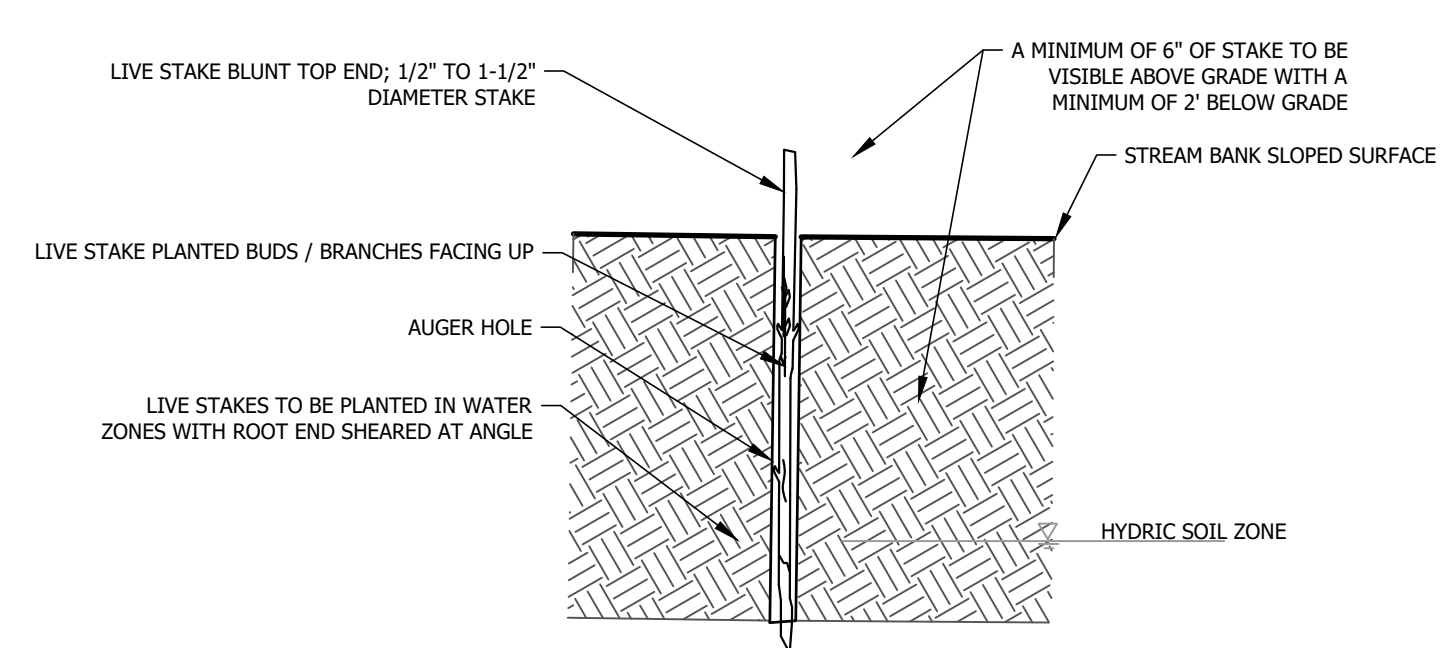


CONSTRUCTION DETAILS

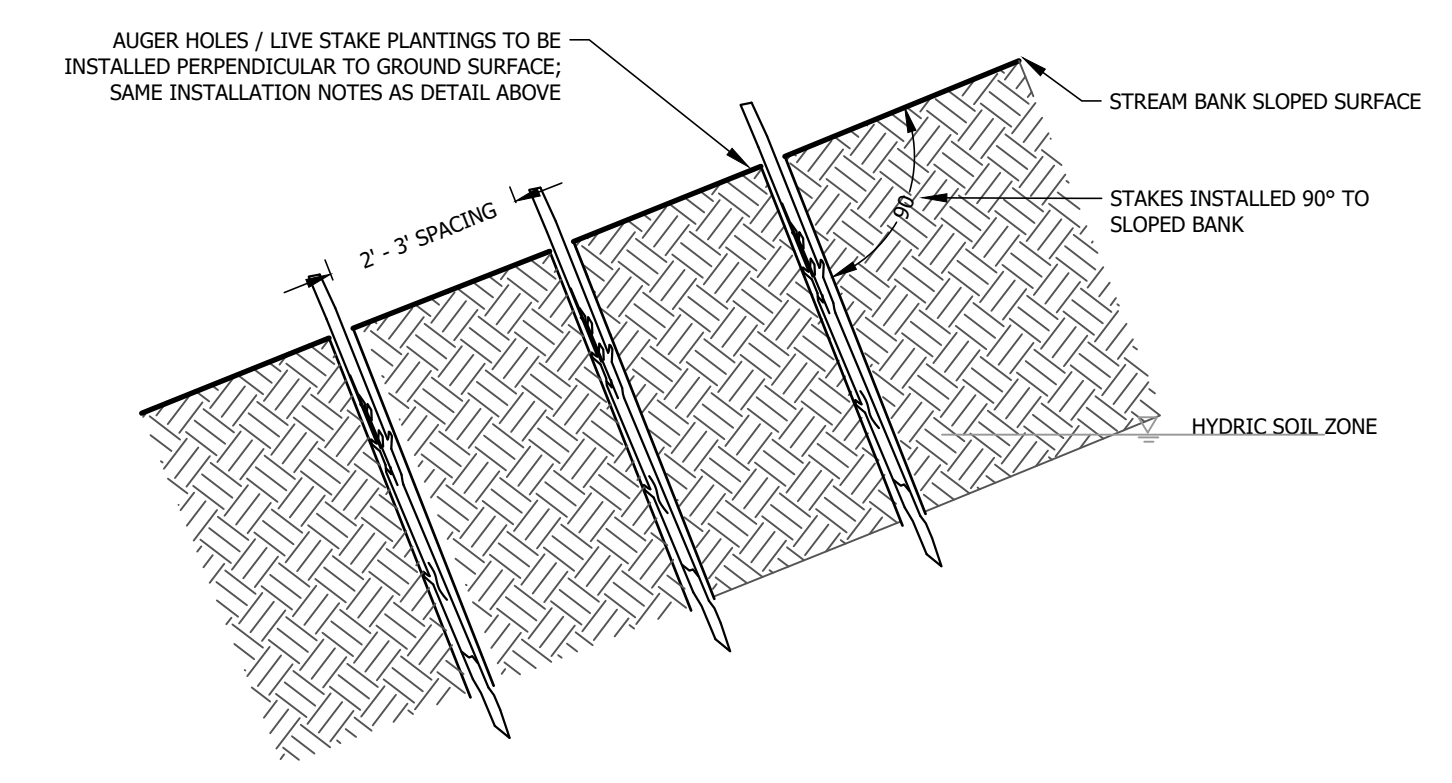
INDEPENDENCE SCHOOL STREAM RESTORATION	
MILL CREEK HUNDRED NEW CASTLE COUNTY	NEWARK DELAWARE
DATE: 06.26.20	PROJECT #: 07101
SURVEYED BY: N/A	SHEET: 13
CREATED BY: 009	13 OF 15
DRAWN BY: AZ	
CHECKED BY: ACH	

**INDEPENDENCE SCHOOL
STREAM RESTORATION PLAN**

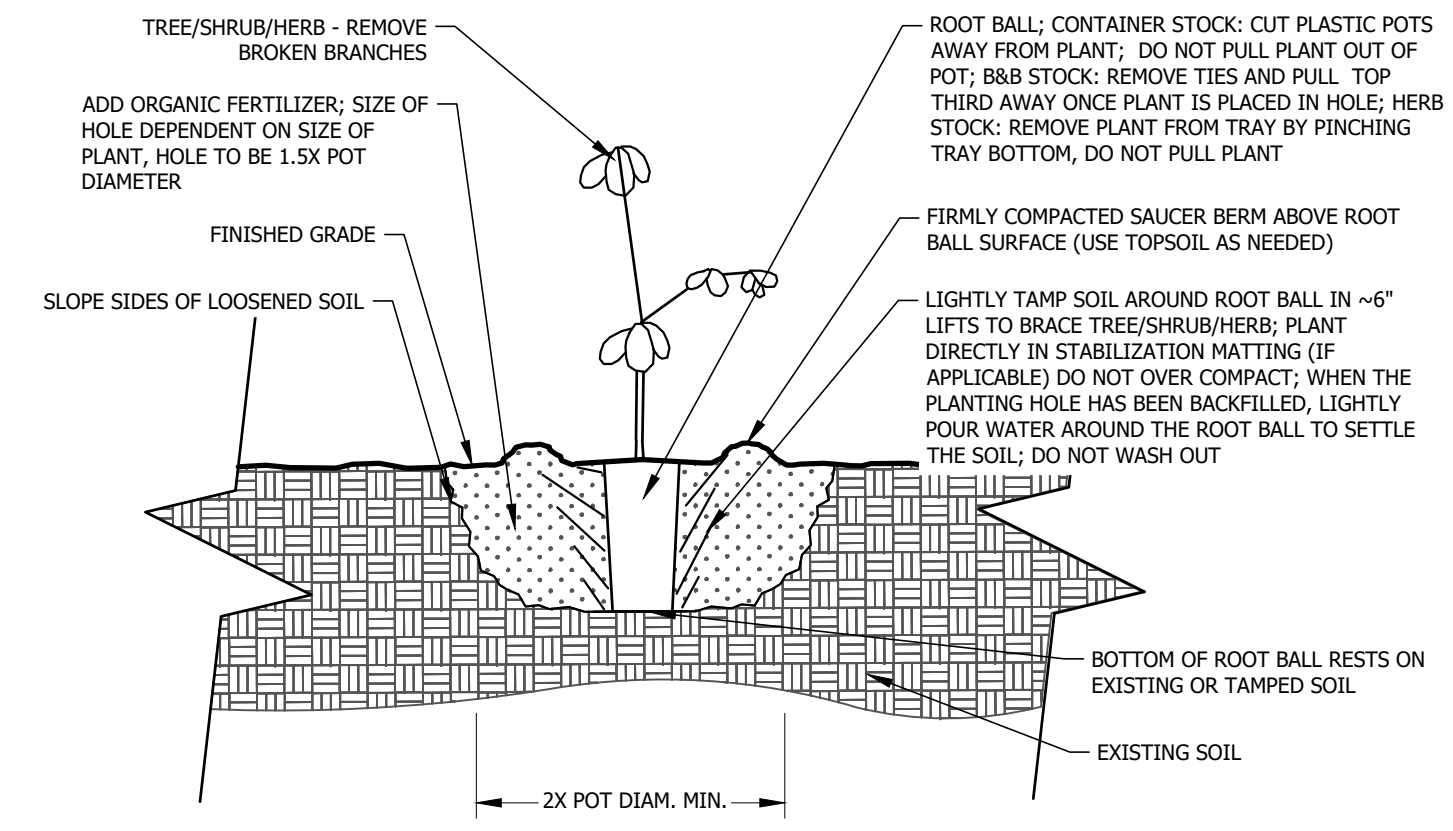
NEW CASTLE CONSERVATION DISTRICT
2430 OLD COUNTRY ROAD, NEWARK, DE 19702



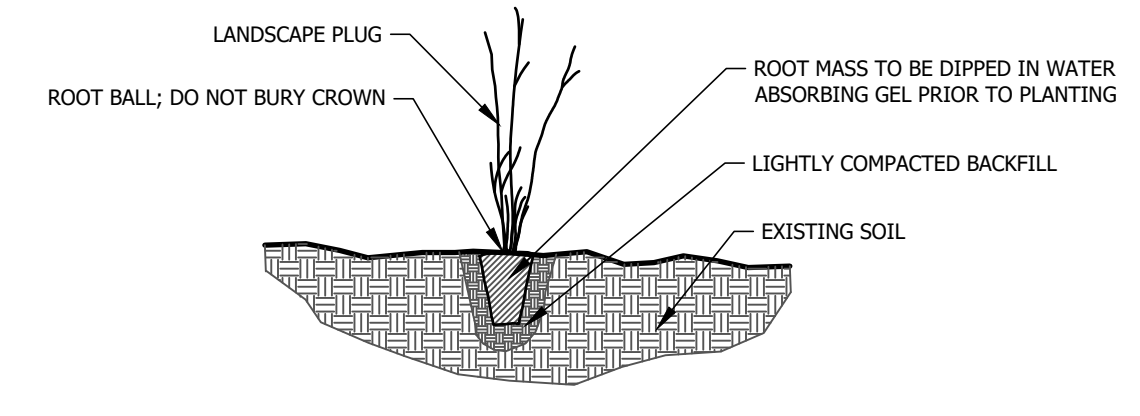
1
14 LIVE STAKE PLANTING
TYPICAL SECTION N.T.S.



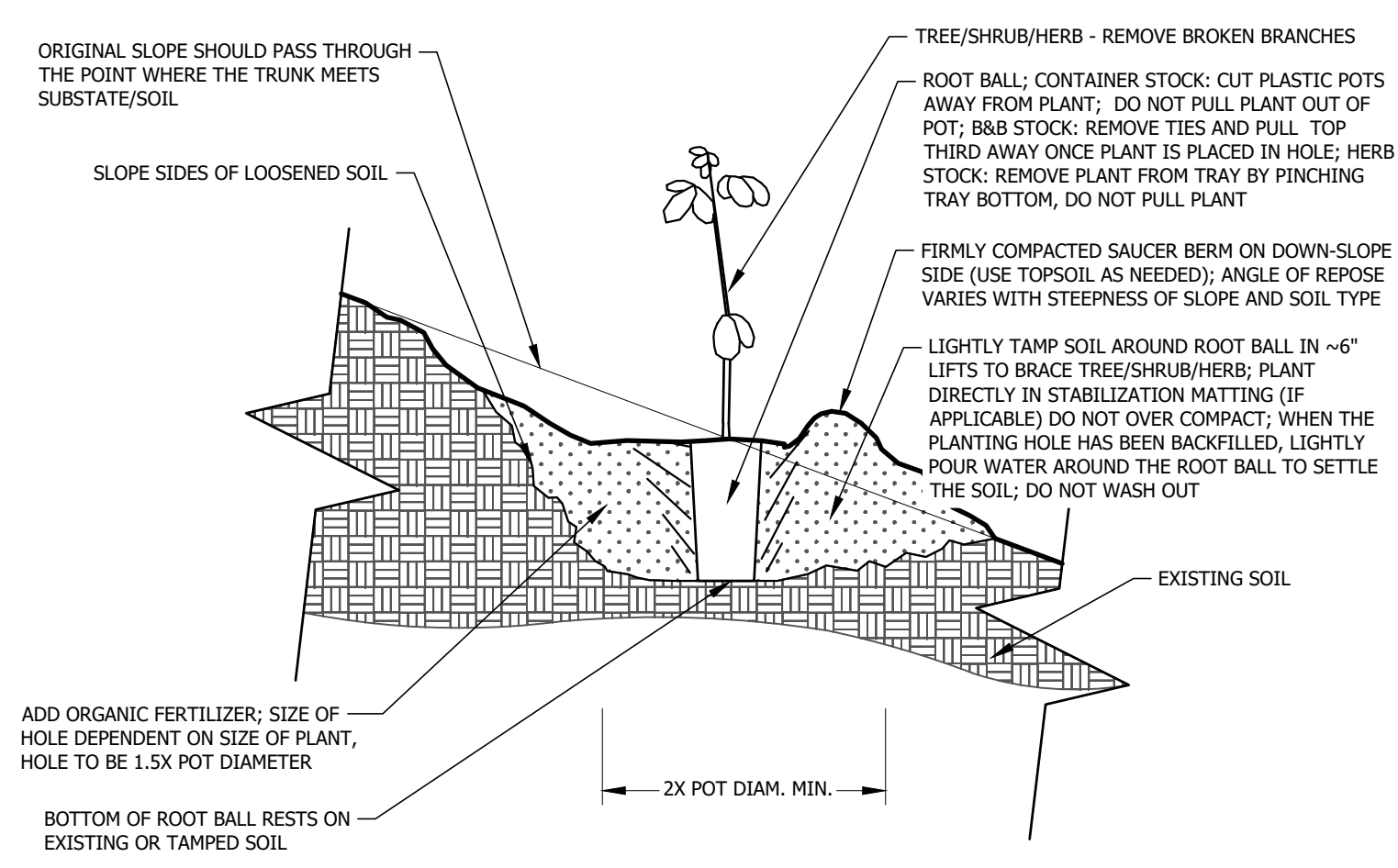
2
14 TREE / SHRUB / HERB PLANTING ON SLOPE
TYPICAL SECTION N.T.S.



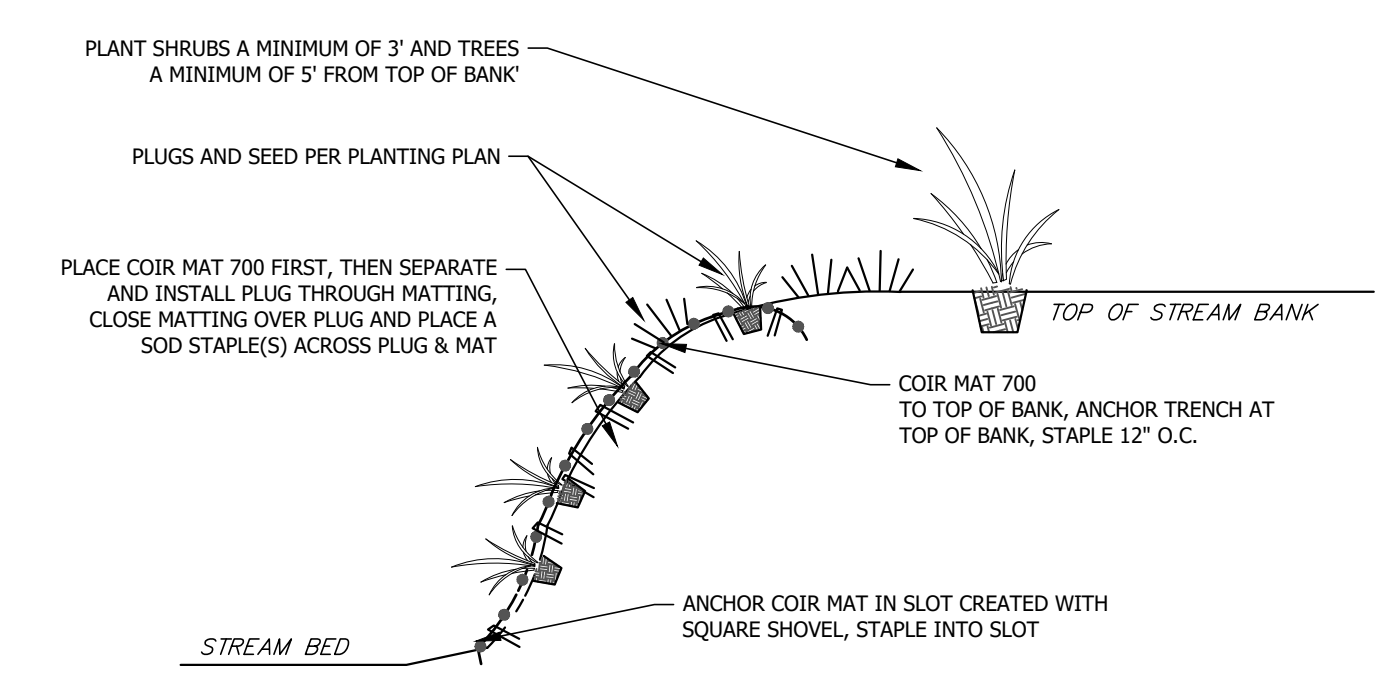
3
14 TREE / SHRUB / HERB PLANTING
TYPICAL SECTION N.T.S.



4
14 PLUG SIZE PLANTING
TYPICAL SECTION N.T.S.



5
14 TREE / SHRUB / HERB PLANTING ON SLOPE
TYPICAL SECTION N.T.S.

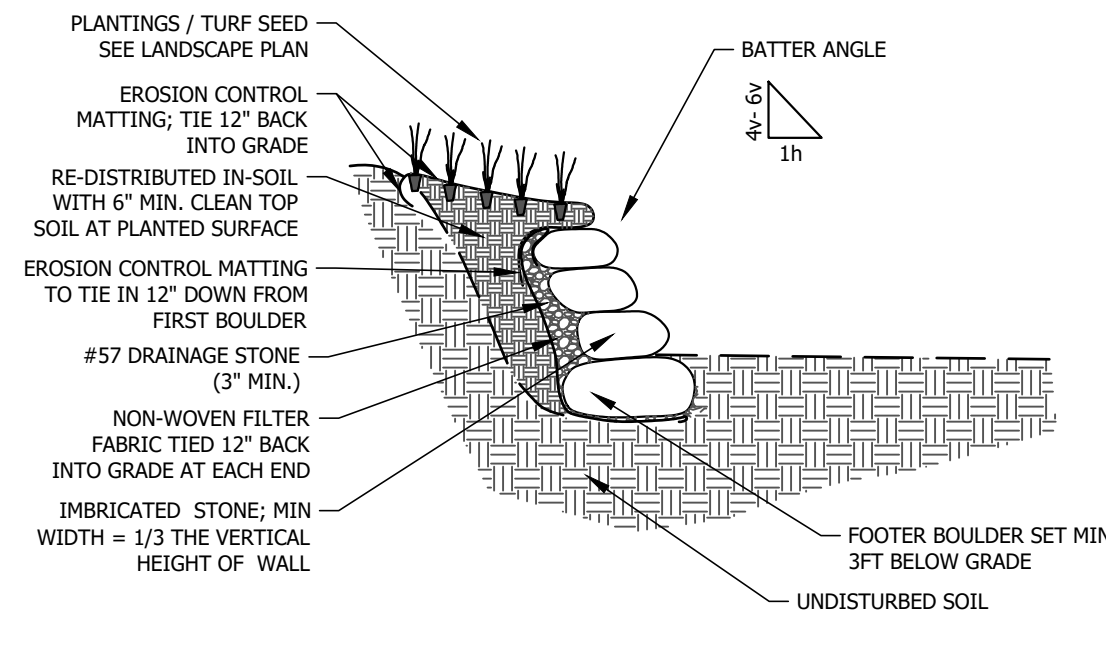


6
14 PLUGS & CONTAINERS WITH MATTING
TYPICAL SECTION N.T.S.

STABILIZATION MATTING SELECTION TABLE			
CRITERIA/ APPLICATION	TYPE	MATERIALS	EXAMPLE PRODUCTS
3:1 OR FLATTER/ SLOPE STABILIZATION ≤ 1.55 PSF/ TEMPORARY CHANNEL LINING	SSM-II	100% STRAW (0.55 LBS/YD ²) 2 LAYERS OF PHOTODEGRADABLE POLYPROPYLENE NETTING DEGRADABLE THREAD BIODEGRADABLE: 100% STRAW 2 LAYERS OF ORGANIC JUTE NETTING BIODEGRADABLE THREAD 12 MONTHS	NORTH AMERICAN GREEN S150 SYNTHETIC INDUSTRIES LANDLOK S2 ECS-2 (DOUBLE STRAW) NORTH AMERICAN GREEN S150BN ECS-2B (ACCELERATED DOUBLE STRAW)
2:1 OR FLATTER/ SLOPE STABILIZATION ≤ 1.65 PSF/ TEMPORARY CHANNEL LINING	SSM-II	100% STRAW (0.55 LBS/YD ²) 2 LAYERS OF PHOTODEGRADABLE POLYPROPYLENE NETTING DEGRADABLE THREAD BIODEGRADABLE: 100% STRAW 2 LAYERS OF ORGANIC JUTE NETTING BIODEGRADABLE THREAD 12 MONTHS	NORTH AMERICAN GREEN S150 SYNTHETIC INDUSTRIES LANDLOK S2 ECS-2 (DOUBLE STRAW) NORTH AMERICAN GREEN S150BN ECS-2B (ACCELERATED DOUBLE STRAW)
1.5:1 OR FLATTER/ SLOPE STABILIZATION ≤ 1.80 PSF/ TEMPORARY CHANNEL LINING	SSM-III	70% STRAW (0.39 LBS/YD ²)/30% COCONUT (0.16 LBS/YD ²) TOP LAYER OF UV-STABILIZED NETTING BOTTOM LAYER OF PHOTODEGRADABLE POLYPROPYLENE NETTING DEGRADABLE THREAD BIODEGRADABLE: 70% STRAW (0.39 LBS/YD ²)/30% COCONUT (0.16 LBS/YD ²) 2 LAYERS OF ORGANIC JUTE NETTING BIODEGRADABLE THREAD 12-24 MONTHS	NORTH AMERICAN GREEN SC150 SYNTHETIC INDUSTRIES LANDLOK CS2 ECS-2 (DOUBLE STRAW/COCONUT) NORTH AMERICAN GREEN SC150BN ECS-2B (BIODEGRADABLE DOUBLE STRAW/COCONUT)
1:1 OR FLATTER/SLOPE STABILIZATION ≤ 2.0 PSF/ TEMPORARY CHANNEL LINING	SSM-IV	100% COCONUT (0.55 LBS/YD ²) TWO LAYERS OF UV-STABILIZED POLYPROPYLENE NETTING UV-STABILIZED POLYPROPYLENE THREAD BIODEGRADABLE: 100% COCONUT (0.55 LBS/YD ²) TWO LAYERS OF ORGANIC JUTE NETTING BIODEGRADABLE THREAD 12-36 MONTHS	NORTH AMERICAN GREEN C125 SYNTHETIC INDUSTRIES LANDLOK C2 ECC-2 (DOUBLE COCONUT) NORTH AMERICAN GREEN C125BN ECC-2B (BIODEGRADABLE DOUBLE COCONUT)
STEEPER THAN 1:1/ SLOPE STABILIZATION ≤ 2 PSF/ PERMANENT CHANNEL LINING	TRM-I	100% POLYPROPYLENE FIBER (0.65 LBS/YD ²) TWO LAYERS OF POLYPROPYLENE NETTING UV-STABILIZED POLYPROPYLENE THREAD	LANDLOK TRM 450 (NON-VEGETATED) NORTH AMERICAN GREEN P300 (NON-VEGETATED) CONTECH C-45 (NON-VEGETATED) ECP-2 (POLYPROPYLENE TURF REINFORCEMENT MAT)
2:1 PSF - 5.9 PSF/ PERMANENT CHANNEL LINING	TRM-II	100% POLYPROPYLENE FIBER (0.88 LBS/YD ²) TWO LAYERS OF POLYPROPYLENE NETTING UV-STABILIZED POLYPROPYLENE THREAD	MIRAFI MIRAMAT TM8 (VEGETATED) LANDLOK TRM 1060 & 1061B (VEGETATED) CONTECH C-60 (VEGETATED) LANDLOK TRM 450 (VEGETATED) PYRAMAT (NON-VEGETATED) NORTH AMERICAN GREEN P550 (VEGETATED)
6 PSF - 8 PSF AND <1500 LBS TENSILE STRENGTH (MACHINE DIRECTION)/ PERMANENT CHANNEL LINING	TRM-III	100% POLYPROPYLENE FIBER MATRIX (0.50 LBS/YD ²) 3-DIMENSIONAL MATTING STRUCTURE	NORTH AMERICAN GREEN P300 & P550 (VEGETATED) COLBOND ENKAMAT 7010 & 7020 (VEGETATED) LANDLOK 300 (VEGETATED)
6 PSF - 8 PSF AND >1500 LBS TENSILE STRENGTH (MACHINE DIRECTION)/ PERMANENT CHANNEL LINING	TRM-IV	100% POLYPROPYLENE FIBER (0.84 LBS/YD ²) POLYPROPYLENE MONOFILAMENT YARNS WOVEN INTO PYRAMID-LIKE PROJECTIONS	PYRAMAT HIGH PERFORMANCE TRM (VEGETATED) COLBOND ENKAMAT 5-20 (VEGETATED)

NOTE:
FOR THIS SITE, ALL EXPOSED CHANNEL AND SLOPE MATTING SHALL BE BIODEGRADABLE.

6
14 STABILIZATION MATTING
SELECTION TABLE NOT TO SCALE



7
14 IMBRICATED RIP RAP WALL
TYPICAL SECTION N.T.S.

#	REVISION / COMMENT	DATE
6	REVISION TO DETAIL 5 SHEET 13 & SPOT ELEVATION UPDATES SHEET 9	05.30.23
5	PER COMMENTS-NPS&USACE	05.06.23
4	ISSUED FOR PERMITTING	05.04.23
3	PER NPS COMMENTS	05.03.23
2	ISSUED FOR PERMITTING	05.11.22
1	ISSUED FOR CLIENT REVIEW	05.11.22

FA FORESITE ASSOCIATES

REGISTERED PROFESSIONAL ENGINEER
STATE OF DELAWARE
1-26-2023

SEAL

CONSTRUCTION DETAILS

INDEPENDENCE SCHOOL
STREAM RESTORATION

MILL CREEK HUNDRED NEW CASTLE COUNTY	NEWARK DELAWARE
DATE: 06.26.20	PROJECT #: 07101
SURVEYED BY: N/A	SHEET: 14
CREATED BY: DSS	14 OF 15
DRAWN BY: AZ	
CHECKED BY: ACH	

TAKE CARE WHEN WORKING AROUND UNDISTURBED STREAM BANKS. MATTING MAY BE PINNED DOWN THE BANK FACE TO AVOID EXCAVATION INTO ERODED AREAS. IF UNSURE CONSULT DESIGN TEAM. BANK FAILURE REPAIRS AT THE TIME OF PLANTING WILL BE COMPLETED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER / NEW CASTLE CONSERVATION DISTRICT.

SAP SENSITIVE AREA PROTECTION

AT THE START OF THE PROJECT THE ROOT ZONE AROUND ALL TREES TO REMAIN WAS PROTECTED WITH SAP. THESE AREAS ARE CURRENTLY TURF AND WILL BE TRANSITIONED TO NATIVE MEADOW IN THIS PHASE OF THE PROJECT IN THE AREAS NOTED ON THE PLAN.

ALL WORK WITHIN THESE AREAS IS TO BE BY HAND. NO MACHINES ALLOWED WITHIN CANOPY AREAS OF EXISTING TREES.

KILL TURF GRASS AS NEEDED; LIGHTLY SCARIFY THE SURFACE WITH A HAND RAKE; INSTALL A 1"-2" LAYER OF TOPSOIL; BEGIN AT THE ROOT FLARE (-1'-2' OUT FROM THE TRUNK) AND FEATHER TOPSOIL OUT; NO SOIL SHOULD ABUT THE TRUNK OF THE TREE; INSTALL SEED PER SEED NOTES.

LAWN SEED; DETAIL 1-8 MIX NO. 4

INSTALL UNDER SSM-II MATTING; PER DETAIL 6-14

PINELANDS NURSERY LOW-GROW MIX DRY SITES

INSTALL WITH ERNST SEED ANNUAL WILDFLOWER MIX 10-12 LBS/ACRE

PINELANDS NURSERY LOW-GROW MIX WET SITES

INSTALL UNDER / THROUGH SSM-IV MATTING; PER DETAIL 6-14

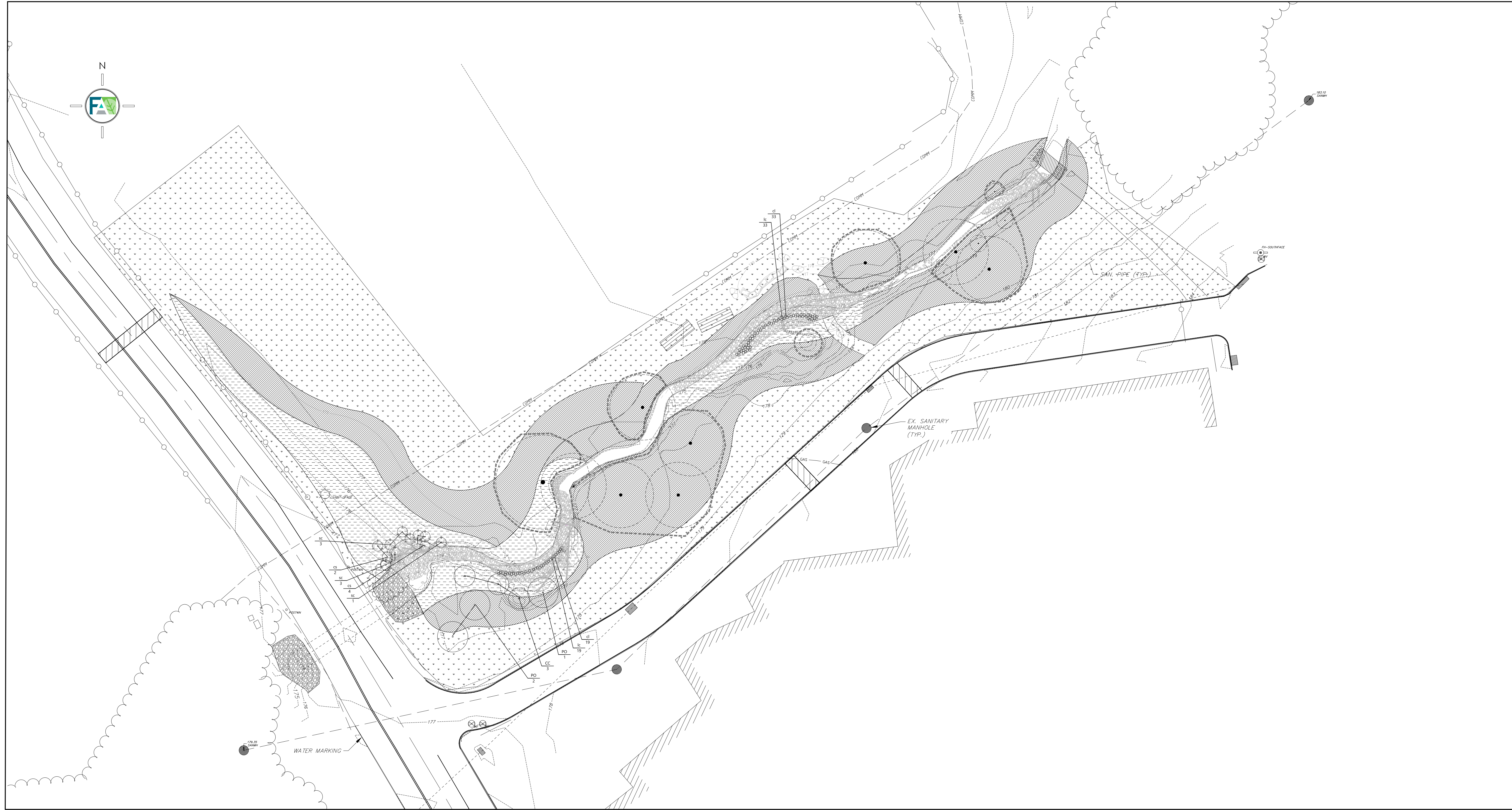
DO NOT PLANT PLUGS WITH EXISTING TREE DRIP LINES / WITHIN SAP IF THERE ARE HEAVY SURFACE ROOTS. CONSULT DESIGN TEAM AS NEEDED TO CONFIRM LOCATIONS OF PLUGS UNDER EXISTING TREES.

PLUG PLANTS
INSTALL A MAX. OF 15" O.C. IN A RANDOM PATTERN.
NO ONE SPECIES WILL COMPRISE MORE THAN 30% OF MIX. SELECT SPECIES INCLUDE:
AGERATINA ALTISSIMA - WHITE SNAKE ROOT
PACKERA AUREA - GOLDEN RAGWORT
SOLIDAGO FLEXICALLIS - ZIGZAG GOLDENROD
POLYSTICHUM ACROSTICHOIDES - CHRISTMAS FERN
ONOCLEA SENSIBILIS - SENSITIVE FERN
CHELONE GLABRA - TURTLEHEAD
IRIS VERSICOLOR - BLUE FLAG IRIS
CAREX LURIDA - SHALLOW SEDGE
CAREX AMPHIBOLA - GRAY SEDGE
CONOCLINIUM COELESTINUM - BLUE MIST FLOWER

PLANTINGS PER PLAN CALL-OUTS

PLANT SCHEDULE

QTY	LATIN NAME	COMMON NAME	SIZE (min)	COMMENTS	MAINTENANCE
CC 3	Carpinus caroliniana	American hornbeam	8'-10'		Mature size can be 20'+; monitor young bark for sun scaled along south side of tree during winter months
PO 3	Platanus occidentalis	American sycamore	1"-1.5" caliper		Mature size can be 50'+; London Plane Tree is NOT an acceptable substitution
CS 6	Cornus sericea	red-osier dogwood	2-3 gal.	container	cut back in late winter to 1'-2' tall to maintain red color stems and desired height.
SC 7	Sambucus canadensis	American black elderberry	2-3 gal.	container	cut back in late winter to 1'-2' tall to maintain desired height; easily propagated with cuttings
cl 52	Carex lurida	sallow sedge	1qt	container	until year 3 supplemental watering may be required during dry weather
lc 52	Lobelia cardinalis	cardinal flower	1qt	container	until year 3 supplemental watering may be required during dry weather



- CIVIL ENGINEERING
- LANDSCAPE ARCHITECTURE
- ECOLOGICAL RESTORATION

FORESITE ASSOCIATES INC.
2401 PHILADELPHIA PIKE
CLAYMONT, DE 19703
PHONE: 302.351.3421
INFO@FORESITEASSOCIATES.COM

INDEPENDENCE SCHOOL
STREAM RESTORATION PLAN
NEW CASTLE CONSERVATION DISTRICT
2430 OLD COUNTRY ROAD, NEWARK, DE 19702

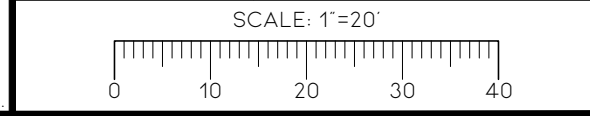
#	COMMENT	BY	DATE
6	REVISION TO DETAIL 5 SHEET 13 & SPOT ELEVATION. UPDATES SHEET 9	DDS	05.30.23
5	PER COMMENTS - NPS & USACE	DDS	05.06.23
4	ISSUED FOR PERMITTING	DDS	04.04.23
3	PER NPS COMMENTS	DDS	02.16.23
2	ISSUED FOR PERMITTING	DDS	11.02.21
1	ISSUED FOR CLIENT REVIEW	DDS	11.23.20



LANDSCAPE PLAN

INDEPENDENCE SCHOOL
STREAM RESTORATION

MILL CREEK HUNDRED NEW CASTLE COUNTY	NEWARK DELAWARE
DATE: 06.26.20	PROJECT #: 07101
SURVEYED BY: N/A	SHEET: 15
CREATED BY: DDS	15 OF 15
DRAWN BY: DDS	
CHECKED BY: ACH	



© FORESITE ASSOCIATES, INC. ALL RIGHTS RESERVED.