

March 13, 2023

Via Email: planning@northcastleny.com

Christopher Carthy, Chairman
Members of the Town of North Castle Planning Board
15 Bedford Road
Armonk, NY 10504

Re: Paul Eisenberg
47 Windmill Road
Section 102.03, Block 1, Lot 1

Dear Chairman Carthy and Members of the Planning Board:

The following are our responses to Kellard Sessions' Memo dated July 7, 2022, updated February 24, 2023:

1. The components of the septic system are not known. A record request was submitted to the WCHD and no information was found. The download of Town files did not provide any information regarding the septic system. There is only a general idea as to the location which is directly behind the house. The proposed work in the rear yard is not disturbing the area where the septic system is located. The area will be cordoned off during construction. The project has been discussed with the WCHD and we expect a signoff from them.
2. A Floodplain Development Permit Application is enclosed with this submission. It is not yet complete as the construction values are not yet known.
3. Enclosed is the updated Mitigation Plan approved by the Conservation Board. It has been updated with reference to long term monitoring.
4. Please see the Mitigation Plan.
5. Certified structural calculations are enclosed.
6. The silt fence row has been doubled.
7. The Stormwater Management Plan has been updated and enclosed. The detail of the inlet/outlet controls have been added to the Plan. Testing was performed in conjunction with Kellard Session's office. The soil test logs are in the Stormwater Management Report.
8. The driveway profile has been modified to meet this requirement.
9. This was discussed with the Planning Board.
10. The detail has been corrected.
11. A graded shoulder has been added.
12. This note has been removed to avoid confusion.
13. The elevations on the Stormtech detail have been revised.
14. This information is provided. No impervious soil layers were encountered.

The Planning Department Memo items have been addressed above.

251-F Underhill Avenue • Yorktown Heights, New York 10598

60 Walnut Grove Road • Ridgefield, Connecticut 06877

(914) 962-4488

(203) 431-9504

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We are including the following in this submission.

- Flood Permit;
- Retaining Wall Design;
- SWPPP;
- Kellard Sessions' Memo, for reference;
- Planning Department 2-27-23 ARK Memo;
- Mitigation Planting Plan; and
- The Site Plan titled "Site Plan prepared for Paul Eisenberg", Sheets 1-6 of 6, dated 3/12/22, last revised 3-10-23;

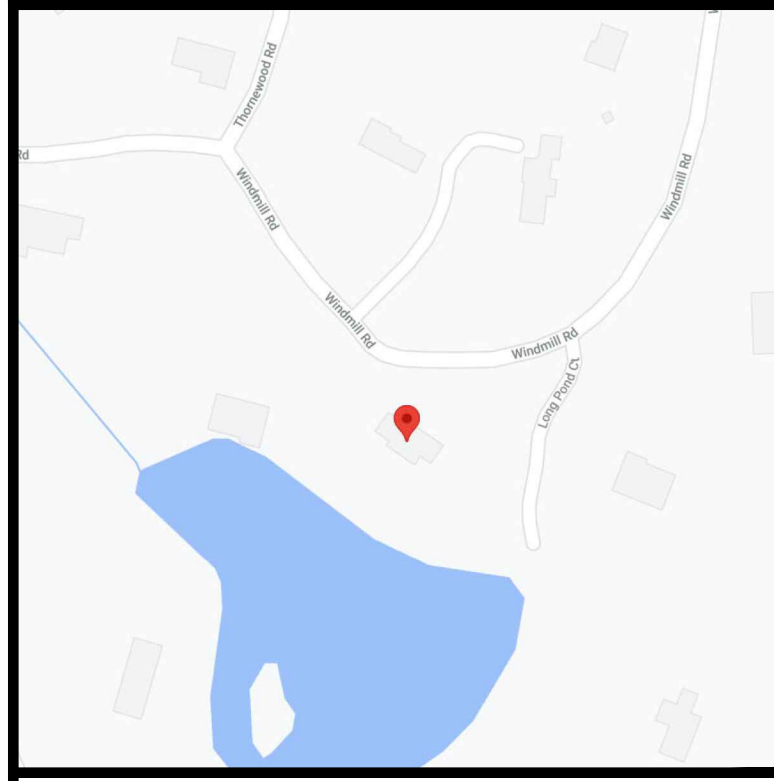
Please contact us if you have any questions. We have provided this submission in an email to Adam Kaufman in pdf format. Thank you.

Yours Truly,

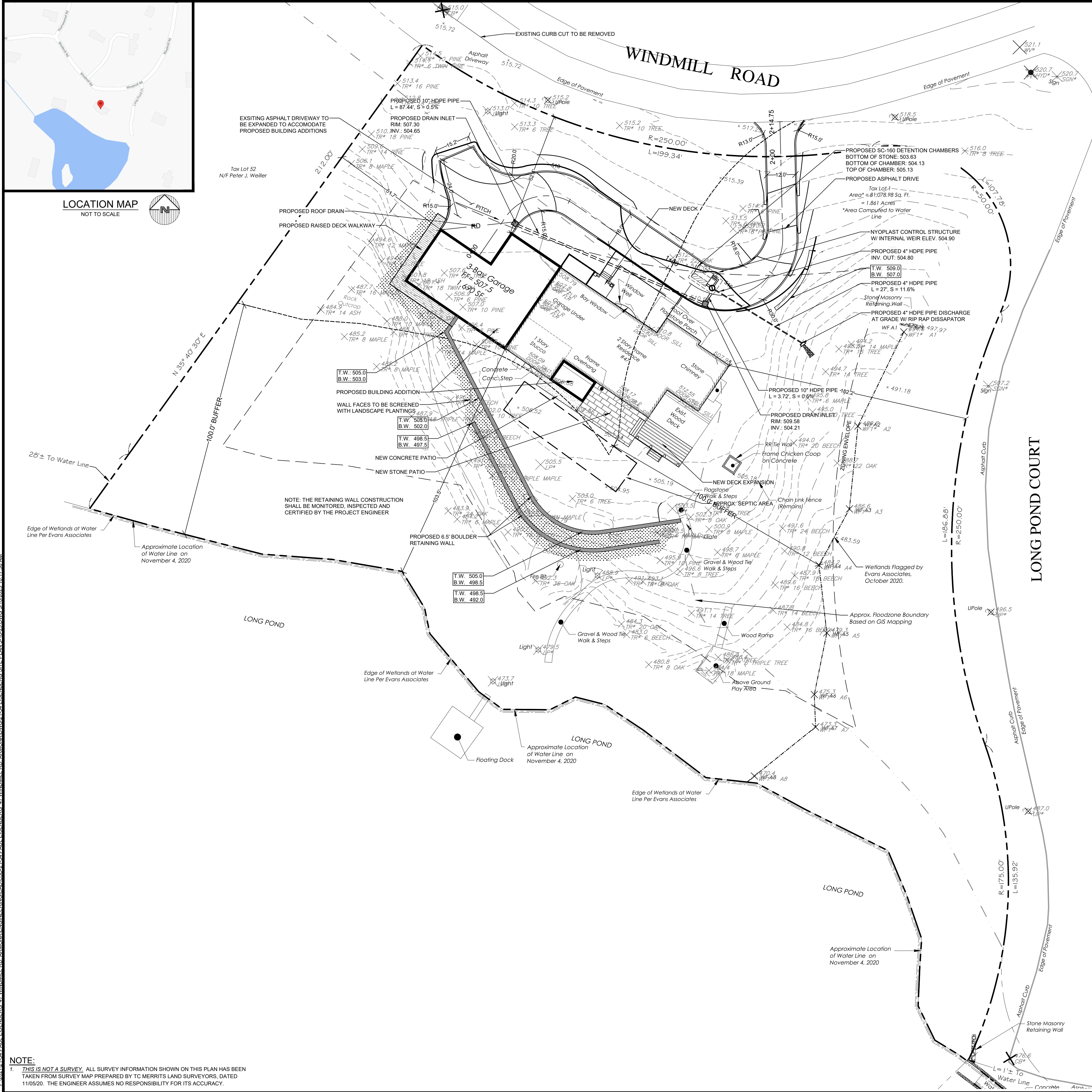
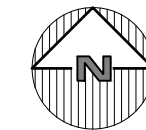

Joseph C. Riina, P.E.

JCR/cm/enc./sdc 21-54





LOCATION MAP
NOT TO SCALE



SITE DATA:

OWNER / DEVELOPER: PAUL EISENBERG
 47 WINDMILL ROAD
 ARMONK, NY 10504

PROJECT LOCATION: 47 WINDMILL ROAD
 ARMONK, NY 10504

EXISTING TOWN ZONING: R-1.5A, RESIDENTIAL
 PROPOSED USE: SECTION 102.03, BLOCK 1, LOT 1
 TOWN TAX MAP DATA: 1.86 ACRES (81,078 SF)

SEWAGE FACILITIES: ONSITE SSSTS
 WATER FACILITIES: PUBLIC WATER FACILITIES
 SCHOOL DISTRICT: BYRAM HILLS
 FIRE DISTRICT: FD#2

ZONING SCHEDULE:

ZONING DISTRICT: R-1.5A, SINGLE FAMILY RESIDENTIAL			
DIMENSIONAL REGULATIONS:	REQUIRED	PROVIDED	VARIANCE REQUIRED
MINIMUM SIZE OF LOT:			
MINIMUM LOT AREA:	65,340 SF.	81,078 SF.	NONE
MINIMUM LOT WIDTH:	150 FT.	268 FT.	NONE
MINIMUM LOT FRONTAGE:	150 FT.	570 FT.	NONE
MINIMUM YARD DIMENSIONS:			
PRINCIPAL BUILDING:			
FRONT YARD SETBACK:	50 FT.	52.4 FT.	NONE
REAR YARD SETBACK:	40 FT.	103.5 FT.	NONE
SIDE YARD SETBACK:	30 FT.	51.7 FT.	NONE
MAXIMUM % OF LOT TO BE OCCUPIED:			
PRINCIPAL BUILDING COVERAGE:	10% OF LOT AREA	5.9 % OF LOT AREA	NONE
MAXIMUM HEIGHT:			
PRINCIPAL BUILDING - FEET:	30 FEET	30 FT MAX	NONE
PRINCIPAL BUILDING - STORIES:	2 1/2	2 1/2 MAX	NONE

TABLE OF BUFFER DISTURBANCE

Description	Surface Area (SF)		
	Non-impervious	Impervious	Disturbance
Existing	5,705	2,530	8,235
Proposed	6,469	3,735	10,204
Net Change	+764	+1,205	+1,969

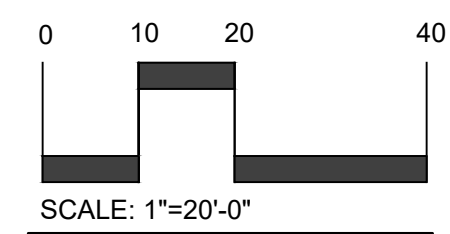
APPROVED BY THE TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION DATED: _____ Date: _____

CHRISTOPHER CARTHY, CHAIRMAN,
 TOWN OF NORTH CASTLE PLANNING BOARD
 ENGINEERING PLANS REVIEWED FOR CONFORMANCE TO RESOLUTION: _____ Date: _____

JOSEPH M. CERMELE, PE
 KELLARD SESSIONS CONSULTING
 CONSULTING TOWN ENGINEERS

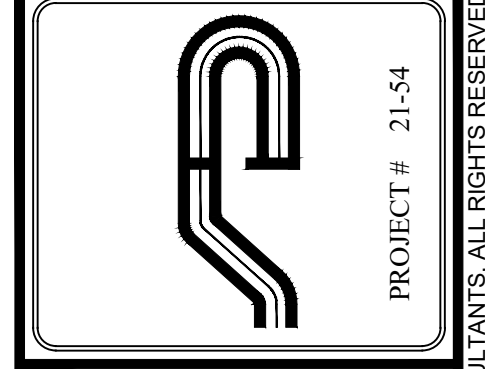
LEGEND

- 222 --- EXISTING GRADING
- x 222.8 EXISTING SPOT GRADE
- 200 --- PROPOSED GRADING
- --- PROPERTY LINE / RIGHT OF WAY
- - - - - EDGE OF WETLAND
- - - - - 100' WETLAND BUFFER
- ⊙ EXISTING FIRE HYDRANT
- --- PROPOSED DRAINAGE LINE
- --- PROPOSED CATCH BASIN
- ⊙ PROPOSED DRAINAGE MANHOLE
- --- PROPOSED HEADWALL WITH RIP RAP
- RD PROPOSED ROOF DRAIN
- --- PROPOSED HOUSE AND DRIVE
- --- PROPOSED RETAINING WALLS

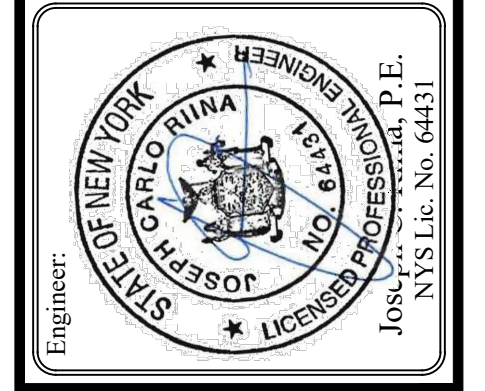


SCALE: 1"=20'-0"

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Revisions:

No.	Date	Comments
1	6/27/22	Town Comments
2	11/23/22	Rev. Tree Removal
3	3/10/23	Town Comments

SCALE: 1" = 20'

DRAWN BY: TK

DATE: 03-12-22

SITE PLAN

SITE PLAN PREPARED FOR
PAUL EISENBERG
 47 WINDMILL ROAD
 Town of North Castle, Westchester County, New York

NOTE:
 1. THIS IS NOT A SURVEY. ALL SURVEY INFORMATION SHOWN ON THIS PLAN HAS BEEN TAKEN FROM A SURVEY MAP PREPARED BY TC MERRITS LAND SURVEYORS, DATED 11/05/20. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR ITS ACCURACY.

NOTE: UNAUTHORIZED ALTERATIONS OR ADDITIONS TO THIS DRAWING IS A VIOLATION OF SECTION 7209 (2)(f) OF THE NEW YORK STATE EDUCATION LAW.

GENERAL EROSION CONTROL NOTES:

- Contractor shall be responsible for compliance with all sediment and erosion control practices. The sediment and erosion control practices are to be installed prior to any major soil disturbances, and maintained until permanent protection is established. Road surface flows from the site should be dissipated with tracking pad or appropriate measures during adjacent road shoulder regrading. Contractor is responsible for the installation and maintenance of all soil erosion and sedimentation control devices throughout the course of construction.
- Catch basin inlet protection must be installed and operating at all times until tributary areas have been stabilized. When possible flows should be stabilized before reaching inlet protection structure. Timely maintenance of sediment control structures is the responsibility of the Contractor.
- All structures shall be maintained in good working order at all times. The sediment level in all sediment traps shall be closely monitored and sediment removed promptly when maximum levels are reached or as ordered by the engineer. All sediment control structures shall be inspected on a regular basis, and after each heavy rain to insure proper operation as designed. An inspection schedule shall be set forth prior to the start of construction.
- The locations and the installation times of the sediment capturing standards shall be as specified in these plans, as ordered by the Engineer, and in accordance with the latest edition of the "New York Standards and Specifications for Erosion and Sediment Control" (NYSSESC).
- All topsoil shall be placed in a stabilized stockpile for reuse on the site. All stockpile material required for final grading and stored on site shall be temporarily seeded and mulched within 7 days. Refer to soil stockpile details.
- Any disturbed areas that will be left exposed more than 7 days and not subject to construction traffic, shall immediately receive temporary seeding. Mulch shall be used if the season prevents the establishment of a temporary cover. Disturbed areas shall not be limed and fertilized prior to temporary seeding.
- All disturbed areas within 500 feet of an inhabited dwelling shall be wetted as necessary to provide dust control.
- The contractor shall keep the roadways within the project clear of soil and debris and is responsible for any street cleaning necessary during the course of the project.
- Sediment and erosion control structures shall be removed and the area stabilized when the drainage area has been properly stabilized by permanent measures.
- All sediment and erosion control measures shall be installed in accordance with current edition of NYSSESC.
- All regraded areas must be stabilized appropriately prior to any rock blasting, cutting, and/or filling of soils. Special care should be taken during construction to insure stability during maintenance and integrity of control structures.
- Any slopes graded at 3:1 or greater shall be stabilized with erosion blankets to be staked into place in accordance with the manufacturers requirements. Erosion blankets may also be required at the discretion of Town officials or Project Engineer. When stabilized blanket is utilized for channel stabilization, place all of the volume of seed mix prior to laying net, or as recommended by the manufacturer.
- To prevent heavy construction equipment and trucks from tracking soil off-site, construct a pervious crushed stone pad. Locate and construct pads as detailed in these plans.
- Contractor is responsible for controlling dust by sprinkling exposed soil areas periodically with water as required. Contractor to supply all equipment and water.
- Contractor shall be responsible for construction inspections as per NYSDEC GP-0-20-001 and Town of North Castle Code.

MAINTENANCE OF TEMPORARY EROSION AND SEDIMENT CONTROL STRUCTURES:

- N.Y.S.D.E.C. GP-0-20-001 EXPOSURE RESTRICTIONS - States that any exposed earthwork shall be stabilized in accordance with the guidelines of this plan.
- Trees and vegetation shall be protected at all times as shown on the detail drawing and as directed by the Engineer.
 - Care should be taken so as not to channel concentrated runoff through the areas of construction activity on the site.
 - Fill and site disturbances should not be created which causes water to pond off site or on adjacent properties.
 - Runoff from land disturbances shall not be discharged or have the potential to discharge off site without first being intercepted by a control structure, such as a sediment trap or silt fence. Sediment shall be removed before exceeding 50% of the retention structure's capacity.
 - For finished grading, adequate grade shall be provided so that water will not pond on lawns for more than 24 hours after rainfall, except in swale flow areas which may drain for as long as 48 hours after rainfall.
 - All swales and other areas of concentrated flow shall be properly stabilized with temporary control measures to prevent erosion and sediment travel. Surface flows over cut and fill areas shall be stabilized at all times.
 - All sites shall be stabilized with erosion control materials within 7 days of final grading.
 - Temporary sediment trapping devices shall be removed from the site within 30 days of final stabilization.

MAINTENANCE SCHEDULE:

	DAILY	WEEKLY	MONTHLY	AFTER RAINFALL	NECESSARY TO MAINTAIN FUNCTION	AFTER APPROVAL OF INSPECTOR
SILT FENCE	---	INSP.	INSP.	INSP.	CLEAN/REPLACE	REMOVE
WHEEL CLEANER	CLEAN	---	---	---	REPLACE	REMOVE
INLET PROTECTION	---	INSP.	INSP.	CLEAN	REPLACE	REMOVE

MAINTENANCE OF PERMANENT CONTROL STRUCTURES DURING CONSTRUCTION:

The stormwater management system and outlet structure shall be inspected on a regular basis and after every rainfall event. Sediment build up shall be removed from the inlet protection regularly to insure detention capacity and proper drainage. Outlet structure shall be free of obstructions. All piping and drain inlets shall be free of obstruction. Any sediment build up shall be removed.

MAINTENANCE OF CONTROLS AFTER CONSTRUCTION:

Controls (including respective outlet structures) should be inspected periodically for the first few months after construction and on an annual basis thereafter. They should also be inspected after major storm events.

DEBRIS AND LITTER REMOVAL:

Twice a year, inspect outlet structure and drain inlets for accumulated debris. Also, remove any accumulations during each mowing operation.

STRUCTURAL REPAIR/REPLACEMENT:

Outlet structure must be inspected twice a year for evidence of structural damage and repaired immediately.

EROSION CONTROL:

Unstable areas tributary to the basin shall immediately be stabilized with vegetation or other appropriate erosion control measures.

SEDIMENT REMOVAL:

Sediment should be removed after it has reached a maximum depth of five inches above the stormwater management system floor.

CONSTRUCTION SEQUENCE:

REFER TO THE PLAN SET FOR ALL PLANS AND DETAILS WHICH RELATE TO CONSTRUCTION SEQUENCE.

- A LICENSED SURVEYOR MUST DEFINE INFRASTRUCTURE LOCATIONS, LIMITS OF DISTURBANCE, STORMWATER BASIN LIMITS, AND GRADES IN THE FIELD PRIOR TO START OF ANY CONSTRUCTION. LIMITS OF DISTURBANCE SHALL BE MARKED WITH THE INSTALLATION OF CONSTRUCTION OR APPROVED EQUAL.
- INSTALL ALL PERIMETER EROSION CONTROL MEASURES, CONSTRUCTION ENTRANCE AS SHOWN ON THE EROSION AND SEDIMENT CONTROL PLAN AND THE ASSOCIATED DETAILS.
- CUT AND CLEAR TREES WITHIN WORK AREA. TIMBERED TREES, WOOD CHIPS, AND STUMPS SHALL BE REMOVED OFF-SITE. STRIP SITE AND PLACE TOPSOIL IN STOCKPILE LOCATIONS SHOWN ON THE PLAN.
- START CONSTRUCTION OF PROJECT ACCESS POINTS, SET-UP STAGING AREAS AS SHOWN ON EROSION AND SEDIMENT CONTROL PLAN.
- BEGIN DEMOLITIONS, REMOVALS AND ROUGH GRADING THE SITE.
- ROUGH GRADE OF FOUNDATION FOR ADDITIONS. SOIL SHALL BE STOCKPILED AS SHOWN AND STABILIZED THE NEXT DAY IF THEY ARE TO BE LEFT ALONE FOR OVER SEVEN DAYS.
- BEGIN EXCAVATION OF BUILDING FOUNDATIONS, WALL, AND UTILITIES. PROTECT OPEN EXCAVATIONS. WHERE APPLICABLE, PLACE FILL ON THE UP-SLOPES AND SIDE EDGES OF FILL AREA. FILL SHOULD BE PUSHED IN PLACE AND STABILIZED WITH TRACKING PERPENDICULAR TO THE SLOPE. PLACE SOIL STOCKPILES IN LOCATIONS SHOWN ON THE EROSION AND SEDIMENT CONTROL PLANS AND ASSOCIATED DETAILS.
- BEGIN CONSTRUCTION OF THE HOUSE ADDITION.
- UPON COMPLETION OF FOUNDATION, BACKFILL TO GRADE AND IMMEDIATELY STABILIZE AREAS THAT WILL NOT RECEIVE TRAFFIC OR DISTURBANCE WITHIN SEVEN (7) DAYS.
- BEGIN INSTALLATION OF RETAINING WALLS. INSTALLATION OF STORMWATER MANAGEMENT SYSTEM SHALL NOT BE INSTALLED UNTIL ADJACENT WALLS HAVE BEEN COMPLETED.
- BEGIN INSTALLATION OF SUBSURFACE INFILTRATION CHAMBERS. BLOCK ENTRY INTO CHAMBERS UNTIL FINAL SITE STABILIZATION.
- BEGIN THE EXCAVATION AND INSTALLATION OF UTILITIES AND DRAINAGE SYSTEM. PROTECT TRENCHES AND OPEN EXCAVATIONS FROM EROSION. ALL DRAINAGE INLETS SHALL BE PROTECTED FROM SEDIMENT ENTERING. THERE SHALL BE NO DIRECT UNFILTERED DISCHARGE INTO THE STORMWATER SYSTEMS. THE STORMWATER OUTLET SHALL BE BLOCKED UNTIL ALL UPSTREAM AREAS HAVE BEEN PERMANENTLY STABILIZED.
- DURING BUILDING AND SITE CONSTRUCTION MAINTAIN AND RE-ESTABLISH AS REQUIRED EROSION CONTROL AND STABILIZATION MEASURES AS REQUIRED BY THE SITE PLAN AND DETAILS.
- TOPSOIL, RAKE, SEED AND MULCH ALL DISTURBED AREAS. ONCE ALL PROPOSED DISTURBANCES ARE COMPLETED, BEGIN FULL STABILIZATION OF THE SITE. ONCE THE SITE HAS BEEN STABILIZED, REMOVE ALL TEMPORARY EROSION CONTROL MEASURES. THIS SHALL BE DONE DURING OPTIMUM WEATHER CONDITIONS TO AVOID SEDIMENT TRANSPORT. A SITE SHALL BE CONSIDERED STABILIZED WHEN IT HAS A MINIMUM UNIFORM 80% PERENNIAL VEGETATION COVER OR OTHER PERMANENT NON VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION. ONCE FINAL STABILIZATION HAS BEEN ACHIEVED, UNBLOCK PIPING TO INFILTRATORS IN ORDER TO ALLOW FLOW TO ENTER.

WINTER STABILIZATION NOTES:

- IF CONSTRUCTION ACTIVITIES ARE EXPECTED TO EXTEND INTO OR OCCUR DURING THE WINTER SEASON THE CONTRACTOR SHALL ANTICIPATE PROPER STABILIZATION AND SEQUENCING. CONSTRUCTION SHALL BE SEQUENCED SUCH THAT WHEREVER POSSIBLE AREAS OF DISTURBANCE THAT CAN BE COMPLETED AND PERMANENTLY STABILIZED SHALL BE DONE BY APPLYING AND ESTABLISHING PERMANENT VEGETATIVE COVER BEFORE THE FIRST FROST. AREAS SUBJECT TO TEMPORARY DISTURBANCE THAT WILL NOT BE WORKED FOR AN EXTENDED PERIOD OF TIME SHALL BE TREATED WITH TEMPORARY SEED, MULCH, AND/OR EROSION BLANKETS.

TOPSOIL:

Existing topsoil will be removed and stored in piles sufficiently as to avoid mixing with other excavation. Stockpiles shall be surrounded by erosion control as outlined on these plans. The furnishing of new topsoil shall be of a better or equal to the following criteria (SS713.01 NYSDOT):

- The pH of the material shall be 5.5 to 7.6.
- The organic content shall not be less than 2% or more than 70%.
- Gradation:

SIEVE SIZE	% PASSING BY WGT.
2 INCH	100
1 INCH	85 TO 100
1/4 INCH	65 TO 100
NO. 200 MESH	20 TO 80

PERMANENT VEGETATIVE COVER:

- Site preparation:
 - Install erosion control measures.
 - Scarify compacted soil areas.
 - Lime as required to pH 6.5.
 - Fertilize with 10-6-4 4 lbs/1,000 S.F.
 - Incorporate amendments into soil with disc harrow.
- Seed mixtures for use on swales and cut and fill areas.

MIXTURE		LBS/ACRE
ALT. A	KENTUCKY BLUE GRASS	20
	CREeping RED FESCUE	28
	RYE GRASS OR REDTOP	5
ALT. B	CREeping RED FESCUE	20
	REDTOP	2
	TALL FESCUE/SMOOTH BLOOMGRASS	20
- SEEDING
 - Prepare seed bed by raking to remove stones, twigs, roots and other foreign material.
 - Apply soil amendments and integrate into soil.
 - Apply seed uniformly by cyclone seeder culti-packer or hydro-seeder at rate indicated.
 - Stabilize seeded areas in drainage swales.
 - Irrigate to fully saturate soil layer, but not to dislodge planting soil.
 - Seed between April 1st and May 15th or August 15th and October 15th.
 - Seeding may occur May 15th and August 15th if adequate irrigation is provided.

TEMPORARY VEGETATIVE COVER:

- SITE PREPARATION:**
- Install erosion control measures.
 - Scarify areas of compacted soil.
 - Fertilize with 10-10-10 at 400/acre.
 - Lime as required to pH 6.5.

SEED SPECIES:

MIXTURE	LBS/ACRE
Rapidly germinating annual ryegrass (or approved equal)	20
Perennial ryegrass	20
Cereal oats	36

SEEDING:
Same as permanent vegetative cover

CONTRACTOR CERTIFICATION STATEMENT

Certification Statement - All contractors and subcontractors as identified in a SWPPP, by the Owner or Operator, in accordance with Part III.A.5 of the SPDES General Permit for Stormwater Runoff from Construction Activity, GP-0-15-002, dated January 29, 2015, Page 10 of 40, shall sign a copy of the following Certification Statement before undertaking any construction activity at the Site identified in the SWPPP:

"I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the Qualified Inspector during a site inspection. I also understand that the Owner or Operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System ("SPDES") General Permit for Stormwater Discharge from Construction Activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings."

Individual Contractor: _____
 Name and Title (please print): _____
 Signature of Contractor: _____
 Company / Contracting Firm: _____
 Name of Company: _____
 Address of Company: _____
 Telephone Number / Cell Number: _____
 Site Information:
 Address of Site: _____

 Today's Date: _____

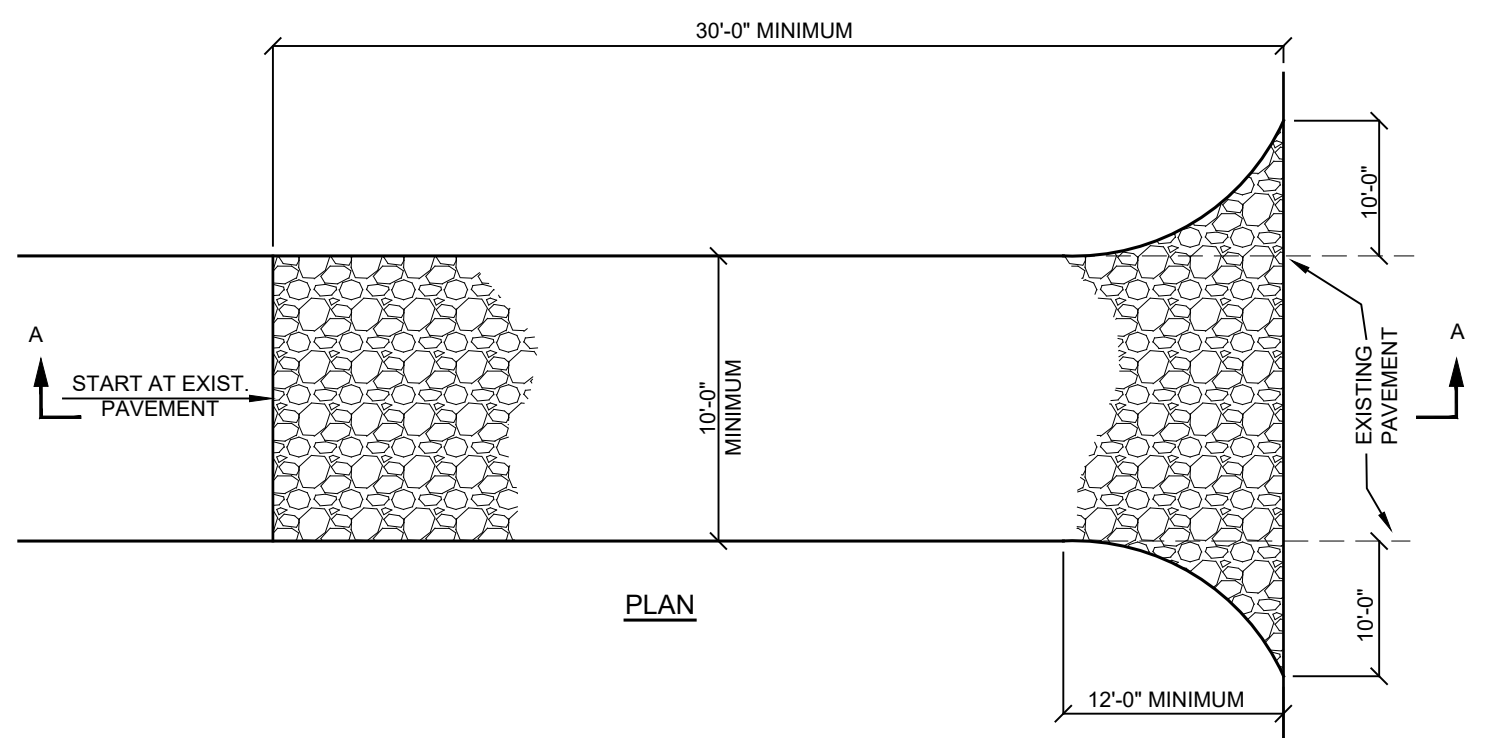
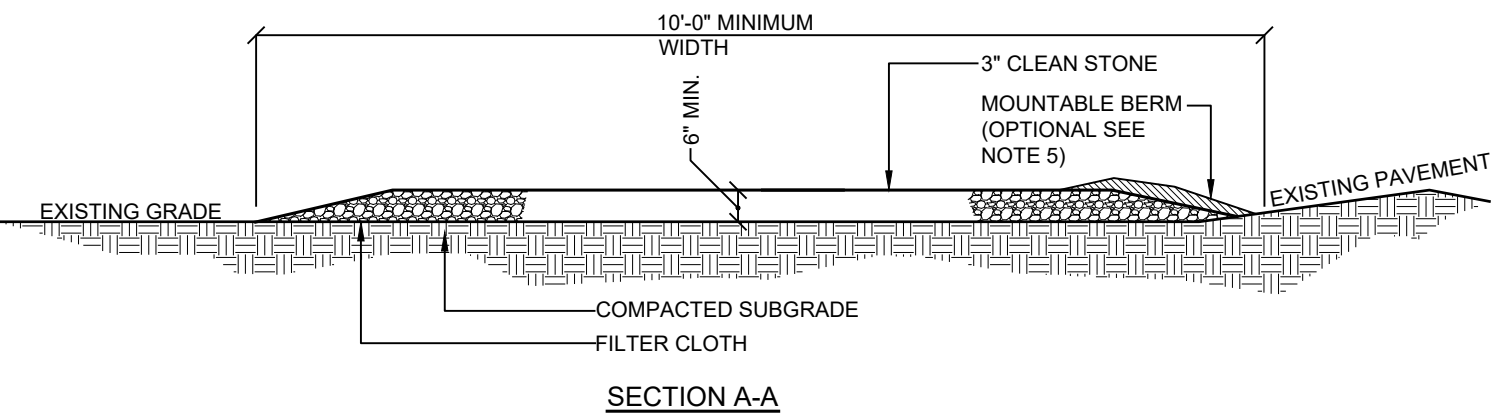
OWNER / OPERATOR CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. Further, I hereby certify that the SWPPP meets all Federal, State, and local erosion and sediment control requirements. I am aware that false statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law."

Name (please print): _____
 Title: _____
 Date: _____
 Address: _____
 Phone: _____
 E-mail: _____
 Signature: _____

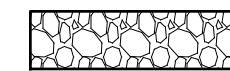
APPROVED BY THE TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION DATED: _____

Date: _____
 CHRISTOPHER CARTHY, CAHIRMAN,
 TOWN OF NORTH CASTLE PLANNING BOARD
 ENGINEERING PLANS REVIEWED FOR CONFORMANCE TO RESOLUTION:
 Date: _____
 JOSEPH M. CERMELE, PE
 KELLARD SESSIONS CONSULTING
 CONSULTING TOWN ENGINEERS

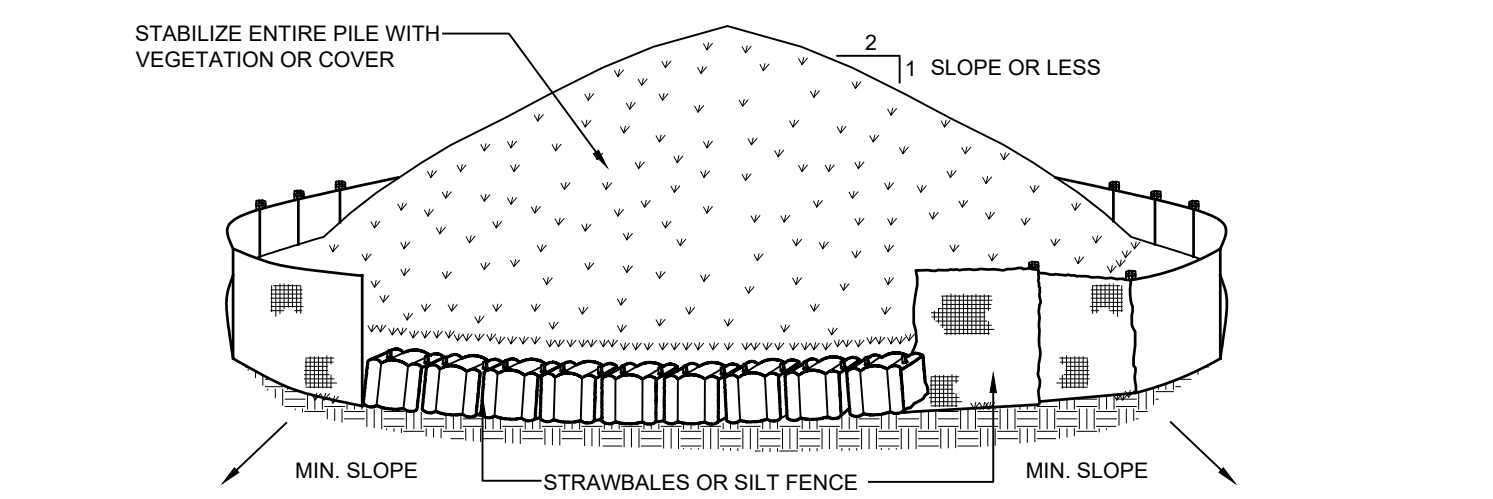


- INSTALLATION NOTES:**
- Stone size - use 3" min. Stone, or reclaimed or recycled concrete equivalent.
 - Length - as required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum length would apply).
 - Thickness - not less than six (6) inches.
 - Width - 10 foot minimum, but not less than the full width at points where ingress or egress occur. 24 ft if single entrance to site.
 - 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 right of way this may require periodic top dressing with additional stone as conditions demand and repair and/or cleanouts of any measures used to trap sediment. All sediment spilled, dropped, washed or tracked onto public right of way must be removed immediately.
 - Washing - wheels shall be cleaned to remove sediment prior to entrance onto public right 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.
 - Periodic inspection and needed maintenance shall be provided after each rain.

SYMBOL



E-4 STABILIZED CONSTRUCTION ENTRANCE DETAIL
NOT TO SCALE

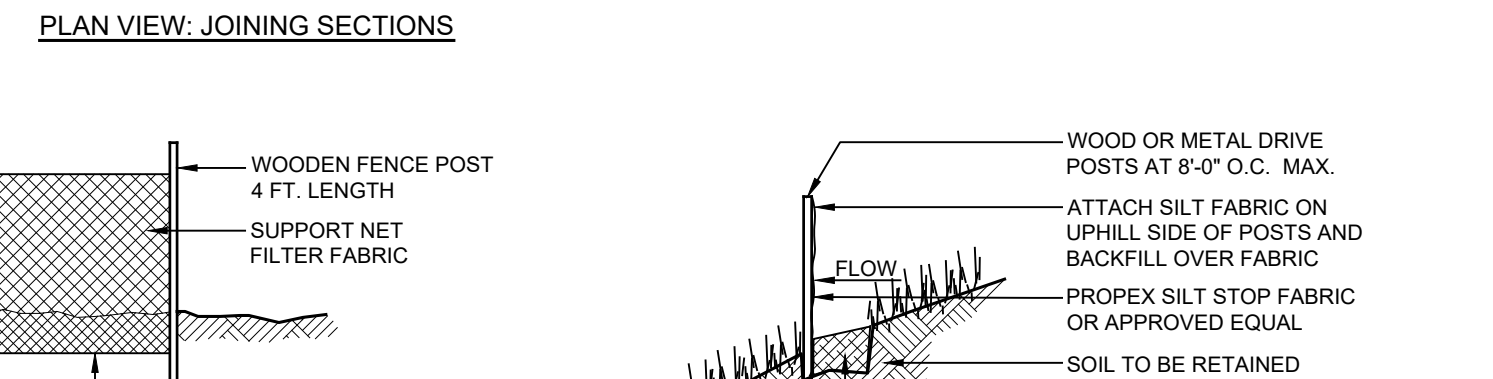
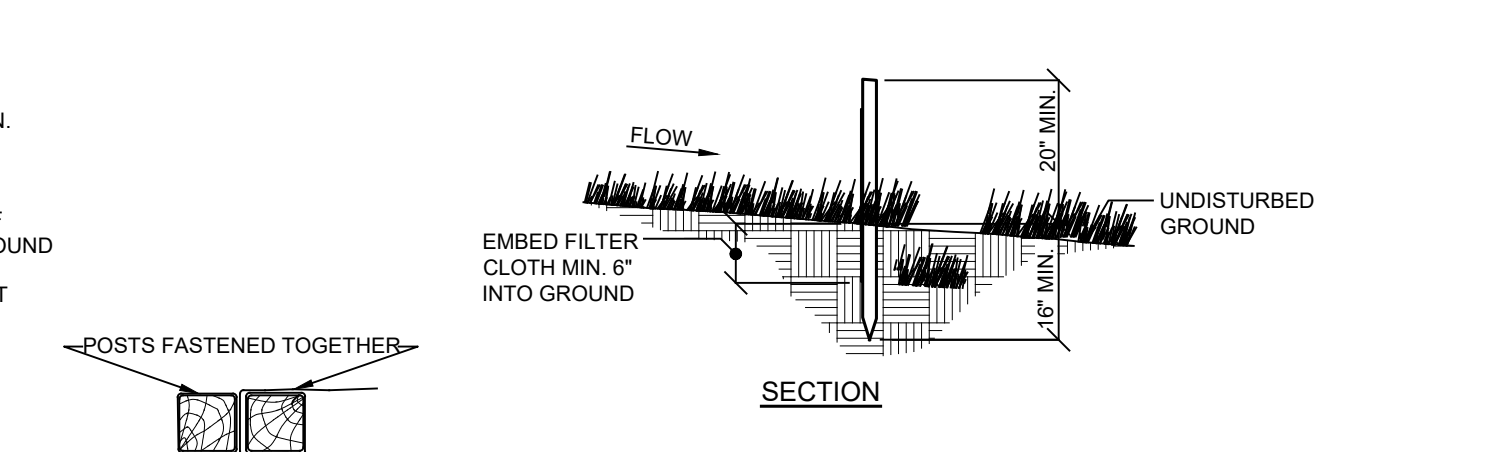


- NOTES:**
- Areas chosen for stockpiling operations shall be dry and stable.
 - Maximum slope of stockpile shall be 1:2.
 - Upon completion of soil stockpiling, each pile shall be surrounded with either silt fencing or strawbales, then stabilized with vegetation or covered.
 - See detail for installation of silt fence.

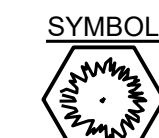
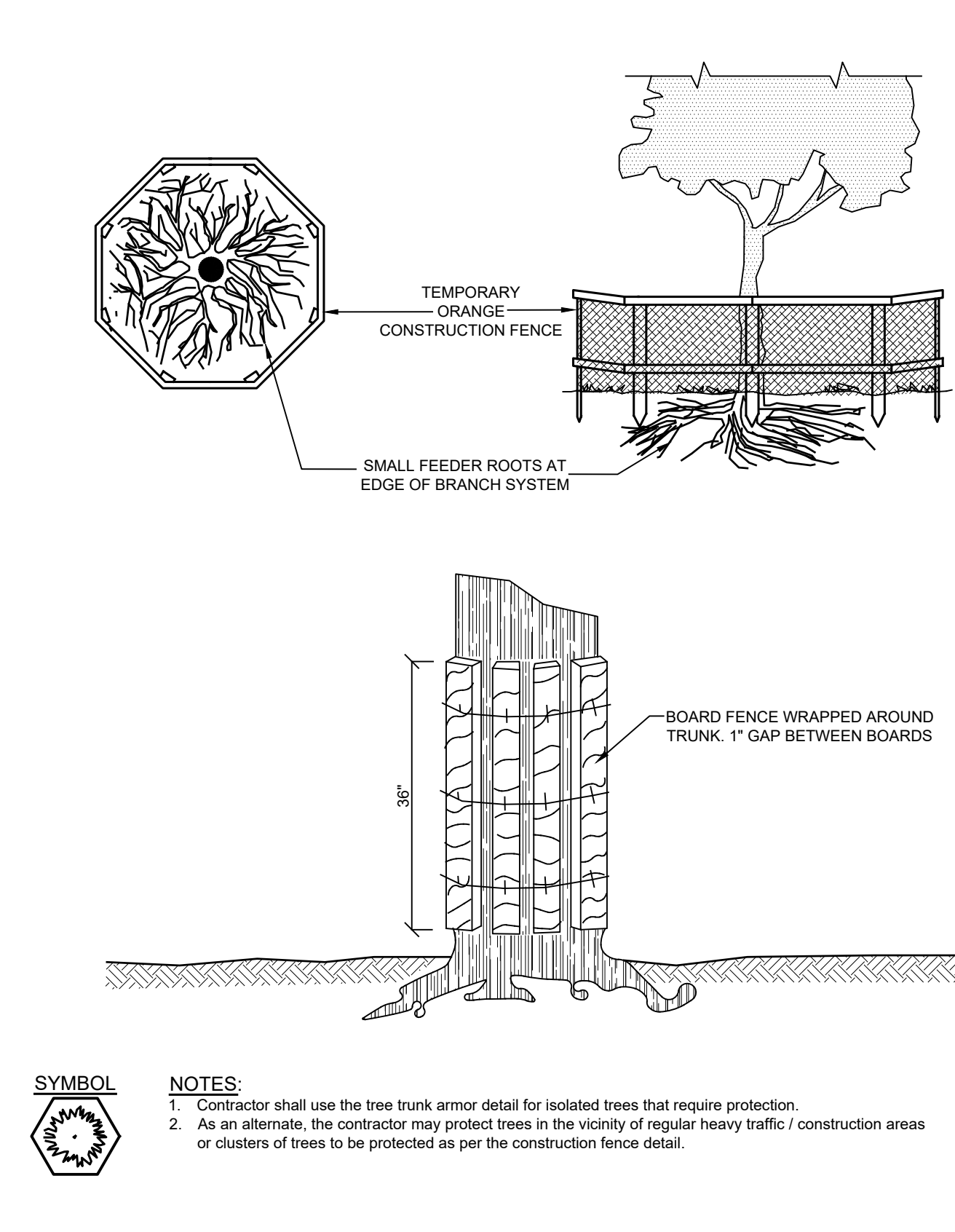
SYMBOL



E-5 SOIL STOCKPILE DETAIL
NOT TO SCALE

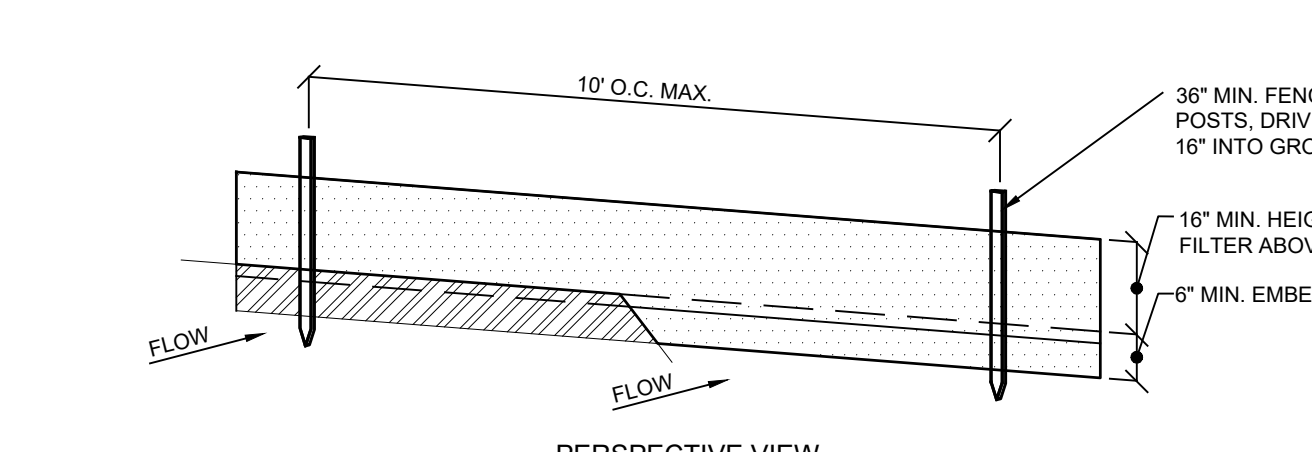


E-3 SILT FENCE DETAIL
NOT TO SCALE



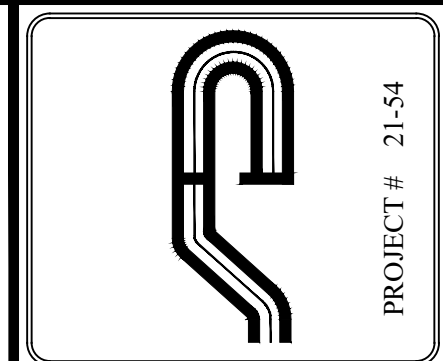
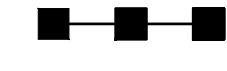
- NOTES:**
- Contractor shall use the tree trunk armor detail for isolated trees that require protection.
 - As an alternate, the contractor may protect trees in the vicinity of regular heavy traffic / construction areas or clusters of trees to be protected as per the construction fence detail.

E-1 TREE PROTECTION DETAIL
NOT TO SCALE

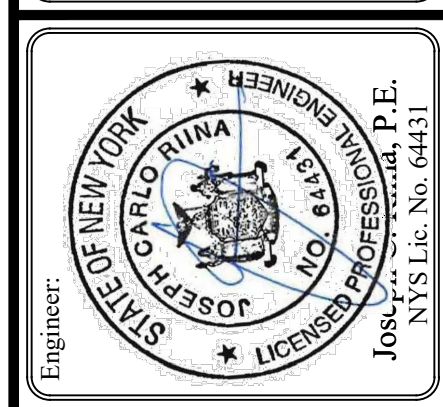


- NOTES:**
- Filter cloth to be fastened securely to post: steel either 1 or u type or 2" hardwood posts at top and mid section.
 - When two sections of filter cloth adjoin each other they shall be overlapped by 6 inches and folded. Filter cloth shall be miraf 100x, stabilinka t140n or approved equal.
 - Maintenance shall be performed as needed and material removed when "bulges" develop in the silt fence.
 - Excavate 4 inch trench along the lower perimeter of the site.
 - Unroll a section at a time and position the post against the back (downstream) wall of the trench (net side away from direction of flow).
 - Drive the post into the ground until the netting is approximately 2 inches from the trench bottom.
 - Lay the toe-in flap of fabric onto the undisturbed bottom of the trench, backfill the trench and tamp the soil. Steeper slopes require an intercept trench.
 - Join sections as shown above.

SYMBOL



Site Design Consultants
 Civil Engineers • Land Planners
 251-J Underhill Avenue, Yorktown Heights, NY 10598
 (914) 962-4488 - Fax: (914) 962-7386
 www.sitedesignconsultants.com



Revisions:

No.	Date	Comments
1	6/27/22	Town Comments
2	11/23/22	Rev. Use Removal
3	3/10/23	Town Comments

SCALE: NTS
 DRAWN BY: TK
 DATE: 03-12-22

E&SC NOTES AND DETAILS

SITE PLAN PREPARED FOR
PAUL EISENBERG
 47 WINDMILL ROAD
 Westchester County, New York

NOTE: UNAUTHORIZED ALTERATIONS OR ADDITIONS TO THIS DRAWING IS A VIOLATION OF SECTION 1209 (2) OF THE NEW YORK STATE EDUCATION LAW.

MITIGATION PLANT LIST					
TREES					
KEY	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE AT PLANTING	SPACING AT PLANTING
AC	3	Amelanchier canadensis	Shadblo	6'-8", B&B	12' o.c.
AR	3	Acer rubrum	Red Maple	2"-2-1/2" cal., B&B	20' o.c.
AS	2	Acer saccharum	Sugar Maple	2"-2-1/2" cal., B&B	as shown
CC	2	Cercis canadensis	Eastern Redbud	2"-2-1/2" cal., B&B	12' o.c.
HV	2	Hamamelis virginiana	Witch Hazel	6 gal. container	as shown
PG	3	Picea glauca	White Spruce	7'-8" ht., B&B	15' o.c.
QP	2	Quercus palustris	Pin Oak	2"-2-1/2" cal., B&B	20' o.c.

SHRUBS					
KEY	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE AT PLANTING	SPACING AT PLANTING
AA	7	Aronia arbutifolia	Red Chokeberry	3 gal. container	5' o.c.
AM	8	Kalmia latifolia	Mountain Laurel	3'-4" ht.	8' o.c.
KL	4	Lindera latifolia	Spicebush	3 gal. container	6' o.c.
LF	6	Leucothoe fontanesiana	Fetterbush	3 gal. container	6' o.c.
PJM	6	Rhododendron PJM	PJM Rhododendron	3 gal. container	5' o.c.

HERBACEOUS PLANTS					
KEY	QUANTITY	BOTANICAL NAME	COMMON NAME	CONTAINER SIZE	SPACING
dp	54	Dennstaedtia punctiloba	Hay-Scented Fern	1 gal. container	3' o.c.
pa	54	Polystichum acrostichoides	Christmas Fern	1 gal. container	3' o.c.

SEED MIXES				
ERNMX-105	1 lb.	Mesic to Dry Native Pollinator Mix		
ERNMX-181	1 lb.	Native Steep Slope Mix w/Annual Ryegrass		

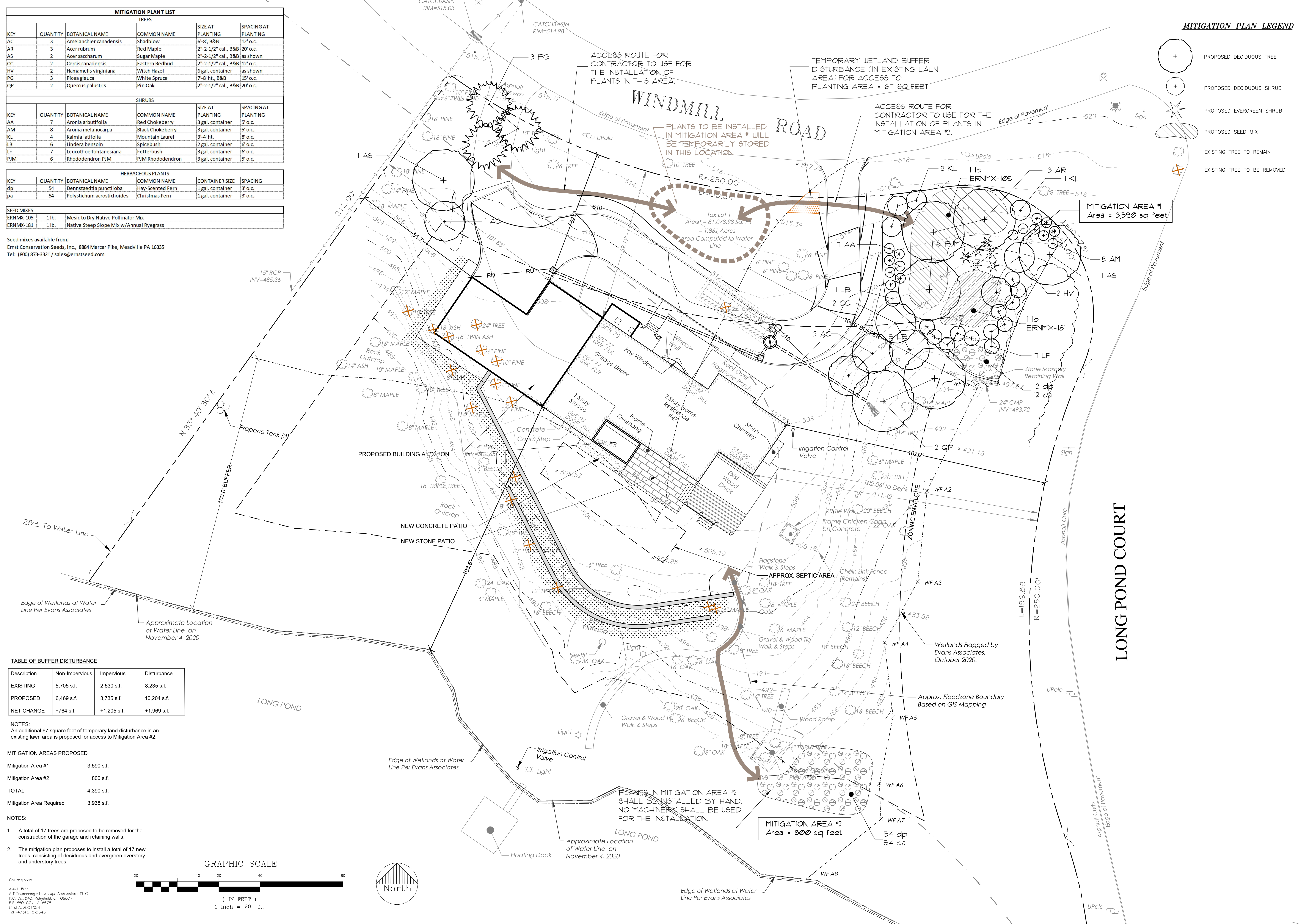
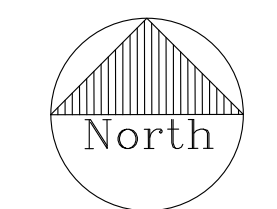
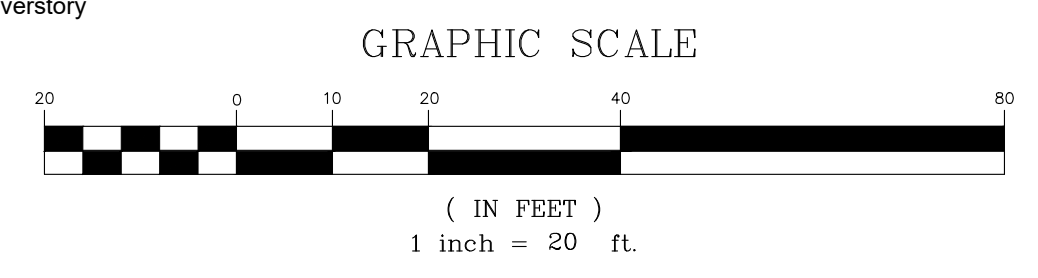
Seed mixes available from:
 Ernst Conservation Seeds, Inc., 8884 Mercer Pike, Meadville PA 16335
 Tel: (800) 873-3321 / sales@ernstseed.com

TABLE OF BUFFER DISTURBANCE			
Description	Non-impervious	Impervious	Disturbance
EXISTING	5,705 s.f.	2,530 s.f.	8,235 s.f.
PROPOSED	6,469 s.f.	3,735 s.f.	10,204 s.f.
NET CHANGE	+764 s.f.	+1,205 s.f.	+1,969 s.f.

NOTES:
 An additional 67 square feet of temporary land disturbance in an existing lawn area is proposed for access to Mitigation Area #2.

MITIGATION AREAS PROPOSED	
Mitigation Area #1	3,590 s.f.
Mitigation Area #2	800 s.f.
TOTAL	4,390 s.f.
Mitigation Area Required	3,938 s.f.

NOTES:
 1. A total of 17 trees are proposed to be removed for the construction of the garage and retaining walls.
 2. The mitigation plan proposes to install a total of 17 new trees, consisting of deciduous and evergreen overstory and understory trees.



MITIGATION PLAN LEGEND

- PROPOSED DECIDUOUS TREE
- PROPOSED DECIDUOUS SHRUB
- PROPOSED EVERGREEN SHRUB
- PROPOSED SEED MIX
- EXISTING TREE TO REMAIN
- EXISTING TREE TO BE REMOVED

CONSULTANTS:
 PROJECT ENGINEER:
 Site Design Consultants
 Civil Engineers • Land Planners
 251-F Underhill Avenue
 Yorktown Heights, NY 10598
 Ph: 914-962-4488
 Fx: 914-962-7386

ISSUED:
 Rev. as per comments of
 Ping Bd & Town Consultant 11/22/2022
 Added access routes to
 proposed mitigation areas 03/10/2023

OWNERSHIP AND USE OF DOCUMENTS
 UNAUTHORIZED ALTERATIONS AND ADDITIONS TO
 THIS DRAWING IS A VIOLATION OF SECTION 7209(2) OF
 THE NEW YORK STATE EDUCATION LAW.
 No part of these drawings shall be copied, disclosed to others
 or used in connection with any work or project other than for
 which they have been prepared without the express written
 consent of the licensed professional who prepared the
 document.

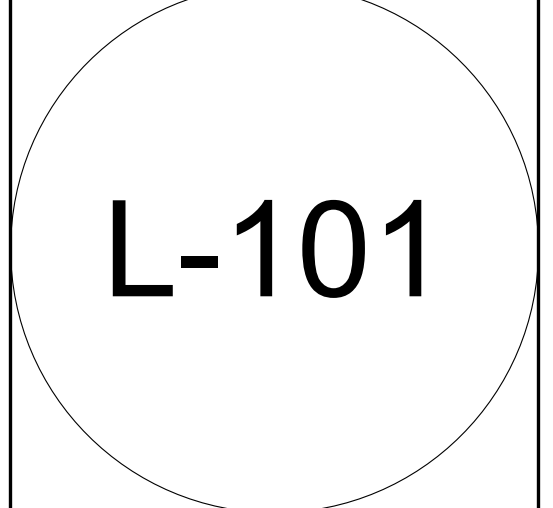


PROJECT NAME:
EISENBERG PROPERTY
 47 Windmill Road
 Armonk, New York 10504

ENGINEER & LANDSCAPE ARCHITECT:
ALP ENGINEERING
 & LANDSCAPE ARCHITECTURE, PLLC
 P.O. Box 843 Ridgefield, CT 06877
 Direct Tel: (475) 215-5343 Cell: (203) 710-0587

Drawing Title:
Mitigation Planting Plan

Date: September 12, 2022
 Dwn. by: alp
 ID: 47 Windmill_03-10-2023



LONG-TERM WETLAND MONITORING & MAINTENANCE PLAN FOR 47 WINDMILL ROAD

1. Wetland Monitoring & Maintenance Plan

- The purpose of the Wetland Monitoring & Maintenance Plan is to ensure that development in the wetland buffer does not compromise the functional integrity of the wetland buffer, ponds or wetlands and resulting mitigation meets its stated goals as described in the Final Resolution adopted by the Town of North Castle “Town” Planning Board for (the “Permittee”).

2. Protocol for Commencement of Wetland Monitoring & Maintenance Plan

- Permittee shall implement the mitigation plan (wetland plantings) approved by the Town Planning Board.
- Following the installation of all wetland mitigation in accordance with the Final Resolution and plans adopted by the Planning Board, the Permittee shall submit two (2) copies of the following:
 - Certification from a Qualified Environmental Consultant (“Consultant”) approved by the Planning Board or its designee verifying the proper installation of all plants and materials in accordance with the approved Planning Board Resolution. The Consultant shall note any deficiencies in the installation of the plant materials or deviations from the approved resolution so that these can be corrected before final approval.
 - As-Built plan prepared by a Licensed Engineer or Licensed Surveyor detailing the (1) location of plantings and (2) number of species of individual plants.
 - The monitoring period shall begin with the review of all required submitted information/materials and final written approval by the Town’s Wetland Consultant and continue for a period of 3 years.

3. Assurances

- All plantings and seed mixture applications in conjunction with the mitigation work shall be accomplished in accordance with the approved drawings and completed within the first growing season after site clean-up is complete and topsoil is re-spread on the disturbed areas to be re-vegetated.
- The Permittee shall ensure that all plants in conjunction with the wetland mitigation plan shall have a minimum 85% survival rate of installed plants, which must be met or exceeded at the end of the second growing season following the

initial planting/seeding. If the 85% survival rate is not met at the end of the second growing season, the Permittee shall take all necessary measures to ensure the level of survival by the end of the next growing season, including replanting and re-grading with topsoil, if necessary. Continue the program for the full term of the 3 years after planting.

4. Monitoring Reports

- The purpose of the mitigation monitoring and maintenance reports shall be to: (1) evaluate the progress of the establishment of the mitigation areas, (2) assess compliance with plant survival and plant condition requirements, and (3) identify those aspects of the mitigation areas that may require remediation by the Permittee in order to achieve the mitigation objectives.
- Permittee shall submit the mitigation monitoring and maintenance reports prepared by a Licensed Landscape Architect (or an environmental professional approved by the Town of North Castle) annually no later than November 1st to the Town's Wetland Consultant for review.
- Information for said reports shall be collected a minimum of 5 times: once prior to construction; once immediately post-construction; and annually for 3 years post-construction between the months of June 1st and September 1st.
- Minimum requirements for monitoring reports:
 - Identification of the number of surviving approved plants and area coverage at the time of the observation. The report should detail the condition, vigor, size (dbh) of all planted material and compliance with the approved Planning Board Resolution.
 - Color photographs from established stations approved by the Town's Wetland Consultant showing representative conditions in the mitigation areas taken annually during the designated period defined above.
 - An estimate of the vegetative cover in the mitigation areas, noting, in particular, areas which are bare of vegetation and/or locations where erosion and sedimentation are occurring; or where invasive plant species have become established. Aerial coverage of invasive plant species must be less than 15% of the total wetland mitigation area on the site.
 - A qualitative analysis of the extent to which the mitigation has been successful. Said reports shall note areas of deficiencies and/or non-

compliance and provide recommendations/measures to be taken to ensure continued success of the mitigation efforts and soil stabilization.

5. Completion of Monitoring Period

- Final Report submitted by the Permittee and certified by the Permittee's Consultant.
- The Town's Wetland Consultant will review the submitted material and perform an inspection of the site for conformance with the approved Planning Board Resolution and As-Built Plans. Upon review and inspection, the Town's Wetland Consultant shall submit written approval to the Planning Board.
- A Monitoring Data Form (in Report) shall be filled out that includes the above information and the following information, if applicable:
 - The vegetative cover shall be comprised of native species (not invasive species), whether planted or resulting from natural colonization. If vegetative cover is less than 85%, replanting shall occur with native species which have survived and show good vigor within the wetland buffer mitigation planting areas.
 - Elimination of invasive plant species within the mitigation areas and extending 20 feet beyond the mitigation areas. Permittee shall demonstrate 100% removal of target species at initial treatment. Ongoing removal shall be demonstrated at each inspection period. Target species shall be tested, as necessary, to prevent re-establishment, including, but not limited to, Japanese Barberry (*Barberis thunbergii*), Common Reed (*Phragmites australis*), Bittersweet (*Celastrus orbiculatus*), Multiflora Rose (*Rosa multiflora*), Porcelain Berry (*Ampelopsis brevipedunculata*), Autumn Olive (*Elaeagnus umbellata*), Winged Euonymus (*Euonymus alatus*) and Garlic Mustard (*Alliaria petiolata*). It is incumbent on the Permittee to remove such invasive species during the appropriate season in which removal is optimal. Hand removal of any deformed, diseased or otherwise unhealthy plantings and replacement "in kind" as necessary to meet the 85% survival threshold.

6. Pesticide and fertilizer use is restricted within the 100' wetland buffer from the edge of the wetland line, except for those products which are permitted by the NYSDEC.



Town of North Castle Building Department

17 Bedford Road

Armonk, New York 10504-1898

Telephone: (914) 273-3000 ext. 44 Fax: (914) 273-3554

www.northcastleny.com

Floodplain Development Permit Application

Section I- PROJECT ADDRESS: 47 Windmill Road DATE: 6/21/22

Section II- CONTACT INFORMATION: (Please print clearly. All information must be current)

APPLICANT: Paul Eisenberg

ADDRESS: 47 Windmill Road

PHONE: 917-628-8269 MOBILE: _____ EMAIL: paul@rcgtower.com

PROPERTY OWNER: Paul Eisenberg

ADDRESS: 47 Windmill Road

PHONE: 917-628-8269 MOBILE: _____ EMAIL: paul@rcgtower.com

Architect/ Engineer: Joseph Riina

ADDRESS: 251-F Underhill Ave

PHONE: 914-962-4488 MOBILE: _____ EMAIL: jriina@sitedesignconsultants.com

Section III- DESCRIPTION OF WORK:

~~It is proposed to add an addition onto an existing house for a garage. A new Driveway entrance and retaining walls will also be part of the project. The walls to be installed will create a more usable area behind the house.~~

Section IV- STRUCTURAL DEVELOPMENT AND OTHER ACTIVITIES: (Check all that apply)

- Relocation New Structure Residential (1 & 2 Family) Demolition Alteration Addition
- Multi Family Non residential (Flood Proofing?) Grading Property(Up to 6") Filling Property Excavation
- Water Course Alteration (Including Dredging or Channel Modifications) Drainage Improvements (Including Culvert Work)
- Road, Street, Or Bridge Construction Subdivision Water & Sewer Installation
- Other (Please Specify) _____

Section V- PERMIT FEES: (\$250 and a \$500 escrow if required)

ESTIMATED COST OF CONSTRUCTION (Based on fair market value labor & material) \$ _____

Town of North Castle Building Department

Section VI- (Continued)

AFFIDAVIT OF CONSTRUCTION COST: This affidavit must be completed by the Design Professional if the estimated cost is \$20,000 or more.

I _____ do hereby affirm and certify as follows: (i) I am the architect/engineer (circle one) licensed by the State of New York; (ii) I have reviewed the plans, drawings and specifications for this application and am fully familiar with the proposed construction; (iii) based on my experience, I estimate the total cost of construction including all labor, all materials, all professional fees and all associated costs to be approximately \$ _____, and (iv) pursuant to Penal Law 210.45, I acknowledge that a false statement made knowingly is a Class A misdemeanor.

Signature: _____ Date: _____



Section VII- GENERAL PROVISIONS: (Applicant read and sign)

1. No Work of any kind may start until a permit is issued.
2. The Permit may be revoked if any false statements are made herein.
3. If revoked, all work must cease until permit is re-issued.
4. Development shall not be used or occupied until a Certificate of Compliance is issued.
5. The permit will expire if no work is commenced within 12 months of issuance.
6. Applicant is hereby informed that other permits may be required to fulfill local, state and federal regulatory requirements.
7. Applicant hereby gives consent to the Local Administrator or his/her representative to make reasonable inspections required to verify compliance.

THE APPLICANT, CERTIFY THAT ALL STATEMENTS HEREIN AND IN ATTACHMENTS TO THIS APPLICATION ARE, TO THE BEST OF MY KNOWLEDGE, TRUE AND ACCURATE.

(APPLICANT'S SIGNATURE) _____ DATE _____

OFFICE USE ONLY

Flood Plain Determination (To be completed by Local Administrator)

Section VIII- FIRM PANEL: (All Panels Dated September 28, 2007)

The proposed development is located on Firm Panel No. (Choose one)

- 162F 163F 164F 166F 167F 168F 169F 186F 188F 257F
 259F 267F 277F 279F 281 F 286F

Is the proposed development in or adjacent to a Special Flood Hazard Area? Yes No

The property is located in Firm Zone _____.

Town of North Castle Building Department

OFFICE USE ONLY

Flood Plain Determination (To be completed by Local Administrator)

Section VIII- FIRM PANEL: (Continued)

The 100 year flood elevation at this site is _____ ft. NAVD. Height not determined

Is the proposed development located in a floodway? Yes No

Section IX- ADDITIONAL INFORMATION REUIRED: (Check all that apply)

Subm. N/A

- A site plan showing the location of all existing structures, water bodies, adjacent roads, lot dimensions, and proposed development.
- Development plans, drawn to scale, and specifications, including where applicable: details for anchoring structures, proposed elevation of lowest floor (including basement), types of water-resistant materials used below the first floor, details of flood proofing of utilities located below the first floor, and details of enclosures below the first floor.
Also, _____
- Subdivision or other development plans. (If the subdivision or other development exceeds 50 lots or 5 acres, whichever is lesser, the applicant must provide "100-year" flood elevations if they are not otherwise available).
- Plans showing the extent of watercourse relocation and/or landform alterations.
- Change in water elevation (in feet) _____. Meets ordinance limits on elevation increases [] YES [] NO
- Top of new compacted fill elevation _____ ft. NGVD (MSL).
- Flood proofing protection level (non-residential only) _____ ft. NGVD (MSL). For flood proofed structures, applicant must attach certification from registered engineer or architect.
- Certification from a registered engineer that the proposed activity in a regulatory floodway will not result in any increase in the height of the "100-year" flood. A copy of all data and hydraulic/hydrologic calculations supporting this finding must also be submitted.
- Other: _____

If Box B is checked, the Local Administrator will provide a written summary of deficiencies. Applicant may revise and resubmit an application to the Local Administrator or may request a hearing from the Board of Appeals.

Section X- PERMIT DETERMINATION:

Is the structure within the flood plain? Yes No

I have determined that the proposed activity: A. Is

B. Is Not

In conformance with Town of North Castle code Chapter 177-Flood Damage Prevention. – Flood Damage Prevention, the permit is issued subject to the conditions attached to and made part of this permit.

SIGNED _____ DATE _____

If Box A is checked, the Local Administrator may issue a Development Permit upon payment of designated fee.

Town of North Castle Building Department

OFFICE USE ONLY

Flood Plain Determination (To be completed by Local Administrator)

Section XI- APPEALS BOARD

APPEALS: Appealed to the Town Board? Yes No
Hearing Date: _____
Town Board Decision - Approved? Yes No

Reasons/Conditions: _____

Section XII- AS-BUILT ELEVATIONS: (To be submitted by Applicant before Certificate of Compliance is issued)

1. Actual (As-Built) Elevation of the top of the lowest floor, including basement (in Coastal High Hazard Areas, bottom of lowest structural member of the lowest floor, excluding piling and columns) is: _____ FT. G NGVD 1929/ NAVD 1988 (MSL).
2. Actual (As-Built) Elevation of flood proofing protection is _____ FT. G NGVD 1929/ G NAVD 1988 (MSL)
Attach Flood proofing Certificate FEMA Form 81-65.

Section XIII- COMPLIANCE ACTION: (Inspections)

Date: _____ Inspector: _____ Deficiencies: Yes No
Date: _____ Inspector: _____ Deficiencies: Yes No
Date: _____ Inspector: _____ Deficiencies: Yes No

Section XIV- CERTIFICATE OF COMPLIANCE:

Signature: _____ Date: _____

STORMWATER MANAGEMENT PLAN

Prepared for
Paul Eisenberg
47 Windmill Road
Town of North Castle, NY

Prepared by:

Site Design Consultants
251F Underhill Avenue
Yorktown Heights, NY 10598
914-962-4488

Joseph C. Riina, P.E.
NYS Lic. No. 64431
CPESC No. 2670
CPSWQ No. 0073

March 2023



STORMWATER MANAGEMENT PLAN

Prepared for

Paul Eisenberg
47 Windmill Road
Town of North Castle, NY

Property Owner: Paul Eisenberg
47 Windmill Road
Armonk, NY 11598

Site Engineer: Joseph C. Riina, P.E.
NYS Lic. No. 64431
CPESC No. 2670
CPSQW No. 0073
jriina@sitedesignconsultants.com

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March 2023



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Appendices

Appendix A List of Required Approvals and Applications

- Town of North Castle Site Plan Approval - approval pending
- Town of North Castle Building Permit - approval pending;

Appendix B Regulatory Ordinances

- Local Ordinance - Town of North Castle Chapter 267 of the Town Code

Appendix C Construction Sequence

Appendix D Soil Testing Data

Appendix E Hydrologic Analysis

Appendix F Hydraulic Storm Sewer Capacity Analysis

Appendix G Stormwater Management Practices Design:

- Subsurface Stormwater Management System Volume Calculations

Appendix H Standard and Specifications for Erosion and Sediment Control Measures

Appendix I Project Plans

1.0 Project Description

The subject property is located at 47 Windmill Road, Town of North Castle, Westchester County, New York (see Figure 1.1 - Location Map and Figure 1.2 - Vicinity Map). The parcel is identified as tax lot 102.03-1-1 with a total area of 1.86 acres. The site is within the R-1.5A Single Family Residential zoning ordinance, which requires a minimum lot size of 1.5 acres. Topography varies greatly throughout the site with a total elevation difference of 44 feet. The highest contour elevation of 516 feet is located along the front of the property at Windmill Road and the lowest of 472 is located by the rear of the property along Long Pond. The parcel is already developed for residential use. Current coverage of the site consists of a two-story one-family residence, forested area, and grassed areas. A Pond is located at the rear of the property to the south. Along the eastern edge of the property is an existing wetland that is fed by a 24" culvert that discharges runoff from Windmill Road and the surrounding area. An existing driveway from windmill road on the western side of the property provides access to the existing residence.

The Proposed Project consists of building house additions on the southern and western side of the house as well as a driveway addition in front of the house with a circular turnaround area. The existing drainage system in the driveway which discharges directly to the pond at the rear will be removed and a new drainage system will be installed. This system will be connected to SC-160 subsurface infiltration chambers that will attenuate flows up to the 25-year storm for the new impervious surfaces and existing driveway. The total disturbance expected for the project is 0.36 acres.

As required by the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-20-001, Part IIIA.8, an historic resource screening determination was conducted. This was done using the online tools at the NYS Office of Parks, Recreation and Historic Places (OPRHP) website. This screening determined that there are no areas with historic or archeological sensitivity near the site. Figure 1.3 - NYS OPRHP Historic Resource Map was created from the website showing sensitive areas in Town of North Castle.

The following Report and Plans included in Appendix I describe, in detail, the design and implementation of the Stormwater Management Plan.

2.0 Stormwater Regulatory Requirements

2.1 Stormwater Impacts

Urban stormwater impacts relate to significant changes to stormwater quantity and quality as a result of land development. "Urban Development has a profound influence on the quality of New York's waters."¹ This proposed development will change the runoff characteristics of this site altering the quantity and quality of the surface stormwater. The impacts of this must be mitigated by managing the stormwater prior to discharge. This would be accomplished by the capture and treatment of surface runoff prior to discharge.

¹ New York State Stormwater Management Design Manual, January 2015.

Development of a site alters the hydrology therefore changing the characteristics of the surface and groundwater discharge of runoff. Changing the surface conditions alters a site's natural ability to store, treat, or infiltrate runoff. The change also allows for the discharge of potentially damaging pollutants and sediments to adjoining water bodies. This can occur during the construction phase, and long-term after development. During the construction phase, graded, destabilized, areas are subject to erosion which can cause the displacement of sediment. After development, changes in the surface conditions, such as impervious surfaces, roofs and pavement, or lawn surfaces can generate pollutants which would be collected and discharged through runoff. Some of the pollutants of concern are: Total Suspended Solids (TSS); Biological Oxygen Demand (BOD); Total Phosphorus (TP); and Total Nitrogen (TN), as well as oil or grease, and chloride.

The most common sources of these pollutants from developed sites are atmospheric deposition, fertilizers, pesticides, and leaked discharges from vehicle. These pollutants would collect on these impervious surfaces and quickly wash off during even the smallest storm event.

In the planning and design of the development, stormwater will be managed to minimize potential impacts. A Stormwater Management and Pollution Prevention Plan will be prepared. This Plan will deal with all aspects of the stormwater management programs such as identifying potential pollutant sources, design of temporary and permanent features, implementation, and maintenance.

2.2 Regulatory Obligation

2.2.1 USEPA/NYSDEC

The Federal Government's Clean Water Act (CWA), Section 402 states "Stormwater discharges from certain construction activities are unlawful unless they are authorized by a National Pollutant Discharge Elimination System ("NPDES") permit or by a state permit program." New York State is a NPDES delegated State. The necessary permitting is administered through the State Pollutant Discharge Elimination System (SPDES) under the General Permit, GP-0-20-001, for Stormwater Discharges from Construction Activity. The Permit requires that any development meeting the disturbance thresholds listed in Tables 1 and 2 of Appendix B of the General Permit must prepare a SWPPP. Activities listed in Table 1 requires preparation of only an Erosion and Sediment Control Plan. Those listed in Table 2 would additionally require post-construction stormwater management practices. This project does not meet the threshold requiring filing a notice of intent (NOI) with the NYS DEC.

The Plan identifies the potential sources of pollution, and a design prepared and implemented to reduce pollutant loadings. This project will be required to prepare the following to be in compliance:

- Prepare an Erosion and Sediment Control Plan;
- Design and implement a stormwater management system to capture and attenuate all storm events up to the 25-year storm.

2.2.2 Local Municipality

Since the project disturbance is less than one acre, the filing of a Notice of Intent with the NYS DEC for compliance with General Permit 0-20-001 is not required. Therefore, the project only needs to comply with the provisions of the Town of North Castle Code Chapter 267 Stormwater Management. Therefore, the project must provide management of the 25-year storm event.

The technical standards providing guidance in the preparation of the E&SC and SWPPP are the latest revisions of the following:

- “New York Standards & Specifications for Erosion and Sediment Control” (NYSSESC) published by the Empire State Chapter of the Soil and Water Conservation Society; and;
- “New York State Stormwater Management Design Manual” prepared by the Center of Watershed Protection, for the NYS DEC;
- Town of North Castle - Town Code Chapter 267 Stormwater Management;

3.0 Reducing Pollutant Impacts

3.1 Sources of Impact

For this project, the potential for contamination of stormwater occurs both during construction and after the completion of development. The goal to achieve reduced impacts involves containment and treatment of the various pollutants.

The proposed project will require temporary sediment and erosion control measures. The greatest source of pollutants during these phases is the potential of soil erosion. The nature of the construction plan is to have exposed soils which can erode and potentially discharge to sensitive areas. During construction, existing vegetation is removed exposing soils. Also, stockpiling of soils takes place. These conditions if not stabilized, are subject to erosion during rainfall events and wind conditions. Sediment discharged to a wetland can destroy vegetation and habitat affecting the function of the wetland. This degradation potential can be irreversible and eliminate its function in the ecosystem. Increases in turbidity to open water bodies such as streams, ponds, etc., are an additional environmental impact.

The implementation of proper erosion control measures and sediment containment along with a planned construction sequence can minimize or eliminate these potential impacts. The selection and implementation of erosion and sediment practices are described in a later section of this Report.

3.2 Stormwater Management During Construction

The Erosion and Sediment Control plan will be implemented during all phases of construction until the completion of the project. This will minimize or eliminate the potential short-term adverse impacts which may occur during construction. After completion, the erosion and sediment control will become a maintenance plan to ensure that permanent erosion and sediment controls continue to function and prevent the transport of sediments.

The Erosion and Sediment Control plan includes the Sequence of Construction and designed measures to be installed, operated and maintained during all aspects of construction. The appropriate measures were selected and detailed in plan for implementation by the site contractor. The main objective of the plan is to prevent erosion from occurring by stabilization of the construction site where possible. Sediment controls are to be used as a containment system to allow the removal of sediment from runoff to the greatest extent possible before leaving the work site. Control methods and standards utilized are provided in the NYSSESC.

Potential sources of destabilization of the site have been determined so that proper measures will be used. The locations and methods designed for erosion and sediment control measures change as the construction sequence progresses. The priority is to stabilize disturbed areas subject to erosion and use containment and / or filtering practices where sediment may concentrate. Some of the practices and methods that will be used for this project are:

- Minimization of open disturbance by use of stabilizers such as seed, mulch, and erosion blankets, stone, etc. Areas not subject to construction traffic for extended periods will be temporarily stabilized.
- The work areas will be contained. Down grade perimeters will be lined with barriers such as silt fence, diversions, berms, etc.
- Where possible, clean stormwater will be diverted away or around the work site to reduce the amount of runoff requiring treatment.
- Sediment traps will be constructed where heavy concentrations of runoff may accumulate.
- Dust control measures will be maintained on-site such as water trucks.
- Runoff will be prevented from gaining erosive velocities on long slopes. This can be achieved with seed and mulch, erosion control blankets, curb dams and multiple rows of silt fence.
- Existing drainage structures will be protected from sediment-laden runoff.
- Regular weekly inspections and reports, if required, will be filed with the Operator by the Town.

Additional methods of practices may be employed dependent on the situation. The NYSSESC consists of NYS DEC accepted and recommended practices. The design requirements of temporary and permanent erosion and sediment control practices of this Manual have been followed.

Prior to completion of the project, all permanent structural features will be cleaned, restored, and re-vegetated as necessary. The erosion and sediment control phase of the project is complete when all work is finished, and all areas are stabilized.

3.3 Stormwater Management Post-Construction

The post-construction design of the project must be included in the Stormwater Pollution Prevention and Stormwater Management Plans to minimize or eliminate potential long-term adverse impacts which might be caused by surface runoff from the site. This will deal with the management of the stormwater upon completion and operation of the site. The plan will be an analysis of all potential impacts due to stormwater and the means of protecting adjoining water bodies.

The management plan begins with conceptual designs of the collection and conveyance system and the proposed treatment practices. The treatment practices are subject to different parameters and must be designed to best fit the site including

green infrastructure planning. Some of the limitations that may be encountered include soil types and properties, depth to groundwater or bedrock, distance to structures, and maintenance. A list of acceptable practices can be found in Chapters 3, 5, and 10 of the NYS Stormwater Design Manual (SMDM). Chapter 3 states "The Practices on this list are selected based on the following criteria:

1. Can capture and treat the full water quality volume (WQV)
2. Are capable of 80% TSS removal and 40% TP removal
3. Have acceptable longevity in the field
4. Have a pre-treatment mechanism."

Green Infrastructure Practices include:

- I. Preservation of Natural Resources
- II. Reduction of Impervious Cover
- III. Runoff Reduction Techniques

The five broad groups of standard stormwater management practices are:

- I. Stormwater Ponds
- II. Stormwater Wetlands
- III. Infiltration Practices
- IV. Filtering Practices
- V. Open-channel Practices

These practices "are presumed to meet water quality requirements set forth in this manual if designed in accordance with the sizing criteria presented in Chapter 4 and constructed in accordance with the performance criteria in Chapter 6."²

4.0 Site Characteristics

4.1 Soils

On-site soils were classified by using the USDA Natural Resources Conservation Service (NRCS) Websoil survey for Westchester County, NY, see Figure 4.1 - Soil Map.

The predominant soil type for this project is Charlton Chatfield, CsD. This soil is well drained. It has a depth to bedrock of over 6 feet. The Hydrologic classification of this soil is "B". These soils have a high infiltration rate when thoroughly wet. The erosion hazard level for these soils is moderate. These soil properties are essential in the design and proper construction management of the site. Independent soil tests were performed, and the results are located in the Appendix D of this Report.

- Chatfield-Charlton - Consists of well drained soils with 15 to 35 percent slopes. Typically, very rocky;

Deep Test Soil Logs and soil percolation test data are included in Appendix D of this Report. The locations of these deep soil tests are indicated on the Construction Drawings. On-site soil investigation and knowledge of the soil groups facilitated the selection of coefficient values used for the pre- and post-development

² Pg. 3-7 NYS Stormwater Management Design Manual, January 2015.

pollutant load scenarios. Additionally, curve numbers were determined for use in the analysis.

4.2 Hydrology

The proposed improvements will not significantly change the surface runoff patterns. Currently, the surface runoff pattern is in a North to South direction, toward the rear yard of the property where it borders Long Pond. The surface runoff pattern is a combination of shallow concentrated flow and channel flow from existing paved and pervious surfaces. The site consists of an existing residence, forested areas, and outdoor hardscapes. Additionally, there is an outlet pipe from Windmill Road on the property that feeds the existing wetland which drains to the pond that was excluded from the analysis due to insufficient information on the upstream conditions. The wetland that is fed by this pipe as well as the Long Pond will serve as the design lines for this project.

Under the proposed condition the general direction of the surface runoff will not be altered. Almost the entire amount of surface runoff from the additional impervious areas will be collected and attenuated. Since the land is developed, the predeveloped condition being analyzed is the existing site as it currently is with the proposed impervious being captured separately so that flows may be attenuated. Therefore, there will be a minor increase in the peak rate of runoff generated by the site for a given rainfall event. This will be mitigated with stormwater management practices.

In the planning, design and construction of the development, stormwater will be managed to minimize or eliminate potential off-site impacts. The proper implementation of temporary sediment and erosion control measures are used to achieve this goal. An Erosion and Sediment Control Plan has been established and will be implemented during construction until the completion of the project. The Erosion and Sediment Control Plan incorporates the sequence of construction and designed measures to be installed, operated and maintained during all aspects of each phase. The erosion and sediment controls are designed in accordance with the NYS Standards and Specifications for Erosion and Sediment Control.

5.0 Hydrologic Analysis

The method used to compute project runoff was the Soil Conservation Service TR-55. The basis for the analysis was the Type III, 24-hour storm, for the 1- year, 2- year, 10-year, 25-year storm event. The rainfall depth for the respective storm events are 2.8, 3.4, 4.3, 5.1, and 6.5. The runoff coefficient "CN" and Time of Concentration for existing and post-development conditions were computed using Standard TR-55 criteria.

5.1 Pre-Development Condition

As stated, the proposed site consists of an addition to the house and a addition to the patio area. Therefore, these areas along with the existing house will be considered as impervious surface for the site. Pre-development condition will include the current house, patio area, and forested areas on the site. This project was analyzed in its pre-developed condition in order to understand current drainage patterns. The contributing watersheds are shown on Figure 5.1 - Pre-Development Watershed Map.

The Drainage Basin sizes, curve numbers and travel times used in the analysis are summarized in the Table below:

Pre-Development Conditions Watershed Analysis Variables

Drainage Basin	Area (acres)	Curve Number CN	Travel Time, Tc (hrs)
DA-1	1.555	63	0.132

5.2 Post-Development Condition

A hydrologic analysis has been done for the site to determine the expected runoff depth for each storm event. The results of this analysis were used to calculate the rain garden sizes required for this parcel. The rain garden were sized to accommodate the 25-year storm event. The contributing watersheds are shown on Figure 5.2 - Post-Development Watershed Map.

The hydrologic analysis assumes that full soil restoration as required in Chapter 5 of SMDM will be implemented. The areas of soil restoration will be shown on the E&SC Plan if required.

A portion of the volume of runoff generated from the watersheds analyzed is being infiltrated into the ground. Therefore, there is no increase in the peak rate of runoff discharge or volume up to the 25-year 24-hour rainfall for the project.

The Drainage Basin sizes, curve numbers and travel times used in the analysis are summarized in the Table below:

Post-Development Conditions Watershed Analysis Variables

Drainage Basin	Area (acres)	Curve Number CN	Travel Time, Tc (hrs)
DA-1	1.55	63	0.132
DA-2	0.322	78	0.083

6.0 Unified Stormwater Sizing Criteria

6.1 Flood Control Criteria

The purpose of the extreme flood analysis is to prevent flood damage from large storm events by maintaining predevelopment 25-year flood plain boundaries and protecting the integrity of stormwater management practices. The basis of the analysis, as per Town code, is to maintain pre-development peak rates of runoff for the 25-year, 24-hour storm event with proper stormwater management. Detailed criteria can be found in Chapter 267 of the Town code.

A summary of peak discharge rates at each design point for the pre and post-developed storm events analyzed for each drainage basin is summarized in the tables below:

Design Point 1:

Storm Event (year)	Pre-Developed Peak Flow (cfs)	Post-Developed Peak Flow (cfs)	Net Change of Peak Flow (cfs)	% Change
1	0.34	0.22	0.12	-35.3%
2	0.78	0.55	0.23	-28.2%
10	2.65	1.98	0.67	-24.2%
25	4.15	3.14	1.01	-23.1%

As can be seen by the results, peak discharge rates are decreased for the 25-year storm. Slight increases for some of the storm events are shown but they are relatively insignificant and can be attributed to rounding errors in the analysis and are well within acceptable ranges.

See Hydrologic Analysis (Appendix E) and Subsurface Detention Chamber Design for input values and results.

7.0 Stormwater Management Practices Selection, Justification and Design

Since the only requirement is the attenuation of the increase in stormwater runoff during the 25-year storm event most of the runoff from the impervious areas is being collected and detained with a controlled release with no increase in peak runoff over existing conditions.

The selected practices are as follows:

Infiltration - SC-160 Infiltration Chambers NYS DEC SMDM:

Stormwater Infiltration Practices capture and temporarily retain stormwater runoff. The stormwater is then infiltrated into the existing soil strata over an extended period of time allowing recharge into the groundwater. These systems will consist of pre-manufactured HDPE chambers manufactured by Stormtech. The chambers are installed on a gravel bed and also backfilled with gravel. The entry point to the system will be into a vertical Nyloplast manhole access structure. The structure will have a manhole-type cover for maintenance. Within the structure there will be a diversion weir to send initial flow volumes to the first row of the system which is an isolation row. This row is a pre-treatment system which will capture, sediment laden runoff before it enters the main system. This row will have an inspection/flushing port at the far end. The system will have a low flow overflow to attenuate flows.

The design of the practices can be found in Appendix H of this Report.

8.0 Erosion and Sediment Control

Erosion and sediment control practices were selected and designed in accordance with the NYSSDESC. The practices proposed for this project are described below. Standard details and specifications are included in Appendix H as well as on the Construction Plans. Initial locations of each practice are shown on the Plans as construction progresses it may become necessary to repair, replace or relocate these practices as conditions warrant.

Stabilized Construction Entrance:

This has been specified for the entrance of the driveway. The installation will occur at the beginning of the project as described in the Suggested Construction Sequence. It will be maintained so as to prevent the tracking of sediment off-site.

Silt / Sediment Fence and Haybales:

Silt fence and haybales have been specified to control and contain sediment from leaving areas under disturbance to undisturbed areas. The fence shall be installed as best as possible following the contours and will be spaced in accordance with the NYSSESC. The fence will be inspected daily, repaired, and sediment removed as necessary.

Soil Stockpile:

Areas are provided for temporary stockpiling of delivered soil material for the construction. These areas will be contained with sediment fence to prevent the movement of sediment. The stockpiles, if not active for more than seven (7) days, will be seeded and mulched. The stockpile areas were placed to best suit the proposed construction activity. The stockpile will be installed as described in the Construction Sequence.

Stabilization:

The Contractor shall initiate stabilization measures as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than seven (7) days after the construction activity in that portion of the site has temporarily or permanently ceased. This requirement does not apply in the following instance:

Where the initiation of stabilization measures by the 7th day after construction activity temporarily or permanently ceased is precluded by snow cover or frozen ground conditions, stabilization measures shall be initiated as soon as practicable.

All areas not designated as buildings, roads, driveways, parking lots, walks, or aprons shall be established as lawn or vegetative areas. Permanent planting and vegetation shall be provided per approved the landscaping plan.

9.0 Construction Sequence

A key objective of the SWPPP is to reduce erosion and sedimentation potentials for the project. As a means to accomplish this, a suggested construction sequence was developed to assist the developer with incorporating, into the project, various controls designed to reduce such potentials. The sequence considers the performance of development activities in a phased approach, in conjunction with the installation, construction and monitoring of erosion and sedimentation control devices prior to and during construction.

Appendix C contains the project specific Suggested Construction Sequence. Essentially, the sequence has been broken down into various activities designed to ensure that certain erosion/sedimentation controls are in place, prior to and during construction, in recognition of site development.

The Responsible Party during and after Construction is as follows:

Paul Eisenberg
47 Windmill Road
North Castle, NY 10504
Phone: (917) 628-8269

10.0 Installation and Maintenance of Stormwater Management Practices

10.1 During Construction

The Contractor shall be responsible for the installation and maintenance of all temporary erosion control measures. The Contractor shall also be responsible for the installation of permanent control measures. The Operator shall be responsible for the maintenance of all permanent control measures.

All temporary erosion control measures installed on the project site shall be observed and maintained to ensure that they are operating as intended as follows:

1. Temporary measures will be inspected by the trained Contractor daily. Any necessary repairs, replacements, or upgrades will be made immediately.
2. Accumulated sediments will be removed as required to keep the measures functional. In the case of silt fencing and haybales (if applicable), remove deposits where accumulations reach half the height of the fence or bale. In the case of sediment basins, remove deposits whenever their capacity has been reduced by fifty percent (50%) from the design capacity.
3. All erosion of the silt fence will be repaired immediately with compacted backfill materials.
4. Disturbed areas, stockpile areas, areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system or downstream.
5. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.
6. Locations where vehicles enter or exit the site shall be inspected for evidence of off-site sediment tracking.
7. The permanent storm drainage system shall be inspected and cleaned of all sediment prior to completion of project.

10.2 After Construction

The long-term operation and maintenance of the stormwater management system will be the responsibility of the Owner. The following is the proposed Inspection and Maintenance Schedule:

Control to be Inspected	Inspection Frequency	Maintenance Threshold Criteria	Maintenance Procedure
Drain Inlets	Quarterly	3"+ accumulated sediment	Remove debris and sediment annually.
Subsurface Infiltration	Bi-annually	3"+ accumulated sediment	JetVac debris and sediment. Replace gravel surface when necessary.

Recommended Maintenance Access:

Drain Inlets:

Access through grate structure and remove debris and sediment with hand tools or vacuum truck.

In General:

- Controls should be inspected periodically for the first few months after construction and on a semi-annual basis thereafter. They should also be inspected after major storm events (greater than 0.5 inches).
- All stormwater controls shall be inspected and cleaned of any debris or sediment.
- Any erosion shall be repaired and stabilized with seeding and mulch or stone.
- Maintenance and access shall comply with all local, State and Federal safety codes and guidelines.

Please note that additional notes regarding maintenance activities are contained on the project Construction Drawings and should be adhered to during and after construction.

11.0 Conclusion

The Stormwater Management Plan has been established for this project in accordance with the requirements of NYS DEC GP-0-20-001 and the Town Code of North Castle. This plan will effectively control stormwater generated by this project during and after construction. The management of the stormwater is based on controlling increases in peak runoff. The design of the stormwater management system will accommodate storm flows up to the 25-year storm. Overall, it would improve even the existing conditions.

The final design of the project will detail the proposed practices and will establish the method with which they will be constructed. The detail will include

layout, grading, plantings, outlet structures, and any other component as required for the design based on the Erosion and Sediment Control established in this Report. These will be part of the project Construction Drawings. The Sequence of Construction and required maintenance will also be set forth as part of the final construction plan. The full Construction Plan shall be considered part of the Stormwater Management Plan or Stormwater Pollution Prevention Plan.

The effectiveness of the stormwater practices selected in design will be insured by implementing a maintenance plan. The maintenance plan details specific activities, safeguards and provisions to be monitored and performed by specified frequencies. By adhering to the maintenance plan, optimum performance of the stormwater practices can be expected.

Based on the results of the analysis and recommended maintenance practices for the collection and treatment system, the proposed stormwater control designs will provide maximum control efficiency, high effectiveness for removal of pollutants of concern, and the best attainable post-development pollutant loading scenario.

In conclusion, the Stormwater Management Plan will not create negative downstream impacts as a result of this project.

Joseph C. Riina, P.E

March 10, 2023

FIGURES

STORMWATER MANAGEMENT PLAN

Prepared for

Paul Eisenberg
47 Windmill Road
Town of North Castle, NY

Property Owner: Paul Eisenberg
47 Windmill Road
Armonk, NY 11598

Site Engineer: Joseph C. Riina, P.E.
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March 2023

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Appendices

Appendix A List of Required Approvals and Applications

- Town of North Castle Site Plan Approval - approval pending
- Town of North Castle Building Permit - approval pending;

Appendix B Regulatory Ordinances

- Local Ordinance - Town of North Castle Chapter 267 of the Town Code

Appendix C Construction Sequence

Appendix D Soil Testing Data

Appendix E Hydrologic Analysis

Appendix F Hydraulic Storm Sewer Capacity Analysis

Appendix G Stormwater Management Practices Design:

- Subsurface Stormwater Management System Volume Calculations

Appendix H Standard and Specifications for Erosion and Sediment Control Measures

Appendix I Project Plans

1.0 Project Description

The subject property is located at 47 Windmill Road, Town of North Castle, Westchester County, New York (see Figure 1.1 - Location Map and Figure 1.2 - Vicinity Map). The parcel is identified as tax lot 102.03-1-1 with a total area of 1.86 acres. The site is within the R-1.5A Single Family Residential zoning ordinance, which requires a minimum lot size of 1.5 acres. Topography varies greatly throughout the site with a total elevation difference of 44 feet. The highest contour elevation of 516 feet is located along the front of the property at Windmill Road and the lowest of 472 is located by the rear of the property along Long Pond. The parcel is already developed for residential use. Current coverage of the site consists of a two-story one-family residence, forested area, and grassed areas. A Pond is located at the rear of the property to the south. Along the eastern edge of the property is an existing wetland that is fed by a 24" culvert that discharges runoff from Windmill Road and the surrounding area. An existing driveway from windmill road on the western side of the property provides access to the existing residence.

The Proposed Project consists of building house additions on the southern and western side of the house as well as a driveway addition in front of the house with a circular turnaround area. The existing drainage system in the driveway which discharges directly to the pond at the rear will be removed and a new drainage system will be installed. This system will be connected to SC-160 subsurface infiltration chambers that will attenuate flows up to the 25-year storm for the new impervious surfaces and existing driveway. The total disturbance expected for the project is 0.36 acres.

As required by the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-20-001, Part IIIA.8, an historic resource screening determination was conducted. This was done using the online tools at the NYS Office of Parks, Recreation and Historic Places (OPRHP) website. This screening determined that there are no areas with historic or archeological sensitivity near the site. Figure 1.3 - NYS OPRHP Historic Resource Map was created from the website showing sensitive areas in Town of North Castle.

The following Report and Plans included in Appendix I describe, in detail, the design and implementation of the Stormwater Management Plan.

2.0 Stormwater Regulatory Requirements

2.1 Stormwater Impacts

Urban stormwater impacts relate to significant changes to stormwater quantity and quality as a result of land development. "Urban Development has a profound influence on the quality of New York's waters."¹ This proposed development will change the runoff characteristics of this site altering the quantity and quality of the surface stormwater. The impacts of this must be mitigated by managing the stormwater prior to discharge. This would be accomplished by the capture and treatment of surface runoff prior to discharge.

¹ New York State Stormwater Management Design Manual, January 2015.

Development of a site alters the hydrology therefore changing the characteristics of the surface and groundwater discharge of runoff. Changing the surface conditions alters a site's natural ability to store, treat, or infiltrate runoff. The change also allows for the discharge of potentially damaging pollutants and sediments to adjoining water bodies. This can occur during the construction phase, and long-term after development. During the construction phase, graded, destabilized, areas are subject to erosion which can cause the displacement of sediment. After development, changes in the surface conditions, such as impervious surfaces, roofs and pavement, or lawn surfaces can generate pollutants which would be collected and discharged through runoff. Some of the pollutants of concern are: Total Suspended Solids (TSS); Biological Oxygen Demand (BOD); Total Phosphorus (TP); and Total Nitrogen (TN), as well as oil or grease, and chloride.

The most common sources of these pollutants from developed sites are atmospheric deposition, fertilizers, pesticides, and leaked discharges from vehicle. These pollutants would collect on these impervious surfaces and quickly wash off during even the smallest storm event.

In the planning and design of the development, stormwater will be managed to minimize potential impacts. A Stormwater Management and Pollution Prevention Plan will be prepared. This Plan will deal with all aspects of the stormwater management programs such as identifying potential pollutant sources, design of temporary and permanent features, implementation, and maintenance.

2.2 Regulatory Obligation

2.2.1 USEPA/NYSDEC

The Federal Government's Clean Water Act (CWA), Section 402 states "Stormwater discharges from certain construction activities are unlawful unless they are authorized by a National Pollutant Discharge Elimination System ("NPDES") permit or by a state permit program." New York State is a NPDES delegated State. The necessary permitting is administered through the State Pollutant Discharge Elimination System (SPDES) under the General Permit, GP-0-20-001, for Stormwater Discharges from Construction Activity. The Permit requires that any development meeting the disturbance thresholds listed in Tables 1 and 2 of Appendix B of the General Permit must prepare a SWPPP. Activities listed in Table 1 requires preparation of only an Erosion and Sediment Control Plan. Those listed in Table 2 would additionally require post-construction stormwater management practices. This project does not meet the threshold requiring filing a notice of intent (NOI) with the NYS DEC.

The Plan identifies the potential sources of pollution, and a design prepared and implemented to reduce pollutant loadings. This project will be required to prepare the following to be in compliance:

- Prepare an Erosion and Sediment Control Plan;
- Design and implement a stormwater management system to capture and attenuate all storm events up to the 25-year storm.

2.2.2 Local Municipality

Since the project disturbance is less than one acre, the filing of a Notice of Intent with the NYS DEC for compliance with General Permit 0-20-001 is not required. Therefore, the project only needs to comply with the provisions of the Town of North Castle Code Chapter 267 Stormwater Management. Therefore, the project must provide management of the 25-year storm event.

The technical standards providing guidance in the preparation of the E&SC and SWPPP are the latest revisions of the following:

- “New York Standards & Specifications for Erosion and Sediment Control” (NYSSESC) published by the Empire State Chapter of the Soil and Water Conservation Society; and;
- “New York State Stormwater Management Design Manual” prepared by the Center of Watershed Protection, for the NYS DEC;
- Town of North Castle - Town Code Chapter 267 Stormwater Management;

3.0 Reducing Pollutant Impacts

3.1 Sources of Impact

For this project, the potential for contamination of stormwater occurs both during construction and after the completion of development. The goal to achieve reduced impacts involves containment and treatment of the various pollutants.

The proposed project will require temporary sediment and erosion control measures. The greatest source of pollutants during these phases is the potential of soil erosion. The nature of the construction plan is to have exposed soils which can erode and potentially discharge to sensitive areas. During construction, existing vegetation is removed exposing soils. Also, stockpiling of soils takes place. These conditions if not stabilized, are subject to erosion during rainfall events and wind conditions. Sediment discharged to a wetland can destroy vegetation and habitat affecting the function of the wetland. This degradation potential can be irreversible and eliminate its function in the ecosystem. Increases in turbidity to open water bodies such as streams, ponds, etc., are an additional environmental impact.

The implementation of proper erosion control measures and sediment containment along with a planned construction sequence can minimize or eliminate these potential impacts. The selection and implementation of erosion and sediment practices are described in a later section of this Report.

3.2 Stormwater Management During Construction

The Erosion and Sediment Control plan will be implemented during all phases of construction until the completion of the project. This will minimize or eliminate the potential short-term adverse impacts which may occur during construction. After completion, the erosion and sediment control will become a maintenance plan to ensure that permanent erosion and sediment controls continue to function and prevent the transport of sediments.

The Erosion and Sediment Control plan includes the Sequence of Construction and designed measures to be installed, operated and maintained during all aspects of construction. The appropriate measures were selected and detailed in plan for implementation by the site contractor. The main objective of the plan is to prevent erosion from occurring by stabilization of the construction site where possible. Sediment controls are to be used as a containment system to allow the removal of sediment from runoff to the greatest extent possible before leaving the work site. Control methods and standards utilized are provided in the NYSSESC.

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- Minimization of open disturbance by use of stabilizers such as seed, mulch, and erosion blankets, stone, etc. Areas not subject to construction traffic for extended periods will be temporarily stabilized.
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- Existing drainage structures will be protected from sediment-laden runoff.
- Regular weekly inspections and reports, if required, will be filed with the Operator by the Town.

Additional methods of practices may be employed dependent on the situation. The NYSSESC consists of NYS DEC accepted and recommended practices. The design requirements of temporary and permanent erosion and sediment control practices of this Manual have been followed.

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The post-construction design of the project must be included in the Stormwater Pollution Prevention and Stormwater Management Plans to minimize or eliminate potential long-term adverse impacts which might be caused by surface runoff from the site. This will deal with the management of the stormwater upon completion and operation of the site. The plan will be an analysis of all potential impacts due to stormwater and the means of protecting adjoining water bodies.

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The predominant soil type for this project is Charlton Chatfield, CsD. This soil is well drained. It has a depth to bedrock of over 6 feet. The Hydrologic classification of this soil is "B". These soils have a high infiltration rate when thoroughly wet. The erosion hazard level for these soils is moderate. These soil properties are essential in the design and proper construction management of the site. Independent soil tests were performed, and the results are located in the Appendix D of this Report.

- Chatfield-Charlton - Consists of well drained soils with 15 to 35 percent slopes. Typically, very rocky;

Deep Test Soil Logs and soil percolation test data are included in Appendix D of this Report. The locations of these deep soil tests are indicated on the Construction Drawings. On-site soil investigation and knowledge of the soil groups facilitated the selection of coefficient values used for the pre- and post-development

² Pg. 3-7 NYS Stormwater Management Design Manual, January 2015.

pollutant load scenarios. Additionally, curve numbers were determined for use in the analysis.

4.2 Hydrology

The proposed improvements will not significantly change the surface runoff patterns. Currently, the surface runoff pattern is in a North to South direction, toward the rear yard of the property where it borders Long Pond. The surface runoff pattern is a combination of shallow concentrated flow and channel flow from existing paved and pervious surfaces. The site consists of an existing residence, forested areas, and outdoor hardscapes. Additionally, there is an outlet pipe from Windmill Road on the property that feeds the existing wetland which drains to the pond that was excluded from the analysis due to insufficient information on the upstream conditions. The wetland that is fed by this pipe as well as the Long Pond will serve as the design lines for this project.

Under the proposed condition the general direction of the surface runoff will not be altered. Almost the entire amount of surface runoff from the additional impervious areas will be collected and attenuated. Since the land is developed, the predeveloped condition being analyzed is the existing site as it currently is with the proposed impervious being captured separately so that flows may be attenuated. Therefore, there will be a minor increase in the peak rate of runoff generated by the site for a given rainfall event. This will be mitigated with stormwater management practices.

In the planning, design and construction of the development, stormwater will be managed to minimize or eliminate potential off-site impacts. The proper implementation of temporary sediment and erosion control measures are used to achieve this goal. An Erosion and Sediment Control Plan has been established and will be implemented during construction until the completion of the project. The Erosion and Sediment Control Plan incorporates the sequence of construction and designed measures to be installed, operated and maintained during all aspects of each phase. The erosion and sediment controls are designed in accordance with the NYS Standards and Specifications for Erosion and Sediment Control.

5.0 Hydrologic Analysis

The method used to compute project runoff was the Soil Conservation Service TR-55. The basis for the analysis was the Type III, 24-hour storm, for the 1- year, 2- year, 10-year, 25-year storm event. The rainfall depth for the respective storm events are 2.8, 3.4, 4.3, 5.1, and 6.5. The runoff coefficient "CN" and Time of Concentration for existing and post-development conditions were computed using Standard TR-55 criteria.

5.1 Pre-Development Condition

As stated, the proposed site consists of an addition to the house and a addition to the patio area. Therefore, these areas along with the existing house will be considered as impervious surface for the site. Pre-development condition will include the current house, patio area, and forested areas on the site. This project was analyzed in its pre-developed condition in order to understand current drainage patterns. The contributing watersheds are shown on Figure 5.1 - Pre-Development Watershed Map.

The Drainage Basin sizes, curve numbers and travel times used in the analysis are summarized in the Table below:

Pre-Development Conditions Watershed Analysis Variables

Drainage Basin	Area (acres)	Curve Number CN	Travel Time, Tc (hrs)
DA-1	1.555	63	0.132

5.2 Post-Development Condition

A hydrologic analysis has been done for the site to determine the expected runoff depth for each storm event. The results of this analysis were used to calculate the rain garden sizes required for this parcel. The rain garden were sized to accommodate the 25-year storm event. The contributing watersheds are shown on Figure 5.2 - Post-Development Watershed Map.

The hydrologic analysis assumes that full soil restoration as required in Chapter 5 of SMDM will be implemented. The areas of soil restoration will be shown on the E&SC Plan if required.

A portion of the volume of runoff generated from the watersheds analyzed is being infiltrated into the ground. Therefore, there is no increase in the peak rate of runoff discharge or volume up to the 25-year 24-hour rainfall for the project.

The Drainage Basin sizes, curve numbers and travel times used in the analysis are summarized in the Table below:

Post-Development Conditions Watershed Analysis Variables

Drainage Basin	Area (acres)	Curve Number CN	Travel Time, Tc (hrs)
DA-1	1.55	63	0.132
DA-2	0.322	78	0.083

6.0 Unified Stormwater Sizing Criteria

6.1 Flood Control Criteria

The purpose of the extreme flood analysis is to prevent flood damage from large storm events by maintaining predevelopment 25-year flood plain boundaries and protecting the integrity of stormwater management practices. The basis of the analysis, as per Town code, is to maintain pre-development peak rates of runoff for the 25-year, 24-hour storm event with proper stormwater management. Detailed criteria can be found in Chapter 267 of the Town code.

A summary of peak discharge rates at each design point for the pre and post-developed storm events analyzed for each drainage basin is summarized in the tables below:

Design Point 1:

Storm Event (year)	Pre-Developed Peak Flow (cfs)	Post- Developed Peak Flow (cfs)	Net Change of Peak Flow (cfs)	% Change
1	0.34	0.22	0.12	-35.3%
2	0.78	0.55	0.23	-28.2%
10	2.65	1.98	0.67	-24.2%
25	4.15	3.14	1.01	-23.1%

As can be seen by the results, peak discharge rates are decreased for the 25-year storm. Slight increases for some of the storm events are shown but they are relatively insignificant and can be attributed to rounding errors in the analysis and are well within acceptable ranges.

See Hydrologic Analysis (Appendix E) and Subsurface Detention Chamber Design for input values and results.

7.0 Stormwater Management Practices Selection, Justification and Design

Since the only requirement is the attenuation of the increase in stormwater runoff during the 25-year storm event most of the runoff from the impervious areas is being collected and detained with a controlled release with no increase in peak runoff over existing conditions.

The selected practices are as follows:

Infiltration - SC-160 Infiltration Chambers NYS DEC SMDM:

Stormwater Infiltration Practices capture and temporarily retain stormwater runoff. The stormwater is then infiltrated into the existing soil strata over an extended period of time allowing recharge into the groundwater. These systems will consist of pre-manufactured HDPE chambers manufactured by Stormtech. The chambers are installed on a gravel bed and also backfilled with gravel. The entry point to the system will be into a vertical Nyloplast manhole access structure. The structure will have a manhole-type cover for maintenance. Within the structure there will be a diversion weir to send initial flow volumes to the first row of the system which is an isolation row. This row is a pre-treatment system which will capture, sediment laden runoff before it enters the main system. This row will have an inspection/flushing port at the far end. The system will have a low flow overflow to attenuate flows.

The design of the practices can be found in Appendix H of this Report.

8.0 Erosion and Sediment Control

Erosion and sediment control practices were selected and designed in accordance with the NYSSDESC. The practices proposed for this project are described below. Standard details and specifications are included in Appendix H as well as on the Construction Plans. Initial locations of each practice are shown on the Plans as construction progresses it may become necessary to repair, replace or relocate these practices as conditions warrant.

Stabilized Construction Entrance:

This has been specified for the entrance of the driveway. The installation will occur at the beginning of the project as described in the Suggested Construction Sequence. It will be maintained so as to prevent the tracking of sediment off-site.

Silt / Sediment Fence and Haybales:

Silt fence and haybales have been specified to control and contain sediment from leaving areas under disturbance to undisturbed areas. The fence shall be installed as best as possible following the contours and will be spaced in accordance with the NYSSESC. The fence will be inspected daily, repaired, and sediment removed as necessary.

Soil Stockpile:

Areas are provided for temporary stockpiling of delivered soil material for the construction. These areas will be contained with sediment fence to prevent the movement of sediment. The stockpiles, if not active for more than seven (7) days, will be seeded and mulched. The stockpile areas were placed to best suit the proposed construction activity. The stockpile will be installed as described in the Construction Sequence.

Stabilization:

The Contractor shall initiate stabilization measures as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than seven (7) days after the construction activity in that portion of the site has temporarily or permanently ceased. This requirement does not apply in the following instance:

Where the initiation of stabilization measures by the 7th day after construction activity temporarily or permanently ceased is precluded by snow cover or frozen ground conditions, stabilization measures shall be initiated as soon as practicable.

All areas not designated as buildings, roads, driveways, parking lots, walks, or aprons shall be established as lawn or vegetative areas. Permanent planting and vegetation shall be provided per approved the landscaping plan.

9.0 Construction Sequence

A key objective of the SWPPP is to reduce erosion and sedimentation potentials for the project. As a means to accomplish this, a suggested construction sequence was developed to assist the developer with incorporating, into the project, various controls designed to reduce such potentials. The sequence considers the performance of development activities in a phased approach, in conjunction with the installation, construction and monitoring of erosion and sedimentation control devices prior to and during construction.

Appendix C contains the project specific Suggested Construction Sequence. Essentially, the sequence has been broken down into various activities designed to ensure that certain erosion/sedimentation controls are in place, prior to and during construction, in recognition of site development.

The Responsible Party during and after Construction is as follows:

Paul Eisenberg
47 Windmill Road
North Castle, NY 10504
Phone: (917) 628-8269

10.0 Installation and Maintenance of Stormwater Management Practices

10.1 During Construction

The Contractor shall be responsible for the installation and maintenance of all temporary erosion control measures. The Contractor shall also be responsible for the installation of permanent control measures. The Operator shall be responsible for the maintenance of all permanent control measures.

All temporary erosion control measures installed on the project site shall be observed and maintained to ensure that they are operating as intended as follows:

1. Temporary measures will be inspected by the trained Contractor daily. Any necessary repairs, replacements, or upgrades will be made immediately.
2. Accumulated sediments will be removed as required to keep the measures functional. In the case of silt fencing and haybales (if applicable), remove deposits where accumulations reach half the height of the fence or bale. In the case of sediment basins, remove deposits whenever their capacity has been reduced by fifty percent (50%) from the design capacity.
3. All erosion of the silt fence will be repaired immediately with compacted backfill materials.
4. Disturbed areas, stockpile areas, areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system or downstream.
5. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.
6. Locations where vehicles enter or exit the site shall be inspected for evidence of off-site sediment tracking.
7. The permanent storm drainage system shall be inspected and cleaned of all sediment prior to completion of project.

10.2 After Construction

The long-term operation and maintenance of the stormwater management system will be the responsibility of the Owner. The following is the proposed Inspection and Maintenance Schedule:

Control to be Inspected	Inspection Frequency	Maintenance Threshold Criteria	Maintenance Procedure
Drain Inlets	Quarterly	3"+ accumulated sediment	Remove debris and sediment annually.
Subsurface Infiltration	Bi-annually	3"+ accumulated sediment	JetVac debris and sediment. Replace gravel surface when necessary.

Recommended Maintenance Access:

Drain Inlets:

Access through grate structure and remove debris and sediment with hand tools or vacuum truck.

In General:

- Controls should be inspected periodically for the first few months after construction and on a semi-annual basis thereafter. They should also be inspected after major storm events (greater than 0.5 inches).
- All stormwater controls shall be inspected and cleaned of any debris or sediment.
- Any erosion shall be repaired and stabilized with seeding and mulch or stone.
- Maintenance and access shall comply with all local, State and Federal safety codes and guidelines.

Please note that additional notes regarding maintenance activities are contained on the project Construction Drawings and should be adhered to during and after construction.

11.0 Conclusion

The Stormwater Management Plan has been established for this project in accordance with the requirements of NYS DEC GP-0-20-001 and the Town Code of North Castle. This plan will effectively control stormwater generated by this project during and after construction. The management of the stormwater is based on controlling increases in peak runoff. The design of the stormwater management system will accommodate storm flows up to the 25-year storm. Overall, it would improve even the existing conditions.

The final design of the project will detail the proposed practices and will establish the method with which they will be constructed. The detail will include

layout, grading, plantings, outlet structures, and any other component as required for the design based on the Erosion and Sediment Control established in this Report. These will be part of the project Construction Drawings. The Sequence of Construction and required maintenance will also be set forth as part of the final construction plan. The full Construction Plan shall be considered part of the Stormwater Management Plan or Stormwater Pollution Prevention Plan.

The effectiveness of the stormwater practices selected in design will be insured by implementing a maintenance plan. The maintenance plan details specific activities, safeguards and provisions to be monitored and performed by specified frequencies. By adhering to the maintenance plan, optimum performance of the stormwater practices can be expected.

Based on the results of the analysis and recommended maintenance practices for the collection and treatment system, the proposed stormwater control designs will provide maximum control efficiency, high effectiveness for removal of pollutants of concern, and the best attainable post-development pollutant loading scenario.

In conclusion, the Stormwater Management Plan will not create negative downstream impacts as a result of this project.

Joseph C. Riina, P.E

March 10, 2023

FIGURES

APPENDIX A

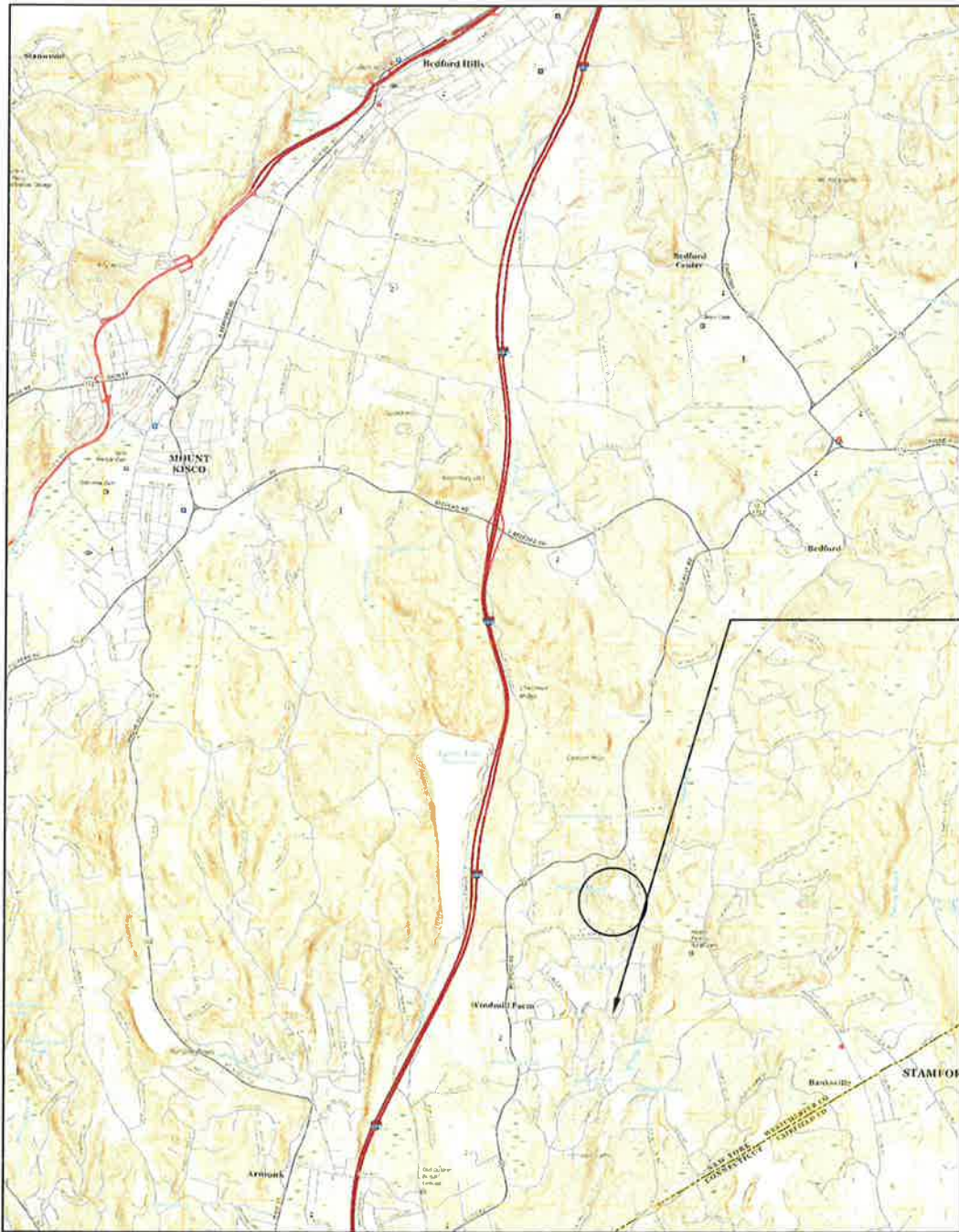
List of Required Approvals and Applications:

Town of North Castle Site Plan Approval - approval pending

Town of North Castle Building Permit - approval pending

47 Windmill Road

FIGURES



SITE



NOTE:

1. Map Source: USGS 7.5 Minute Series Topographic Quadrangle Map (1:24,000 scale) for Yorktown Heights, Westchester County, New York.

FIGURE 1.1 - LOCATION MAP

PREPARED FOR
Paul Eisenberg

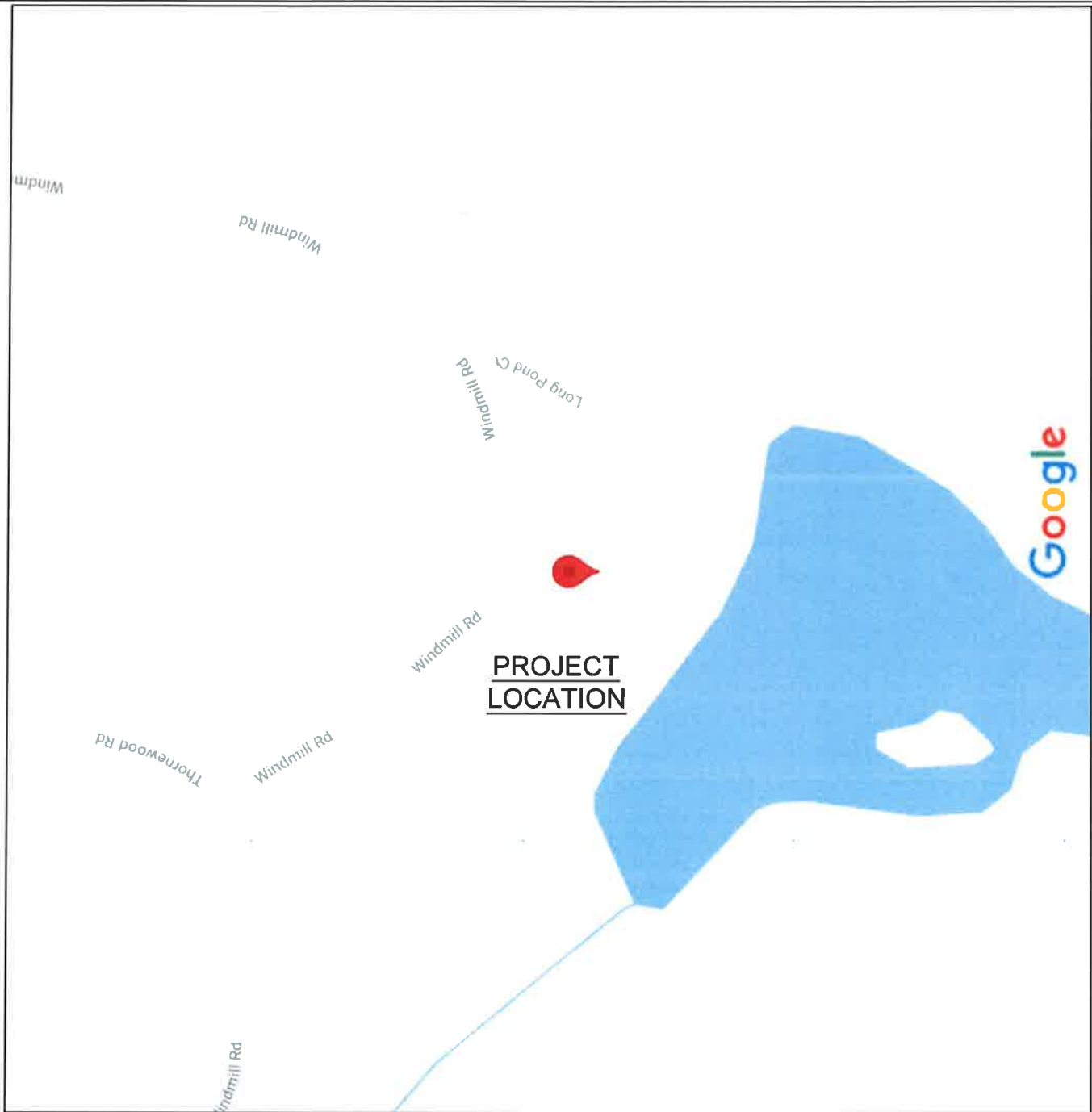
Town of Yorktown Heights Westchester Co., New York

Site Design Consultants

Civil Engineers • Land Planners

251 F Underhill Avenue Yorktown Heights, NY 10598
(914) 962-4488 - Fax (914) 962-7386
www.sitedesignconsultants.com

NOT TO SCALE
DATE: 03/23/16



NOTE:

1. Map Source: Google Maps Image.



FIGURE 1.2 - VICINITY MAP

PREPARED FOR

Paul Eisenberg

Town of Yorktown Heights

Westchester Co., New York

Site Design Consultants

Civil Engineers • Land Planners

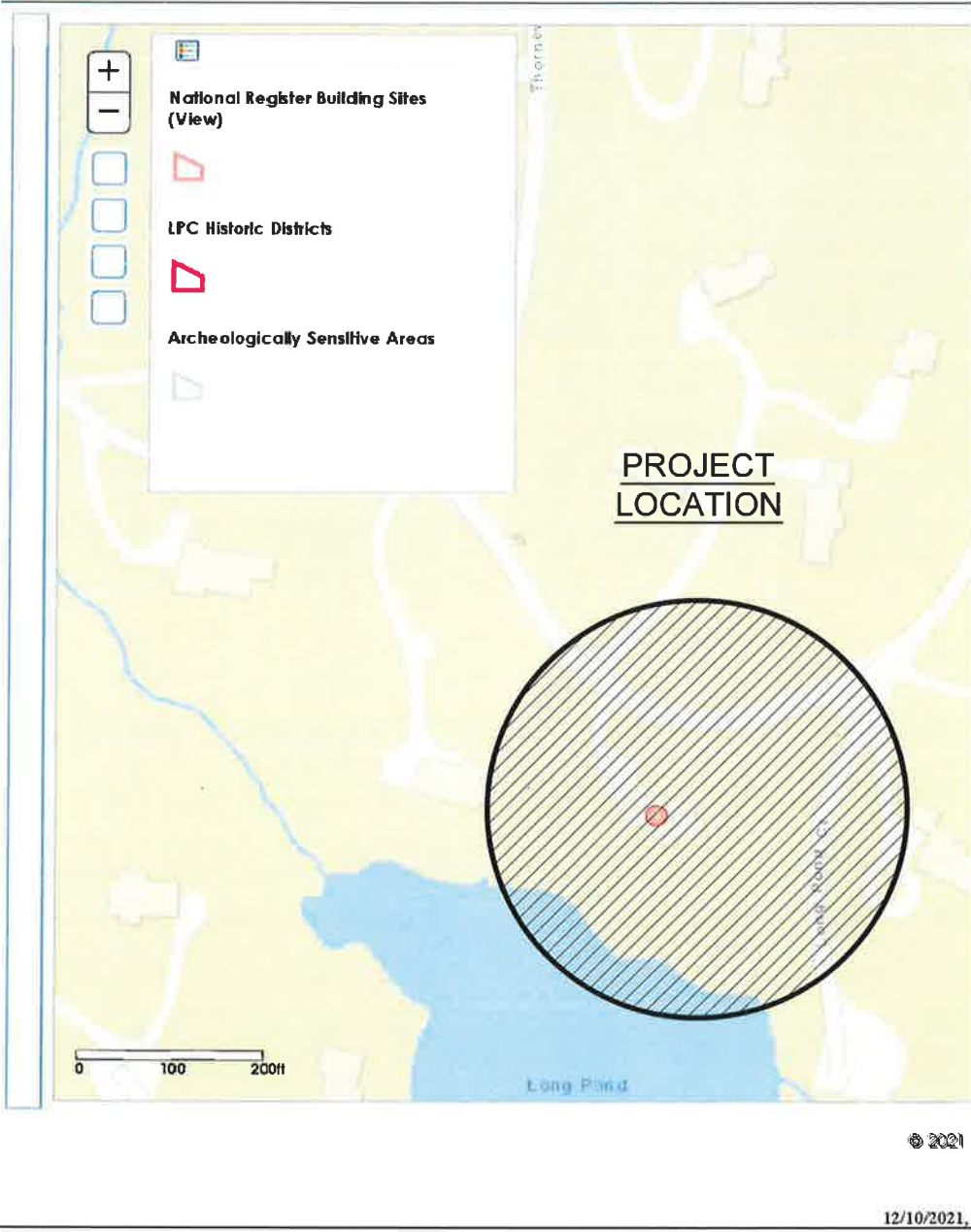
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HOME SUBMIT **SEARCH** COMMUNICATE



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NOTE:

1. Map Source: NYS Historic Preservation Office, GIS Public Access.



FIGURE 1.3 - NYS OPRHP HISTORIC RESOURCE MAP

PREPARED FOR
Paul Eisenberg

Town of Yorktown Heights

Westchester Co., New York

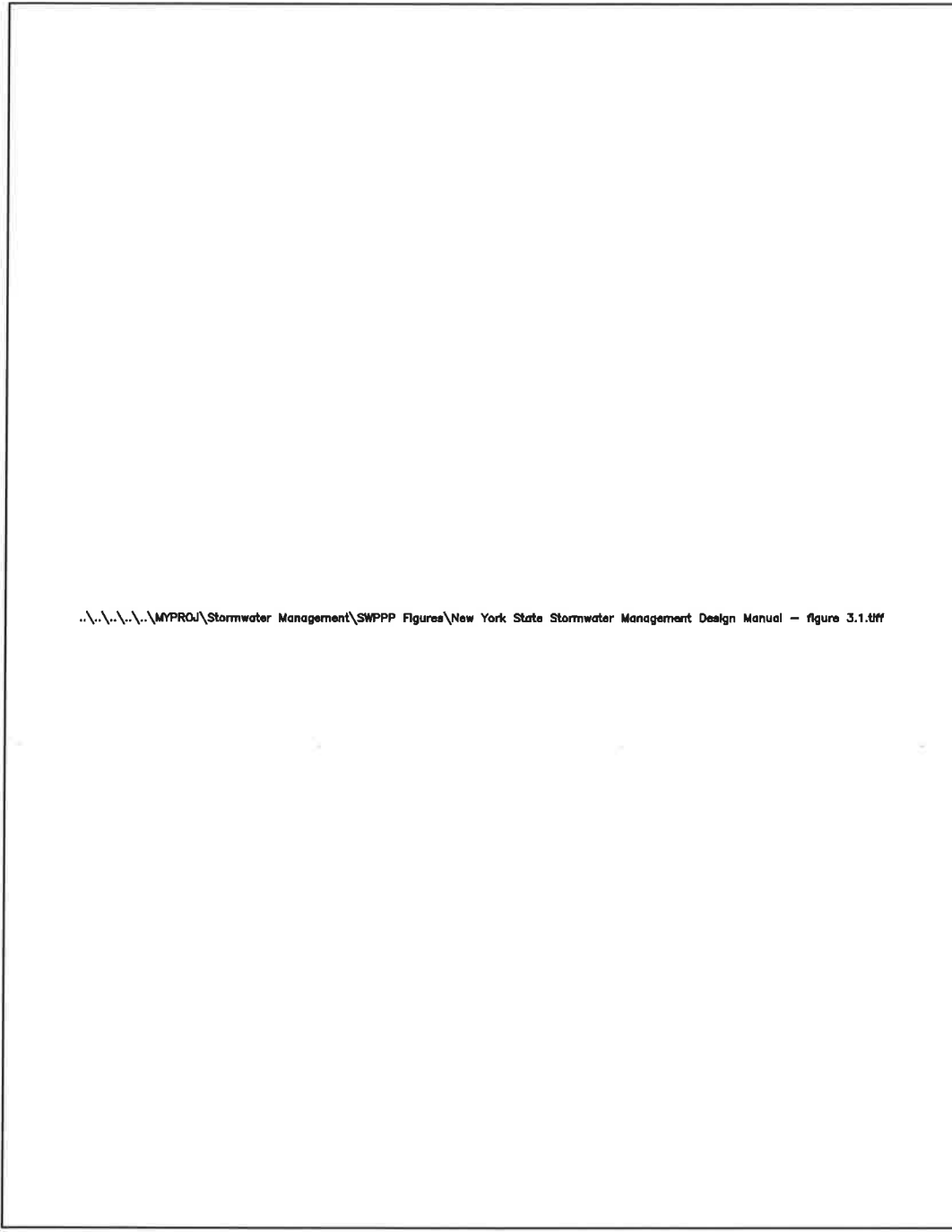
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..\..\..\..\MYPROG\Stormwater Management\SWPPP Figures\New York State Stormwater Management Design Manual - figure 3.1.tif

NOTE:

- 1. Source: NYS DEC Stormwater Design Manual - August 2010

FIGURE 3.1 - STORMWATER SITE PLANNING AND PRACTICE
SELECTION FLOW CHART

PREPARED FOR
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NOTE:

1. Map Source: USDA National Resources Conservation Service, National Cooperative Soil Survey, Web Soil Survey Map.

FIGURE 4.1.1 - SOIL MAP

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MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

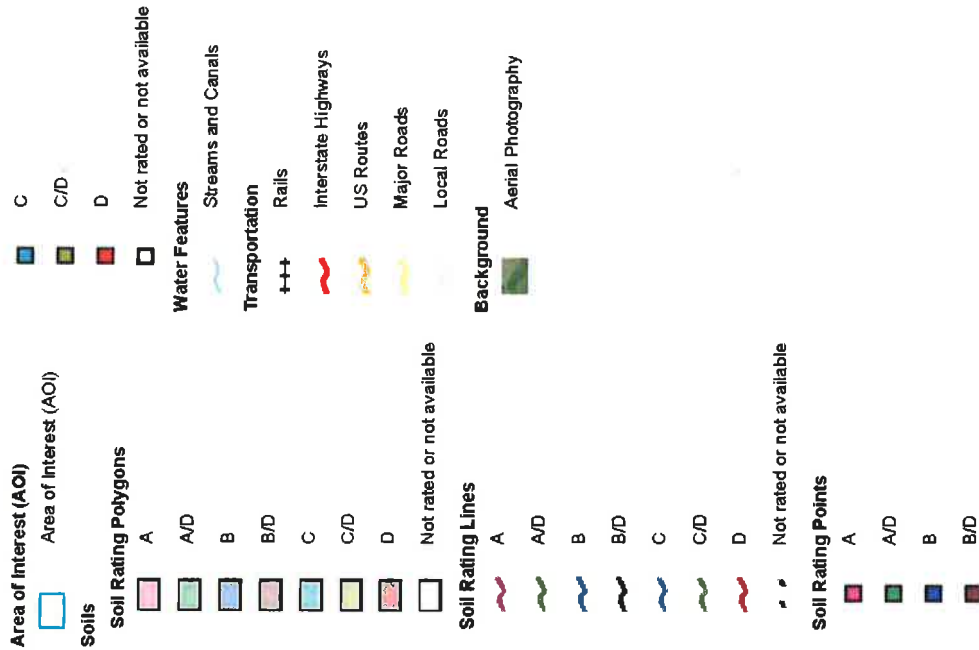
Soil Survey Area: Westchester County, New York
Survey Area Data: Version 17, Sep 1, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Oct 16, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

MAP LEGEND



NOTE:

1. Map Source: USDA National Resources Conservation Service, National Cooperative Soil Survey, Web Soil Survey Map.

FIGURE 4.1.2 - SOIL MAP

PREPARED FOR

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DATE: 03/23/16

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres In AOI	Percent of AOI
CrC	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	B	0.2	3.0%
CsD	Chatfield-Charlton complex, 15 to 35 percent slopes, very rocky	B	3.8	67.7%
CuD	Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes	D	0.9	15.9%
W	Water		0.8	13.5%
Totals for Area of Interest			5.7	100.0%

NOTE:

1. Map Source: USDA National Resources Conservation Service, National Cooperative Soil Survey, Web Soil Survey Map.

FIGURE 4.1.3 - SOIL MAP

PREPARED FOR

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DATE: 03/23/16



DRAINAGE AREA 1
TOTAL AREA: 53,618 SF
IMPERVIOUS: 4,362 SF

Edge of Wetlands of Water
Line Per Evans Associates

Edge of Wetlands of Water
Line Per Evans Associates

DESIGN LINE

Table 5.3 Soil Restoration Requirements			
Type of Soil Disturbance	Soil Restoration Requirement		Comments/Examples
No soil disturbance	Restoration not permitted		Preservation of Natural Features
Minimal soil disturbance	Restoration not required		Clearing and grubbing
Areas where topsoil is stripped only - no change in grade	HSG A & B	HSG C & D	Protect area from any ongoing construction activities.
	apply 6 inches of topsoil	Aerate* and apply 6 inches of topsoil	
Areas of cut or fill	HSG A & B	HSG C & D	
	Aerate and apply 6 inches of topsoil	Apply full Soil Restoration **	
Heavy traffic areas on site (especially in a zone 5-25 feet around buildings but not within a 5 foot perimeter around foundation walls)	Apply full Soil Restoration (de-compaction and compost enhancement)		
Areas where Runoff Reduction and/or Infiltration practices are applied	Restoration not required, but may be applied to enhance the reduction specified for appropriate practices.		Keep construction equipment from crossing these areas. To protect newly installed practice from any ongoing construction activities construct a single phase operation fence area
Redevelopment projects	Soil Restoration is required on redevelopment projects in areas where existing impervious area will be converted to pervious area.		

*Aeration includes the use of machines such as tractor-drawn implements with coulters making a narrow slit in the soil, a roller with many spikes making indentations in the soil, or prongs which function like a mini-subsoiler.

** Per "Deep Ripping and De-compaction, DEC 2008".

August 2010

5-22

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FIGURE 8.1 - SOIL RESTORATION REQUIREMENTS

PREPARED FOR

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DATE: 7/20/11

APPENDIX A

List of Required Approvals and Applications:

Town of North Castle Site Plan Approval - approval pending

Town of North Castle Building Permit - approval pending

47 Windmill Road

APPENDIX B

Regulatory Ordinances:

Local Ordinance

Town of North Castle, NY
Monday, December 13, 2021

Chapter 267. Stormwater Management

[HISTORY: Adopted by the Town Board of the Town of North Castle 12-19-2007 by L.L. No. 22-2007 (Ch. 173 of the 1987 Code). Amendments noted where applicable.]

GENERAL REFERENCES

Building code administration and enforcement — See Ch. 127.

Excavations — See Ch. 157.

Filling and grading — See Ch. 161.

Flood damage prevention — See Ch. 177.

Sewers — See Ch. 250.

Subdivision of land — See Ch. 275.

Water — See Ch. 336.

Wetlands and watercourses — See Ch. 340.

Zoning — See Ch. 355.

Article I. Stormwater Management and Erosion and Sediment Control

§ 267-1. Title.

This chapter shall be known and cited as the "Stormwater Management, Erosion and Sediment Control Law and Illicit Discharges, Activities and Connections to Separate Storm Sewer System of the Town of North Castle."

§ 267-2. Statutory authority.

In accordance with § 10 of the Municipal Home Rule Law of the State of New York, the Town Board of North Castle has the authority to enact local laws and amend local laws for the purpose of promoting the health, safety or general welfare of the Town of North Castle and for the protection and enhancement of its physical environment. The Town Board of North Castle may include in any such local law provisions for the appointment of any municipal officer, employees or independent contractor to effectuate, administer and enforce such local law.

§ 267-3. Findings; purpose; applicability; exemptions.

A. Findings. The Town Board of the Town of North Castle hereby finds that:

- (1) Land development activities and associated increases in site impervious cover often alter the hydrologic response of local watersheds and increase stormwater runoff rates and volumes, flooding, stream channel erosion, or sediment transport and deposition.
- (2) This stormwater runoff contributes to increased quantities of waterborne pollutants, including siltation of aquatic habitat for fish and other desirable species.
- (3) Clearing and grading during construction tends to increase soil erosion and add to the loss of native vegetation necessary for terrestrial and aquatic habitat.
- (4) Improper design and construction of stormwater management practices can increase the velocity of stormwater runoff, thereby increasing stream bank erosion and sedimentation.
- (5) Impervious surfaces allow less water to percolate into the soil, thereby decreasing groundwater recharge

and stream base flow.

- (6) Substantial economic losses can result from these adverse impacts on the waters of the municipality.
 - (7) Stormwater runoff, soil erosion and nonpoint source pollution can be controlled and minimized through the regulation of stormwater runoff from land development activities.
 - (8) The regulation of stormwater runoff discharges from land development activities in order to control and minimize increases in stormwater runoff rates and volumes, soil erosion, stream channel erosion, and nonpoint source pollution associated with stormwater runoff is in the public interest and will minimize threats to public health and safety.
 - (9) Regulation of land development activities by means of performance standards governing stormwater management and site design will produce development compatible with the natural functions of a particular site or an entire watershed and thereby mitigate the adverse effects of erosion and sedimentation from development.
- B. Purpose. The purpose of this chapter is to establish minimum stormwater management requirements and controls to protect and safeguard the general health, safety and welfare of the public residing within this jurisdiction and to address the findings of fact identified in § 267-3 of this chapter. This chapter seeks to meet those purposes by achieving the following objectives:
- (1) Meet the requirements of Minimum Control Measures four and five of the New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System SPDES General Permit for Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s), Permit No. GP-15-003, or as amended or revised;
[Amended 11-18-2015 by L.L. No. 9-2015]
 - (2) Require land development activities to conform to the substantive requirements of the New York State Department of Environmental Conservation State Pollutant Discharge Elimination System (SPDES) General Permit for Construction Activities, Permit No. GP-15-002, or as amended or revised;
[Amended 11-18-2015 by L.L. No. 9-2015]
 - (3) Minimize increases in stormwater runoff from land development activities in order to reduce flooding, siltation, increases in stream temperature and stream bank erosion and maintain the integrity of stream channels;
 - (4) Minimize increases in pollution caused by stormwater runoff from land development activities which would otherwise degrade local water quality;
 - (5) Minimize the total annual volume of stormwater runoff which flows from any specific site during and following development to the maximum extent practicable; and
 - (6) Reduce stormwater runoff rates and volumes, soil erosion and nonpoint source pollution, wherever possible, through stormwater management practices and to ensure that these management practices are properly maintained and eliminate threats to public safety.
- C. Applicability.
- (1) This chapter shall be applicable to all land development activities as defined in § 267-4B of this chapter.
 - (2) The municipality shall designate a Stormwater Management Officer (SMO), who shall accept and review all stormwater pollution prevention plans and forward such plans to the applicable municipal board. The Stormwater Management Officer may:
 - (a) Review the plans.
 - (b) Upon approval by the Town Board of the Town of North Castle, engage the services of a registered professional engineer to review the plans, specifications and related documents.
 - (3) All land development activities subject to review and approval by the applicable board of the Town of North

Castle under subdivision, site plan and/or special permit regulations shall be reviewed subject to the standards contained in this chapter.

- (4) All land development activities not subject to review as stated in § **267-3C(3)** of this chapter shall be required to submit a stormwater pollution prevention plan (SWPPP) to the Stormwater Management Officer, who shall approve the SWPPP if it complies with the requirements of this chapter.
- (5) The provisions of this chapter shall not apply to any project that has been physically completed prior to the effective date of this chapter.
[Added 11-18-2015 by L.L. No. 9-2015]
- (6) A project that was approved prior to the effective date of this chapter, but which is not in conformity with the provisions of this chapter, may be continued, subject to the following:
[Added 11-18-2015 by L.L. No. 9-2015]
 - (a) All such activities shall continue to be governed by the present regulations of the Town of North Castle.
 - (b) No such activity shall be expanded, changed, enlarged or altered without compliance with this chapter.
 - (c) If such activity is discontinued for 12 consecutive months, any resumption of the activity shall conform to this chapter.
 - (d) If any use or activity is destroyed by human activities, a force of nature or an act of God, it shall not be resumed except in conformity with the provisions of this chapter.

D. Exemptions.

- (1) Repairs to any stormwater management practice or facility deemed necessary by the Stormwater Management Officer.
- (2) Any part of a subdivision if a plat for the subdivision has been approved by the Town of North Castle on or before the effective date of this chapter.
- (3) Land development activities for which a building permit has been approved on or before the effective date of this chapter.
- (4) Cemetery graves.
- (5) Installation of fence, sign, telephone and electric poles and other kinds of posts or poles.
- (6) Emergency activity immediately necessary to protect life, property or natural resources.
- (7) Activities of an individual engaging in home gardening by growing flowers, vegetables and other plants primarily for use by that person and his or her family.
- (8) Landscaping and horticultural activities in connection with an existing structure.

§ 267-4. Definitions and word usage.

- A. Unless specifically defined below, words and phrases used in this chapter shall be interpreted to have the meaning they have in common English usage, to give effect to the purpose set forth in § **267-3B**, and to provide reasonable application of this chapter.
- B. As used in this chapter, the following terms shall have the meanings indicated:

AGRICULTURAL ACTIVITY

The activity of an active farm, including grazing and watering livestock, irrigating crops, harvesting crops, using land for growing agricultural products, and cutting timber for sale, but shall not include the operation of a dude ranch or similar operation or the construction of new structures associated with agricultural activities.

APPLICANT

A property owner or agent of a property owner who has filed an application for a land development activity.

BEST MANAGEMENT PRACTICES (BMPs)

Schedules of activities, prohibitions of practices, general good housekeeping practices, pollution prevention and educational practices, maintenance procedures and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater, receiving waters or stormwater conveyance systems. BMPs also include treatment practices, operating procedures and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

BUILDING

Any structure, either temporary or permanent, having walls and a roof, designed for the shelter of any person, animal or property, and occupying more than 100 square feet of area.

CHANNEL

A natural or artificial watercourse with a definite bed and banks that conducts continuously or periodically flowing water.

CLEAN WATER ACT

The Federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.), and any subsequent amendments thereto.

CLEARING

Any activity that removes the vegetative surface cover.

CONSTRUCTION ACTIVITY

Activity requiring authorization under the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity, GP-15-002, as amended or revised. These activities include construction projects resulting in land disturbance of one or more acres. Such activities include, but are not limited to, clearing and grubbing, grading, excavating and demolition.

[Amended 11-18-2015 by L.L. No. 9-2015]

DEDICATION

The deliberate appropriation of property by its owner for general public use.

DEPARTMENT

The New York State Department of Environmental Conservation.

DESIGN MANUAL

The New York State Stormwater Management Design Manual, most recent version, including applicable updates, that serve as the official guide for stormwater management principles, methods and practices.

DEVELOPER

A person who undertakes land development activities.

EROSION CONTROL MANUAL

The most recent version of the New York Standards and Specifications for Erosion and Sediment Control manual, commonly known as the "Blue Book."

GREEN INFRASTRUCTURE PRACTICE

As set forth in Chapter 5 of the New York State Stormwater Management Design Manual.

[Added 11-18-2015 by L.L. No. 9-2015]

GRADING

Excavation or fill of material, including the resulting conditions thereof.

HAZARDOUS MATERIAL

Any material, including any substance, waste or combination thereof, which, because of its quantity, concentration or physical, chemical or infectious characteristics, may cause or significantly contribute to a substantial present or potential hazard to human health, safety, property or the environment when improperly treated, stored, transported, disposed of or otherwise managed.

ILLICIT CONNECTION

Any drain or conveyance, whether on the surface or subsurface, which allows an illegal discharge to enter the MS4, including but not limited to:

- (1) Any conveyances which allow any nonstormwater discharge, including treated or untreated sewage, process wastewater and wash water, to enter the MS4 and any connections to the storm drain system from indoor drains and sinks, regardless of whether said drain or connection had been previously allowed, permitted or approved by an authorized enforcement agency; or
- (2) Any drain or conveyance connected from a commercial or industrial land use to the MS4 which has not been documented in plans, maps or equivalent records and approved by an authorized enforcement agency.

ILLICIT DISCHARGE

Any direct or indirect nonstormwater discharge to the MS4, except as exempted in § 267-12 of this chapter.

IMPERVIOUS COVER

Those surfaces, improvements and structures that cannot effectively infiltrate rainfall, snowmelt and water (e.g., building rooftops, pavement, sidewalks, driveways, etc.).

INDUSTRIAL ACTIVITY

Activities requiring the NYSDEC SPDES Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity, GP-0-12-001, as amended or revised.
[Amended 11-18-2015 by L.L. No. 9-2015]

INDUSTRIAL STORMWATER PERMIT

A State Pollutant Discharge Elimination System permit issued to a commercial industry or group of industries, which regulates the pollutant levels associated with industrial stormwater discharges or specifies on-site pollution control strategies.

INFILTRATION

The process of percolating stormwater into the subsoil.

JURISDICTIONAL WETLAND

An area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as "hydrophytic vegetation."

LAND DEVELOPMENT ACTIVITY

Construction activity, including clearing, grubbing, grading, filling, excavating or stockpiling activities, that results in soil disturbance equal to or greater than 5,000 square feet. Clearing activities include, but are not limited to, logging equipment operations, the cutting and skidding of trees, and stump removal and/or brush root removal. Land development activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity or original purpose of a facility.

[Amended 11-18-2015 by L.L. No. 9-2015]

LANDOWNER

The legal or beneficial owner of land, including those holding the right to purchase or lease the land, or any other person holding proprietary rights in the land.

LARGER COMMON PLAN OF DEVELOPMENT OR SALE

A contiguous area where multiple separate and distinct land development activities are occurring, or will

occur, under one plan. The term "plan" in "larger common plan of development or sale" is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, marketing plan, advertisement, drawing, permit application, State Environmental Quality Review Act (SEQRA) application, zoning request, computer design, etc.) or physical demarcation (including signs, lot stakes, surveyor markings, etc.) indicating that land development activities may occur on a specific plot. For discrete construction projects that are located within a "larger common plan of development or sale" that are at least 1/4 mile apart, each activity can be treated as a separate plan of development or sale, provided any interconnecting road, pipeline or utility project that is part of the same common plan is not concurrently being disturbed.

[Added 11-18-2015 by L.L. No. 9-2015]

MAINTENANCE AGREEMENT

A legally recorded document that acts as a property deed restriction and which provides for long-term maintenance of stormwater management practices.

MS4

Municipal separate storm sewer system.

MUNICIPALITY

The Town of North Castle.

MUNICIPAL SEPARATE STORM SEWER SYSTEM

A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels or storm drains):

- (1) Owned or operated by the Town of North Castle;
- (2) Designed or used for collecting or conveying stormwater;
- (3) Which is not a combined sewer; and
- (4) Which is not part of a publicly owned treatment works (POTW) as defined at 40 CFR 122.2.

NONPOINT SOURCE POLLUTION

Pollution from any source other than from any discernible, confined and discrete conveyances and shall include, but not be limited to, pollutants from agricultural, silvicultural, mining, construction, subsurface disposal and urban runoff sources.

NONSTORMWATER DISCHARGE

Any discharge to the MS4 that is not composed entirely of stormwater.

PERSON

Any individual, association, organization, partnership, firm, corporation or other entity recognized by law and acting as either the owner or as the owner's agent.

PHASING

Clearing a parcel of land in distinct pieces or parts, with the stabilization of each piece completed before the clearing of the next.

POINT SOURCE POLLUTION

Pollution from a single identifiable localized source, typically a discernible, confined and discrete conveyance.

[Added 11-18-2015 by L.L. No. 9-2015]

POLLUTANT

Dredged spoil, filter backwash, solid waste, incinerator residue, treated or untreated sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, agricultural waste and ballast discharged into

water, which may cause or might reasonably be expected to cause pollution of the waters of the state in contravention of the standards.

POLLUTANT OF CONCERN

Sediment or a water quality measurement that addresses sediment (such as total suspended solids, turbidity or siltation) and any other pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from the land development activity.

PREMISES

Any building, lot, parcel of land or portion of land, whether improved or unimproved, including adjacent sidewalks and parking strips.

PROJECT

Land development activity.

QUALIFIED INSPECTOR

A person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed professional engineer, certified professional in erosion and sediment control (CPESC), registered landscape architect, or other NYSDEC endorsed individual(s). It can also mean someone working under the direct supervision of, and at the same company as, the licensed professional engineer or registered landscape architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed professional engineer or registered landscape architect has received four hours of NYSDEC endorsed training in proper erosion and sediment control principles every three years.

[Added 11-18-2015 by L.L. No. 9-2015]

QUALIFIED PROFESSIONAL

A person that is knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed professional engineer, registered landscape architect or other NYSDEC endorsed individual(s). Individuals preparing SWPPPs that require post-construction stormwater management practices must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design and, in many cases, the principles of hydraulics, in order to prepare a SWPPP that conforms to the NYSDEC's technical standard. All components of the SWPPP that involve the practice of engineering, as defined by the New York State Education Law, shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York.

[Added 11-18-2015 by L.L. No. 9-2015]

RECHARGE

The replenishment of underground water reserves.

SEDIMENT CONTROL

Measures that prevent eroded sediment from leaving the site.

SENSITIVE AREAS

Cold-water fisheries, shellfish beds, swimming beaches, groundwater recharge areas, water supply reservoirs, habitats for threatened, endangered or special concern species.

SPDES GENERAL PERMIT FOR CONSTRUCTION ACTIVITIES GP-15-002

A permit under the New York State Pollutant Discharge Elimination System (SPDES) issued to developers of construction activities to regulate disturbance of one or more acres of land, or 5,000 square feet or more within the New York City east of Hudson Watershed.

[Amended 11-18-2015 by L.L. No. 9-2015]

SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES FROM MUNICIPAL SEPARATE STORMWATER SEWER SYSTEMS GP-15-003

A permit under the New York State Pollutant Discharge Elimination System (SPDES) issued to

municipalities to regulate discharges from municipal separate storm sewers for compliance with EPA-established water quality standards and/or to specify stormwater control standards.

[Amended 11-18-2015 by L.L. No. 9-2015]

SPECIAL CONDITION

- (1) Discharge compliance with water quality standards: the condition that applies where a municipality has been notified that the discharge of stormwater authorized under its MS4 permit may have caused or has the reasonable potential to cause or contribute to the violation of an applicable water quality standard. Under this condition, the municipality must take all necessary actions to ensure future discharges do not cause or contribute to a violation of water quality standards.
- (2) Section 303(d)-listed waters: the condition in the municipality's MS4 permit that applies where the MS4 discharges to a 303(d)-listed water. Under this condition, the stormwater management program must ensure no increase of the listed pollutant of concern to the 303(d)-listed water.
- (3) Total maximum daily load (TMDL) strategy: the condition in the municipality's MS4 permit where a TMDL including requirements for control of stormwater discharges has been approved by the EPA for a water body or watershed into which the MS4 discharges. If the discharge from the MS4 did not meet the TMDL stormwater allocations prior to September 10, 2007, the municipality was required to modify its stormwater management program to ensure that reduction of the pollutant of concern specified in the TMDL is achieved.
- (4) The condition in the municipality's MS4 permit that applies if a TMDL is approved in the future by the EPA for any water body or watershed into which an MS4 discharges. Under this condition, the municipality must review the applicable TMDL to see if it includes requirements for control of stormwater discharges. If an MS4 is not meeting the TMDL stormwater allocations, the municipality must, within six months of the TMDL's approval, modify its stormwater management program to ensure that reduction of the pollutant of concern specified in the TMDL is achieved.

303(D) LIST

A list of all surface waters in the state for which beneficial uses of the water (drinking, recreation, aquatic habitat and industrial use) are impaired by pollutants, prepared periodically by the Department as required by Section 303(d) of the Clean Water Act. Section 303(d)-listed waters are estuaries, lakes and streams that fall short of state surface water quality standards and are not expected to improve within the next two years.

STABILIZATION

The use of practices that prevent exposed soil from eroding.

STABILIZED

That all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a minimum density of 80% over the entire pervious surface has been established; or other equivalent stabilization measures, such as permanent landscape mulches, rock riprap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.

[Added 11-18-2015 by L.L. No. 9-2015]

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (SPDES) STORMWATER DISCHARGE PERMIT

A permit issued by the Department that authorizes the discharge of pollutants to waters of the state.

STOP-WORK ORDER

An order issued which requires that all construction activity on a site be stopped.

STORMWATER

Rainwater, surface runoff, snowmelt and drainage.

STORMWATER HOT SPOT

A land use or activity that generates higher concentrations of hydrocarbons, trace metals or toxicants than

are found in typical stormwater runoff, based on monitoring studies.

STORMWATER MANAGEMENT

The use of structural or nonstructural practices that are designed to reduce stormwater runoff and mitigate its adverse impacts on property, natural resources and the environment.

STORMWATER MANAGEMENT FACILITY

One or a series of stormwater management practices installed, stabilized and operating for the purpose of controlling stormwater runoff.

STORMWATER MANAGEMENT OFFICER (SMO)

An employee or officer designated by the municipality to accept and review stormwater pollution prevention plans, forward the plans to the applicable municipal board and inspect stormwater management practices. In addition, the SMO enforces the prohibition of illicit discharges, activities and connections to the separate storm sewer system.

STORMWATER MANAGEMENT PRACTICES (SMPS)

Measures, either structural or nonstructural, that are determined to be the most-effective practical means of preventing flood damage and preventing or reducing point source or nonpoint source pollution inputs to stormwater runoff and water bodies.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A plan for controlling stormwater runoff and pollutants from a site during and after construction activities, prepared in conformance with this chapter, the SPDES General Permit for Construction Activities, and applicable NYSDEC technical standards.

[Amended 11-18-2015 by L.L. No. 9-2015]

STORMWATER RUNOFF

Flow on the surface of the ground, resulting from precipitation.

SURFACE WATERS OF THE STATE OF NEW YORK

Lakes, bays, sounds, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic Ocean within the territorial seas of the State of New York and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters that do not combine or effect a junction with natural surface or underground waters), which are wholly or partially within or bordering the state or within its jurisdiction. Storm sewers and waste treatment systems, including treatment ponds or lagoons which also meet the criteria of this definition, are not waters of the state. This exclusion applies only to man-made bodies of water which neither were originally created in waters of the state (such as a disposal area in wetlands) nor resulted from impoundment of waters of the state.

TMDL

Total maximum daily load.

TOTAL MAXIMUM DAILY LOAD

The maximum amount of a pollutant to be allowed to be released into a water body so as not to impair uses of the water, allocated among the sources of that pollutant.

TRAINED CONTRACTOR

An employee from the contracting (construction) company that has received four hours of NYSDEC-endorsed training in proper erosion and sediment control principles. After receiving the initial training, the trained contractor shall receive four hours of training every three years. It can also mean an employee from the contracting (construction) company that meets the qualified inspector qualifications as defined herein.

[Added 11-18-2015 by L.L. No. 9-2015]

WASTEWATER

Water that is not stormwater, is contaminated with pollutants, and is or will be discarded.

WATERCOURSE

A permanent or intermittent stream or other body of water, either natural or man-made, which gathers or carries surface water.

WATERWAY

A channel that directs surface runoff to a watercourse or to the public storm drain.

§ 267-5. Stormwater pollution prevention plans.

[Amended 11-18-2015 by L.L. No. 9-2015]

- A. Stormwater pollution prevention plan requirement. No application for approval of a land development activity shall be reviewed until either the SMO or the appropriate board has received a stormwater pollution prevention plan (SWPPP) prepared in accordance with the specifications in this chapter. For projects also requiring coverage under the SPDES General Permit for Construction Activities, applications must also be accompanied by all related NYSDEC forms and certifications.
- B. All SWPPPs shall be prepared by a qualified professional, as defined in § 267-4 of this chapter.
- C. All SWPPPs shall be prepared in conformance with this chapter, the SPDES General Permit for Construction Activities, and the NYSDEC technical standards, as applicable.
- D. Contents of stormwater pollution prevention plans.
 - (1) All SWPPPs shall provide the following background information and erosion and sediment controls:
 - (a) Background information about the scope of the project, including location, type and size of project;
 - (b) Site map/construction drawing(s) for the project, including a general location map. At a minimum, the site map should show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s); wetlands and drainage patterns that could be affected by the construction activity; existing and final slopes; locations of off-site material, waste, borrow or equipment storage areas; and location(s) of the stormwater discharge(s);
 - (c) Description of the soil(s) present at the site;
 - (d) Construction phasing plan describing the intended sequence of construction activities, including clearing and grubbing, excavation and grading, utility and infrastructure installation and any other activity at the site that results in soil disturbance. Consistent with the New York Standards and Specifications for Erosion and Sediment Control (Erosion Control Manual), not more than five acres shall be disturbed at any one time unless a greater amount is determined necessary pursuant to an approved SWPPP;
 - (e) Description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a pollutant source in stormwater runoff;
 - (f) Description of construction and waste materials expected to be stored on site, with updates as appropriate, and a description of controls to reduce pollutants from these materials, including storage practices to minimize exposure of the materials to stormwater, and spill prevention and response;
 - (g) Temporary and permanent structural and vegetative measures to be used for soil stabilization, runoff control and sediment control for each stage of the project, from initial land clearing and grubbing to project closeout;
 - (h) A site map/construction drawing(s) specifying the location(s), size(s) and length(s) of each erosion and sediment control practice;
 - (i) Dimensions, material specifications and installation details for all erosion and sediment control practices, including the siting and sizing of any temporary sediment basins;

- (j) Temporary practices that will be converted to permanent control measures;
 - (k) Implementation schedule for staging temporary erosion and sediment control practices, including the timing of initial placement and the duration that each practice should remain in place;
 - (l) Maintenance schedule to ensure continuous and effective operation of the erosion and sediment control practice;
 - (m) Name(s) of the receiving water(s);
 - (n) Delineation of SWPPP implementation responsibilities for each part of the site;
 - (o) Description of structural practices designed to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable;
 - (p) Any existing data that describes the stormwater runoff at the site; and
 - (q) Post-construction stormwater quantity and quality controls, at the discretion of the SMO and/or the Town Engineer, may be required.
- (2) Post-construction stormwater management practice component.
- (a) All construction projects identified as needing post-construction stormwater management practices pursuant to the SPDES General Permit for Construction Activities shall prepare a SWPPP that includes practices designed in conformance with the Design Manual, including green infrastructure practices, in addition to the items listed under § 267-5D(1) above. Where post-construction stormwater management practices are not designed in conformance with this technical standard, the applicant must demonstrate equivalence to the technical standard.
 - (b) At a minimum, the post-construction stormwater practice component of the SWPPP shall include the following:
 - [1] Identification of all post-construction stormwater management practices to be constructed as part of the project.
 - [2] Site map/construction drawing(s) showing the specific location(s) and size(s) of each post-construction stormwater management practice.
 - [3] Hydrologic and hydraulic analysis for all structural components of the stormwater management control system for the applicable design storms. The analysis shall include tributary area maps with two-foot contours for the predevelopment and post-development conditions.
 - [4] Detailed summary (including calculations) of the sizing criteria that was used to design all post-construction stormwater management practices. At a minimum, the summary shall address the required design criteria from the applicable chapter of the Design Manual; including the identification of and justification for any deviations from the Design Manual, and identification of any design criteria that are not required based on the design criteria or waiver criteria included in the Design Manual.
 - [5] Identification of any elements of the design that are not in conformance with the Design Manual. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is equivalent to the technical standards.
 - [6] Comparison of post-development stormwater runoff conditions with predevelopment conditions.
 - [7] Dimensions, material specifications and installation details for each post-construction stormwater management practice or facility.
 - [8] Site maps must include existing topography with two-foot contours, a proposed grading plan with a limit of disturbance line, and the calculated area of disturbance in acres.
 - [9] An operations and maintenance plan that includes inspection and maintenance schedules and

actions to ensure continuous and effective operation of each post-construction stormwater management practice or facility. The plan shall identify the entity that will be responsible for the long-term operation and maintenance of each practice.

[10] Maintenance easements to ensure access to all stormwater management practices at the site for the purpose of inspection and repair. Easements shall be recorded on the plan and shall remain in effect with transfer of title to the property.

[11] Inspection and maintenance agreement binding on all subsequent landowners served by the on-site stormwater management measures in accordance with § 267-7 of this chapter.

(3) Enhanced phosphorus. All projects that are required to conform to the Enhanced Phosphorus Removal Standards, pursuant to the SPDES General Permit for Construction Activities, shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the Design Manual. At a minimum, the post-construction stormwater management practice component of the SWPPP shall include items D(2)(b)[1] through D(2)(b)[11] above.

E. Other environmental permits. The applicant shall assure that all other applicable environmental permits have been or will be acquired for the land development activity prior to approval of the final stormwater design plan.

F. Contractor certification.

(1) All certifications required pursuant to the SPDES General Permit for Construction Activities shall be submitted, endorsed and incorporated into the SWPPP.

(2) Each contractor and subcontractor identified in the SWPPP who will be responsible for installing, constructing, repairing, inspecting and maintaining the erosion and sediment control practices included in the SWPPP and the post-construction stormwater management practice installation must sign and date a copy of the following contractor certification statement before undertaking any land development activity: "I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") General Permit for Stormwater Discharges from Construction Activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings."

(3) The certification must include the name and title of the person providing the signature, address and telephone number of the contracting firm, the address (or other identifying description) of the site, and the date the certification is made.

(4) The certification statement(s) shall become part of the SWPPP for the land development activity.

G. A copy of the SWPPP shall be retained at the site of the land development activity during construction from the date of initiation of construction activities to the date of final stabilization.

§ 267-6. Performance and design criteria.

All land development activities shall be subject to the following performance and design criteria:

A. Technical standards. For the purpose of this chapter, the following documents shall serve as the official guides and specifications for stormwater management. Stormwater management practices that are designed and constructed in accordance with these technical documents shall be presumed to meet the standards imposed by this chapter.

(1) The New York State Stormwater Management Design Manual (New York State Department of Environmental Conservation, most current version or its successor, hereafter referred to as the "Design

Manual").

- (2) New York Standards and Specifications for Erosion and Sediment Control (Empire State Chapter of the Soil and Water Conservation Society, 2004, most current version or its successor, hereafter referred to as the "Erosion Control Manual").
- B. Equivalence to technical standards. Where stormwater management practices are not in accordance with technical standards, the applicant or developer must demonstrate equivalence to the technical standards set forth in Subsection A of this section, and the SWPPP shall be prepared by a licensed professional.
- C. Water quality standards. Any land development activity shall not cause an increase in turbidity that will result in substantial visible contrast to natural conditions in surface waters of the State of New York.

§ 267-7. Maintenance, inspection and repair of stormwater facilities.

A. Maintenance and inspection during construction.

[Amended 11-18-2015 by L.L. No. 9-2015]

- (1) Inspection requirements shall be as specified within the SPDES General Permit for Construction Activities.
 - (2) The applicant or developer of the land development activity or his or her representative shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the applicant or developer to achieve compliance with the conditions of this chapter. Sediment shall be removed from sediment traps or sediment ponds whenever their design capacity has been reduced by 50%.
 - (3) The applicant/developer must ensure that all erosion and sediment control practices and all post-construction stormwater management practices identified in the SWPPP are maintained in effective operating condition at all times.
 - (4) The applicant/developer shall inspect, in accordance with the requirements of the most current version of the Erosion Control Manual, the erosion and sediment controls identified in the SWPPP to ensure that they are being maintained in effective operating condition at all times. The applicant/developer shall have each of the contractors and subcontractors identify at least one person from their company that will be responsible for implementation of the SWPPP. This person shall be known as the trained contractor. The applicant/developer shall ensure that at least one trained contractor is on site on a daily basis when soil disturbance activities are being performed.
 - (5) For land development activities that disturb one or more acres of land, the applicant shall have a qualified inspector conduct site inspections and document the effectiveness of all erosion and sediment control practices every seven calendar days. Inspection reports shall be prepared in compliance with standards outlined within the SPDES General Permit for Construction Activities. Inspection reports shall be maintained on site and copies furnished to the SMO upon request.
 - (6) Inspections of any post-construction stormwater management practice that includes structural components shall be performed by a New York State licensed professional engineer.
- B. Maintenance easement(s). Prior to the issuance of any approval that has a stormwater management facility as one of the requirements, the applicant or developer must execute a maintenance easement agreement that shall be binding on all subsequent landowners served by the stormwater management facility. The easement shall provide for access to the facility at reasonable times for periodic inspection by the Town of North Castle to ensure that the facility is maintained in proper working condition to meet design standards and any other provisions established by this chapter. The easement shall be recorded by the grantor in the office of the County Clerk after approval by the North Castle Town Attorney.
- C. Maintenance after construction. The owner or operator of permanent stormwater management practices installed in accordance with this chapter shall ensure they are operated and maintained to achieve the goals of this chapter. Proper operation and maintenance also includes, as a minimum, the following:

- (1) A preventive/corrective maintenance program for all critical facilities and systems of treatment and control (or related appurtenances) which are installed or used by the owner or operator to achieve the goals of this chapter.
 - (2) Written procedures for operation and maintenance and training new maintenance personnel.
 - (3) Discharges from the SMPs shall not exceed design criteria or cause or contribute to water quality standard violations in accordance with § 267-6C of this chapter.
- D. Maintenance agreements. The Town of North Castle shall approve a formal maintenance agreement for stormwater management facilities binding on all subsequent landowners and recorded in the office of the County Clerk as a deed restriction on the property prior to final plan approval. The maintenance agreement shall be consistent with the terms and conditions of the Town of North Castle Stormwater Control Facility Maintenance Agreement on file with the Town Attorney. The Town of North Castle, in lieu of a maintenance agreement, at its sole discretion, may accept dedication of any existing or future stormwater management facility, provided such facility meets all the requirements of this chapter and includes adequate and perpetual access and sufficient area, by easement or otherwise, for inspection and regular maintenance.

§ 267-8. Inspections; performance guarantees; enforcement; penalties for offenses; fees.

A. Construction inspections.

(1) Erosion and sediment control inspection.

- (a) The Town of North Castle Stormwater Management Officer may require such inspections as necessary to determine compliance with this Chapter 267 of the Town Code and may either approve that portion of the work completed or notify the applicant wherein the work fails to comply with the requirements of this Chapter 267 of the Town Code and the stormwater pollution prevention plan (SWPPP) as approved. To obtain inspections, the applicant shall notify the Town of North Castle Building Department at least 48 hours before any of the following, as required by the Stormwater Management Officer:

- [1] Start of construction.
- [2] Installation of sediment and erosion control measures.
- [3] Completion of site clearing.
- [4] Completion of rough grading.
- [5] Completion of final grading.
- [6] Close of the construction season.
- [7] Completion of final landscaping.
- [8] Successful establishment of landscaping in public areas.

- (b) If any violations are found, the applicant and developer shall be notified in writing of the nature of the violation and the required corrective actions. No further land development activity shall be conducted except for site stabilization until any violations are corrected and all work previously completed has received approval by the Stormwater Management Officer.

- (2) Stormwater management practice inspections. The Town of North Castle Stormwater Management Officer is responsible for conducting inspections of stormwater management practices (SMPs). All applicants are required to submit as-built plans for any stormwater management practices located on site after final construction is completed. The plan must show the final design specifications for all stormwater management facilities and must be certified by a professional engineer.

- (3) Inspection of stormwater facilities after project completion. Inspection programs shall be established on any reasonable basis, including but not limited to routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; inspection of drainage basins or areas identified as higher-than-typical sources of sediment or other contaminants or pollutants; inspections of businesses or industries of a type associated with higher-than-usual discharges of contaminants or pollutants or with discharges of a type which are more likely than the typical discharge to cause violations of state or federal water or sediment quality standards or the SPDES stormwater permit; and joint inspections with other agencies inspecting under environmental or safety laws. Inspections may include, but are not limited to, reviewing maintenance and repair records; sampling discharges, surface water, groundwater and material or water in drainage control facilities; and evaluating the condition of drainage control facilities and other stormwater management practices.
- (4) Submission of reports. The Town of North Castle Stormwater Management Officer may require monitoring and reporting from entities subject to Chapter **267** of the Town Code as are necessary to determine compliance with this Chapter **267** of the Town Code.
- (5) Right of entry for inspection. When any new stormwater management facility is installed on private property or when any new connection is made between private property and the public stormwater system, the landowner shall grant to the Town of North Castle the right to enter the property at reasonable times and in a reasonable manner for the purpose of inspection as specified in Subsection **A(3)** of this section.

B. Performance guarantee.

- (1) Construction completion guarantee. In order to ensure the full and faithful completion of all land development activities related to compliance with all conditions set forth by the Town of North Castle in its approval of the stormwater pollution prevention plan, the Town of North Castle may require the applicant or developer to provide, prior to construction, a performance bond, cash escrow or irrevocable letter of credit from an appropriate financial or surety institution which guarantees satisfactory completion of the project and names the Town of North Castle as the beneficiary. The security shall be in an amount to be determined by the Town of North Castle based on submission of final design plans, with reference to actual construction and landscaping costs. The performance guarantee shall remain in force until the surety is released from liability by the Town of North Castle, provided that such period shall not be less than one year from the date of final acceptance or such other certification that the facility(ies) has (have) been constructed in accordance with the approved plans and specifications and that a one-year inspection has been conducted and the facilities have been found to be acceptable to the Town of North Castle. Per annum interest on cash escrow deposits shall be reinvested in the account until the surety is released from liability.
- (2) Maintenance guarantee. Where stormwater management and erosion and sediment control facilities are to be operated and maintained by the developer or by a corporation that owns or manages a commercial or industrial facility, the developer, prior to construction, may be required to provide the Town of North Castle with an irrevocable letter of credit from an approved financial institution or surety to ensure proper operation and maintenance of all stormwater management and erosion control facilities both during and after construction and until the facilities are removed from operation. If the developer or landowner fails to properly operate and maintain stormwater management and erosion and sediment control facilities, the Town of North Castle may draw upon the account to cover the costs of proper operation and maintenance, including engineering and inspection costs.
- (3) Recordkeeping. The Town of North Castle may require entities subject to Chapter **267** of the Town Code to maintain records demonstrating compliance with this Chapter **267** of the Town Code.

C. Enforcement and penalties.

- (1) Notice of violation. When the Town of North Castle determines that a land development activity is not being carried out in accordance with the requirements of this Chapter **267** of the Town Code, it may issue a written notice of violation to the landowner. The notice of violation shall contain:
 - (a) The name and address of the landowner, developer or applicant.

- (b) The address, when available, or a description of the building, structure or land upon which the violation is occurring.
 - (c) A statement specifying the nature of the violation.
 - (d) A description of the remedial measures necessary to bring the land development activity into compliance with this chapter and a time schedule for the completion of such remedial action.
 - (e) A statement of the penalty or penalties that shall or may be assessed against the person to whom the notice of violation is directed.
 - (f) A statement that the determination of violation may be appealed to the municipality by filing a written notice of appeal within 15 days of service of notice of violation.
- (2) Stop-work orders. The Town of North Castle may issue a stop-work order for violations of Chapter **267** of the Town Code. Persons receiving a stop-work order shall be required to halt all land development activities, except those activities that address the violations leading to the stop-work order. The stop-work order shall be in effect until the Town of North Castle confirms that the land development activity is in compliance and the violation has been satisfactorily addressed. Failure to address a stop-work order in a timely manner may result in civil, criminal or monetary penalties in accordance with the enforcement measures authorized in this Chapter **267** of the Town Code.
- (3) Violations. Any land development activity that is commenced or is conducted contrary to this chapter may be restrained by injunction or otherwise abated in a manner provided by law.
- (4) Penalties. In addition to or as an alternative to any penalty provided herein or by law, any person who violates the provisions of this article shall be guilty of a violation punishable by a fine not exceeding \$350 or imprisonment for a period not to exceed six months, or both, for conviction of a first offense; for conviction of a second offense, both of which were committed within a period of five years, punishable by a fine not less than \$350 nor more than \$700 or imprisonment for a period not to exceed six months, or both; and upon conviction for a third or subsequent offense, all of which were committed within a period of five years, punishable by a fine not less than \$700 nor more than \$1,000 or imprisonment for a period not to exceed six months, or both. However, for the purpose of conferring jurisdiction upon courts and judicial officers generally, violations of this article shall be deemed misdemeanors, and for such purpose only, all provisions of law relating to misdemeanors shall apply to such violations. Each week's continued violation shall constitute a separate additional violation.
- (5) Withholding of certificate of occupancy. If any building or land development activity is installed or conducted in violation of this chapter, the Stormwater Management Officer may prevent the occupancy of said building or land.
- (6) Restoration of lands. Any violator may be required to restore land to its undisturbed condition. In the event that restoration is not undertaken within a reasonable time after notice, the Town of North Castle may take necessary corrective action, the cost of which shall become a lien upon the property until paid.
- D. Fees for services. The Town of North Castle may require any person undertaking land development activities regulated by Chapter **267** of the Town Code to pay reasonable costs at prevailing rates for review of SWPPPs, inspections or SMP maintenance performed by the Town of North Castle or performed by a third party for the Town of North Castle in such amounts as set forth in the Master Fee Schedule.
[Amended 8-14-2013 by L.L. No. 7-2013]

Article II. Illicit Discharges and Connections to Storm Sewer System

§ 267-9. Purpose.

The purpose of this article is to provide for the health, safety and general welfare of the citizens of the Town of North Castle through the regulation of nonstormwater discharges to the municipal separate storm sewer system (MS4) to the maximum extent practicable as required by federal and state law. This chapter establishes methods for

controlling the introduction of pollutants into the MS4 in order to comply with requirements of the SPDES General Permit for Municipal Separate Storm Sewer Systems. The objectives of this article are:

- A. To meet the requirements of the SPDES General Permit for Stormwater Discharges from MS4s, Permit No. GP-15-003, or as amended or revised;
[Amended 11-18-2015 by L.L. No. 9-2015]
- B. To regulate the contribution of pollutants to the MS4 since such systems are not designed to accept, process or discharge nonstormwater wastes;
- C. To prohibit illicit connections, activities and discharges to the MS4;
- D. To establish legal authority to carry out all inspection, surveillance and monitoring procedures necessary to ensure compliance with this chapter; and
- E. To promote public awareness of the hazards involved in the improper discharge of trash, yard waste, lawn chemicals, pet waste, wastewater, grease, oil, petroleum products, cleaning products, paint products, hazardous waste, sediment and other pollutants into the MS4.

§ 267-10. Applicability.

This article shall apply to all water entering the MS4 generated on any developed and undeveloped lands unless explicitly exempted by an authorized enforcement agency.

§ 267-11. Responsibility for administration.

The Stormwater Management Officer(s) [SMO(s)] shall administer, implement and enforce the provisions of this article. Such powers granted or duties imposed upon the authorized enforcement official may be delegated in writing by the SMO as may be authorized by the municipality.

§ 267-12. Discharge prohibitions.

- A. Prohibition of illegal discharges. No person shall discharge or cause to be discharged into the MS4 any materials other than stormwater except as provided in Subsection **A(1)**. The commencement, conduct or continuance of any illegal discharge to the MS4 is prohibited except as described as follows:
 - (1) The following discharges are exempt from discharge prohibitions established by this chapter, unless the Department or the municipality has determined them to be substantial contributors of pollutants: waterline flushing or other potable water sources; landscape irrigation or lawn watering; existing diverted stream flows; rising groundwater; uncontaminated groundwater infiltration to storm drains; uncontaminated pumped groundwater; foundation or footing drains; crawl space or basement sump pumps; air-conditioning condensate; irrigation water; springs; water from individual residential car washing; natural riparian habitat or wetland flows; dechlorinated swimming pool discharges; residential street wash water; water from firefighting activities; and any other water source not containing pollutants. Such exempt discharges shall be made in accordance with an appropriate plan for reducing pollutants.
 - (2) Discharges approved in writing by the SMO to protect life or property from imminent harm or damage, provided that such approval shall not be construed to constitute compliance with other applicable laws and requirements, and further provided that such discharges may be permitted for a specified time period and under such conditions as the SMO may deem appropriate to protect such life and property while reasonably maintaining the purpose and intent of this chapter.
 - (3) Dye testing in compliance with applicable state and local laws is an allowable discharge but requires a verbal notification to the SMO prior to the time of the test.
 - (4) The prohibition shall not apply to any discharge permitted under an SPDES permit, waiver or waste discharge order issued to the discharger and administered under the authority of the Department, provided

that the discharger is in full compliance with all requirements of the permit, waiver or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the MS4.

B. Prohibition of illicit connections.

- (1) The construction, use, maintenance or continued existence of illicit connections to the MS4 is prohibited.
- (2) This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.
- (3) A person is considered to be in violation of this article if the person connects a line conveying sewage to the municipality's MS4 or allows such a connection to continue.

§ 267-13. Prohibition against activities contaminating stormwater.

A. Activities that are subject to the requirement of this article are those types of activities that:

- (1) Cause or contribute to a violation of the municipality's MS4 SPDES permit.
- (2) Cause or contribute to the municipality being subject to a special condition, as defined in § 267-4 of this chapter.

B. Upon notification to a person that he or she is engaged in activities that cause or contribute to violations of the municipality's MS4 SPDES permit authorization, that person shall take all reasonable actions to correct such activities such that he or she no longer causes or contributes to violations of the municipality's MS4 SPDES permit authorization.

§ 267-14. Use of best management practices to prevent, control and reduce stormwater pollutants.

A. Best management practices. Where the SMO has identified illicit discharges as defined in § 267-4 of this chapter or activities contaminating stormwater as defined in § 267-13, the municipality may require implementation of best management practices (BMPs) to control those illicit discharges and activities.

- (1) The owner or operator of a commercial or industrial establishment shall provide, at its own expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the MS4 through the use of structural and nonstructural BMPs.
- (2) Any person responsible for a property or premises, which is or may be the source of an illicit discharge as defined in § 267-4 of this chapter or an activity contaminating stormwater as defined in § 267-13, may be required to implement, at said person's expense, additional structural and nonstructural BMPs to reduce or eliminate the source of pollutant(s) to the MS4.
- (3) Compliance with all terms and conditions of a valid SPDES permit authorizing the discharge of stormwater associated with industrial activity, to the extent practicable, shall be deemed compliance with the provisions of this article.

§ 267-15. Suspension of access to MS4; illicit discharges in emergency situations.

A. The SMO may, without prior notice, suspend MS4 discharge access to a person when such suspension is necessary to stop an actual or threatened discharge which presents or may present imminent and substantial danger to the environment, to the health or welfare of persons, or to the MS4. The SMO shall notify the person of such suspension within a reasonable time thereafter, in writing, of the reasons for the suspension. If the violator fails to comply with a suspension order issued in an emergency, the SMO may take such steps as

deemed necessary to prevent or minimize damage to the MS4 or to minimize danger to persons.

- B. Suspension due to the detection of illicit discharge. Any person discharging to the municipality's MS4 in violation of this chapter may have his or her MS4 access terminated if such termination would abate or reduce an illicit discharge. The SMO will notify a violator in writing of the proposed termination of its MS4 access and the reasons therefor. The violator may petition the SMO for a reconsideration and hearing. Access may be granted by the SMO if he/she finds that the illicit discharge has ceased and the discharger has taken steps to prevent its recurrence. Access may be denied if the SMO determines in writing that the illicit discharge has not ceased or is likely to recur. A person commits an offense if the person reinstates MS4 access to premises terminated pursuant to this section without the prior approval of the SMO.

§ 267-16. Industrial or construction activity discharges.

Any person subject to an industrial or construction activity SPDES stormwater discharge permit shall comply with all provisions of such permit. Proof of compliance with said permit may be required in a form acceptable to the Town prior to the allowing of discharges to the MS4.

§ 267-17. Access to facilities; monitoring of discharges.

- A. Applicability. This section applies to all facilities that the SMO must inspect to enforce any provision of this article or whenever the authorized enforcement agency has cause to believe that there exists, or potentially exists, in or upon any premises, any condition which constitutes a violation of this article.
- B. Access to facilities.
- (1) The SMO shall be permitted to enter and inspect facilities subject to regulation under this chapter as often as may be necessary to determine compliance with this article. If a discharger has security measures in force which require proper identification and clearance before entry into its premises, the discharger shall make the necessary arrangements to allow access to the SMO.
 - (2) Facility operators shall allow the SMO ready access to all parts of the premises for the purposes of inspection, sampling, examination and the copying of records as may be required to implement this article.
 - (3) The Town shall have the right to set up on any facility subject to this chapter such devices as are necessary in the opinion of the SMO to conduct monitoring and/or sampling of the facility's stormwater discharge.
 - (4) The Town has the right to require the facilities subject to this article to install monitoring equipment as is reasonably necessary to determine compliance with this article. The facility's sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the discharger at its own expense. All devices used to measure stormwater flow and quality shall be calibrated to ensure their accuracy.
 - (5) Unreasonable delays in allowing the Town access to a facility subject to this chapter are a violation of this article. A person who is the operator of a facility subject to this article commits an offense if the person denies the Town reasonable access to the facility for the purpose of conducting any activity authorized or required by this article.
 - (6) If the SMO has been refused access to any part of the premises from which stormwater is discharged and he/she is able to demonstrate probable cause to believe that there may be a violation of this article or that there is a need to inspect and/or sample as part of a routine inspection and sampling program designed to verify compliance with this article or any order issued hereunder, then the SMO may seek issuance of a search warrant from any court of competent jurisdiction.

§ 267-18. Notification of spills.

Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation, has information of any known or suspected release of

materials which are resulting or may result in illegal discharges or pollutants discharging into the MS4, said person shall take all necessary steps to ensure the discovery, containment and cleanup of such release. In the event of such a release of hazardous materials, said person shall immediately notify emergency response agencies of the occurrence via emergency dispatch services. In the event of a release of nonhazardous materials, said person shall notify the Town in person or by telephone or facsimile no later than the next business day. Notifications in person or by telephone shall be confirmed by written notice addressed and mailed to the Town within three business days of the telephone notice. If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on-site written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

§ 267-19. Enforcement.

A. Notice of violation.

- (1) When the Town's SMO finds that a person has violated a prohibition or failed to meet a requirement of this article, he/she may order compliance by written notice of violation to the responsible person. Such notice may require, without limitation:
 - (a) The elimination of illicit connections or discharges;
 - (b) That violating discharges, practices or operations shall cease and desist;
 - (c) The abatement or remediation of stormwater pollution or contamination hazards and the restoration of any affected property;
 - (d) The performance of monitoring, analyses and reporting;
 - (e) Payment of a fine; and
 - (f) The implementation of source control or treatment BMPs.
- (2) If abatement of a violation and/or restoration of affected property is required, the notice shall set forth a deadline within which such remediation or restoration must be completed. Said notice shall further advise that, should the violator fail to remediate or restore within the established deadline, the work will be done by a designated governmental agency or a contractor, and the expense thereof shall be charged to the violator.

- B. Penalties. In addition to or as an alternative to any penalty provided herein or by law, any person who violates the provisions of this article shall be guilty of a violation punishable by a fine not exceeding \$1,000 or by imprisonment for a period not to exceed 15 days, or by both such fine and imprisonment. However, for the purposes of conferring jurisdiction upon courts and judicial officers generally, violations of this article shall be deemed misdemeanors, and for such purpose only, all provisions of law relating to misdemeanors shall apply to such violations. Each day's continued violation shall constitute a separate additional violation.

[Amended 4-29-2020 by L.L. No. 3-2020]

§ 267-20. Appeal of notice of violation.

Any person receiving a notice of violation may appeal the determination of the SMO to the Town Board within 15 days of its issuance, which Board shall hear the appeal within 30 days after the filing of the appeal and, within five days of making its decision, file its decision in the office of the Town Clerk and mail a copy of its decision by certified mail to the discharger.

§ 267-21. Corrective measures after appeal.

- A. If the violation has not been corrected pursuant to the requirements set forth in the notice of violation or, in the event of an appeal, within five business days of the decision of the municipal authority upholding the decision of the SMO, then the SMO shall request the owner's permission for access to the subject private property to take

any and all measures reasonably necessary to abate the violation and/or restore the property.

- B. If refused access to the subject private property, the SMO may seek a warrant in a court of competent jurisdiction to be authorized to enter upon the property to determine whether a violation has occurred. Upon determination that a violation has occurred, the SMO may seek a court order to take any and all measures reasonably necessary to abate the violation and/or restore the property. The cost of implementing and maintaining such measures shall be the sole responsibility of the discharger.

§ 267-22. Injunctive relief.

It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this article. If a person has violated or continues to violate the provisions of this article, the SMO may petition for a preliminary or permanent injunction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.

§ 267-23. Alternative remedies.

- A. Where a person has violated a provision of this article, he/she may be eligible for alternative remedies in lieu of a civil penalty, upon recommendation of the Town Attorney and concurrence of the Town Building Inspector, where:
- (1) The violation was unintentional.
 - (2) The violator has no history of previous violations of this article.
 - (3) Environmental damage was minimal.
 - (4) The violator acted quickly to remedy the violation.
 - (5) The violator cooperated in investigation and resolution.
- B. Alternative remedies may consist of one or more of the following:
- (1) Attendance at compliance workshops.
 - (2) Storm drain stenciling or storm drain marking.
 - (3) River, stream or creek cleanup activities.

§ 267-24. Violations deemed public nuisance.

In addition to the enforcement processes and penalties provided, any condition caused or permitted to exist in violation of any of the provisions of this article is a threat to public health, safety and welfare and is declared and deemed a nuisance, and may be summarily abated or restored at the violator's expense, and/or a civil action to abate, enjoin or otherwise compel the cessation of such nuisance may be taken.

§ 267-25. Remedies not exclusive.

The remedies listed in this article are not exclusive of any other remedies available under any applicable federal, state or local law, and it is within the discretion of the authorized enforcement agency to seek cumulative remedies.

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APPENDIX C

Construction Sequence

Construction Sequence

Refer to the Plan Set for all plans and details which relate to Construction Sequence.

1. A licensed surveyor must define infrastructure locations, limits of disturbance, stormwater basin limits, and grades in the field prior to start of any construction. Limits of disturbance shall be marked with the installation of construction fence or approved equal.
2. Install all perimeter erosion control measures, construction entrance as shown on the Erosion and Sediment Control Plan and the associated Details.
3. Cut and clear trees within work area. Timbered trees, wood chips, and stumps shall be removed off-site. Strip site and place topsoil in stockpile locations shown on the plan.
4. Start construction of project access points, set-up staging areas as shown on Erosion and Sediment Control Plan.
5. Begin rough grading the site.
6. Rough grade of foundation for additions. Soil shall be stockpiled as shown and stabilized the next day if they are to be left alone for over seven days.
7. Begin excavation of building foundations, wall, and utilities. Protect open excavations. Where applicable, place fill on the up-slopes and side edges of fill area. Fill should be pushed in place and stabilized with tracking perpendicular to the slope. Place soil stockpiles in locations shown on the Erosion and Sediment Control Plans and associated Details.
8. Begin construction of the house addition.
9. Upon completion of foundation, backfill to grade and immediately stabilize areas that will not receive traffic or disturbance within seven (7) days.
10. Begin installation of retaining walls. Installation of stormwater management system shall not be installed until adjacent walls have been completed.
11. Begin installation of subsurface infiltration chambers. Entry into chambers shall be block until final site stabilization.
12. Begin the excavation and installation of utilities and drainage system. Protect trenches and open excavations from erosion. All drainage inlets shall be protected from sediment entering. There shall be no direct unfiltered discharge into the stormwater systems. The stormwater outlet shall be blocked until all upstream areas have been permanently stabilized.
13. During building and site construction maintain and re-establish as required erosion control and stabilization measures as required by the site plan and details.
14. Topsoil, rake, seed and mulch all disturbed areas. Once all proposed disturbances are completed, begin full stabilization of the site. Once the site has been stabilized, remove all temporary erosion control measures. This shall be done during optimum weather conditions to avoid sediment transport. A site shall be considered stabilized when it has a minimum uniform 80% perennial vegetation cover or other permanent non vegetative cover with a density sufficient to resist accelerated surface erosion. Once final stabilization has been achieved, unblock piping to infiltrators in order to allow flow to enter.

Winter Stabilization Notes:

1. If construction activities are expected to extend into or occur during the winter season the contractor shall anticipate proper stabilization and sequencing. Construction shall be sequenced such that wherever possible

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areas of disturbance that can be completed and permanently stabilized shall be done by applying and establishing permanent vegetative cover before the first frost. Areas subject to temporary disturbance that will not be worked for an extended period of time shall be treated with temporary seed, mulch, and/or erosion blankets.

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APPENDIX D

Soil Testing Data

TEST PIT DATA REQUIRED TO BE SUBMITTED WITH APPLICATION

DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES

DEPTH	HOLE NO. 1	DEPTH	HOLE NO. 2	DEPTH	HOLE NO. 3	DEPTH	HOLE NO. 4
G.L.		G.L.		G.L.		G.L.	
6"	Top Soil	6"	Top Soil	6"		6"	
12"		12"		12"		12"	
18"		18"		18"		18"	
24"	Reddish Brown Sandy Loam w/ boulders	20"	Reddish Brown Sandy Loam w/ boulders	20"		24"	
28"		28"		30"	28"		
36"		30"		36"		36"	
40"		42"		42"		42"	
48"		48"		48"		48"	
54"	Grayish Brown Sandy Loam w/ boulders	54"	Grayish Brown Sandy Loam w/ boulders	54"		54"	
60"		60"		60"	60"		
66"		66"		66"		66"	
72"		72"		72"		72"	
78"		78"		78"		78"	
84"		84"		84"		84"	
90"		90"		90"		90"	
96"		96"		96"		96"	
	Total Depth = 78"		Total Depth = 72"		Total Depth =		Total Depth =

INDICATE LEVEL AT WHICH GROUND WATER IS ENCOUNTERED
 INDICATE LEVEL FOR WHICH WATER LEVEL RISES AFTER BEING ENCOUNTERED
 TESTS MADE BY Thomas Kerrigan

N/A
 DATE 12/6/2021

Sketch:

INFILTRATION TESTS

SITE DESIGN CONSULTANTS - FIELD INSPECTION REPORT

Job# Paul Eisenberg
 Date 12-7-21

Owner Paul Eisenberg Location 47 Windmill Road Armonk, NY

General Observations Infiltration Testing for Stormwater

Who was Present: Carla Santana

Weather _____ Weather Previous _____

Lot # 1 Approx. Temp. _____

HOLE #	Run No.	CLOCK TIME		Elapse Time Min./Sec	PERCOLATION			Soil Rate in./hr drop
		Start	Stop		Depth to Water From Ground Surface		Water Level in Inches	
					Start Inches	Stop Inches		
				minutes				
1		1:08	1:09	1	3'1"	5'1"	24	1440.00
		1:13	1:15	2	3'1"	5'1"	24	720.00
		1:31	1:33	2	3'1"	5'1"	24	720.00
		1:37	1:39	2	3'1"	5'1"	24	720.00
				minutes				
2		1:19	1:20	1	22"	50"	24	1440.00
		1:21	1:22	1	22"	50"	24	1440.00
		1:23	1:24	1	22"	50"	24	1440.00
		1:26	1:27	1	22"	50"	24	1440.00
				minutes				
3								
				minutes				
4								

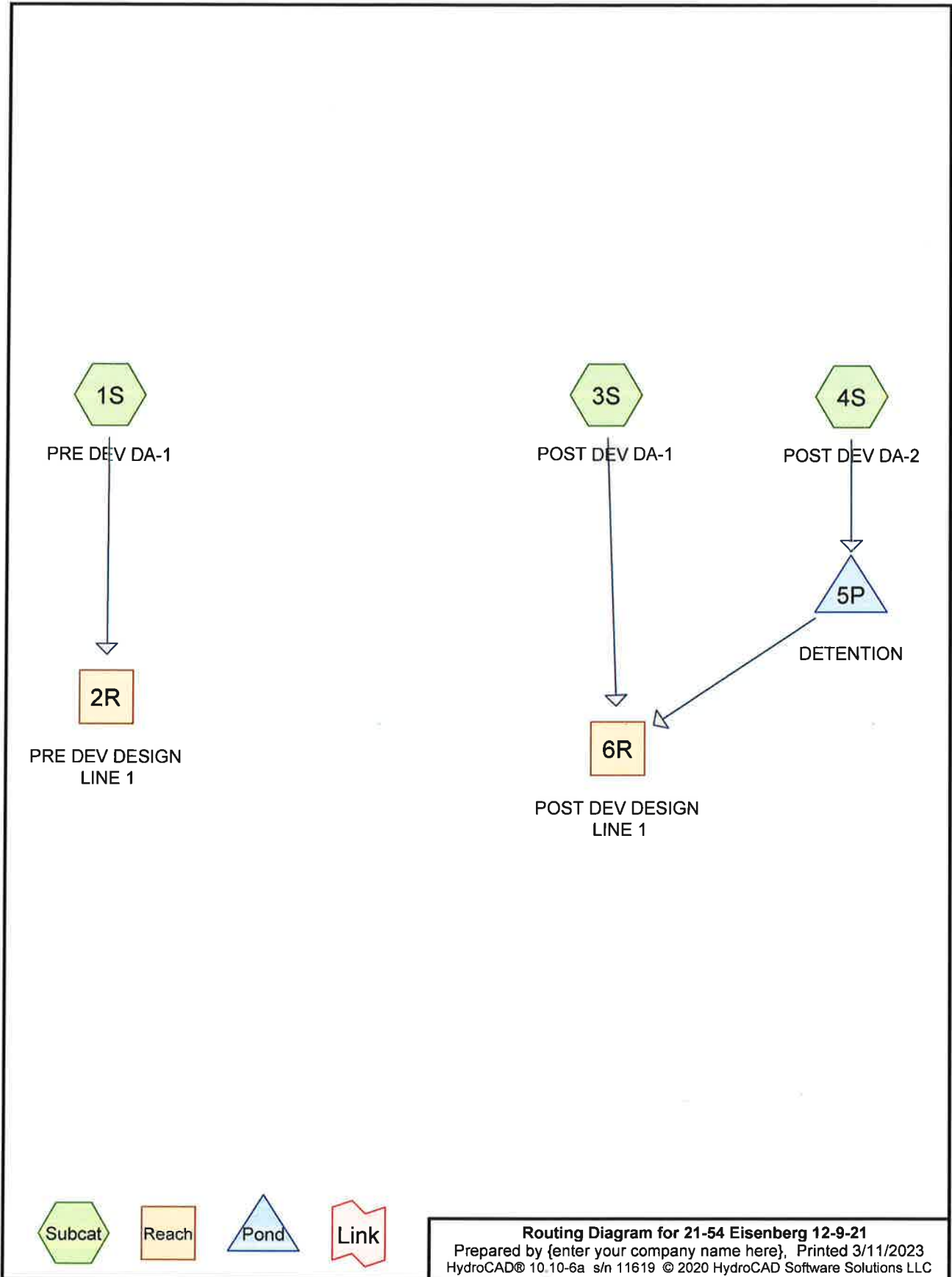
Notes:

- 1) Tests to be repeated at same depth until approximately equal soil rates are obtained at each percolation test hole. All data to be submitted for review.
- 2) Depth measurements to be made from top of hole.

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APPENDIX E

Hydrologic Analysis



21-54 Eisenberg 12-9-21

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Project Notes

Rainfall events imported from "21-18 Grishaj.hcp"

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year	Type III 24-hr		Default	24.00	1	2.80	2
2	2-Year	Type III 24-hr		Default	24.00	1	3.41	2
3	10-Year	Type III 24-hr		Default	24.00	1	5.25	2
4	25-Year	Type III 24-hr		Default	24.00	1	6.49	2

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.848	61	>75% Grass cover, Good, HSG B (1S, 3S, 4S)
0.409	98	Paved parking, HSG B (1S, 3S, 4S)
1.850	58	Woods/grass comb., Good, HSG B (1S, 3S)
3.107	64	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
3.107	HSG B	1S, 3S, 4S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
3.107		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.848	0.000	0.000	0.000	0.848	>75% Grass cover, Good	1S, 3S, 4S
0.000	0.409	0.000	0.000	0.000	0.409	Paved parking	1S, 3S, 4S
0.000	1.850	0.000	0.000	0.000	1.850	Woods/grass comb., Good	1S, 3S
0.000	3.107	0.000	0.000	0.000	3.107	TOTAL AREA	

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	5P	504.80	501.00	27.0	0.1407	0.012	0.0	4.0	0.0

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Type III 24-hr 1-Year Rainfall=2.80"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEV DA-1 Runoff Area=1.555 ac 10.61% Impervious Runoff Depth>0.31"
Flow Length=165' Tc=7.9 min CN=63 Runoff=0.34 cfs 0.040 af

Subcatchment3S: POST DEV DA-1 Runoff Area=1.230 ac 8.13% Impervious Runoff Depth>0.28"
Flow Length=165' Tc=7.9 min CN=62 Runoff=0.22 cfs 0.028 af

Subcatchment4S: POST DEV DA-2 Runoff Area=0.322 ac 44.72% Impervious Runoff Depth>0.91"
Tc=5.0 min CN=78 Runoff=0.36 cfs 0.024 af

Reach 2R: PRE DEV DESIGN LINE 1 Inflow=0.34 cfs 0.040 af
Outflow=0.34 cfs 0.040 af

Reach 6R: POST DEV DESIGN LINE 1 Inflow=0.22 cfs 0.028 af
Outflow=0.22 cfs 0.028 af

Pond 5P: DETENTION Peak Elev=503.64' Storage=0.000 af Inflow=0.36 cfs 0.024 af
Discarded=0.36 cfs 0.024 af Primary=0.00 cfs 0.000 af Outflow=0.36 cfs 0.024 af

Total Runoff Area = 3.107 ac Runoff Volume = 0.092 af Average Runoff Depth = 0.36"
86.84% Pervious = 2.698 ac 13.16% Impervious = 0.409 ac

Summary for Subcatchment 1S: PRE DEV DA-1

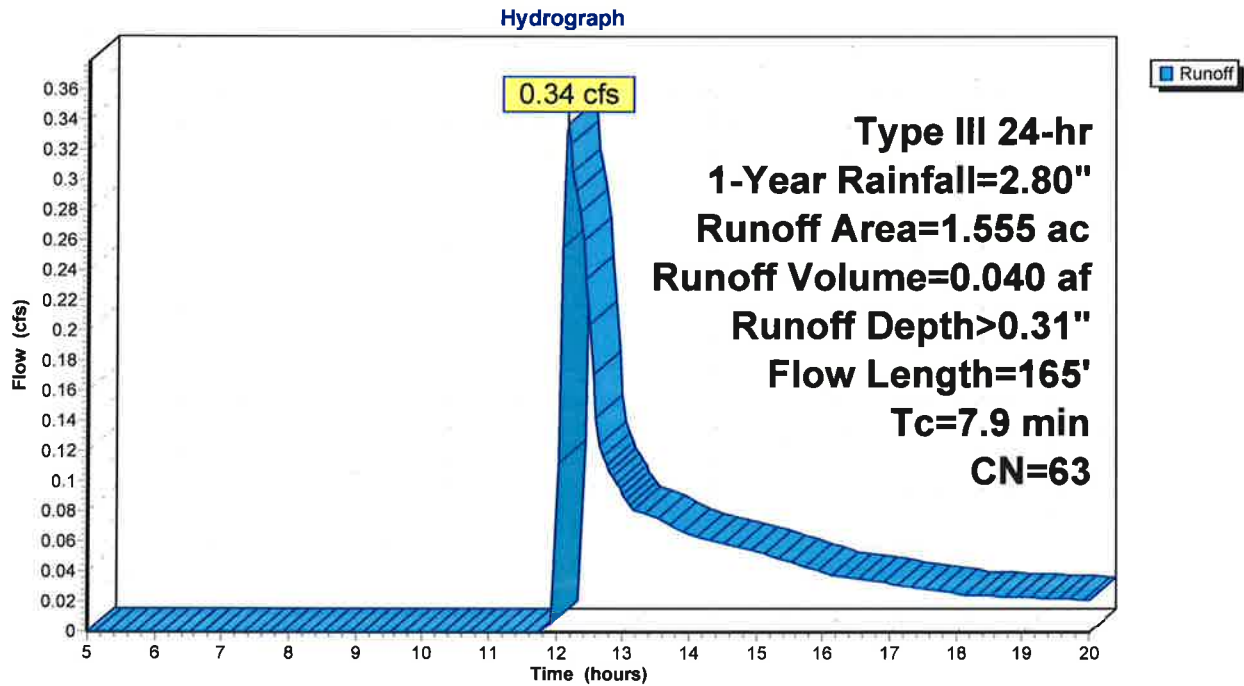
Runoff = 0.34 cfs @ 12.17 hrs, Volume= 0.040 af, Depth> 0.31"
 Routed to Reach 2R : PRE DEV DESIGN LINE 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 1-Year Rainfall=2.80"

Area (ac)	CN	Description
0.165	98	Paved parking, HSG B
0.533	61	>75% Grass cover, Good, HSG B
0.857	58	Woods/grass comb., Good, HSG B
1.555	63	Weighted Average
1.390		89.39% Pervious Area
0.165		10.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	150	0.1870	0.31		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
0.0	15	0.1330	5.87		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
7.9	165	Total			

Subcatchment 1S: PRE DEV DA-1



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Type III 24-hr 1-Year Rainfall=2.80"

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Hydrograph for Subcatchment 1S: PRE DEV DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.16	0.00	0.00	18.25	2.61	0.28	0.02
5.25	0.17	0.00	0.00	18.50	2.62	0.29	0.02
5.50	0.18	0.00	0.00	18.75	2.63	0.29	0.02
5.75	0.19	0.00	0.00	19.00	2.64	0.29	0.02
6.00	0.20	0.00	0.00	19.25	2.65	0.30	0.02
6.25	0.21	0.00	0.00	19.50	2.66	0.30	0.02
6.50	0.23	0.00	0.00	19.75	2.67	0.30	0.02
6.75	0.24	0.00	0.00	20.00	2.68	0.31	0.02
7.00	0.25	0.00	0.00				
7.25	0.27	0.00	0.00				
7.50	0.28	0.00	0.00				
7.75	0.30	0.00	0.00				
8.00	0.32	0.00	0.00				
8.25	0.34	0.00	0.00				
8.50	0.36	0.00	0.00				
8.75	0.38	0.00	0.00				
9.00	0.41	0.00	0.00				
9.25	0.44	0.00	0.00				
9.50	0.46	0.00	0.00				
9.75	0.50	0.00	0.00				
10.00	0.53	0.00	0.00				
10.25	0.57	0.00	0.00				
10.50	0.61	0.00	0.00				
10.75	0.65	0.00	0.00				
11.00	0.70	0.00	0.00				
11.25	0.76	0.00	0.00				
11.50	0.83	0.00	0.00				
11.75	0.99	0.00	0.00				
12.00	1.40	0.01	0.02				
12.25	1.81	0.06	0.31				
12.50	1.97	0.09	0.20				
12.75	2.04	0.11	0.11				
13.00	2.10	0.13	0.09				
13.25	2.15	0.14	0.08				
13.50	2.19	0.15	0.08				
13.75	2.23	0.16	0.07				
14.00	2.27	0.17	0.07				
14.25	2.30	0.18	0.06				
14.50	2.34	0.19	0.06				
14.75	2.36	0.20	0.06				
15.00	2.39	0.21	0.05				
15.25	2.42	0.22	0.05				
15.50	2.44	0.22	0.05				
15.75	2.46	0.23	0.04				
16.00	2.48	0.24	0.04				
16.25	2.50	0.24	0.04				
16.50	2.52	0.25	0.04				
16.75	2.53	0.25	0.03				
17.00	2.55	0.26	0.03				
17.25	2.56	0.26	0.03				
17.50	2.57	0.27	0.03				
17.75	2.59	0.27	0.03				
18.00	2.60	0.28	0.03				

Summary for Subcatchment 3S: POST DEV DA-1

Runoff = 0.22 cfs @ 12.19 hrs, Volume= 0.028 af, Depth> 0.28"
 Routed to Reach 6R : POST DEV DESIGN LINE 1

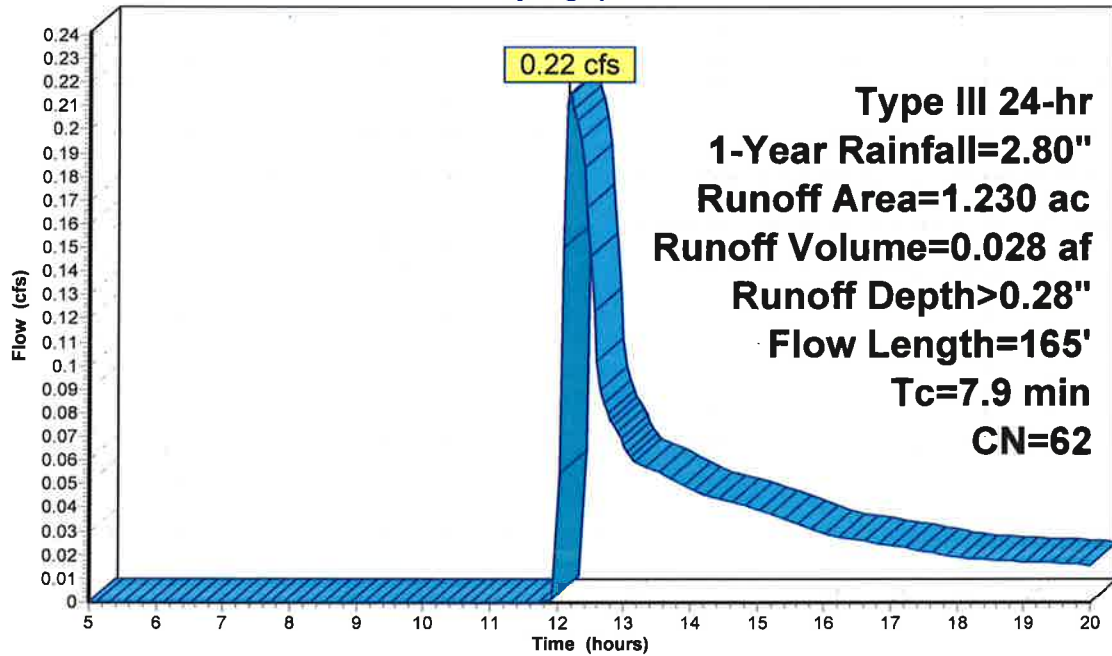
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 1-Year Rainfall=2.80"

Area (ac)	CN	Description
0.100	98	Paved parking, HSG B
0.137	61	>75% Grass cover, Good, HSG B
0.993	58	Woods/grass comb., Good, HSG B
1.230	62	Weighted Average
1.130		91.87% Pervious Area
0.100		8.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	150	0.1870	0.31		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
0.0	15	0.1330	5.87		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
7.9	165	Total			

Subcatchment 3S: POST DEV DA-1

Hydrograph



Runoff

**Type III 24-hr
 1-Year Rainfall=2.80"
 Runoff Area=1.230 ac
 Runoff Volume=0.028 af
 Runoff Depth>0.28"
 Flow Length=165'
 Tc=7.9 min
 CN=62**

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Type III 24-hr 1-Year Rainfall=2.80"

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Hydrograph for Subcatchment 3S: POST DEV DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.16	0.00	0.00	18.25	2.61	0.25	0.02
5.25	0.17	0.00	0.00	18.50	2.62	0.26	0.02
5.50	0.18	0.00	0.00	18.75	2.63	0.26	0.02
5.75	0.19	0.00	0.00	19.00	2.64	0.27	0.02
6.00	0.20	0.00	0.00	19.25	2.65	0.27	0.02
6.25	0.21	0.00	0.00	19.50	2.66	0.27	0.02
6.50	0.23	0.00	0.00	19.75	2.67	0.28	0.02
6.75	0.24	0.00	0.00	20.00	2.68	0.28	0.02
7.00	0.25	0.00	0.00				
7.25	0.27	0.00	0.00				
7.50	0.28	0.00	0.00				
7.75	0.30	0.00	0.00				
8.00	0.32	0.00	0.00				
8.25	0.34	0.00	0.00				
8.50	0.36	0.00	0.00				
8.75	0.38	0.00	0.00				
9.00	0.41	0.00	0.00				
9.25	0.44	0.00	0.00				
9.50	0.46	0.00	0.00				
9.75	0.50	0.00	0.00				
10.00	0.53	0.00	0.00				
10.25	0.57	0.00	0.00				
10.50	0.61	0.00	0.00				
10.75	0.65	0.00	0.00				
11.00	0.70	0.00	0.00				
11.25	0.76	0.00	0.00				
11.50	0.83	0.00	0.00				
11.75	0.99	0.00	0.00				
12.00	1.40	0.00	0.01				
12.25	1.81	0.05	0.21				
12.50	1.97	0.08	0.15				
12.75	2.04	0.10	0.08				
13.00	2.10	0.11	0.07				
13.25	2.15	0.12	0.06				
13.50	2.19	0.13	0.06				
13.75	2.23	0.14	0.05				
14.00	2.27	0.15	0.05				
14.25	2.30	0.16	0.05				
14.50	2.34	0.17	0.04				
14.75	2.36	0.18	0.04				
15.00	2.39	0.19	0.04				
15.25	2.42	0.19	0.04				
15.50	2.44	0.20	0.03				
15.75	2.46	0.21	0.03				
16.00	2.48	0.21	0.03				
16.25	2.50	0.22	0.03				
16.50	2.52	0.22	0.03				
16.75	2.53	0.23	0.03				
17.00	2.55	0.23	0.02				
17.25	2.56	0.24	0.02				
17.50	2.57	0.24	0.02				
17.75	2.59	0.25	0.02				
18.00	2.60	0.25	0.02				

Summary for Subcatchment 4S: POST DEV DA-2

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.36 cfs @ 12.09 hrs, Volume= 0.024 af, Depth> 0.91"
 Routed to Pond 5P : DETENTION

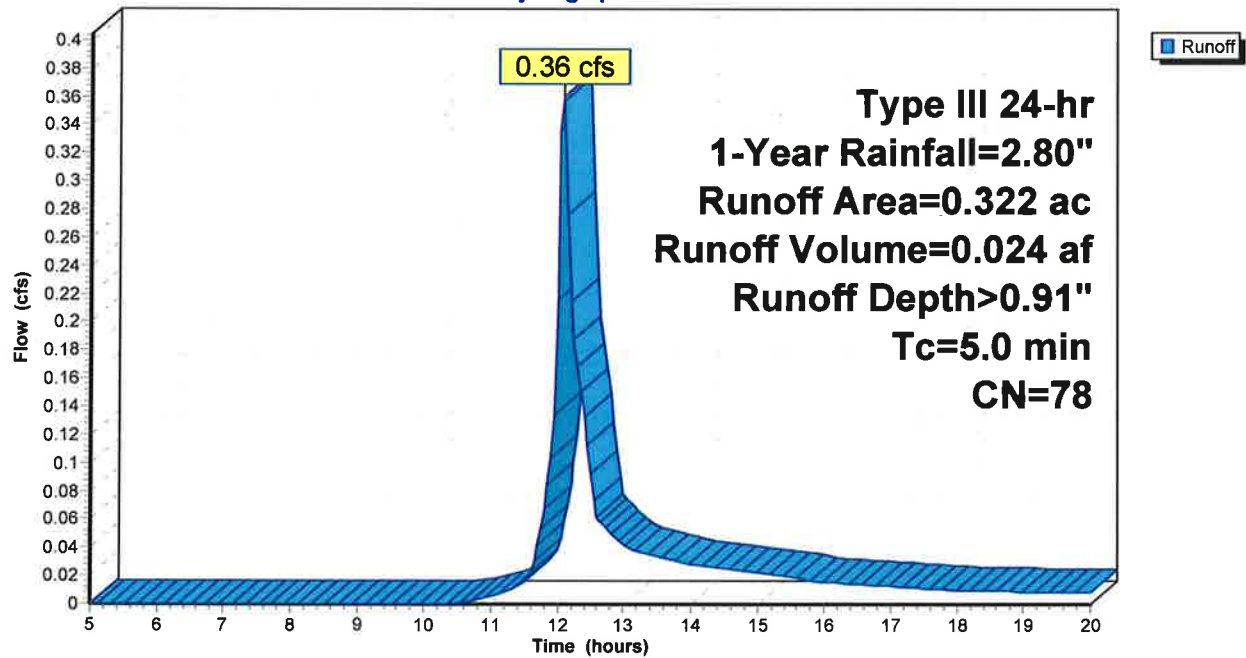
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 1-Year Rainfall=2.80"

Area (ac)	CN	Description
0.144	98	Paved parking, HSG B
0.178	61	>75% Grass cover, Good, HSG B
0.322	78	Weighted Average
0.178		55.28% Pervious Area
0.144		44.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 4S: POST DEV DA-2

Hydrograph



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Type III 24-hr 1-Year Rainfall=2.80"

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Hydrograph for Subcatchment 4S: POST DEV DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.16	0.00	0.00	18.25	2.61	0.86	0.01
5.25	0.17	0.00	0.00	18.50	2.62	0.87	0.01
5.50	0.18	0.00	0.00	18.75	2.63	0.87	0.01
5.75	0.19	0.00	0.00	19.00	2.64	0.88	0.01
6.00	0.20	0.00	0.00	19.25	2.65	0.89	0.01
6.25	0.21	0.00	0.00	19.50	2.66	0.89	0.01
6.50	0.23	0.00	0.00	19.75	2.67	0.90	0.01
6.75	0.24	0.00	0.00	20.00	2.68	0.91	0.01
7.00	0.25	0.00	0.00				
7.25	0.27	0.00	0.00				
7.50	0.28	0.00	0.00				
7.75	0.30	0.00	0.00				
8.00	0.32	0.00	0.00				
8.25	0.34	0.00	0.00				
8.50	0.36	0.00	0.00				
8.75	0.38	0.00	0.00				
9.00	0.41	0.00	0.00				
9.25	0.44	0.00	0.00				
9.50	0.46	0.00	0.00				
9.75	0.50	0.00	0.00				
10.00	0.53	0.00	0.00				
10.25	0.57	0.00	0.00				
10.50	0.61	0.00	0.00				
10.75	0.65	0.00	0.00				
11.00	0.70	0.01	0.01				
11.25	0.76	0.01	0.01				
11.50	0.83	0.02	0.02				
11.75	0.99	0.06	0.05				
12.00	1.40	0.19	0.22				
12.25	1.81	0.38	0.19				
12.50	1.97	0.47	0.09				
12.75	2.04	0.51	0.05				
13.00	2.10	0.54	0.04				
13.25	2.15	0.57	0.04				
13.50	2.19	0.60	0.03				
13.75	2.23	0.62	0.03				
14.00	2.27	0.64	0.03				
14.25	2.30	0.66	0.03				
14.50	2.34	0.68	0.02				
14.75	2.36	0.70	0.02				
15.00	2.39	0.72	0.02				
15.25	2.42	0.73	0.02				
15.50	2.44	0.75	0.02				
15.75	2.46	0.76	0.02				
16.00	2.48	0.78	0.02				
16.25	2.50	0.79	0.01				
16.50	2.52	0.80	0.01				
16.75	2.53	0.81	0.01				
17.00	2.55	0.82	0.01				
17.25	2.56	0.83	0.01				
17.50	2.57	0.84	0.01				
17.75	2.59	0.84	0.01				
18.00	2.60	0.85	0.01				

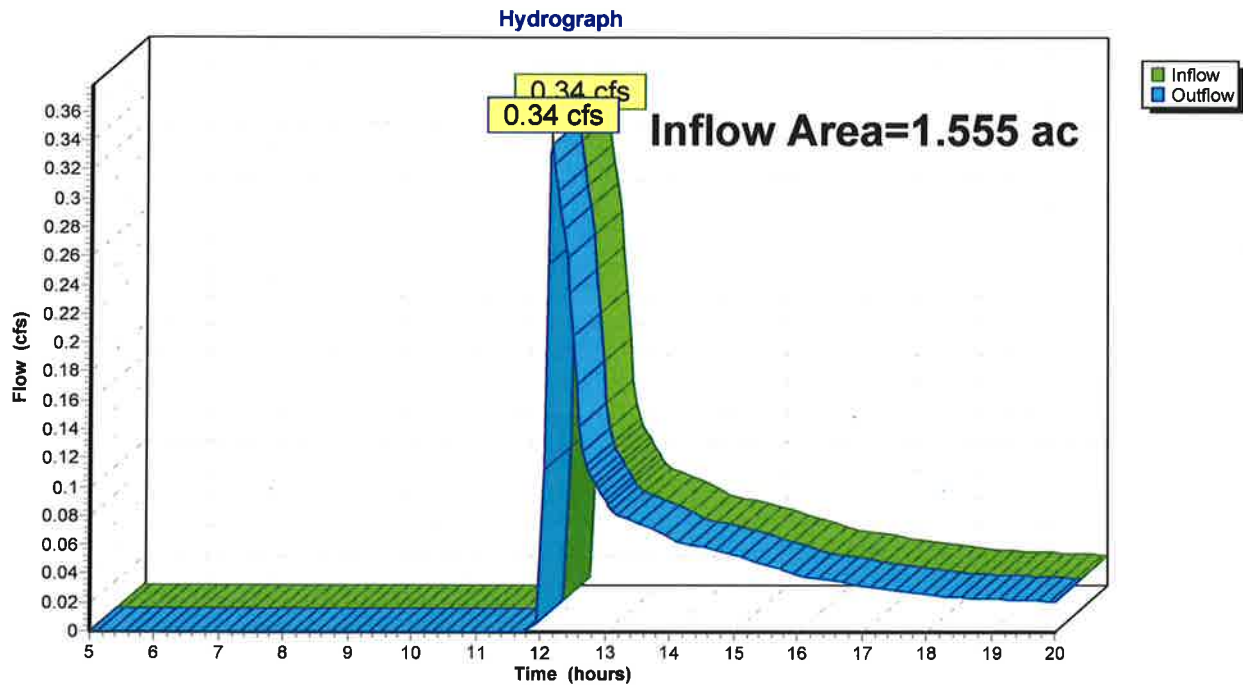
Summary for Reach 2R: PRE DEV DESIGN LINE 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.555 ac, 10.61% Impervious, Inflow Depth > 0.31" for 1-Year event
Inflow = 0.34 cfs @ 12.17 hrs, Volume= 0.040 af
Outflow = 0.34 cfs @ 12.17 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 2R: PRE DEV DESIGN LINE 1



Hydrograph for Reach 2R: PRE DEV DESIGN LINE 1

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
5.00	0.00		0.00	18.25	0.02		0.02
5.25	0.00		0.00	18.50	0.02		0.02
5.50	0.00		0.00	18.75	0.02		0.02
5.75	0.00		0.00	19.00	0.02		0.02
6.00	0.00		0.00	19.25	0.02		0.02
6.25	0.00		0.00	19.50	0.02		0.02
6.50	0.00		0.00	19.75	0.02		0.02
6.75	0.00		0.00	20.00	0.02		0.02
7.00	0.00		0.00				
7.25	0.00		0.00				
7.50	0.00		0.00				
7.75	0.00		0.00				
8.00	0.00		0.00				
8.25	0.00		0.00				
8.50	0.00		0.00				
8.75	0.00		0.00				
9.00	0.00		0.00				
9.25	0.00		0.00				
9.50	0.00		0.00				
9.75	0.00		0.00				
10.00	0.00		0.00				
10.25	0.00		0.00				
10.50	0.00		0.00				
10.75	0.00		0.00				
11.00	0.00		0.00				
11.25	0.00		0.00				
11.50	0.00		0.00				
11.75	0.00		0.00				
12.00	0.02		0.02				
12.25	0.31		0.31				
12.50	0.20		0.20				
12.75	0.11		0.11				
13.00	0.09		0.09				
13.25	0.08		0.08				
13.50	0.08		0.08				
13.75	0.07		0.07				
14.00	0.07		0.07				
14.25	0.06		0.06				
14.50	0.06		0.06				
14.75	0.06		0.06				
15.00	0.05		0.05				
15.25	0.05		0.05				
15.50	0.05		0.05				
15.75	0.04		0.04				
16.00	0.04		0.04				
16.25	0.04		0.04				
16.50	0.04		0.04				
16.75	0.03		0.03				
17.00	0.03		0.03				
17.25	0.03		0.03				
17.50	0.03		0.03				
17.75	0.03		0.03				
18.00	0.03		0.03				

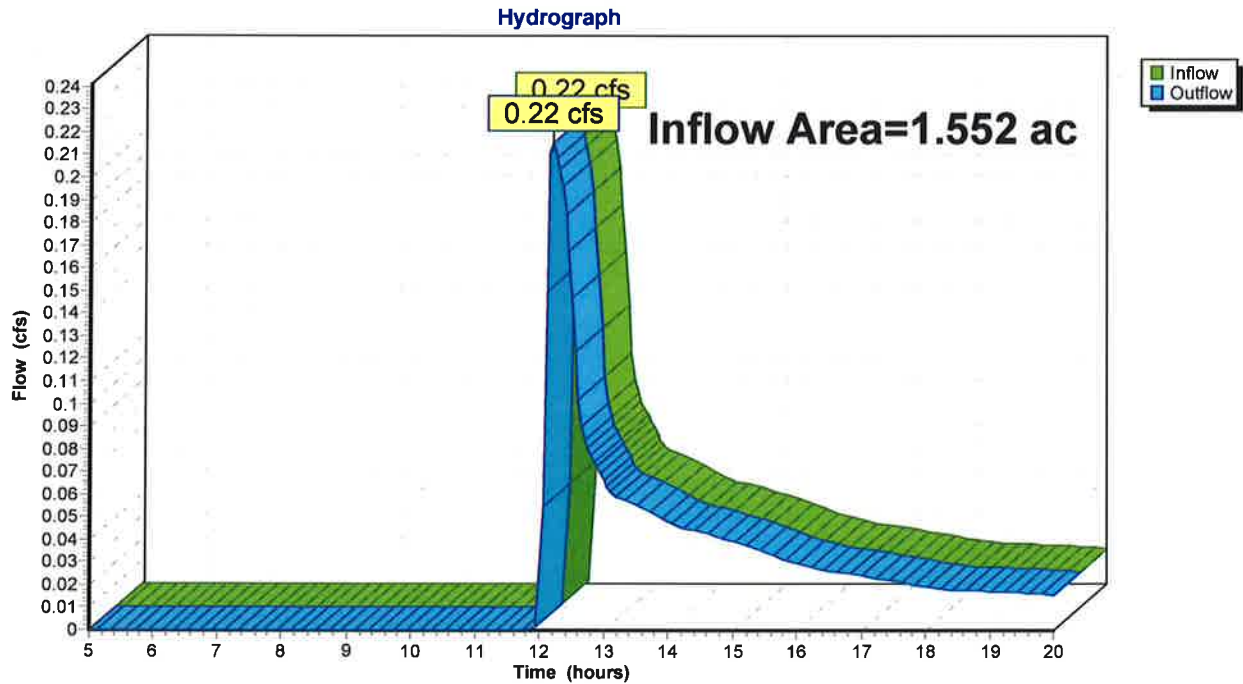
Summary for Reach 6R: POST DEV DESIGN LINE 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.552 ac, 15.72% Impervious, Inflow Depth > 0.22" for 1-Year event
Inflow = 0.22 cfs @ 12.19 hrs, Volume= 0.028 af
Outflow = 0.22 cfs @ 12.19 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: POST DEV DESIGN LINE 1



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Type III 24-hr 1-Year Rainfall=2.80"

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Hydrograph for Reach 6R: POST DEV DESIGN LINE 1

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
5.00	0.00		0.00	18.25	0.02		0.02
5.25	0.00		0.00	18.50	0.02		0.02
5.50	0.00		0.00	18.75	0.02		0.02
5.75	0.00		0.00	19.00	0.02		0.02
6.00	0.00		0.00	19.25	0.02		0.02
6.25	0.00		0.00	19.50	0.02		0.02
6.50	0.00		0.00	19.75	0.02		0.02
6.75	0.00		0.00	20.00	0.02		0.02
7.00	0.00		0.00				
7.25	0.00		0.00				
7.50	0.00		0.00				
7.75	0.00		0.00				
8.00	0.00		0.00				
8.25	0.00		0.00				
8.50	0.00		0.00				
8.75	0.00		0.00				
9.00	0.00		0.00				
9.25	0.00		0.00				
9.50	0.00		0.00				
9.75	0.00		0.00				
10.00	0.00		0.00				
10.25	0.00		0.00				
10.50	0.00		0.00				
10.75	0.00		0.00				
11.00	0.00		0.00				
11.25	0.00		0.00				
11.50	0.00		0.00				
11.75	0.00		0.00				
12.00	0.01		0.01				
12.25	0.21		0.21				
12.50	0.15		0.15				
12.75	0.08		0.08				
13.00	0.07		0.07				
13.25	0.06		0.06				
13.50	0.06		0.06				
13.75	0.05		0.05				
14.00	0.05		0.05				
14.25	0.05		0.05				
14.50	0.04		0.04				
14.75	0.04		0.04				
15.00	0.04		0.04				
15.25	0.04		0.04				
15.50	0.03		0.03				
15.75	0.03		0.03				
16.00	0.03		0.03				
16.25	0.03		0.03				
16.50	0.03		0.03				
16.75	0.03		0.03				
17.00	0.02		0.02				
17.25	0.02		0.02				
17.50	0.02		0.02				
17.75	0.02		0.02				
18.00	0.02		0.02				

Summary for Pond 5P: DETENTION

Inflow Area = 0.322 ac, 44.72% Impervious, Inflow Depth > 0.91" for 1-Year event
 Inflow = 0.36 cfs @ 12.09 hrs, Volume= 0.024 af
 Outflow = 0.36 cfs @ 12.09 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.36 cfs @ 12.09 hrs, Volume= 0.024 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Reach 6R : POST DEV DESIGN LINE 1

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 503.64' @ 12.09 hrs Surf.Area= 0.002 ac Storage= 0.000 af

Plug-Flow detention time= 0.0 min calculated for 0.024 af (100% of inflow)
 Center-of-Mass det. time= 0.0 min (813.6 - 813.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	503.63'	0.001 af	8.25'W x 9.59'L x 2.00'H Field A 0.004 af Overall - 0.000 af Embedded = 0.003 af x 40.0% Voids
#2A	504.13'	0.000 af	ADS_StormTech SC-160LP +Cap x 3 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 3 Chambers in 3 Rows
		0.002 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 2	504.80'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	504.80'	4.0" Round Culvert L= 27.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 504.80' / 501.00' S= 0.1407 ' /' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#3	Discarded	503.63'	720.000 in/hr Exfiltration over Horizontal area

Discarded OutFlow Max=1.32 cfs @ 12.09 hrs HW=503.64' (Free Discharge)
 ↑3=Exfiltration (Exfiltration Controls 1.32 cfs @ 0.02 fps)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=503.63' (Free Discharge)
 ↑2=Culvert (Controls 0.00 cfs)
 ↑1=Orifice/Grate (Controls 0.00 cfs)

Pond 5P: DETENTION - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-160LP +Cap (ADS StormTech® SC-160LP with cap length)

Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf

Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap

1 Chambers/Row x 7.12' Long +0.23' Cap Length x 2 = 7.59' Row Length +12.0" End Stone x 2 = 9.59' Base Length

3 Rows x 25.0" Wide + 12.0" Side Stone x 2 = 8.25' Base Width

6.0" Stone Base + 12.0" Chamber Height + 6.0" Stone Cover = 2.00' Field Height

3 Chambers x 6.8 cf = 20.5 cf Chamber Storage

158.2 cf Field - 20.5 cf Chambers = 137.7 cf Stone x 40.0% Voids = 55.1 cf Stone Storage

Chamber Storage + Stone Storage = 75.6 cf = 0.002 af

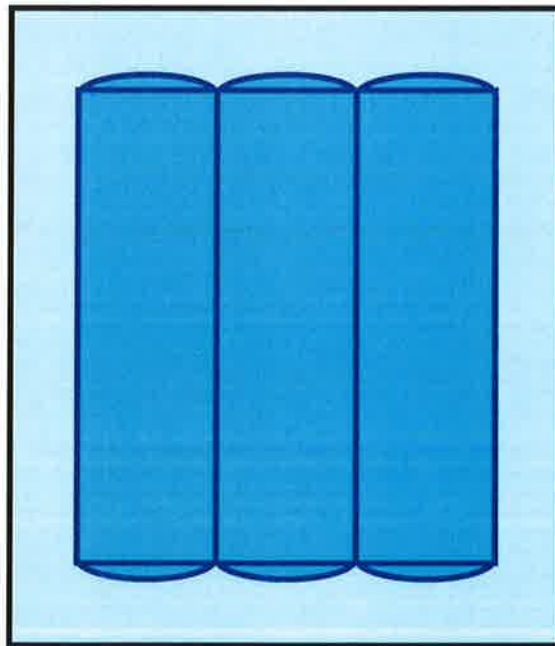
Overall Storage Efficiency = 47.8%

Overall System Size = 9.59' x 8.25' x 2.00'

3 Chambers

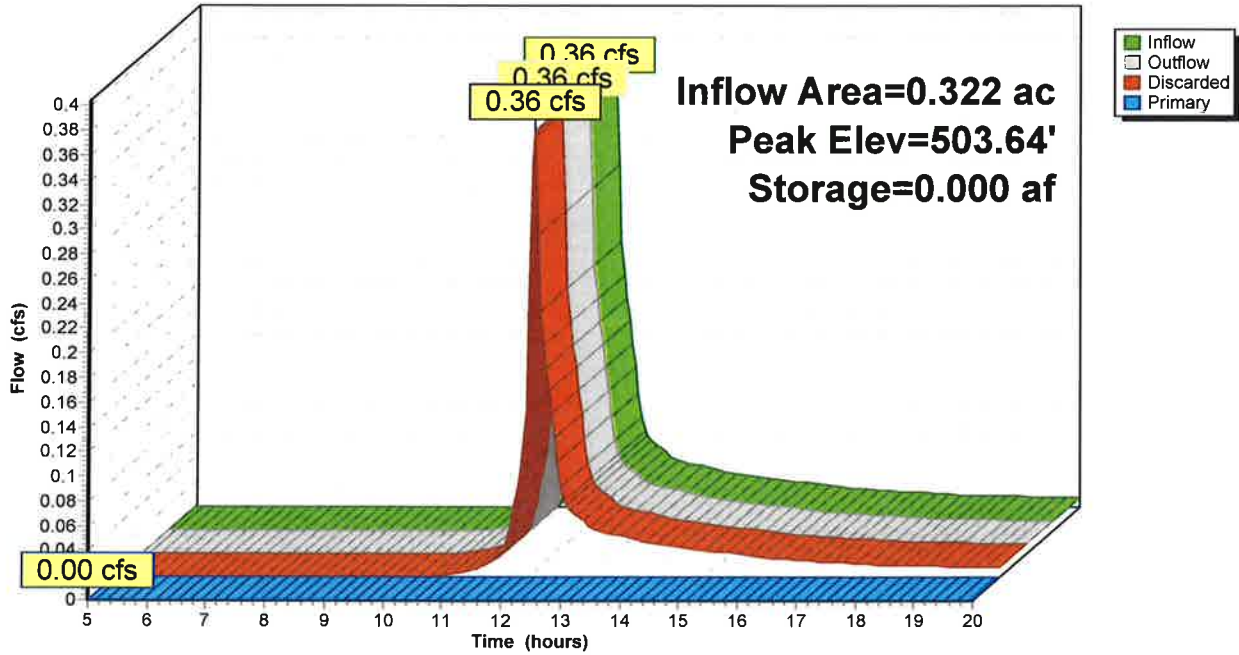
5.9 cy Field

5.1 cy Stone



Pond 5P: DETENTION

Hydrograph



Hydrograph for Pond 5P: DETENTION

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
5.00	0.00	0.000	503.63	0.00	0.00	0.00
5.50	0.00	0.000	503.63	0.00	0.00	0.00
6.00	0.00	0.000	503.63	0.00	0.00	0.00
6.50	0.00	0.000	503.63	0.00	0.00	0.00
7.00	0.00	0.000	503.63	0.00	0.00	0.00
7.50	0.00	0.000	503.63	0.00	0.00	0.00
8.00	0.00	0.000	503.63	0.00	0.00	0.00
8.50	0.00	0.000	503.63	0.00	0.00	0.00
9.00	0.00	0.000	503.63	0.00	0.00	0.00
9.50	0.00	0.000	503.63	0.00	0.00	0.00
10.00	0.00	0.000	503.63	0.00	0.00	0.00
10.50	0.00	0.000	503.63	0.00	0.00	0.00
11.00	0.01	0.000	503.63	0.01	0.01	0.00
11.50	0.02	0.000	503.63	0.02	0.02	0.00
12.00	0.22	0.000	503.63	0.22	0.22	0.00
12.50	0.09	0.000	503.63	0.09	0.09	0.00
13.00	0.04	0.000	503.63	0.04	0.04	0.00
13.50	0.03	0.000	503.63	0.03	0.03	0.00
14.00	0.03	0.000	503.63	0.03	0.03	0.00
14.50	0.02	0.000	503.63	0.02	0.02	0.00
15.00	0.02	0.000	503.63	0.02	0.02	0.00
15.50	0.02	0.000	503.63	0.02	0.02	0.00
16.00	0.02	0.000	503.63	0.02	0.02	0.00
16.50	0.01	0.000	503.63	0.01	0.01	0.00
17.00	0.01	0.000	503.63	0.01	0.01	0.00
17.50	0.01	0.000	503.63	0.01	0.01	0.00
18.00	0.01	0.000	503.63	0.01	0.01	0.00
18.50	0.01	0.000	503.63	0.01	0.01	0.00
19.00	0.01	0.000	503.63	0.01	0.01	0.00
19.50	0.01	0.000	503.63	0.01	0.01	0.00
20.00	0.01	0.000	503.63	0.01	0.01	0.00

Stage-Discharge for Pond 5P: DETENTION

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
503.63	0.00	0.00	0.00	504.69	1.32	1.32	0.00
503.65	1.32	1.32	0.00	504.71	1.32	1.32	0.00
503.67	1.32	1.32	0.00	504.73	1.32	1.32	0.00
503.69	1.32	1.32	0.00	504.75	1.32	1.32	0.00
503.71	1.32	1.32	0.00	504.77	1.32	1.32	0.00
503.73	1.32	1.32	0.00	504.79	1.32	1.32	0.00
503.75	1.32	1.32	0.00	504.81	1.32	1.32	0.00
503.77	1.32	1.32	0.00	504.83	1.32	1.32	0.00
503.79	1.32	1.32	0.00	504.85	1.32	1.32	0.01
503.81	1.32	1.32	0.00	504.87	1.33	1.32	0.01
503.83	1.32	1.32	0.00	504.89	1.34	1.32	0.02
503.85	1.32	1.32	0.00	504.91	1.34	1.32	0.03
503.87	1.32	1.32	0.00	504.93	1.35	1.32	0.03
503.89	1.32	1.32	0.00	504.95	1.36	1.32	0.04
503.91	1.32	1.32	0.00	504.97	1.37	1.32	0.06
503.93	1.32	1.32	0.00	504.99	1.39	1.32	0.07
503.95	1.32	1.32	0.00	505.01	1.40	1.32	0.08
503.97	1.32	1.32	0.00	505.03	1.41	1.32	0.09
503.99	1.32	1.32	0.00	505.05	1.42	1.32	0.11
504.01	1.32	1.32	0.00	505.07	1.44	1.32	0.12
504.03	1.32	1.32	0.00	505.09	1.45	1.32	0.13
504.05	1.32	1.32	0.00	505.11	1.46	1.32	0.14
504.07	1.32	1.32	0.00	505.13	1.47	1.32	0.15
504.09	1.32	1.32	0.00	505.15	1.48	1.32	0.16
504.11	1.32	1.32	0.00	505.17	1.49	1.32	0.17
504.13	1.32	1.32	0.00	505.19	1.49	1.32	0.18
504.15	1.32	1.32	0.00	505.21	1.50	1.32	0.18
504.17	1.32	1.32	0.00	505.23	1.51	1.32	0.19
504.19	1.32	1.32	0.00	505.25	1.52	1.32	0.20
504.21	1.32	1.32	0.00	505.27	1.52	1.32	0.20
504.23	1.32	1.32	0.00	505.29	1.53	1.32	0.21
504.25	1.32	1.32	0.00	505.31	1.54	1.32	0.22
504.27	1.32	1.32	0.00	505.33	1.54	1.32	0.22
504.29	1.32	1.32	0.00	505.35	1.55	1.32	0.23
504.31	1.32	1.32	0.00	505.37	1.55	1.32	0.24
504.33	1.32	1.32	0.00	505.39	1.56	1.32	0.24
504.35	1.32	1.32	0.00	505.41	1.57	1.32	0.25
504.37	1.32	1.32	0.00	505.43	1.57	1.32	0.25
504.39	1.32	1.32	0.00	505.45	1.58	1.32	0.26
504.41	1.32	1.32	0.00	505.47	1.58	1.32	0.26
504.43	1.32	1.32	0.00	505.49	1.59	1.32	0.27
504.45	1.32	1.32	0.00	505.51	1.59	1.32	0.27
504.47	1.32	1.32	0.00	505.53	1.60	1.32	0.28
504.49	1.32	1.32	0.00	505.55	1.60	1.32	0.28
504.51	1.32	1.32	0.00	505.57	1.61	1.32	0.29
504.53	1.32	1.32	0.00	505.59	1.61	1.32	0.29
504.55	1.32	1.32	0.00	505.61	1.62	1.32	0.30
504.57	1.32	1.32	0.00	505.63	1.62	1.32	0.30
504.59	1.32	1.32	0.00				
504.61	1.32	1.32	0.00				
504.63	1.32	1.32	0.00				
504.65	1.32	1.32	0.00				
504.67	1.32	1.32	0.00				

21-54 Eisenberg 12-9-21

Type III 24-hr 2-Year Rainfall=3.41"

Prepared by {enter your company name here}

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEV DA-1

Runoff Area=1.555 ac 10.61% Impervious Runoff Depth>0.55"
Flow Length=165' Tc=7.9 min CN=63 Runoff=0.78 cfs 0.071 af

Subcatchment3S: POST DEV DA-1

Runoff Area=1.230 ac 8.13% Impervious Runoff Depth>0.51"
Flow Length=165' Tc=7.9 min CN=62 Runoff=0.55 cfs 0.052 af

Subcatchment4S: POST DEV DA-2

Runoff Area=0.322 ac 44.72% Impervious Runoff Depth>1.32"
Tc=5.0 min CN=78 Runoff=0.53 cfs 0.035 af

Reach 2R: PRE DEV DESIGN LINE 1

Inflow=0.78 cfs 0.071 af
Outflow=0.78 cfs 0.071 af

Reach 6R: POST DEV DESIGN LINE 1

Inflow=0.55 cfs 0.052 af
Outflow=0.55 cfs 0.052 af

Pond 5P: DETENTION

Peak Elev=503.64' Storage=0.000 af Inflow=0.53 cfs 0.035 af
Discarded=0.53 cfs 0.035 af Primary=0.00 cfs 0.000 af Outflow=0.53 cfs 0.035 af

Total Runoff Area = 3.107 ac Runoff Volume = 0.158 af Average Runoff Depth = 0.61"
86.84% Pervious = 2.698 ac 13.16% Impervious = 0.409 ac

Summary for Subcatchment 1S: PRE DEV DA-1

Runoff = 0.78 cfs @ 12.15 hrs, Volume= 0.071 af, Depth> 0.55"
 Routed to Reach 2R : PRE DEV DESIGN LINE 1

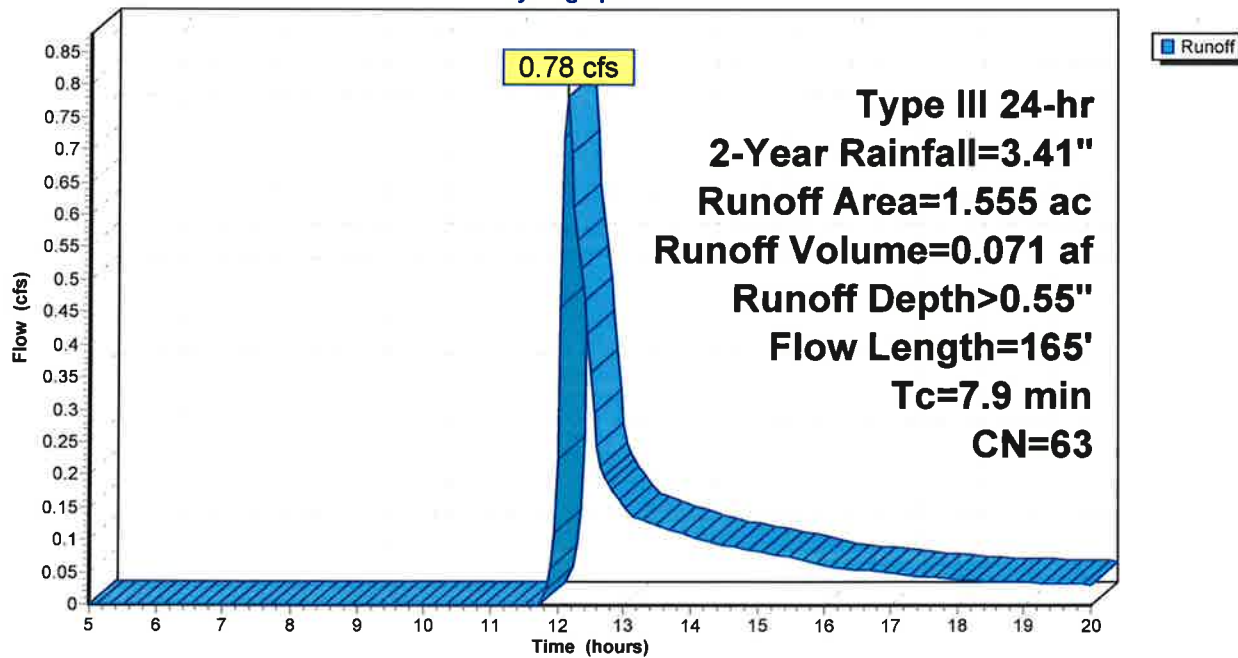
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
0.165	98	Paved parking, HSG B
0.533	61	>75% Grass cover, Good, HSG B
0.857	58	Woods/grass comb., Good, HSG B
1.555	63	Weighted Average
1.390		89.39% Pervious Area
0.165		10.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	150	0.1870	0.31		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
0.0	15	0.1330	5.87		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
7.9	165	Total			

Subcatchment 1S: PRE DEV DA-1

Hydrograph



21-54 Eisenberg 12-9-21

Type III 24-hr 2-Year Rainfall=3.41"

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Hydrograph for Subcatchment 1S: PRE DEV DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.19	0.00	0.00	18.25	3.18	0.51	0.04
5.25	0.21	0.00	0.00	18.50	3.19	0.52	0.04
5.50	0.22	0.00	0.00	18.75	3.20	0.52	0.04
5.75	0.23	0.00	0.00	19.00	3.22	0.53	0.04
6.00	0.25	0.00	0.00	19.25	3.23	0.53	0.03
6.25	0.26	0.00	0.00	19.50	3.24	0.54	0.03
6.50	0.27	0.00	0.00	19.75	3.25	0.54	0.03
6.75	0.29	0.00	0.00	20.00	3.26	0.55	0.03
7.00	0.31	0.00	0.00				
7.25	0.33	0.00	0.00				
7.50	0.35	0.00	0.00				
7.75	0.37	0.00	0.00				
8.00	0.39	0.00	0.00				
8.25	0.41	0.00	0.00				
8.50	0.44	0.00	0.00				
8.75	0.47	0.00	0.00				
9.00	0.50	0.00	0.00				
9.25	0.53	0.00	0.00				
9.50	0.57	0.00	0.00				
9.75	0.60	0.00	0.00				
10.00	0.64	0.00	0.00				
10.25	0.69	0.00	0.00				
10.50	0.74	0.00	0.00				
10.75	0.79	0.00	0.00				
11.00	0.85	0.00	0.00				
11.25	0.92	0.00	0.00				
11.50	1.02	0.00	0.00				
11.75	1.21	0.00	0.00				
12.00	1.70	0.04	0.22				
12.25	2.20	0.15	0.61				
12.50	2.39	0.21	0.36				
12.75	2.49	0.24	0.19				
13.00	2.56	0.26	0.15				
13.25	2.62	0.28	0.13				
13.50	2.67	0.30	0.12				
13.75	2.72	0.32	0.11				
14.00	2.77	0.34	0.10				
14.25	2.81	0.35	0.10				
14.50	2.84	0.37	0.09				
14.75	2.88	0.38	0.09				
15.00	2.91	0.40	0.08				
15.25	2.94	0.41	0.08				
15.50	2.97	0.42	0.07				
15.75	3.00	0.43	0.07				
16.00	3.02	0.44	0.06				
16.25	3.04	0.45	0.06				
16.50	3.06	0.46	0.05				
16.75	3.08	0.47	0.05				
17.00	3.10	0.48	0.05				
17.25	3.12	0.48	0.05				
17.50	3.14	0.49	0.04				
17.75	3.15	0.50	0.04				
18.00	3.16	0.50	0.04				

Summary for Subcatchment 3S: POST DEV DA-1

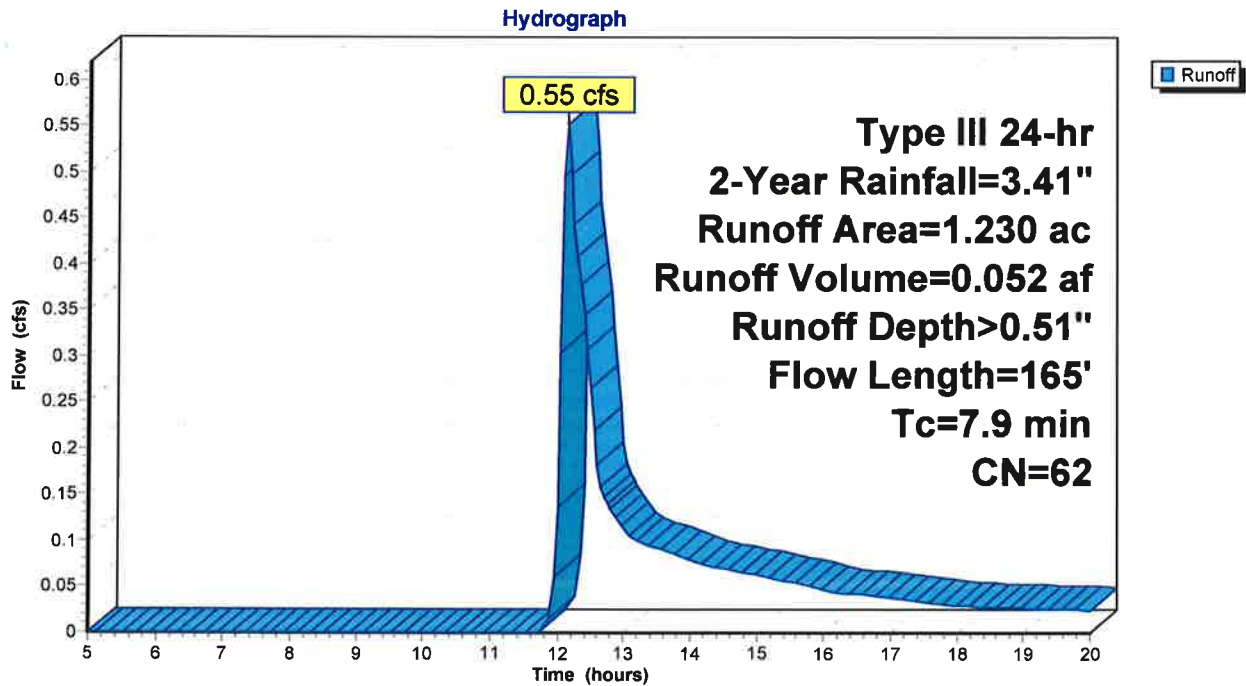
Runoff = 0.55 cfs @ 12.15 hrs, Volume= 0.052 af, Depth> 0.51"
 Routed to Reach 6R : POST DEV DESIGN LINE 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
0.100	98	Paved parking, HSG B
0.137	61	>75% Grass cover, Good, HSG B
0.993	58	Woods/grass comb., Good, HSG B
1.230	62	Weighted Average
1.130		91.87% Pervious Area
0.100		8.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	150	0.1870	0.31		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
0.0	15	0.1330	5.87		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
7.9	165	Total			

Subcatchment 3S: POST DEV DA-1



21-54 Eisenberg 12-9-21

Type III 24-hr 2-Year Rainfall=3.41"

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Hydrograph for Subcatchment 3S: POST DEV DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.19	0.00	0.00	18.25	3.18	0.47	0.03
5.25	0.21	0.00	0.00	18.50	3.19	0.48	0.03
5.50	0.22	0.00	0.00	18.75	3.20	0.48	0.03
5.75	0.23	0.00	0.00	19.00	3.22	0.49	0.03
6.00	0.25	0.00	0.00	19.25	3.23	0.49	0.03
6.25	0.26	0.00	0.00	19.50	3.24	0.50	0.03
6.50	0.27	0.00	0.00	19.75	3.25	0.50	0.02
6.75	0.29	0.00	0.00	20.00	3.26	0.51	0.02
7.00	0.31	0.00	0.00				
7.25	0.33	0.00	0.00				
7.50	0.35	0.00	0.00				
7.75	0.37	0.00	0.00				
8.00	0.39	0.00	0.00				
8.25	0.41	0.00	0.00				
8.50	0.44	0.00	0.00				
8.75	0.47	0.00	0.00				
9.00	0.50	0.00	0.00				
9.25	0.53	0.00	0.00				
9.50	0.57	0.00	0.00				
9.75	0.60	0.00	0.00				
10.00	0.64	0.00	0.00				
10.25	0.69	0.00	0.00				
10.50	0.74	0.00	0.00				
10.75	0.79	0.00	0.00				
11.00	0.85	0.00	0.00				
11.25	0.92	0.00	0.00				
11.50	1.02	0.00	0.00				
11.75	1.21	0.00	0.00				
12.00	1.70	0.03	0.14				
12.25	2.20	0.13	0.44				
12.50	2.39	0.19	0.27				
12.75	2.49	0.21	0.14				
13.00	2.56	0.24	0.11				
13.25	2.62	0.26	0.10				
13.50	2.67	0.28	0.09				
13.75	2.72	0.29	0.09				
14.00	2.77	0.31	0.08				
14.25	2.81	0.32	0.07				
14.50	2.84	0.34	0.07				
14.75	2.88	0.35	0.07				
15.00	2.91	0.36	0.06				
15.25	2.94	0.38	0.06				
15.50	2.97	0.39	0.05				
15.75	3.00	0.40	0.05				
16.00	3.02	0.41	0.05				
16.25	3.04	0.42	0.04				
16.50	3.06	0.42	0.04				
16.75	3.08	0.43	0.04				
17.00	3.10	0.44	0.04				
17.25	3.12	0.45	0.04				
17.50	3.14	0.45	0.03				
17.75	3.15	0.46	0.03				
18.00	3.16	0.47	0.03				

Summary for Subcatchment 4S: POST DEV DA-2

[49] Hint: Tc<2dt may require smaller dt

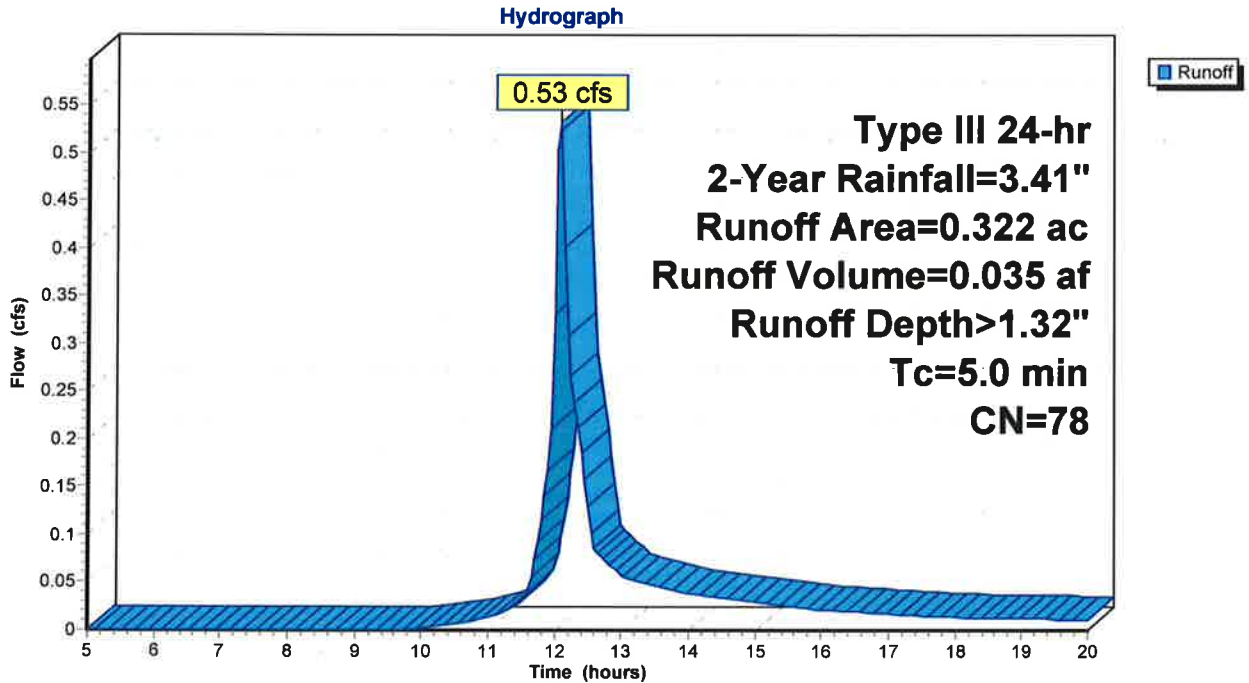
Runoff = 0.53 cfs @ 12.08 hrs, Volume= 0.035 af, Depth> 1.32"
 Routed to Pond 5P : DETENTION

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.41"

Area (ac)	CN	Description
0.144	98	Paved parking, HSG B
0.178	61	>75% Grass cover, Good, HSG B
0.322	78	Weighted Average
0.178		55.28% Pervious Area
0.144		44.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 4S: POST DEV DA-2



21-54 Eisenberg 12-9-21

Type III 24-hr 2-Year Rainfall=3.41"

Prepared by {enter your company name here}

Printed 3/11/2023

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Hydrograph for Subcatchment 4S: POST DEV DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.19	0.00	0.00	18.25	3.18	1.26	0.01
5.25	0.21	0.00	0.00	18.50	3.19	1.27	0.01
5.50	0.22	0.00	0.00	18.75	3.20	1.28	0.01
5.75	0.23	0.00	0.00	19.00	3.22	1.29	0.01
6.00	0.25	0.00	0.00	19.25	3.23	1.29	0.01
6.25	0.26	0.00	0.00	19.50	3.24	1.30	0.01
6.50	0.27	0.00	0.00	19.75	3.25	1.31	0.01
6.75	0.29	0.00	0.00	20.00	3.26	1.32	0.01
7.00	0.31	0.00	0.00				
7.25	0.33	0.00	0.00				
7.50	0.35	0.00	0.00				
7.75	0.37	0.00	0.00				
8.00	0.39	0.00	0.00				
8.25	0.41	0.00	0.00				
8.50	0.44	0.00	0.00				
8.75	0.47	0.00	0.00				
9.00	0.50	0.00	0.00				
9.25	0.53	0.00	0.00				
9.50	0.57	0.00	0.00				
9.75	0.60	0.00	0.00				
10.00	0.64	0.00	0.00				
10.25	0.69	0.01	0.00				
10.50	0.74	0.01	0.01				
10.75	0.79	0.02	0.01				
11.00	0.85	0.03	0.01				
11.25	0.92	0.04	0.02				
11.50	1.02	0.06	0.03				
11.75	1.21	0.12	0.09				
12.00	1.70	0.33	0.33				
12.25	2.20	0.60	0.27				
12.50	2.39	0.72	0.13				
12.75	2.49	0.78	0.07				
13.00	2.56	0.83	0.06				
13.25	2.62	0.86	0.05				
13.50	2.67	0.90	0.05				
13.75	2.72	0.93	0.04				
14.00	2.77	0.97	0.04				
14.25	2.81	0.99	0.04				
14.50	2.84	1.02	0.03				
14.75	2.88	1.04	0.03				
15.00	2.91	1.07	0.03				
15.25	2.94	1.09	0.03				
15.50	2.97	1.11	0.03				
15.75	3.00	1.13	0.02				
16.00	3.02	1.14	0.02				
16.25	3.04	1.16	0.02				
16.50	3.06	1.17	0.02				
16.75	3.08	1.19	0.02				
17.00	3.10	1.20	0.02				
17.25	3.12	1.21	0.02				
17.50	3.14	1.23	0.02				
17.75	3.15	1.24	0.01				
18.00	3.16	1.25	0.01				

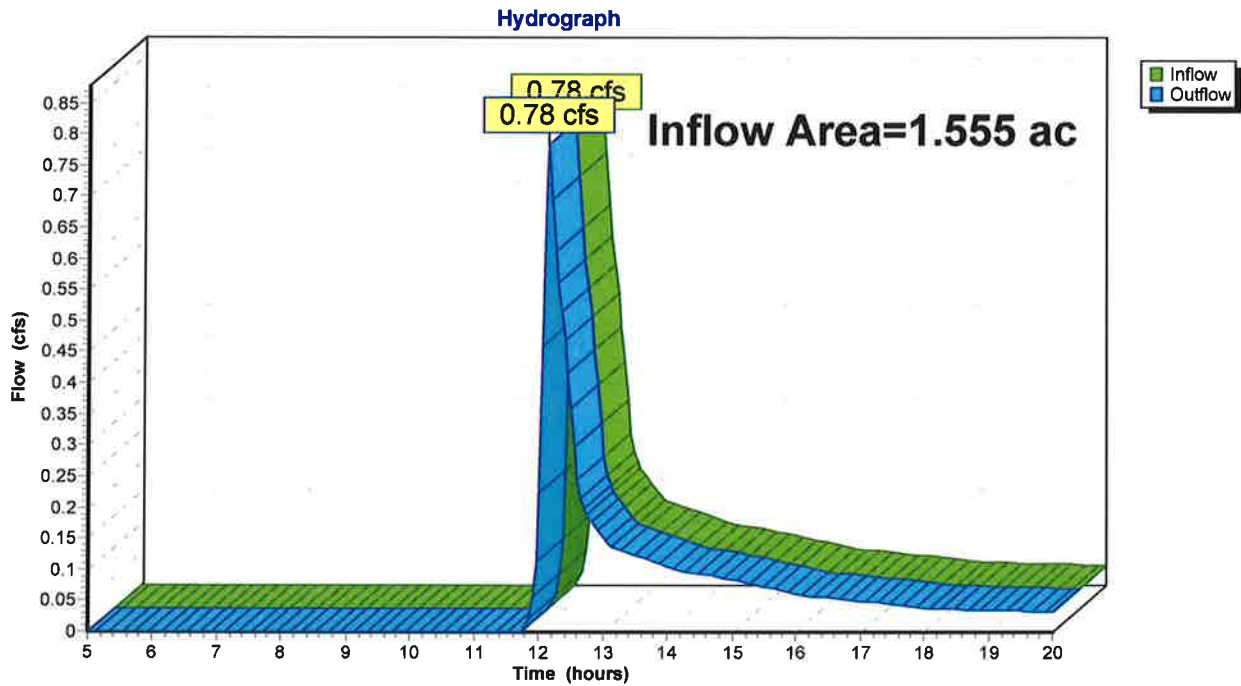
Summary for Reach 2R: PRE DEV DESIGN LINE 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.555 ac, 10.61% Impervious, Inflow Depth > 0.55" for 2-Year event
Inflow = 0.78 cfs @ 12.15 hrs, Volume= 0.071 af
Outflow = 0.78 cfs @ 12.15 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 2R: PRE DEV DESIGN LINE 1



Hydrograph for Reach 2R: PRE DEV DESIGN LINE 1

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
5.00	0.00		0.00	18.25	0.04		0.04
5.25	0.00		0.00	18.50	0.04		0.04
5.50	0.00		0.00	18.75	0.04		0.04
5.75	0.00		0.00	19.00	0.04		0.04
6.00	0.00		0.00	19.25	0.03		0.03
6.25	0.00		0.00	19.50	0.03		0.03
6.50	0.00		0.00	19.75	0.03		0.03
6.75	0.00		0.00	20.00	0.03		0.03
7.00	0.00		0.00				
7.25	0.00		0.00				
7.50	0.00		0.00				
7.75	0.00		0.00				
8.00	0.00		0.00				
8.25	0.00		0.00				
8.50	0.00		0.00				
8.75	0.00		0.00				
9.00	0.00		0.00				
9.25	0.00		0.00				
9.50	0.00		0.00				
9.75	0.00		0.00				
10.00	0.00		0.00				
10.25	0.00		0.00				
10.50	0.00		0.00				
10.75	0.00		0.00				
11.00	0.00		0.00				
11.25	0.00		0.00				
11.50	0.00		0.00				
11.75	0.00		0.00				
12.00	0.22		0.22				
12.25	0.61		0.61				
12.50	0.36		0.36				
12.75	0.19		0.19				
13.00	0.15		0.15				
13.25	0.13		0.13				
13.50	0.12		0.12				
13.75	0.11		0.11				
14.00	0.10		0.10				
14.25	0.10		0.10				
14.50	0.09		0.09				
14.75	0.09		0.09				
15.00	0.08		0.08				
15.25	0.08		0.08				
15.50	0.07		0.07				
15.75	0.07		0.07				
16.00	0.06		0.06				
16.25	0.06		0.06				
16.50	0.05		0.05				
16.75	0.05		0.05				
17.00	0.05		0.05				
17.25	0.05		0.05				
17.50	0.04		0.04				
17.75	0.04		0.04				
18.00	0.04		0.04				

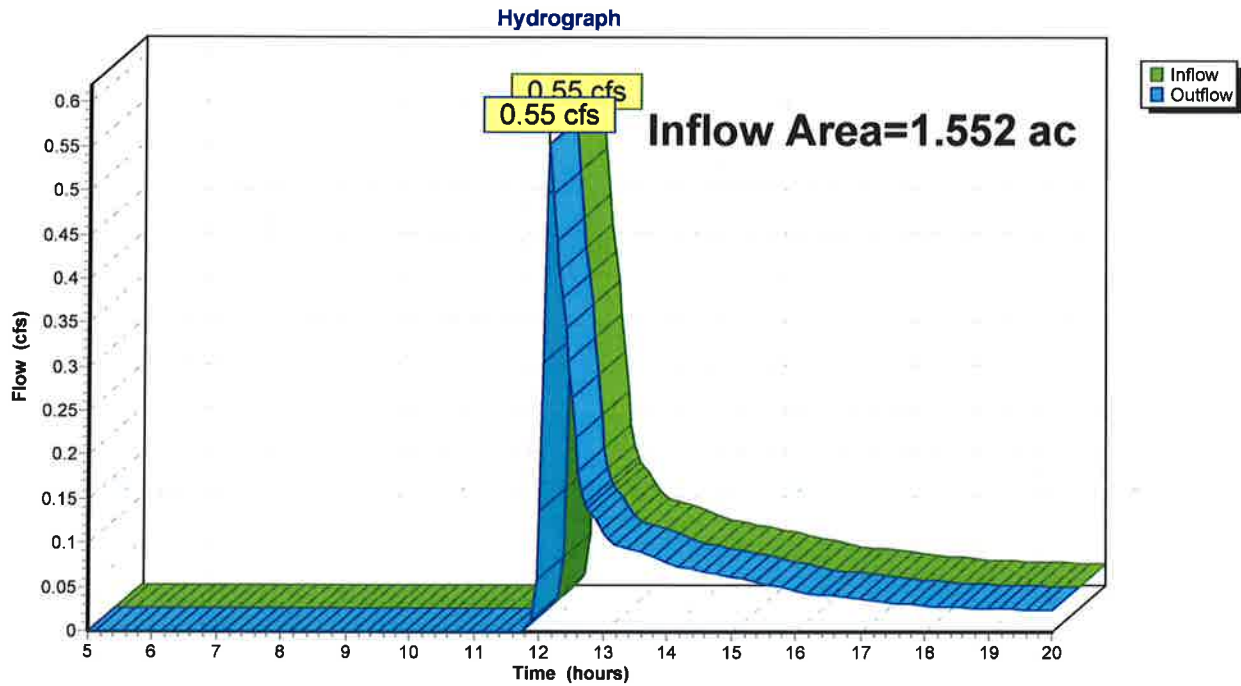
Summary for Reach 6R: POST DEV DESIGN LINE 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.552 ac, 15.72% Impervious, Inflow Depth > 0.40" for 2-Year event
Inflow = 0.55 cfs @ 12.15 hrs, Volume= 0.052 af
Outflow = 0.55 cfs @ 12.15 hrs, Volume= 0.052 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: POST DEV DESIGN LINE 1



Hydrograph for Reach 6R: POST DEV DESIGN LINE 1

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
5.00	0.00		0.00	18.25	0.03		0.03
5.25	0.00		0.00	18.50	0.03		0.03
5.50	0.00		0.00	18.75	0.03		0.03
5.75	0.00		0.00	19.00	0.03		0.03
6.00	0.00		0.00	19.25	0.03		0.03
6.25	0.00		0.00	19.50	0.03		0.03
6.50	0.00		0.00	19.75	0.02		0.02
6.75	0.00		0.00	20.00	0.02		0.02
7.00	0.00		0.00				
7.25	0.00		0.00				
7.50	0.00		0.00				
7.75	0.00		0.00				
8.00	0.00		0.00				
8.25	0.00		0.00				
8.50	0.00		0.00				
8.75	0.00		0.00				
9.00	0.00		0.00				
9.25	0.00		0.00				
9.50	0.00		0.00				
9.75	0.00		0.00				
10.00	0.00		0.00				
10.25	0.00		0.00				
10.50	0.00		0.00				
10.75	0.00		0.00				
11.00	0.00		0.00				
11.25	0.00		0.00				
11.50	0.00		0.00				
11.75	0.00		0.00				
12.00	0.14		0.14				
12.25	0.44		0.44				
12.50	0.27		0.27				
12.75	0.14		0.14				
13.00	0.11		0.11				
13.25	0.10		0.10				
13.50	0.09		0.09				
13.75	0.09		0.09				
14.00	0.08		0.08				
14.25	0.07		0.07				
14.50	0.07		0.07				
14.75	0.07		0.07				
15.00	0.06		0.06				
15.25	0.06		0.06				
15.50	0.05		0.05				
15.75	0.05		0.05				
16.00	0.05		0.05				
16.25	0.04		0.04				
16.50	0.04		0.04				
16.75	0.04		0.04				
17.00	0.04		0.04				
17.25	0.04		0.04				
17.50	0.03		0.03				
17.75	0.03		0.03				
18.00	0.03		0.03				

Summary for Pond 5P: DETENTION

Inflow Area = 0.322 ac, 44.72% Impervious, Inflow Depth > 1.32" for 2-Year event
 Inflow = 0.53 cfs @ 12.08 hrs, Volume= 0.035 af
 Outflow = 0.53 cfs @ 12.08 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.53 cfs @ 12.08 hrs, Volume= 0.035 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Reach 6R : POST DEV DESIGN LINE 1

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 503.64' @ 12.08 hrs Surf.Area= 0.002 ac Storage= 0.000 af

Plug-Flow detention time= 0.0 min calculated for 0.035 af (100% of inflow)
 Center-of-Mass det. time= 0.0 min (805.2 - 805.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	503.63'	0.001 af	8.25'W x 9.59'L x 2.00'H Field A 0.004 af Overall - 0.000 af Embedded = 0.003 af x 40.0% Voids
#2A	504.13'	0.000 af	ADS_StormTech SC-160LP +Cap x 3 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 3 Chambers in 3 Rows
		0.002 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 2	504.80'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	504.80'	4.0" Round Culvert L= 27.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 504.80' / 501.00' S= 0.1407 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#3	Discarded	503.63'	720.000 in/hr Exfiltration over Horizontal area

Discarded OutFlow Max=1.32 cfs @ 12.08 hrs HW=503.64' (Free Discharge)
 ↑ **3=Exfiltration** (Exfiltration Controls 1.32 cfs @ 0.02 fps)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=503.63' (Free Discharge)
 ↑ **2=Culvert** (Controls 0.00 cfs)
 ↑ **1=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: DETENTION - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-160LP +Cap (ADS StormTech®SC-160LP with cap length)

Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf

Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap

1 Chambers/Row x 7.12' Long +0.23' Cap Length x 2 = 7.59' Row Length +12.0" End Stone x 2 = 9.59' Base Length

3 Rows x 25.0" Wide + 12.0" Side Stone x 2 = 8.25' Base Width

6.0" Stone Base + 12.0" Chamber Height + 6.0" Stone Cover = 2.00' Field Height

3 Chambers x 6.8 cf = 20.5 cf Chamber Storage

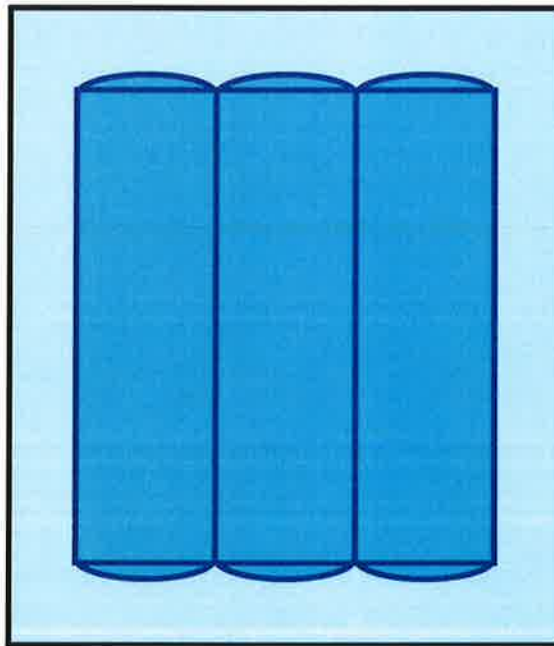
158.2 cf Field - 20.5 cf Chambers = 137.7 cf Stone x 40.0% Voids = 55.1 cf Stone Storage

Chamber Storage + Stone Storage = 75.6 cf = 0.002 af

Overall Storage Efficiency = 47.8%

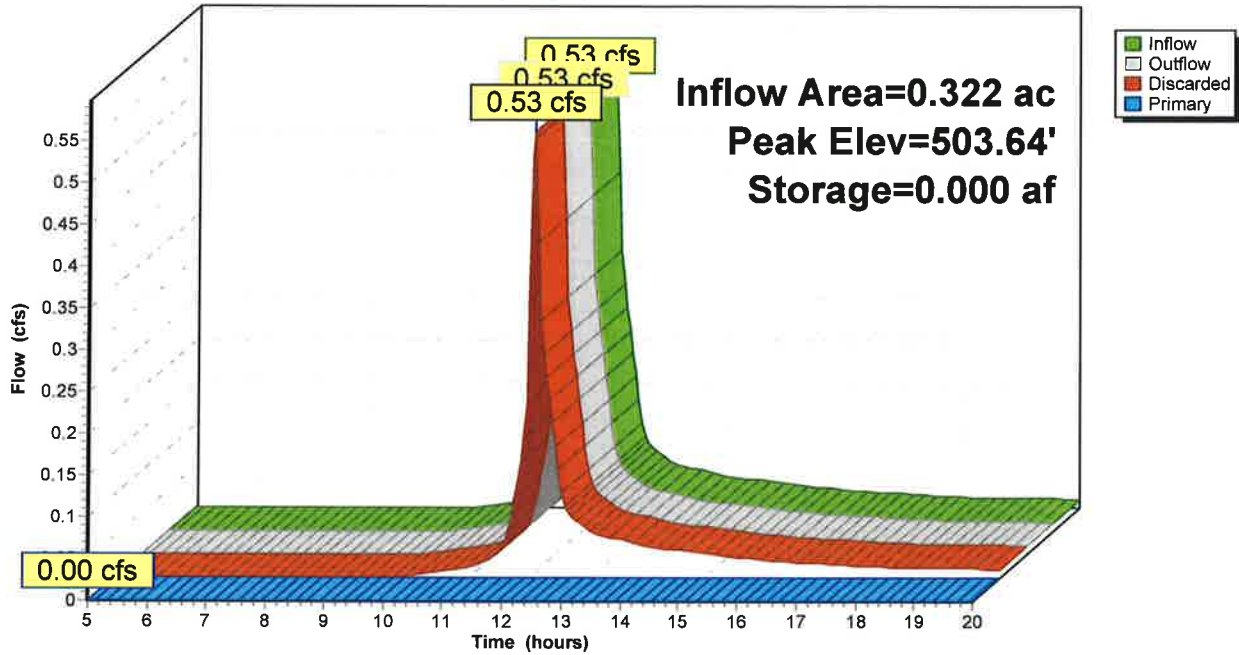
Overall System Size = 9.59' x 8.25' x 2.00'

- 3 Chambers
- 5.9 cy Field
- 5.1 cy Stone



Pond 5P: DETENTION

Hydrograph



Hydrograph for Pond 5P: DETENTION

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
5.00	0.00	0.000	503.63	0.00	0.00	0.00
5.50	0.00	0.000	503.63	0.00	0.00	0.00
6.00	0.00	0.000	503.63	0.00	0.00	0.00
6.50	0.00	0.000	503.63	0.00	0.00	0.00
7.00	0.00	0.000	503.63	0.00	0.00	0.00
7.50	0.00	0.000	503.63	0.00	0.00	0.00
8.00	0.00	0.000	503.63	0.00	0.00	0.00
8.50	0.00	0.000	503.63	0.00	0.00	0.00
9.00	0.00	0.000	503.63	0.00	0.00	0.00
9.50	0.00	0.000	503.63	0.00	0.00	0.00
10.00	0.00	0.000	503.63	0.00	0.00	0.00
10.50	0.01	0.000	503.63	0.01	0.01	0.00
11.00	0.01	0.000	503.63	0.01	0.01	0.00
11.50	0.03	0.000	503.63	0.03	0.03	0.00
12.00	0.33	0.000	503.64	0.33	0.33	0.00
12.50	0.13	0.000	503.63	0.13	0.13	0.00
13.00	0.06	0.000	503.63	0.06	0.06	0.00
13.50	0.05	0.000	503.63	0.05	0.05	0.00
14.00	0.04	0.000	503.63	0.04	0.04	0.00
14.50	0.03	0.000	503.63	0.03	0.03	0.00
15.00	0.03	0.000	503.63	0.03	0.03	0.00
15.50	0.03	0.000	503.63	0.03	0.03	0.00
16.00	0.02	0.000	503.63	0.02	0.02	0.00
16.50	0.02	0.000	503.63	0.02	0.02	0.00
17.00	0.02	0.000	503.63	0.02	0.02	0.00
17.50	0.02	0.000	503.63	0.02	0.02	0.00
18.00	0.01	0.000	503.63	0.01	0.01	0.00
18.50	0.01	0.000	503.63	0.01	0.01	0.00
19.00	0.01	0.000	503.63	0.01	0.01	0.00
19.50	0.01	0.000	503.63	0.01	0.01	0.00
20.00	0.01	0.000	503.63	0.01	0.01	0.00

Stage-Discharge for Pond 5P: DETENTION

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
503.63	0.00	0.00	0.00	504.69	1.32	1.32	0.00
503.65	1.32	1.32	0.00	504.71	1.32	1.32	0.00
503.67	1.32	1.32	0.00	504.73	1.32	1.32	0.00
503.69	1.32	1.32	0.00	504.75	1.32	1.32	0.00
503.71	1.32	1.32	0.00	504.77	1.32	1.32	0.00
503.73	1.32	1.32	0.00	504.79	1.32	1.32	0.00
503.75	1.32	1.32	0.00	504.81	1.32	1.32	0.00
503.77	1.32	1.32	0.00	504.83	1.32	1.32	0.00
503.79	1.32	1.32	0.00	504.85	1.32	1.32	0.01
503.81	1.32	1.32	0.00	504.87	1.33	1.32	0.01
503.83	1.32	1.32	0.00	504.89	1.34	1.32	0.02
503.85	1.32	1.32	0.00	504.91	1.34	1.32	0.03
503.87	1.32	1.32	0.00	504.93	1.35	1.32	0.03
503.89	1.32	1.32	0.00	504.95	1.36	1.32	0.04
503.91	1.32	1.32	0.00	504.97	1.37	1.32	0.06
503.93	1.32	1.32	0.00	504.99	1.39	1.32	0.07
503.95	1.32	1.32	0.00	505.01	1.40	1.32	0.08
503.97	1.32	1.32	0.00	505.03	1.41	1.32	0.09
503.99	1.32	1.32	0.00	505.05	1.42	1.32	0.11
504.01	1.32	1.32	0.00	505.07	1.44	1.32	0.12
504.03	1.32	1.32	0.00	505.09	1.45	1.32	0.13
504.05	1.32	1.32	0.00	505.11	1.46	1.32	0.14
504.07	1.32	1.32	0.00	505.13	1.47	1.32	0.15
504.09	1.32	1.32	0.00	505.15	1.48	1.32	0.16
504.11	1.32	1.32	0.00	505.17	1.49	1.32	0.17
504.13	1.32	1.32	0.00	505.19	1.49	1.32	0.18
504.15	1.32	1.32	0.00	505.21	1.50	1.32	0.18
504.17	1.32	1.32	0.00	505.23	1.51	1.32	0.19
504.19	1.32	1.32	0.00	505.25	1.52	1.32	0.20
504.21	1.32	1.32	0.00	505.27	1.52	1.32	0.20
504.23	1.32	1.32	0.00	505.29	1.53	1.32	0.21
504.25	1.32	1.32	0.00	505.31	1.54	1.32	0.22
504.27	1.32	1.32	0.00	505.33	1.54	1.32	0.22
504.29	1.32	1.32	0.00	505.35	1.55	1.32	0.23
504.31	1.32	1.32	0.00	505.37	1.55	1.32	0.24
504.33	1.32	1.32	0.00	505.39	1.56	1.32	0.24
504.35	1.32	1.32	0.00	505.41	1.57	1.32	0.25
504.37	1.32	1.32	0.00	505.43	1.57	1.32	0.25
504.39	1.32	1.32	0.00	505.45	1.58	1.32	0.26
504.41	1.32	1.32	0.00	505.47	1.58	1.32	0.26
504.43	1.32	1.32	0.00	505.49	1.59	1.32	0.27
504.45	1.32	1.32	0.00	505.51	1.59	1.32	0.27
504.47	1.32	1.32	0.00	505.53	1.60	1.32	0.28
504.49	1.32	1.32	0.00	505.55	1.60	1.32	0.28
504.51	1.32	1.32	0.00	505.57	1.61	1.32	0.29
504.53	1.32	1.32	0.00	505.59	1.61	1.32	0.29
504.55	1.32	1.32	0.00	505.61	1.62	1.32	0.30
504.57	1.32	1.32	0.00	505.63	1.62	1.32	0.30
504.59	1.32	1.32	0.00				
504.61	1.32	1.32	0.00				
504.63	1.32	1.32	0.00				
504.65	1.32	1.32	0.00				
504.67	1.32	1.32	0.00				

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEV DA-1 Runoff Area=1.555 ac 10.61% Impervious Runoff Depth>1.52"
Flow Length=165' Tc=7.9 min CN=63 Runoff=2.65 cfs 0.197 af

Subcatchment3S: POST DEV DA-1 Runoff Area=1.230 ac 8.13% Impervious Runoff Depth>1.45"
Flow Length=165' Tc=7.9 min CN=62 Runoff=1.98 cfs 0.149 af

Subcatchment4S: POST DEV DA-2 Runoff Area=0.322 ac 44.72% Impervious Runoff Depth>2.73"
Tc=5.0 min CN=78 Runoff=1.11 cfs 0.073 af

Reach 2R: PRE DEV DESIGN LINE 1 Inflow=2.65 cfs 0.197 af
Outflow=2.65 cfs 0.197 af

Reach 6R: POST DEV DESIGN LINE 1 Inflow=1.98 cfs 0.149 af
Outflow=1.98 cfs 0.149 af

Pond 5P: DETENTION Peak Elev=503.65' Storage=0.000 af Inflow=1.11 cfs 0.073 af
Discarded=1.11 cfs 0.073 af Primary=0.00 cfs 0.000 af Outflow=1.11 cfs 0.073 af

Total Runoff Area = 3.107 ac Runoff Volume = 0.419 af Average Runoff Depth = 1.62"
86.84% Pervious = 2.698 ac 13.16% Impervious = 0.409 ac

Summary for Subcatchment 1S: PRE DEV DA-1

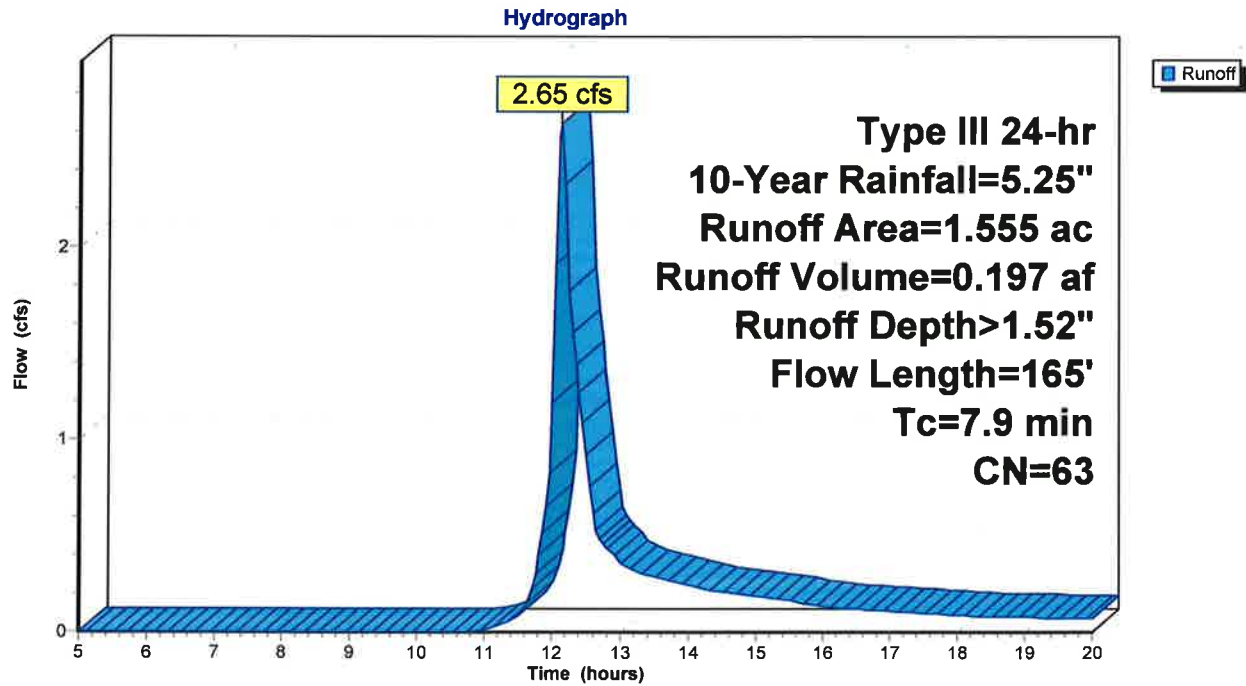
Runoff = 2.65 cfs @ 12.12 hrs, Volume= 0.197 af, Depth> 1.52"
 Routed to Reach 2R : PRE DEV DESIGN LINE 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=5.25"

Area (ac)	CN	Description
0.165	98	Paved parking, HSG B
0.533	61	>75% Grass cover, Good, HSG B
0.857	58	Woods/grass comb., Good, HSG B
1.555	63	Weighted Average
1.390		89.39% Pervious Area
0.165		10.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	150	0.1870	0.31		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
0.0	15	0.1330	5.87		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
7.9	165	Total			

Subcatchment 1S: PRE DEV DA-1



21-54 Eisenberg 12-9-21

Type III 24-hr 10-Year Rainfall=5.25"

Prepared by {enter your company name here}

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Hydrograph for Subcatchment 1S: PRE DEV DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.30	0.00	0.00	18.25	4.89	1.44	0.08
5.25	0.32	0.00	0.00	18.50	4.91	1.45	0.08
5.50	0.34	0.00	0.00	18.75	4.93	1.47	0.08
5.75	0.36	0.00	0.00	19.00	4.95	1.48	0.08
6.00	0.38	0.00	0.00	19.25	4.97	1.49	0.07
6.25	0.40	0.00	0.00	19.50	4.99	1.50	0.07
6.50	0.42	0.00	0.00	19.75	5.01	1.51	0.07
6.75	0.45	0.00	0.00	20.00	5.02	1.52	0.07
7.00	0.48	0.00	0.00				
7.25	0.50	0.00	0.00				
7.50	0.53	0.00	0.00				
7.75	0.57	0.00	0.00				
8.00	0.60	0.00	0.00				
8.25	0.63	0.00	0.00				
8.50	0.67	0.00	0.00				
8.75	0.72	0.00	0.00				
9.00	0.77	0.00	0.00				
9.25	0.82	0.00	0.00				
9.50	0.87	0.00	0.00				
9.75	0.93	0.00	0.00				
10.00	0.99	0.00	0.00				
10.25	1.06	0.00	0.00				
10.50	1.14	0.00	0.00				
10.75	1.22	0.00	0.00				
11.00	1.31	0.00	0.02				
11.25	1.42	0.01	0.04				
11.50	1.56	0.02	0.09				
11.75	1.87	0.07	0.30				
12.00	2.62	0.29	1.19				
12.25	3.38	0.60	1.77				
12.50	3.69	0.75	0.92				
12.75	3.83	0.82	0.46				
13.00	3.94	0.88	0.37				
13.25	4.03	0.93	0.31				
13.50	4.11	0.98	0.29				
13.75	4.19	1.02	0.27				
14.00	4.26	1.06	0.24				
14.25	4.32	1.10	0.22				
14.50	4.38	1.13	0.21				
14.75	4.43	1.16	0.20				
15.00	4.48	1.19	0.19				
15.25	4.53	1.22	0.18				
15.50	4.58	1.25	0.16				
15.75	4.62	1.27	0.15				
16.00	4.65	1.29	0.14				
16.25	4.68	1.31	0.13				
16.50	4.72	1.33	0.12				
16.75	4.75	1.35	0.12				
17.00	4.77	1.37	0.11				
17.25	4.80	1.38	0.10				
17.50	4.83	1.40	0.10				
17.75	4.85	1.41	0.09				
18.00	4.87	1.43	0.09				

Summary for Subcatchment 3S: POST DEV DA-1

Runoff = 1.98 cfs @ 12.12 hrs, Volume= 0.149 af, Depth> 1.45"

Routed to Reach 6R : POST DEV DESIGN LINE 1

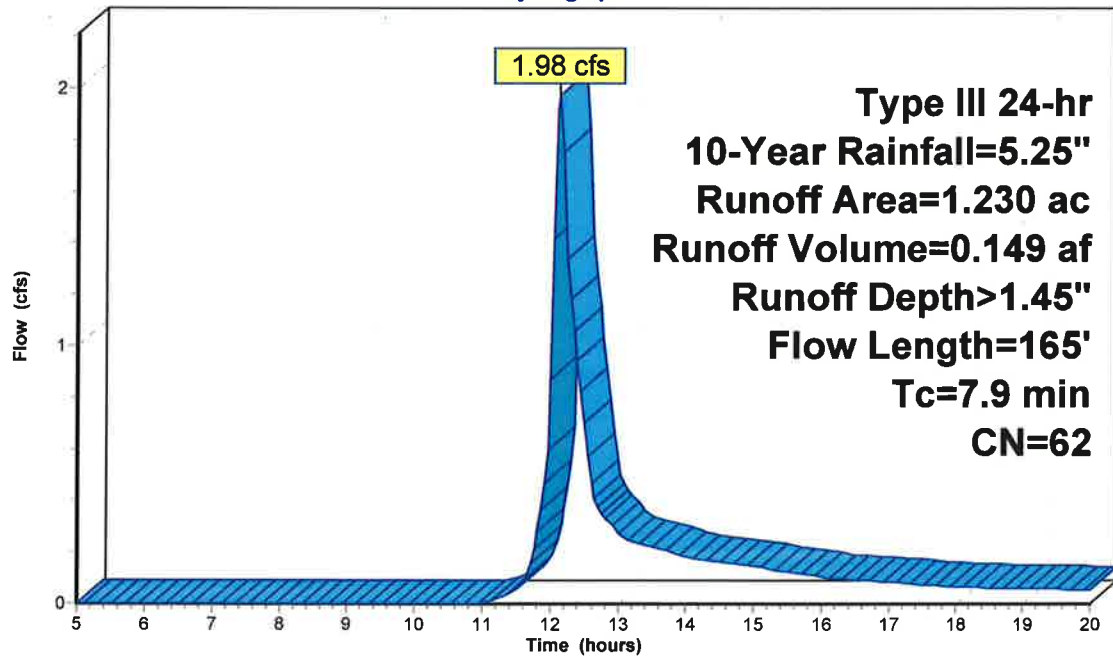
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=5.25"

Area (ac)	CN	Description
0.100	98	Paved parking, HSG B
0.137	61	>75% Grass cover, Good, HSG B
0.993	58	Woods/grass comb., Good, HSG B
1.230	62	Weighted Average
1.130		91.87% Pervious Area
0.100		8.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	150	0.1870	0.31		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
0.0	15	0.1330	5.87		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
7.9	165	Total			

Subcatchment 3S: POST DEV DA-1

Hydrograph



Runoff

**Type III 24-hr
 10-Year Rainfall=5.25"
 Runoff Area=1.230 ac
 Runoff Volume=0.149 af
 Runoff Depth>1.45"
 Flow Length=165'
 Tc=7.9 min
 CN=62**

Hydrograph for Subcatchment 3S: POST DEV DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.30	0.00	0.00	18.25	4.89	1.37	0.06
5.25	0.32	0.00	0.00	18.50	4.91	1.39	0.06
5.50	0.34	0.00	0.00	18.75	4.93	1.40	0.06
5.75	0.36	0.00	0.00	19.00	4.95	1.41	0.06
6.00	0.38	0.00	0.00	19.25	4.97	1.42	0.06
6.25	0.40	0.00	0.00	19.50	4.99	1.43	0.06
6.50	0.42	0.00	0.00	19.75	5.01	1.44	0.05
6.75	0.45	0.00	0.00	20.00	5.02	1.45	0.05
7.00	0.48	0.00	0.00				
7.25	0.50	0.00	0.00				
7.50	0.53	0.00	0.00				
7.75	0.57	0.00	0.00				
8.00	0.60	0.00	0.00				
8.25	0.63	0.00	0.00				
8.50	0.67	0.00	0.00				
8.75	0.72	0.00	0.00				
9.00	0.77	0.00	0.00				
9.25	0.82	0.00	0.00				
9.50	0.87	0.00	0.00				
9.75	0.93	0.00	0.00				
10.00	0.99	0.00	0.00				
10.25	1.06	0.00	0.00				
10.50	1.14	0.00	0.00				
10.75	1.22	0.00	0.00				
11.00	1.31	0.00	0.01				
11.25	1.42	0.01	0.02				
11.50	1.56	0.02	0.06				
11.75	1.87	0.06	0.21				
12.00	2.62	0.26	0.87				
12.25	3.38	0.56	1.34				
12.50	3.69	0.70	0.70				
12.75	3.83	0.77	0.35				
13.00	3.94	0.83	0.28				
13.25	4.03	0.88	0.24				
13.50	4.11	0.92	0.22				
13.75	4.19	0.97	0.20				
14.00	4.26	1.00	0.19				
14.25	4.32	1.04	0.17				
14.50	4.38	1.07	0.16				
14.75	4.43	1.10	0.15				
15.00	4.48	1.13	0.14				
15.25	4.53	1.16	0.14				
15.50	4.58	1.18	0.13				
15.75	4.62	1.21	0.12				
16.00	4.65	1.23	0.10				
16.25	4.68	1.25	0.10				
16.50	4.72	1.27	0.09				
16.75	4.75	1.28	0.09				
17.00	4.77	1.30	0.08				
17.25	4.80	1.32	0.08				
17.50	4.83	1.33	0.07				
17.75	4.85	1.35	0.07				
18.00	4.87	1.36	0.07				

Summary for Subcatchment 4S: POST DEV DA-2

[49] Hint: Tc<2dt may require smaller dt

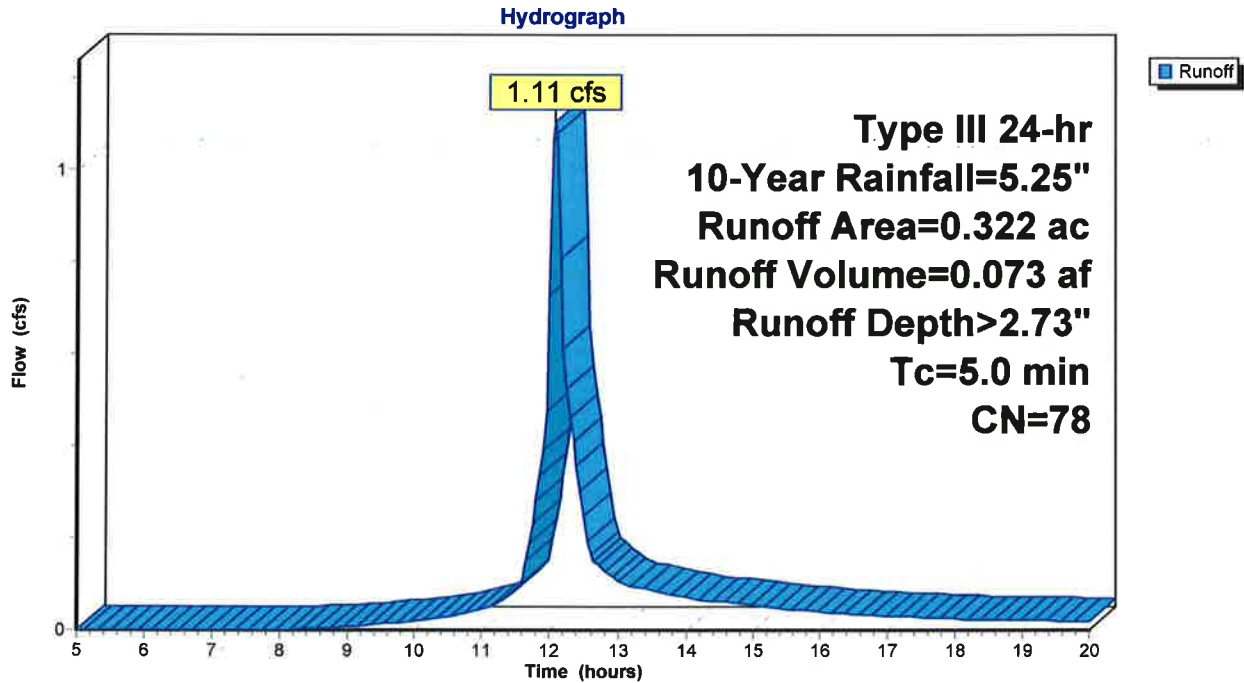
Runoff = 1.11 cfs @ 12.08 hrs, Volume= 0.073 af, Depth> 2.73"
 Routed to Pond 5P : DETENTION

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=5.25"

Area (ac)	CN	Description
0.144	98	Paved parking, HSG B
0.178	61	>75% Grass cover, Good, HSG B
0.322	78	Weighted Average
0.178		55.28% Pervious Area
0.144		44.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 4S: POST DEV DA-2



Hydrograph for Subcatchment 4S: POST DEV DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.30	0.00	0.00	18.25	4.89	2.62	0.02
5.25	0.32	0.00	0.00	18.50	4.91	2.64	0.02
5.50	0.34	0.00	0.00	18.75	4.93	2.65	0.02
5.75	0.36	0.00	0.00	19.00	4.95	2.67	0.02
6.00	0.38	0.00	0.00	19.25	4.97	2.69	0.02
6.25	0.40	0.00	0.00	19.50	4.99	2.70	0.02
6.50	0.42	0.00	0.00	19.75	5.01	2.72	0.02
6.75	0.45	0.00	0.00	20.00	5.02	2.73	0.02
7.00	0.48	0.00	0.00				
7.25	0.50	0.00	0.00				
7.50	0.53	0.00	0.00				
7.75	0.57	0.00	0.00				
8.00	0.60	0.00	0.00				
8.25	0.63	0.00	0.00				
8.50	0.67	0.00	0.00				
8.75	0.72	0.01	0.01				
9.00	0.77	0.01	0.01				
9.25	0.82	0.02	0.01				
9.50	0.87	0.03	0.01				
9.75	0.93	0.04	0.02				
10.00	0.99	0.06	0.02				
10.25	1.06	0.07	0.02				
10.50	1.14	0.10	0.03				
10.75	1.22	0.12	0.04				
11.00	1.31	0.16	0.04				
11.25	1.42	0.20	0.06				
11.50	1.56	0.26	0.08				
11.75	1.87	0.41	0.23				
12.00	2.62	0.87	0.72				
12.25	3.38	1.41	0.52				
12.50	3.69	1.64	0.25				
12.75	3.83	1.75	0.14				
13.00	3.94	1.84	0.11				
13.25	4.03	1.91	0.09				
13.50	4.11	1.98	0.09				
13.75	4.19	2.04	0.08				
14.00	4.26	2.09	0.07				
14.25	4.32	2.15	0.07				
14.50	4.38	2.19	0.06				
14.75	4.43	2.24	0.06				
15.00	4.48	2.28	0.05				
15.25	4.53	2.32	0.05				
15.50	4.58	2.36	0.05				
15.75	4.62	2.39	0.04				
16.00	4.65	2.42	0.04				
16.25	4.68	2.45	0.04				
16.50	4.72	2.47	0.03				
16.75	4.75	2.50	0.03				
17.00	4.77	2.52	0.03				
17.25	4.80	2.54	0.03				
17.50	4.83	2.57	0.03				
17.75	4.85	2.58	0.03				
18.00	4.87	2.60	0.02				

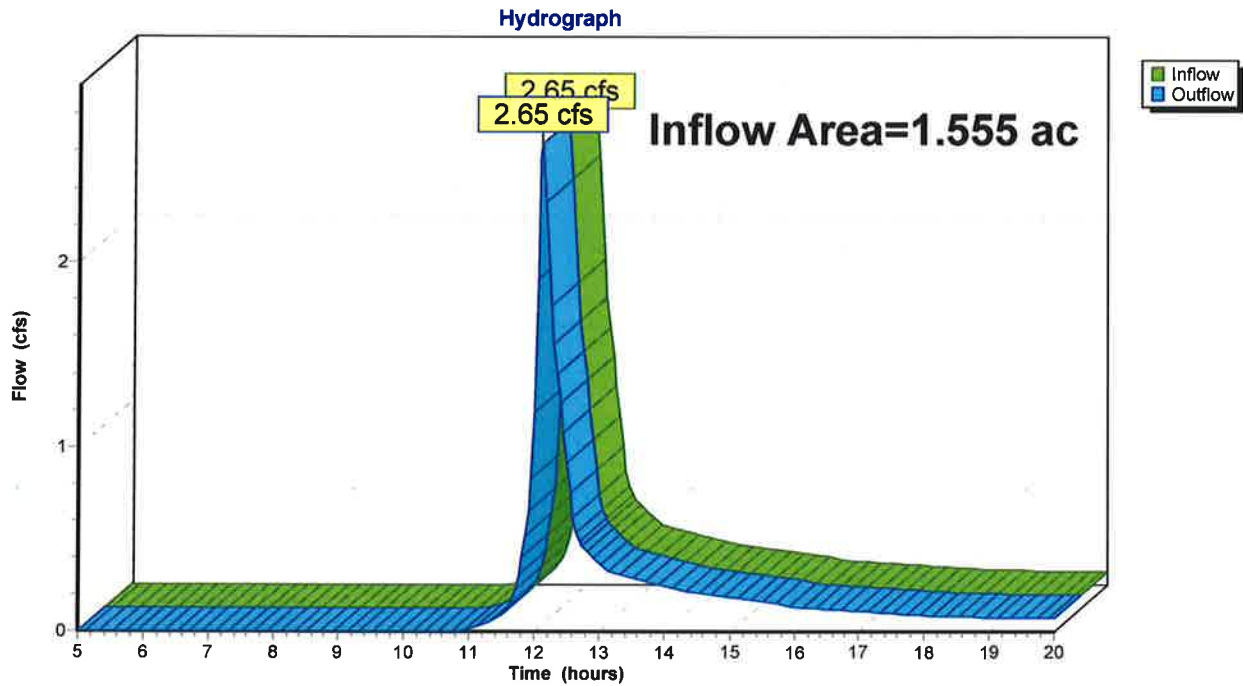
Summary for Reach 2R: PRE DEV DESIGN LINE 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.555 ac, 10.61% Impervious, Inflow Depth > 1.52" for 10-Year event
Inflow = 2.65 cfs @ 12.12 hrs, Volume= 0.197 af
Outflow = 2.65 cfs @ 12.12 hrs, Volume= 0.197 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 2R: PRE DEV DESIGN LINE 1



Hydrograph for Reach 2R: PRE DEV DESIGN LINE 1

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
5.00	0.00		0.00	18.25	0.08		0.08
5.25	0.00		0.00	18.50	0.08		0.08
5.50	0.00		0.00	18.75	0.08		0.08
5.75	0.00		0.00	19.00	0.08		0.08
6.00	0.00		0.00	19.25	0.07		0.07
6.25	0.00		0.00	19.50	0.07		0.07
6.50	0.00		0.00	19.75	0.07		0.07
6.75	0.00		0.00	20.00	0.07		0.07
7.00	0.00		0.00				
7.25	0.00		0.00				
7.50	0.00		0.00				
7.75	0.00		0.00				
8.00	0.00		0.00				
8.25	0.00		0.00				
8.50	0.00		0.00				
8.75	0.00		0.00				
9.00	0.00		0.00				
9.25	0.00		0.00				
9.50	0.00		0.00				
9.75	0.00		0.00				
10.00	0.00		0.00				
10.25	0.00		0.00				
10.50	0.00		0.00				
10.75	0.00		0.00				
11.00	0.02		0.02				
11.25	0.04		0.04				
11.50	0.09		0.09				
11.75	0.30		0.30				
12.00	1.19		1.19				
12.25	1.77		1.77				
12.50	0.92		0.92				
12.75	0.46		0.46				
13.00	0.37		0.37				
13.25	0.31		0.31				
13.50	0.29		0.29				
13.75	0.27		0.27				
14.00	0.24		0.24				
14.25	0.22		0.22				
14.50	0.21		0.21				
14.75	0.20		0.20				
15.00	0.19		0.19				
15.25	0.18		0.18				
15.50	0.16		0.16				
15.75	0.15		0.15				
16.00	0.14		0.14				
16.25	0.13		0.13				
16.50	0.12		0.12				
16.75	0.12		0.12				
17.00	0.11		0.11				
17.25	0.10		0.10				
17.50	0.10		0.10				
17.75	0.09		0.09				
18.00	0.09		0.09				

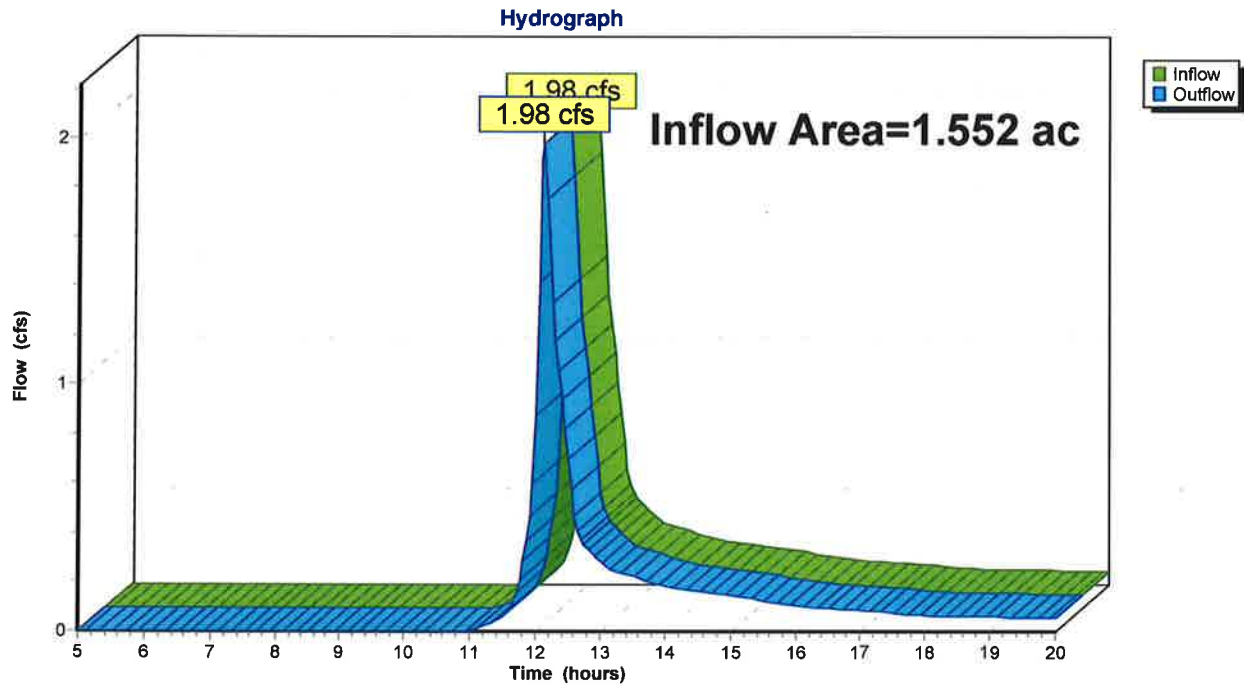
Summary for Reach 6R: POST DEV DESIGN LINE 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.552 ac, 15.72% Impervious, Inflow Depth > 1.15" for 10-Year event
Inflow = 1.98 cfs @ 12.12 hrs, Volume= 0.149 af
Outflow = 1.98 cfs @ 12.12 hrs, Volume= 0.149 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: POST DEV DESIGN LINE 1



Hydrograph for Reach 6R: POST DEV DESIGN LINE 1

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
5.00	0.00		0.00	18.25	0.06		0.06
5.25	0.00		0.00	18.50	0.06		0.06
5.50	0.00		0.00	18.75	0.06		0.06
5.75	0.00		0.00	19.00	0.06		0.06
6.00	0.00		0.00	19.25	0.06		0.06
6.25	0.00		0.00	19.50	0.06		0.06
6.50	0.00		0.00	19.75	0.05		0.05
6.75	0.00		0.00	20.00	0.05		0.05
7.00	0.00		0.00				
7.25	0.00		0.00				
7.50	0.00		0.00				
7.75	0.00		0.00				
8.00	0.00		0.00				
8.25	0.00		0.00				
8.50	0.00		0.00				
8.75	0.00		0.00				
9.00	0.00		0.00				
9.25	0.00		0.00				
9.50	0.00		0.00				
9.75	0.00		0.00				
10.00	0.00		0.00				
10.25	0.00		0.00				
10.50	0.00		0.00				
10.75	0.00		0.00				
11.00	0.01		0.01				
11.25	0.02		0.02				
11.50	0.06		0.06				
11.75	0.21		0.21				
12.00	0.87		0.87				
12.25	1.34		1.34				
12.50	0.70		0.70				
12.75	0.35		0.35				
13.00	0.28		0.28				
13.25	0.24		0.24				
13.50	0.22		0.22				
13.75	0.20		0.20				
14.00	0.19		0.19				
14.25	0.17		0.17				
14.50	0.16		0.16				
14.75	0.15		0.15				
15.00	0.14		0.14				
15.25	0.14		0.14				
15.50	0.13		0.13				
15.75	0.12		0.12				
16.00	0.10		0.10				
16.25	0.10		0.10				
16.50	0.09		0.09				
16.75	0.09		0.09				
17.00	0.08		0.08				
17.25	0.08		0.08				
17.50	0.07		0.07				
17.75	0.07		0.07				
18.00	0.07		0.07				

Summary for Pond 5P: DETENTION

Inflow Area = 0.322 ac, 44.72% Impervious, Inflow Depth > 2.73" for 10-Year event
 Inflow = 1.11 cfs @ 12.08 hrs, Volume= 0.073 af
 Outflow = 1.11 cfs @ 12.08 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.0 min
 Discarded = 1.11 cfs @ 12.08 hrs, Volume= 0.073 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Reach 6R : POST DEV DESIGN LINE 1

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 503.65' @ 12.08 hrs Surf.Area= 0.002 ac Storage= 0.000 af

Plug-Flow detention time= 0.0 min calculated for 0.073 af (100% of inflow)
 Center-of-Mass det. time= 0.0 min (788.8 - 788.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	503.63'	0.001 af	8.25'W x 9.59'L x 2.00'H Field A 0.004 af Overall - 0.000 af Embedded = 0.003 af x 40.0% Voids
#2A	504.13'	0.000 af	ADS_StormTech SC-160LP +Cap x 3 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 3 Chambers in 3 Rows
		0.002 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 2	504.80'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	504.80'	4.0" Round Culvert L= 27.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 504.80' / 501.00' S= 0.1407 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#3	Discarded	503.63'	720.000 in/hr Exfiltration over Horizontal area

Discarded OutFlow Max=1.32 cfs @ 12.08 hrs HW=503.65' (Free Discharge)
 ↑ **3=Exfiltration** (Exfiltration Controls 1.32 cfs @ 0.02 fps)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=503.63' (Free Discharge)
 ↑ **2=Culvert** (Controls 0.00 cfs)
 ↑ **1=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: DETENTION - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-160LP+Cap (ADS StormTech®SC-160LP with cap length)

Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf

Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap

1 Chambers/Row x 7.12' Long +0.23' Cap Length x 2 = 7.59' Row Length +12.0" End Stone x 2 = 9.59' Base Length

3 Rows x 25.0" Wide + 12.0" Side Stone x 2 = 8.25' Base Width

6.0" Stone Base + 12.0" Chamber Height + 6.0" Stone Cover = 2.00' Field Height

3 Chambers x 6.8 cf = 20.5 cf Chamber Storage

158.2 cf Field - 20.5 cf Chambers = 137.7 cf Stone x 40.0% Voids = 55.1 cf Stone Storage

Chamber Storage + Stone Storage = 75.6 cf = 0.002 af

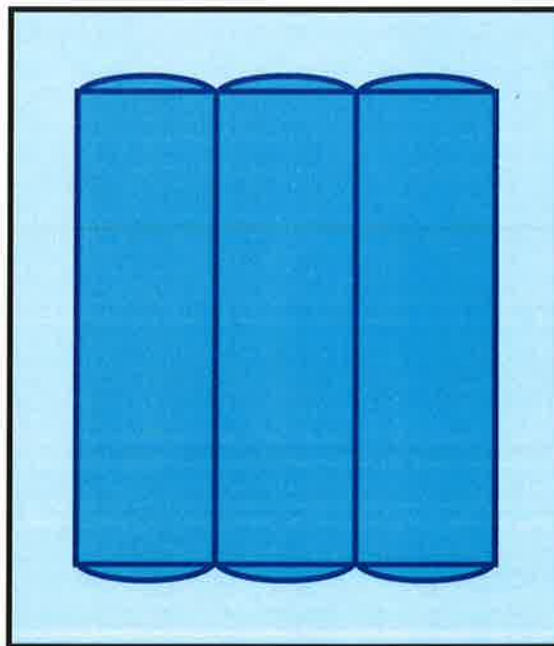
Overall Storage Efficiency = 47.8%

Overall System Size = 9.59' x 8.25' x 2.00'

3 Chambers

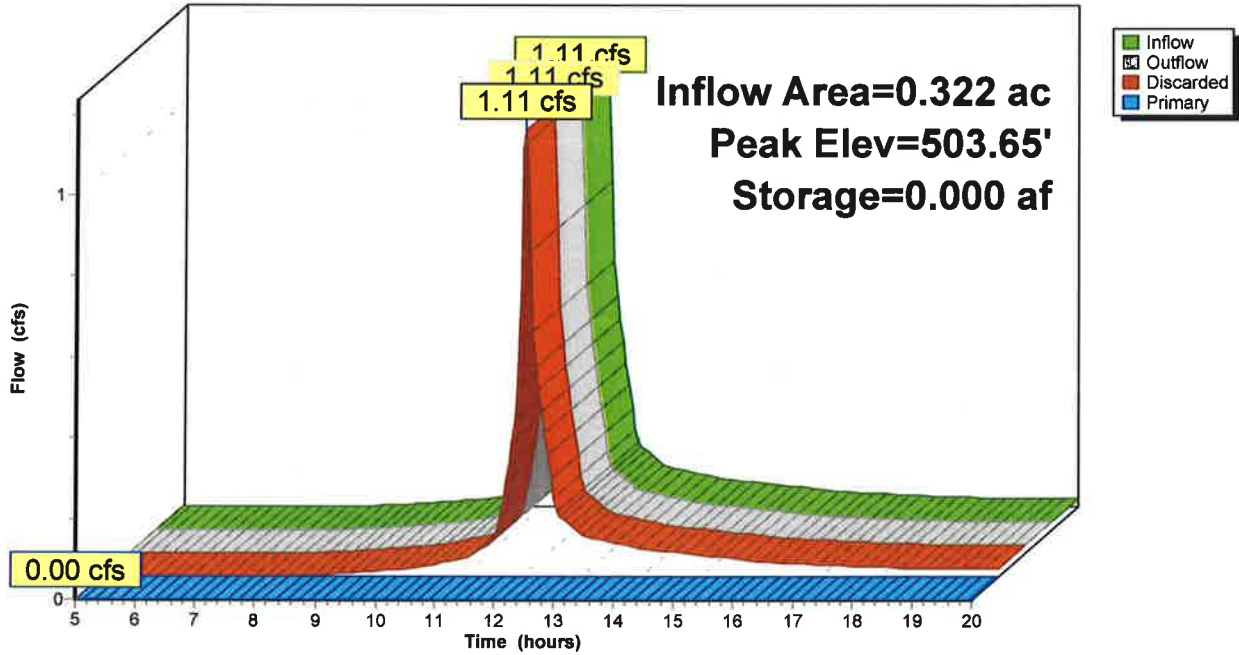
5.9 cy Field

5.1 cy Stone



Pond 5P: DETENTION

Hydrograph



Hydrograph for Pond 5P: DETENTION

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
5.00	0.00	0.000	503.63	0.00	0.00	0.00
5.50	0.00	0.000	503.63	0.00	0.00	0.00
6.00	0.00	0.000	503.63	0.00	0.00	0.00
6.50	0.00	0.000	503.63	0.00	0.00	0.00
7.00	0.00	0.000	503.63	0.00	0.00	0.00
7.50	0.00	0.000	503.63	0.00	0.00	0.00
8.00	0.00	0.000	503.63	0.00	0.00	0.00
8.50	0.00	0.000	503.63	0.00	0.00	0.00
9.00	0.01	0.000	503.63	0.01	0.01	0.00
9.50	0.01	0.000	503.63	0.01	0.01	0.00
10.00	0.02	0.000	503.63	0.02	0.02	0.00
10.50	0.03	0.000	503.63	0.03	0.03	0.00
11.00	0.04	0.000	503.63	0.04	0.04	0.00
11.50	0.08	0.000	503.63	0.08	0.08	0.00
12.00	0.72	0.000	503.64	0.72	0.72	0.00
12.50	0.25	0.000	503.63	0.25	0.25	0.00
13.00	0.11	0.000	503.63	0.11	0.11	0.00
13.50	0.09	0.000	503.63	0.09	0.09	0.00
14.00	0.07	0.000	503.63	0.07	0.07	0.00
14.50	0.06	0.000	503.63	0.06	0.06	0.00
15.00	0.05	0.000	503.63	0.05	0.05	0.00
15.50	0.05	0.000	503.63	0.05	0.05	0.00
16.00	0.04	0.000	503.63	0.04	0.04	0.00
16.50	0.03	0.000	503.63	0.03	0.03	0.00
17.00	0.03	0.000	503.63	0.03	0.03	0.00
17.50	0.03	0.000	503.63	0.03	0.03	0.00
18.00	0.02	0.000	503.63	0.02	0.02	0.00
18.50	0.02	0.000	503.63	0.02	0.02	0.00
19.00	0.02	0.000	503.63	0.02	0.02	0.00
19.50	0.02	0.000	503.63	0.02	0.02	0.00
20.00	0.02	0.000	503.63	0.02	0.02	0.00

Stage-Discharge for Pond 5P: DETENTION

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
503.63	0.00	0.00	0.00	504.69	1.32	1.32	0.00
503.65	1.32	1.32	0.00	504.71	1.32	1.32	0.00
503.67	1.32	1.32	0.00	504.73	1.32	1.32	0.00
503.69	1.32	1.32	0.00	504.75	1.32	1.32	0.00
503.71	1.32	1.32	0.00	504.77	1.32	1.32	0.00
503.73	1.32	1.32	0.00	504.79	1.32	1.32	0.00
503.75	1.32	1.32	0.00	504.81	1.32	1.32	0.00
503.77	1.32	1.32	0.00	504.83	1.32	1.32	0.00
503.79	1.32	1.32	0.00	504.85	1.32	1.32	0.01
503.81	1.32	1.32	0.00	504.87	1.33	1.32	0.01
503.83	1.32	1.32	0.00	504.89	1.34	1.32	0.02
503.85	1.32	1.32	0.00	504.91	1.34	1.32	0.03
503.87	1.32	1.32	0.00	504.93	1.35	1.32	0.03
503.89	1.32	1.32	0.00	504.95	1.36	1.32	0.04
503.91	1.32	1.32	0.00	504.97	1.37	1.32	0.06
503.93	1.32	1.32	0.00	504.99	1.39	1.32	0.07
503.95	1.32	1.32	0.00	505.01	1.40	1.32	0.08
503.97	1.32	1.32	0.00	505.03	1.41	1.32	0.09
503.99	1.32	1.32	0.00	505.05	1.42	1.32	0.11
504.01	1.32	1.32	0.00	505.07	1.44	1.32	0.12
504.03	1.32	1.32	0.00	505.09	1.45	1.32	0.13
504.05	1.32	1.32	0.00	505.11	1.46	1.32	0.14
504.07	1.32	1.32	0.00	505.13	1.47	1.32	0.15
504.09	1.32	1.32	0.00	505.15	1.48	1.32	0.16
504.11	1.32	1.32	0.00	505.17	1.49	1.32	0.17
504.13	1.32	1.32	0.00	505.19	1.49	1.32	0.18
504.15	1.32	1.32	0.00	505.21	1.50	1.32	0.18
504.17	1.32	1.32	0.00	505.23	1.51	1.32	0.19
504.19	1.32	1.32	0.00	505.25	1.52	1.32	0.20
504.21	1.32	1.32	0.00	505.27	1.52	1.32	0.20
504.23	1.32	1.32	0.00	505.29	1.53	1.32	0.21
504.25	1.32	1.32	0.00	505.31	1.54	1.32	0.22
504.27	1.32	1.32	0.00	505.33	1.54	1.32	0.22
504.29	1.32	1.32	0.00	505.35	1.55	1.32	0.23
504.31	1.32	1.32	0.00	505.37	1.55	1.32	0.24
504.33	1.32	1.32	0.00	505.39	1.56	1.32	0.24
504.35	1.32	1.32	0.00	505.41	1.57	1.32	0.25
504.37	1.32	1.32	0.00	505.43	1.57	1.32	0.25
504.39	1.32	1.32	0.00	505.45	1.58	1.32	0.26
504.41	1.32	1.32	0.00	505.47	1.58	1.32	0.26
504.43	1.32	1.32	0.00	505.49	1.59	1.32	0.27
504.45	1.32	1.32	0.00	505.51	1.59	1.32	0.27
504.47	1.32	1.32	0.00	505.53	1.60	1.32	0.28
504.49	1.32	1.32	0.00	505.55	1.60	1.32	0.28
504.51	1.32	1.32	0.00	505.57	1.61	1.32	0.29
504.53	1.32	1.32	0.00	505.59	1.61	1.32	0.29
504.55	1.32	1.32	0.00	505.61	1.62	1.32	0.30
504.57	1.32	1.32	0.00	505.63	1.62	1.32	0.30
504.59	1.32	1.32	0.00				
504.61	1.32	1.32	0.00				
504.63	1.32	1.32	0.00				
504.65	1.32	1.32	0.00				
504.67	1.32	1.32	0.00				

21-54 Eisenberg 12-9-21

Type III 24-hr 25-Year Rainfall=6.49"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PRE DEV DA-1

Runoff Area=1.555 ac 10.61% Impervious Runoff Depth>2.32"
Flow Length=165' Tc=7.9 min CN=63 Runoff=4.15 cfs 0.301 af

Subcatchment3S: POST DEV DA-1

Runoff Area=1.230 ac 8.13% Impervious Runoff Depth>2.23"
Flow Length=165' Tc=7.9 min CN=62 Runoff=3.14 cfs 0.229 af

Subcatchment4S: POST DEV DA-2

Runoff Area=0.322 ac 44.72% Impervious Runoff Depth>3.76"
Tc=5.0 min CN=78 Runoff=1.51 cfs 0.101 af

Reach 2R: PRE DEV DESIGN LINE 1

Inflow=4.15 cfs 0.301 af
Outflow=4.15 cfs 0.301 af

Reach 6R: POST DEV DESIGN LINE 1

Inflow=3.14 cfs 0.229 af
Outflow=3.14 cfs 0.229 af

Pond 5P: DETENTION

Peak Elev=504.65' Storage=0.001 af Inflow=1.51 cfs 0.101 af
Discarded=1.32 cfs 0.101 af Primary=0.00 cfs 0.000 af Outflow=1.32 cfs 0.101 af

Total Runoff Area = 3.107 ac Runoff Volume = 0.630 af Average Runoff Depth = 2.43"
86.84% Pervious = 2.698 ac 13.16% Impervious = 0.409 ac

Summary for Subcatchment 1S: PRE DEV DA-1

Runoff = 4.15 cfs @ 12.12 hrs, Volume= 0.301 af, Depth> 2.32"
 Routed to Reach 2R : PRE DEV DESIGN LINE 1

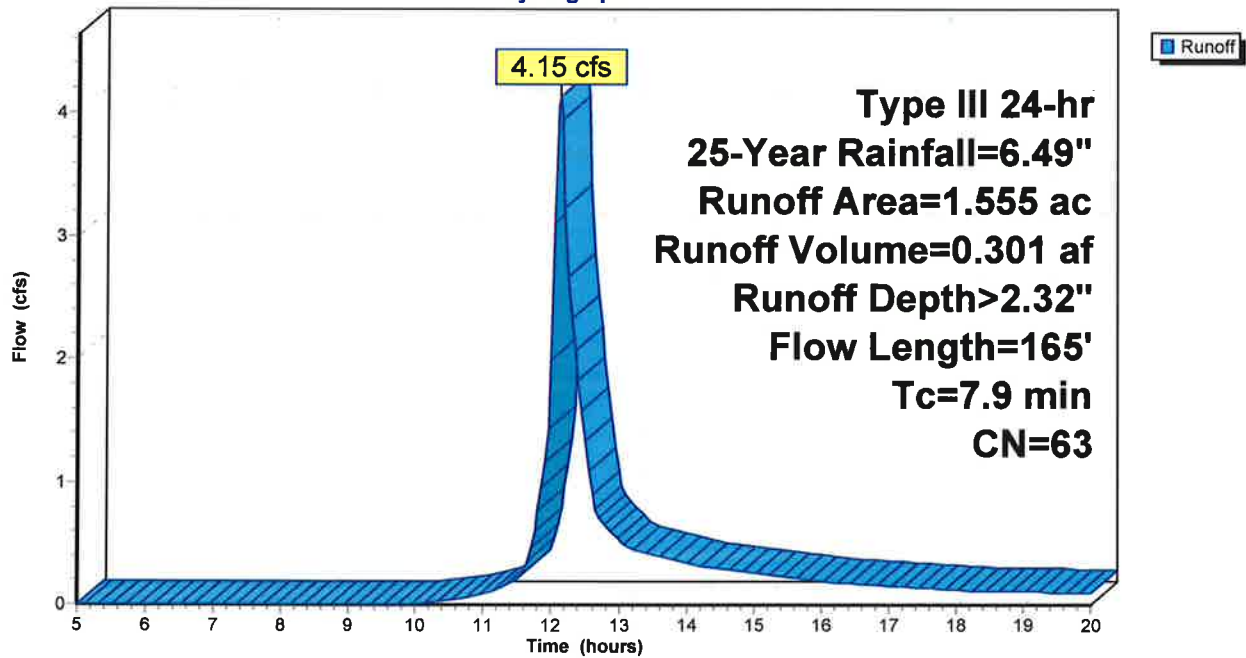
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.49"

Area (ac)	CN	Description
0.165	98	Paved parking, HSG B
0.533	61	>75% Grass cover, Good, HSG B
0.857	58	Woods/grass comb., Good, HSG B
1.555	63	Weighted Average
1.390		89.39% Pervious Area
0.165		10.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	150	0.1870	0.31		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
0.0	15	0.1330	5.87		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
7.9	165	Total			

Subcatchment 1S: PRE DEV DA-1

Hydrograph



21-54 Eisenberg 12-9-21

Type III 24-hr 25-Year Rainfall=6.49"

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Hydrograph for Subcatchment 1S: PRE DEV DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.37	0.00	0.00	18.25	6.05	2.21	0.11
5.25	0.39	0.00	0.00	18.50	6.07	2.23	0.11
5.50	0.42	0.00	0.00	18.75	6.10	2.25	0.11
5.75	0.44	0.00	0.00	19.00	6.12	2.26	0.11
6.00	0.47	0.00	0.00	19.25	6.14	2.28	0.10
6.25	0.49	0.00	0.00	19.50	6.17	2.29	0.10
6.50	0.52	0.00	0.00	19.75	6.19	2.31	0.10
6.75	0.55	0.00	0.00	20.00	6.21	2.33	0.10
7.00	0.59	0.00	0.00				
7.25	0.62	0.00	0.00				
7.50	0.66	0.00	0.00				
7.75	0.70	0.00	0.00				
8.00	0.74	0.00	0.00				
8.25	0.78	0.00	0.00				
8.50	0.83	0.00	0.00				
8.75	0.89	0.00	0.00				
9.00	0.95	0.00	0.00				
9.25	1.01	0.00	0.00				
9.50	1.08	0.00	0.00				
9.75	1.15	0.00	0.00				
10.00	1.23	0.00	0.00				
10.25	1.31	0.00	0.02				
10.50	1.41	0.01	0.04				
10.75	1.51	0.02	0.06				
11.00	1.62	0.03	0.09				
11.25	1.76	0.05	0.13				
11.50	1.93	0.09	0.21				
11.75	2.31	0.18	0.60				
12.00	3.24	0.54	1.99				
12.25	4.18	1.02	2.67				
12.50	4.56	1.24	1.34				
12.75	4.73	1.34	0.67				
13.00	4.87	1.43	0.53				
13.25	4.98	1.50	0.45				
13.50	5.08	1.56	0.41				
13.75	5.18	1.62	0.38				
14.00	5.26	1.68	0.34				
14.25	5.34	1.73	0.32				
14.50	5.41	1.78	0.30				
14.75	5.48	1.82	0.28				
15.00	5.54	1.86	0.26				
15.25	5.60	1.90	0.25				
15.50	5.66	1.94	0.23				
15.75	5.71	1.97	0.21				
16.00	5.75	2.00	0.19				
16.25	5.79	2.03	0.18				
16.50	5.83	2.06	0.17				
16.75	5.87	2.08	0.16				
17.00	5.90	2.11	0.15				
17.25	5.94	2.13	0.14				
17.50	5.97	2.15	0.14				
17.75	6.00	2.17	0.13				
18.00	6.02	2.19	0.12				

Summary for Subcatchment 3S: POST DEV DA-1

Runoff = 3.14 cfs @ 12.12 hrs, Volume= 0.229 af, Depth> 2.23"

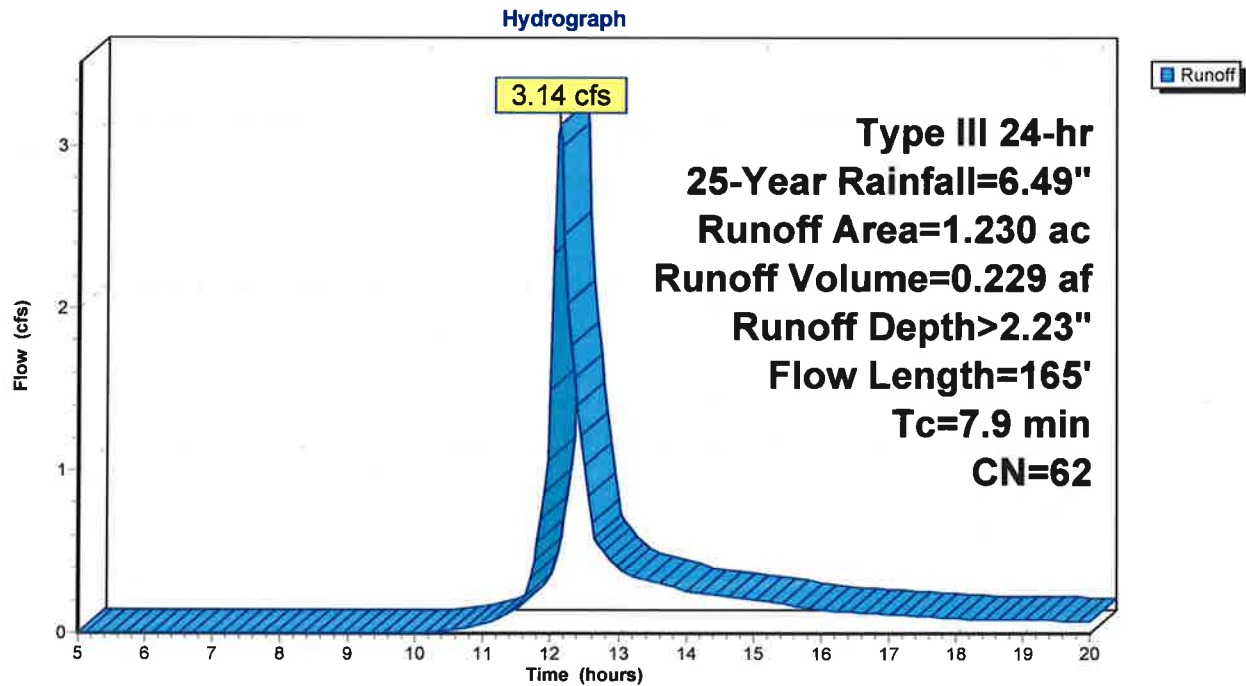
Routed to Reach 6R : POST DEV DESIGN LINE 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.49"

Area (ac)	CN	Description
0.100	98	Paved parking, HSG B
0.137	61	>75% Grass cover, Good, HSG B
0.993	58	Woods/grass comb., Good, HSG B
1.230	62	Weighted Average
1.130		91.87% Pervious Area
0.100		8.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	150	0.1870	0.31		Sheet Flow, Grass: Dense n= 0.240 P2= 3.30"
0.0	15	0.1330	5.87		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
7.9	165	Total			

Subcatchment 3S: POST DEV DA-1



21-54 Eisenberg 12-9-21

Type III 24-hr 25-Year Rainfall=6.49"

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Hydrograph for Subcatchment 3S: POST DEV DA-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.37	0.00	0.00	18.25	6.05	2.12	0.09
5.25	0.39	0.00	0.00	18.50	6.07	2.14	0.09
5.50	0.42	0.00	0.00	18.75	6.10	2.16	0.08
5.75	0.44	0.00	0.00	19.00	6.12	2.17	0.08
6.00	0.47	0.00	0.00	19.25	6.14	2.19	0.08
6.25	0.49	0.00	0.00	19.50	6.17	2.21	0.08
6.50	0.52	0.00	0.00	19.75	6.19	2.22	0.08
6.75	0.55	0.00	0.00	20.00	6.21	2.24	0.07
7.00	0.59	0.00	0.00				
7.25	0.62	0.00	0.00				
7.50	0.66	0.00	0.00				
7.75	0.70	0.00	0.00				
8.00	0.74	0.00	0.00				
8.25	0.78	0.00	0.00				
8.50	0.83	0.00	0.00				
8.75	0.89	0.00	0.00				
9.00	0.95	0.00	0.00				
9.25	1.01	0.00	0.00				
9.50	1.08	0.00	0.00				
9.75	1.15	0.00	0.00				
10.00	1.23	0.00	0.00				
10.25	1.31	0.00	0.01				
10.50	1.41	0.01	0.02				
10.75	1.51	0.01	0.04				
11.00	1.62	0.02	0.06				
11.25	1.76	0.04	0.09				
11.50	1.93	0.07	0.15				
11.75	2.31	0.16	0.44				
12.00	3.24	0.50	1.49				
12.25	4.18	0.96	2.04				
12.50	4.56	1.17	1.03				
12.75	4.73	1.27	0.51				
13.00	4.87	1.36	0.41				
13.25	4.98	1.43	0.34				
13.50	5.08	1.49	0.32				
13.75	5.18	1.55	0.29				
14.00	5.26	1.60	0.26				
14.25	5.34	1.65	0.24				
14.50	5.41	1.70	0.23				
14.75	5.48	1.74	0.22				
15.00	5.54	1.78	0.20				
15.25	5.60	1.82	0.19				
15.50	5.66	1.86	0.18				
15.75	5.71	1.89	0.16				
16.00	5.75	1.92	0.15				
16.25	5.79	1.95	0.14				
16.50	5.83	1.98	0.13				
16.75	5.87	2.00	0.12				
17.00	5.90	2.02	0.12				
17.25	5.94	2.05	0.11				
17.50	5.97	2.07	0.10				
17.75	6.00	2.09	0.10				
18.00	6.02	2.11	0.09				

Summary for Subcatchment 4S: POST DEV DA-2

[49] Hint: Tc<2dt may require smaller dt

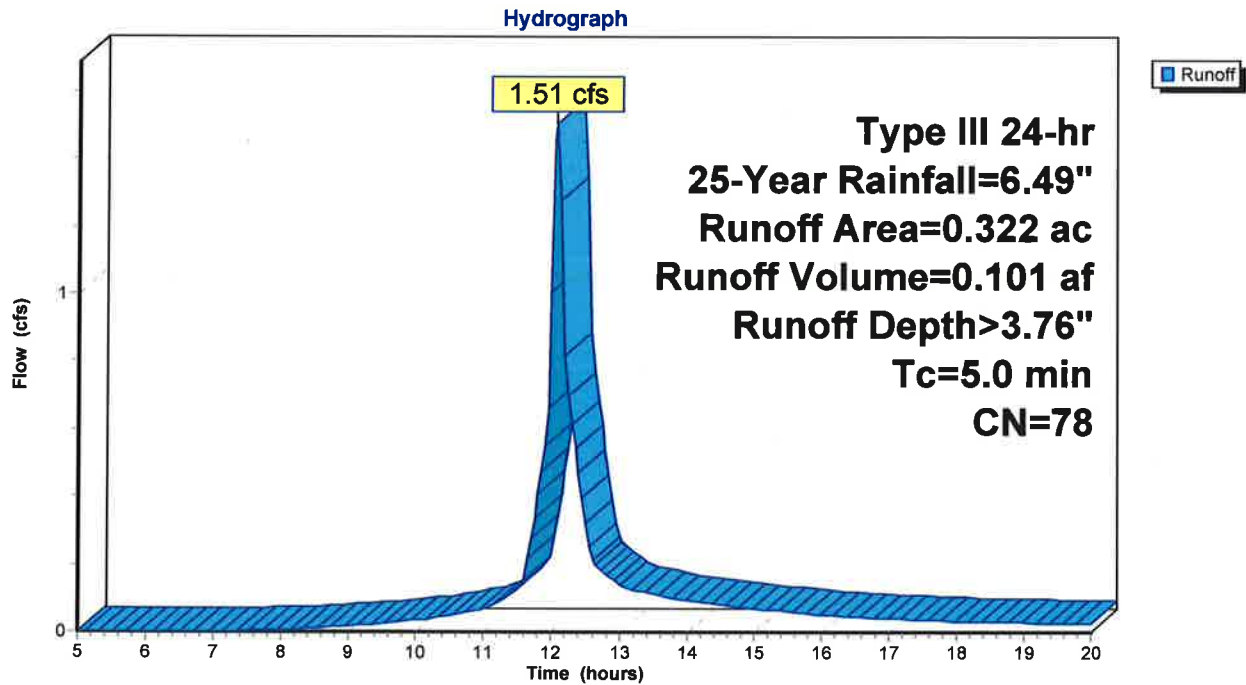
Runoff = 1.51 cfs @ 12.08 hrs, Volume= 0.101 af, Depth> 3.76"
 Routed to Pond 5P : DETENTION

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.49"

Area (ac)	CN	Description
0.144	98	Paved parking, HSG B
0.178	61	>75% Grass cover, Good, HSG B
0.322	78	Weighted Average
0.178		55.28% Pervious Area
0.144		44.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 4S: POST DEV DA-2



21-54 Eisenberg 12-9-21

Type III 24-hr 25-Year Rainfall=6.49"

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Hydrograph for Subcatchment 4S: POST DEV DA-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.37	0.00	0.00	18.25	6.05	3.62	0.03
5.25	0.39	0.00	0.00	18.50	6.07	3.64	0.03
5.50	0.42	0.00	0.00	18.75	6.10	3.67	0.03
5.75	0.44	0.00	0.00	19.00	6.12	3.69	0.03
6.00	0.47	0.00	0.00	19.25	6.14	3.71	0.03
6.25	0.49	0.00	0.00	19.50	6.17	3.73	0.03
6.50	0.52	0.00	0.00	19.75	6.19	3.75	0.03
6.75	0.55	0.00	0.00	20.00	6.21	3.77	0.02
7.00	0.59	0.00	0.00				
7.25	0.62	0.00	0.00				
7.50	0.66	0.00	0.00				
7.75	0.70	0.01	0.00				
8.00	0.74	0.01	0.01				
8.25	0.78	0.02	0.01				
8.50	0.83	0.02	0.01				
8.75	0.89	0.03	0.01				
9.00	0.95	0.05	0.02				
9.25	1.01	0.06	0.02				
9.50	1.08	0.08	0.02				
9.75	1.15	0.10	0.03				
10.00	1.23	0.13	0.03				
10.25	1.31	0.16	0.04				
10.50	1.41	0.19	0.05				
10.75	1.51	0.24	0.06				
11.00	1.62	0.29	0.07				
11.25	1.76	0.36	0.09				
11.50	1.93	0.45	0.13				
11.75	2.31	0.66	0.34				
12.00	3.24	1.31	1.01				
12.25	4.18	2.03	0.70				
12.50	4.56	2.34	0.32				
12.75	4.73	2.48	0.18				
13.00	4.87	2.60	0.14				
13.25	4.98	2.70	0.12				
13.50	5.08	2.78	0.11				
13.75	5.18	2.86	0.10				
14.00	5.26	2.94	0.09				
14.25	5.34	3.00	0.09				
14.50	5.41	3.07	0.08				
14.75	5.48	3.12	0.08				
15.00	5.54	3.18	0.07				
15.25	5.60	3.23	0.07				
15.50	5.66	3.28	0.06				
15.75	5.71	3.32	0.05				
16.00	5.75	3.36	0.05				
16.25	5.79	3.40	0.05				
16.50	5.83	3.43	0.04				
16.75	5.87	3.46	0.04				
17.00	5.90	3.49	0.04				
17.25	5.94	3.52	0.04				
17.50	5.97	3.55	0.04				
17.75	6.00	3.58	0.03				
18.00	6.02	3.60	0.03				

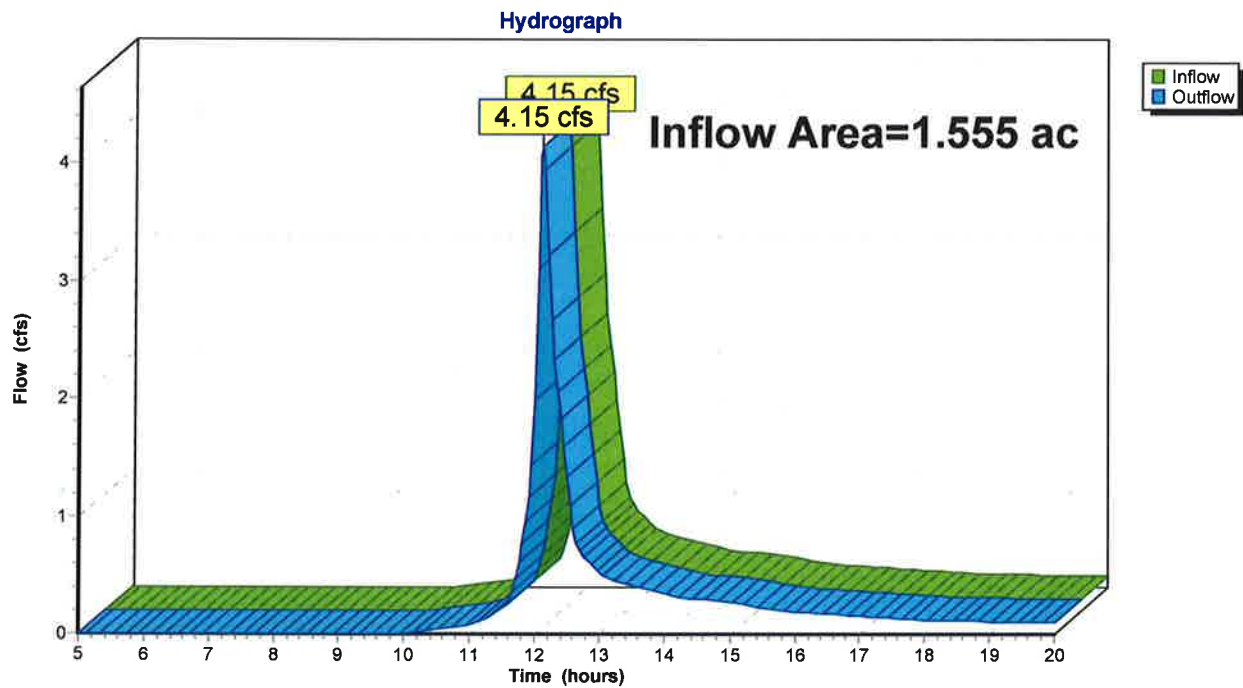
Summary for Reach 2R: PRE DEV DESIGN LINE 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.555 ac, 10.61% Impervious, Inflow Depth > 2.32" for 25-Year event
Inflow = 4.15 cfs @ 12.12 hrs, Volume= 0.301 af
Outflow = 4.15 cfs @ 12.12 hrs, Volume= 0.301 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 2R: PRE DEV DESIGN LINE 1



Hydrograph for Reach 2R: PRE DEV DESIGN LINE 1

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
5.00	0.00		0.00	18.25	0.11		0.11
5.25	0.00		0.00	18.50	0.11		0.11
5.50	0.00		0.00	18.75	0.11		0.11
5.75	0.00		0.00	19.00	0.11		0.11
6.00	0.00		0.00	19.25	0.10		0.10
6.25	0.00		0.00	19.50	0.10		0.10
6.50	0.00		0.00	19.75	0.10		0.10
6.75	0.00		0.00	20.00	0.10		0.10
7.00	0.00		0.00				
7.25	0.00		0.00				
7.50	0.00		0.00				
7.75	0.00		0.00				
8.00	0.00		0.00				
8.25	0.00		0.00				
8.50	0.00		0.00				
8.75	0.00		0.00				
9.00	0.00		0.00				
9.25	0.00		0.00				
9.50	0.00		0.00				
9.75	0.00		0.00				
10.00	0.00		0.00				
10.25	0.02		0.02				
10.50	0.04		0.04				
10.75	0.06		0.06				
11.00	0.09		0.09				
11.25	0.13		0.13				
11.50	0.21		0.21				
11.75	0.60		0.60				
12.00	1.99		1.99				
12.25	2.67		2.67				
12.50	1.34		1.34				
12.75	0.67		0.67				
13.00	0.53		0.53				
13.25	0.45		0.45				
13.50	0.41		0.41				
13.75	0.38		0.38				
14.00	0.34		0.34				
14.25	0.32		0.32				
14.50	0.30		0.30				
14.75	0.28		0.28				
15.00	0.26		0.26				
15.25	0.25		0.25				
15.50	0.23		0.23				
15.75	0.21		0.21				
16.00	0.19		0.19				
16.25	0.18		0.18				
16.50	0.17		0.17				
16.75	0.16		0.16				
17.00	0.15		0.15				
17.25	0.14		0.14				
17.50	0.14		0.14				
17.75	0.13		0.13				
18.00	0.12		0.12				

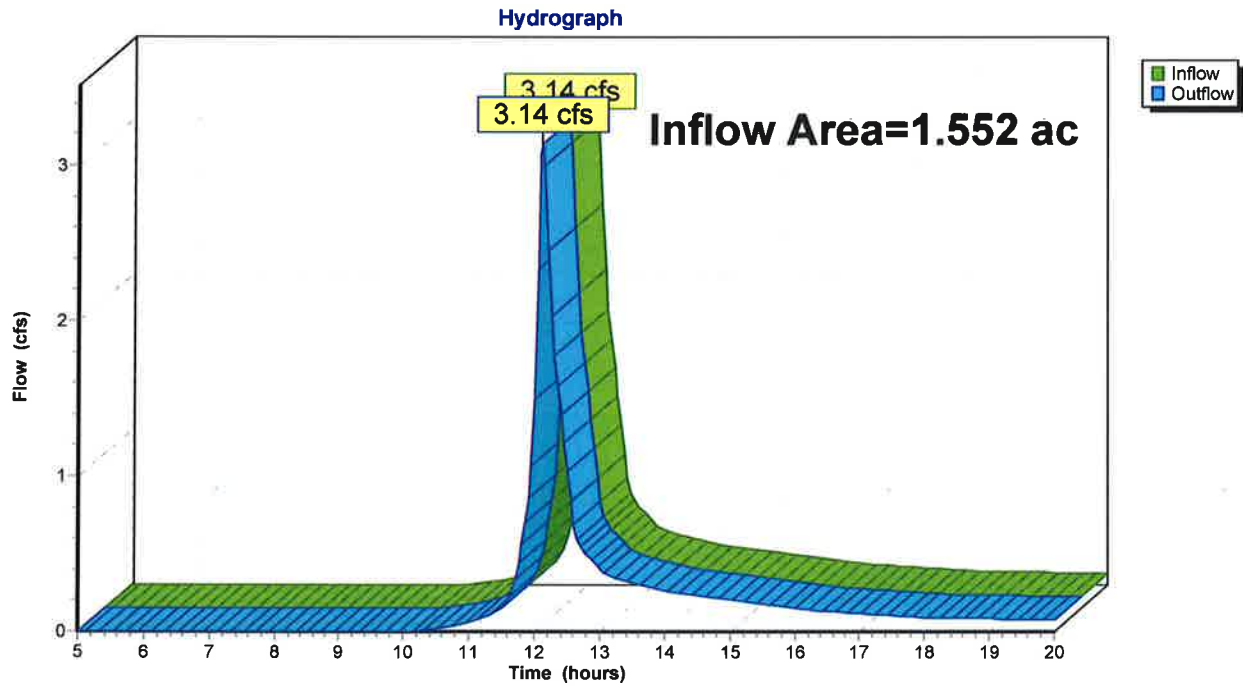
Summary for Reach 6R: POST DEV DESIGN LINE 1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.552 ac, 15.72% Impervious, Inflow Depth > 1.77" for 25-Year event
Inflow = 3.14 cfs @ 12.12 hrs, Volume= 0.229 af
Outflow = 3.14 cfs @ 12.12 hrs, Volume= 0.229 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 6R: POST DEV DESIGN LINE 1



Hydrograph for Reach 6R: POST DEV DESIGN LINE 1

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
5.00	0.00		0.00	18.25	0.09		0.09
5.25	0.00		0.00	18.50	0.09		0.09
5.50	0.00		0.00	18.75	0.08		0.08
5.75	0.00		0.00	19.00	0.08		0.08
6.00	0.00		0.00	19.25	0.08		0.08
6.25	0.00		0.00	19.50	0.08		0.08
6.50	0.00		0.00	19.75	0.08		0.08
6.75	0.00		0.00	20.00	0.07		0.07
7.00	0.00		0.00				
7.25	0.00		0.00				
7.50	0.00		0.00				
7.75	0.00		0.00				
8.00	0.00		0.00				
8.25	0.00		0.00				
8.50	0.00		0.00				
8.75	0.00		0.00				
9.00	0.00		0.00				
9.25	0.00		0.00				
9.50	0.00		0.00				
9.75	0.00		0.00				
10.00	0.00		0.00				
10.25	0.01		0.01				
10.50	0.02		0.02				
10.75	0.04		0.04				
11.00	0.06		0.06				
11.25	0.09		0.09				
11.50	0.15		0.15				
11.75	0.44		0.44				
12.00	1.49		1.49				
12.25	2.04		2.04				
12.50	1.03		1.03				
12.75	0.51		0.51				
13.00	0.41		0.41				
13.25	0.34		0.34				
13.50	0.32		0.32				
13.75	0.29		0.29				
14.00	0.26		0.26				
14.25	0.24		0.24				
14.50	0.23		0.23				
14.75	0.22		0.22				
15.00	0.20		0.20				
15.25	0.19		0.19				
15.50	0.18		0.18				
15.75	0.16		0.16				
16.00	0.15		0.15				
16.25	0.14		0.14				
16.50	0.13		0.13				
16.75	0.12		0.12				
17.00	0.12		0.12				
17.25	0.11		0.11				
17.50	0.10		0.10				
17.75	0.10		0.10				
18.00	0.09		0.09				

Summary for Pond 5P: DETENTION

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=75)

Inflow Area = 0.322 ac, 44.72% Impervious, Inflow Depth > 3.76" for 25-Year event
 Inflow = 1.51 cfs @ 12.08 hrs, Volume= 0.101 af
 Outflow = 1.32 cfs @ 12.05 hrs, Volume= 0.101 af, Atten= 13%, Lag= 0.0 min
 Discarded = 1.32 cfs @ 12.05 hrs, Volume= 0.101 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Reach 6R : POST DEV DESIGN LINE 1

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 504.65' @ 12.11 hrs Surf.Area= 0.002 ac Storage= 0.001 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.3 min (781.6 - 781.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	503.63'	0.001 af	8.25'W x 9.59'L x 2.00'H Field A 0.004 af Overall - 0.000 af Embedded = 0.003 af x 40.0% Voids
#2A	504.13'	0.000 af	ADS_StormTech SC-160LP +Cap x 3 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 3 Chambers in 3 Rows
		0.002 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 2	504.80'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	504.80'	4.0" Round Culvert L= 27.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 504.80' / 501.00' S= 0.1407 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#3	Discarded	503.63'	720.000 in/hr Exfiltration over Horizontal area

Discarded OutFlow Max=1.32 cfs @ 12.05 hrs HW=504.06' (Free Discharge)
 ↑ **3=Exfiltration** (Exfiltration Controls 1.32 cfs @ 0.02 fps)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=503.63' (Free Discharge)
 ↑ **2=Culvert** (Controls 0.00 cfs)
 ↑ **1=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: DETENTION - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-160LP+Cap (ADS StormTech®SC-160LP with cap length)

Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf

Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap

1 Chambers/Row x 7.12' Long +0.23' Cap Length x 2 = 7.59' Row Length +12.0" End Stone x 2 = 9.59' Base Length

3 Rows x 25.0" Wide + 12.0" Side Stone x 2 = 8.25' Base Width

6.0" Stone Base + 12.0" Chamber Height + 6.0" Stone Cover = 2.00' Field Height

3 Chambers x 6.8 cf = 20.5 cf Chamber Storage

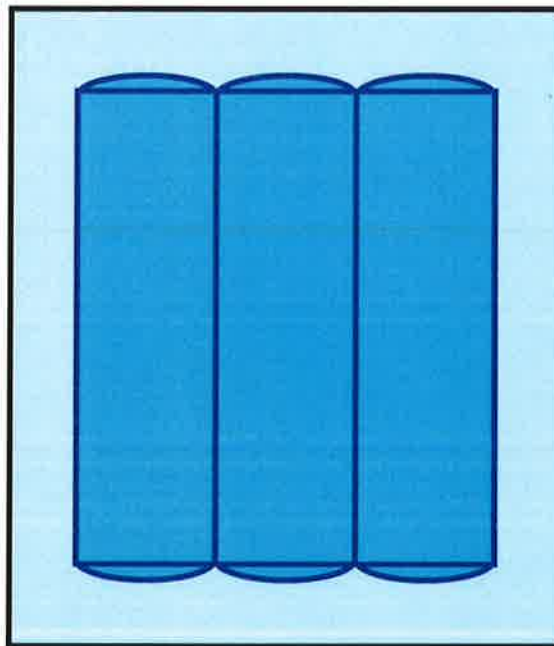
158.2 cf Field - 20.5 cf Chambers = 137.7 cf Stone x 40.0% Voids = 55.1 cf Stone Storage

Chamber Storage + Stone Storage = 75.6 cf = 0.002 af

Overall Storage Efficiency = 47.8%

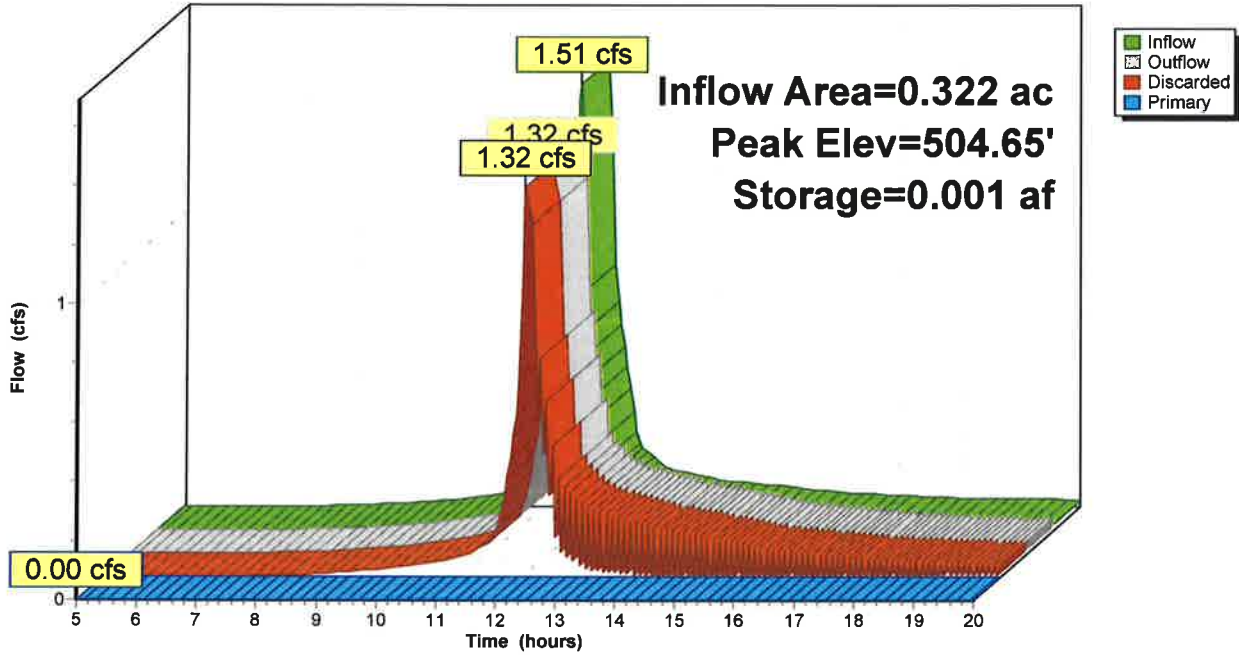
Overall System Size = 9.59' x 8.25' x 2.00'

- 3 Chambers
- 5.9 cy Field
- 5.1 cy Stone



Pond 5P: DETENTION

Hydrograph



Hydrograph for Pond 5P: DETENTION

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
5.00	0.00	0.000	503.63	0.00	0.00	0.00
5.50	0.00	0.000	503.63	0.00	0.00	0.00
6.00	0.00	0.000	503.63	0.00	0.00	0.00
6.50	0.00	0.000	503.63	0.00	0.00	0.00
7.00	0.00	0.000	503.63	0.00	0.00	0.00
7.50	0.00	0.000	503.63	0.00	0.00	0.00
8.00	0.01	0.000	503.63	0.01	0.01	0.00
8.50	0.01	0.000	503.63	0.01	0.01	0.00
9.00	0.02	0.000	503.63	0.02	0.02	0.00
9.50	0.02	0.000	503.63	0.02	0.02	0.00
10.00	0.03	0.000	503.63	0.03	0.03	0.00
10.50	0.05	0.000	503.63	0.05	0.05	0.00
11.00	0.07	0.000	503.63	0.07	0.07	0.00
11.50	0.13	0.000	503.63	0.13	0.13	0.00
12.00	1.01	0.000	503.65	1.01	1.01	0.00
12.50	0.32	0.000	503.64	0.45	0.45	0.00
13.00	0.14	0.000	503.63	0.25	0.25	0.00
13.50	0.11	0.000	503.63	0.21	0.21	0.00
14.00	0.09	0.000	503.63	0.18	0.18	0.00
14.50	0.08	0.000	503.63	0.16	0.16	0.00
15.00	0.07	0.000	503.63	0.14	0.14	0.00
15.50	0.06	0.000	503.63	0.12	0.12	0.00
16.00	0.05	0.000	503.63	0.10	0.10	0.00
16.50	0.04	0.000	503.63	0.09	0.09	0.00
17.00	0.04	0.000	503.63	0.08	0.08	0.00
17.50	0.04	0.000	503.63	0.07	0.07	0.00
18.00	0.03	0.000	503.63	0.06	0.06	0.00
18.50	0.03	0.000	503.63	0.06	0.06	0.00
19.00	0.03	0.000	503.63	0.05	0.05	0.00
19.50	0.03	0.000	503.63	0.05	0.05	0.00
20.00	0.02	0.000	503.63	0.04	0.04	0.00

Stage-Discharge for Pond 5P: DETENTION

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
503.63	0.00	0.00	0.00	504.69	1.32	1.32	0.00
503.65	1.32	1.32	0.00	504.71	1.32	1.32	0.00
503.67	1.32	1.32	0.00	504.73	1.32	1.32	0.00
503.69	1.32	1.32	0.00	504.75	1.32	1.32	0.00
503.71	1.32	1.32	0.00	504.77	1.32	1.32	0.00
503.73	1.32	1.32	0.00	504.79	1.32	1.32	0.00
503.75	1.32	1.32	0.00	504.81	1.32	1.32	0.00
503.77	1.32	1.32	0.00	504.83	1.32	1.32	0.00
503.79	1.32	1.32	0.00	504.85	1.32	1.32	0.01
503.81	1.32	1.32	0.00	504.87	1.33	1.32	0.01
503.83	1.32	1.32	0.00	504.89	1.34	1.32	0.02
503.85	1.32	1.32	0.00	504.91	1.34	1.32	0.03
503.87	1.32	1.32	0.00	504.93	1.35	1.32	0.03
503.89	1.32	1.32	0.00	504.95	1.36	1.32	0.04
503.91	1.32	1.32	0.00	504.97	1.37	1.32	0.06
503.93	1.32	1.32	0.00	504.99	1.39	1.32	0.07
503.95	1.32	1.32	0.00	505.01	1.40	1.32	0.08
503.97	1.32	1.32	0.00	505.03	1.41	1.32	0.09
503.99	1.32	1.32	0.00	505.05	1.42	1.32	0.11
504.01	1.32	1.32	0.00	505.07	1.44	1.32	0.12
504.03	1.32	1.32	0.00	505.09	1.45	1.32	0.13
504.05	1.32	1.32	0.00	505.11	1.46	1.32	0.14
504.07	1.32	1.32	0.00	505.13	1.47	1.32	0.15
504.09	1.32	1.32	0.00	505.15	1.48	1.32	0.16
504.11	1.32	1.32	0.00	505.17	1.49	1.32	0.17
504.13	1.32	1.32	0.00	505.19	1.49	1.32	0.18
504.15	1.32	1.32	0.00	505.21	1.50	1.32	0.18
504.17	1.32	1.32	0.00	505.23	1.51	1.32	0.19
504.19	1.32	1.32	0.00	505.25	1.52	1.32	0.20
504.21	1.32	1.32	0.00	505.27	1.52	1.32	0.20
504.23	1.32	1.32	0.00	505.29	1.53	1.32	0.21
504.25	1.32	1.32	0.00	505.31	1.54	1.32	0.22
504.27	1.32	1.32	0.00	505.33	1.54	1.32	0.22
504.29	1.32	1.32	0.00	505.35	1.55	1.32	0.23
504.31	1.32	1.32	0.00	505.37	1.55	1.32	0.24
504.33	1.32	1.32	0.00	505.39	1.56	1.32	0.24
504.35	1.32	1.32	0.00	505.41	1.57	1.32	0.25
504.37	1.32	1.32	0.00	505.43	1.57	1.32	0.25
504.39	1.32	1.32	0.00	505.45	1.58	1.32	0.26
504.41	1.32	1.32	0.00	505.47	1.58	1.32	0.26
504.43	1.32	1.32	0.00	505.49	1.59	1.32	0.27
504.45	1.32	1.32	0.00	505.51	1.59	1.32	0.27
504.47	1.32	1.32	0.00	505.53	1.60	1.32	0.28
504.49	1.32	1.32	0.00	505.55	1.60	1.32	0.28
504.51	1.32	1.32	0.00	505.57	1.61	1.32	0.29
504.53	1.32	1.32	0.00	505.59	1.61	1.32	0.29
504.55	1.32	1.32	0.00	505.61	1.62	1.32	0.30
504.57	1.32	1.32	0.00	505.63	1.62	1.32	0.30
504.59	1.32	1.32	0.00				
504.61	1.32	1.32	0.00				
504.63	1.32	1.32	0.00				
504.65	1.32	1.32	0.00				
504.67	1.32	1.32	0.00				

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- 51 Pond 5P: DETENTION

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- 56 Node Listing
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- 61 Subcat 4S: POST DEV DA-2
- 63 Reach 2R: PRE DEV DESIGN LINE 1
- 65 Reach 6R: POST DEV DESIGN LINE 1
- 67 Pond 5P: DETENTION

APPENDIX F

Hydraulic Storm Sewer Capacity Analysis

Channel Report

10 inch Pipe 25 year Storm

Circular

Diameter (ft) = 0.83

Invert Elev (ft) = 505.04

Slope (%) = 0.50

N-Value = 0.012

Calculations

Compute by: Known Q

Known Q (cfs) = 1.62

Highlighted

Depth (ft) = 0.67

Q (cfs) = 1.620

Area (sqft) = 0.47

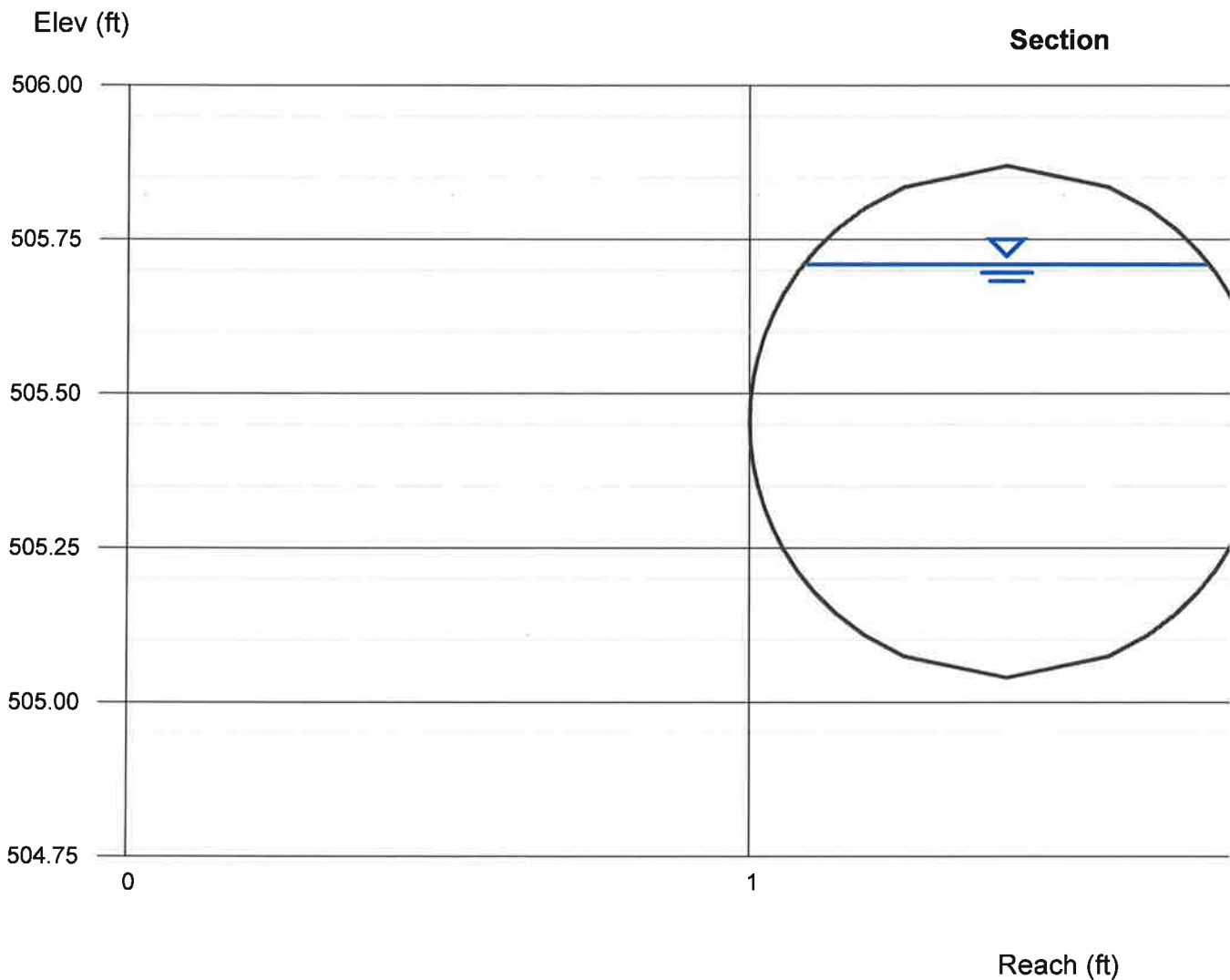
Velocity (ft/s) = 3.46

Wetted Perim (ft) = 1.86

Crit Depth, Y_c (ft) = 0.58

Top Width (ft) = 0.65

EGL (ft) = 0.86



APPENDIX G

Stormwater Management Practices Design:

Stormtech SC-160 Chamber Sizing

User Inputs

Chamber Model:	SC-160LP
Outlet Control Structure:	Yes
Project Name:	Eisenberg 12-9-21
Engineer:	Thomas Kerrigan
Project Location:	New York
Measurement Type:	Imperial
Required Storage Volume:	320 cubic ft.
Stone Porosity:	40%
Stone Foundation Depth:	6 in.
Stone Above Chambers:	6 in.
Average Cover Over Chambers:	14 in.
Design Constraint Dimensions:	(11 ft. x 31 ft.)

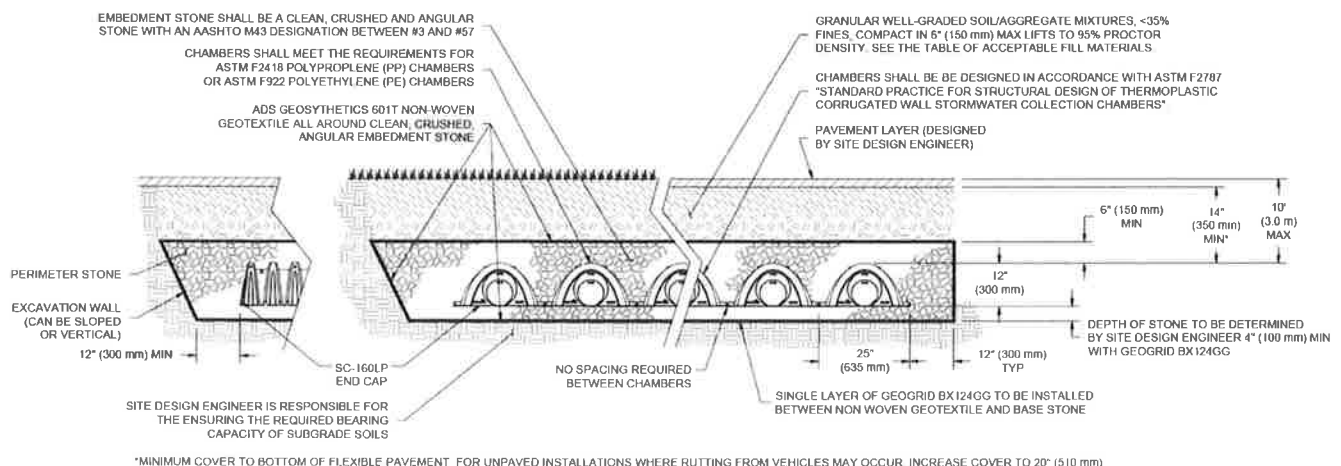
Results

System Volume and Bed Size

Installed Storage Volume:	341.28 cubic ft.
Storage Volume Per Chamber:	6.85 cubic ft.
Number Of Chambers Required:	16
Number Of End Caps Required:	8
Chamber Rows:	4
Maximum Length:	34.39 ft.
Maximum Width:	10.33 ft.
Approx. Bed Size Required:	344.39 square ft.

System Components

Amount Of Stone Required:	21.45 cubic yards
Volume Of Excavation (Not Including Fill):	25.51 cubic yards
Non-woven Geotextile Required (excluding Isolator Row):	115.69 square yards
Non-woven Geotextile Required (Isolator Row):	0 square yards
Total Non-woven Geotextile Required:	115.69 square yards
Woven Geotextile Required (excluding Isolator Row):	5 square yards
Woven Geotextile Required (Isolator Row):	15.43 square yards
Total Woven Geotextile Required:	20.43 square yards



APPENDIX H

**Standard and Specifications for
Erosion and Sediment Control Measures**

STANDARD AND SPECIFICATIONS FOR CONSTRUCTION ROAD STABILIZATION



Definition & Scope

The stabilization of temporary construction access routes, on-site vehicle transportation routes, and construction parking areas to control erosion on temporary construction routes and parking areas.

Conditions Where Practice Applies

All traffic routes and parking areas for temporary use by construction traffic.

Design Criteria

Construction roads should be located to reduce erosion potential, minimize impact on existing site resources, and maintain operations in a safe manner. Highly erosive soils, wet or rocky areas, and steep slopes should be avoided. Roads should be routed where seasonal water tables are deeper than 18 inches. Surface runoff and control should be in accordance with other standards.

Road Grade – A maximum grade of 12% is recommended, although grades up to 15% are possible for short distances.

Road Width – 12 foot minimum for one-way traffic or 24 foot minimum for two-way traffic.

Side Slope of Road Embankment – 2:1 or flatter.

Ditch Capacity – On-site roadside ditch and culvert capacities shall be the 10 yr. peak runoff.

Composition – Use a 6-inch layer of NYS DOT sub-base Types 1,2,3, 4 or equivalent as specified in NYSDOT Standard Specifications.

Construction Specifications

1. Clear and strip roadbed and parking areas of all vegetation, roots, and other objectionable material.
2. Locate parking areas on naturally flat areas as available. Keep grades sufficient for drainage, but not more than 2 to 3 percent.
3. Provide surface drainage and divert excess runoff to stabilized areas.
4. Maintain cut and fill slopes to 2:1 or flatter and stabilized with vegetation as soon as grading is accomplished.
5. Spread 6-inch layer of sub-base material evenly over the full width of the road and smooth to avoid depressions.
6. Provide appropriate sediment control measures to prevent offsite sedimentation.

Maintenance

Inspect construction roads and parking areas periodically for condition of surface. Top dress with new gravel as needed. Check ditches for erosion and sedimentation after rainfall events. Maintain vegetation in a healthy, vigorous condition. Areas producing sediment should be treated immediately.

STANDARD AND SPECIFICATIONS FOR DUST CONTROL



Definition & Scope

The control of dust resulting from land-disturbing activities, to prevent surface and air movement of dust from disturbed soil surfaces that may cause off-site damage, health hazards, and traffic safety problems.

Conditions Where Practice Applies

On construction roads, access points, and other disturbed areas subject to surface dust movement and dust blowing where off-site damage may occur if dust is not controlled.

Design Criteria

Construction operations should be scheduled to minimize the amount of area disturbed at one time. Buffer areas of vegetation should be left where practical. Temporary or permanent stabilization measures shall be installed. No specific design criteria is given; see construction specifications below for common methods of dust control.

Water quality must be considered when materials are selected for dust control. Where there is a potential for the material to wash off to a stream, ingredient information must be provided to the NYSDEC.

No polymer application shall take place without written approval from the NYSDEC.

Construction Specifications

A. **Non-driving Areas** – These areas use products and materials applied or placed on soil surfaces to prevent airborne migration of soil particles.

Vegetative Cover – For disturbed areas not subject to traffic, vegetation provides the most practical method of

dust control (see Section 3).

Mulch (including gravel mulch) – Mulch offers a fast effective means of controlling dust. This can also include rolled erosion control blankets.

Spray adhesives – These are products generally composed of polymers in a liquid or solid form that are mixed with water to form an emulsion that is sprayed on the soil surface with typical hydroseeding equipment. The mixing ratios and application rates will be in accordance with the manufacturer's recommendations for the specific soils on the site. In no case should the application of these adhesives be made on wet soils or if there is a probability of precipitation within 48 hours of its proposed use. Material Safety Data Sheets will be provided to all applicators and others working with the material.

B. **Driving Areas** – These areas utilize water, polymer emulsions, and barriers to prevent dust movement from the traffic surface into the air.

Sprinkling – The site may be sprayed with water until the surface is wet. This is especially effective on haul roads and access route to provide short term limited dust control.

Polymer Additives – These polymers are mixed with water and applied to the driving surface by a water truck with a gravity feed drip bar, spray bar or automated distributor truck. The mixing ratios and application rates will be in accordance with the manufacturer's recommendations. Incorporation of the emulsion into the soil will be done to the appropriate depth based on expected traffic. Compaction after incorporation will be by vibratory roller to a minimum of 95%. The prepared surface shall be moist and no application of the polymer will be made if there is a probability of precipitation within 48 hours of its proposed use. Material Safety Data Sheets will be provided to all applicators working with the material.

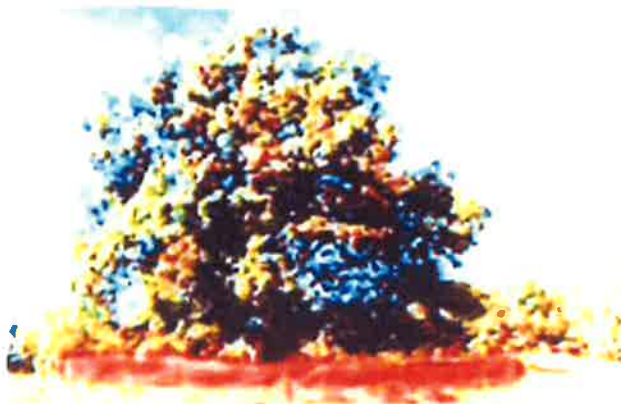
Barriers – Woven geo-textiles can be placed on the driving surface to effectively reduce dust throw and particle migration on haul roads. Stone can also be used for construction roads for effective dust control.

Windbreak – A silt fence or similar barrier can control air currents at intervals equal to ten times the barrier height. Preserve existing wind barrier vegetation as much as practical.

Maintenance

Maintain dust control measures through dry weather periods until all disturbed areas are stabilized.

STANDARD AND SPECIFICATIONS FOR PROTECTING VEGETATION DURING CONSTRUCTION



Definition & Scope

The protection of trees, shrubs, ground cover and other vegetation from damage by construction equipment. In order to preserve existing vegetation determined to be important for soil erosion control, water quality protection, shade, screening, buffers, wildlife habitat, wetland protection, and other values.

Conditions Where Practices Applies

On planned construction sites where valued vegetation exists and needs to be preserved.

Design Criteria

1. Planning Considerations

A. Inventory:

1) Property boundaries, topography, vegetation and soils information should be gathered. Identify potentially high erosion areas, areas with tree windthrow potential, etc. A vegetative cover type map should be made on a copy of a topographic map which shows other natural and manmade features. Vegetation that is desirable to preserve because of its value for screening, shade, critical erosion control, endangered species, aesthetics, etc., should be identified and marked on the map.

2) Based upon this data, general statements should be prepared about the present condition, potential problem areas, and unique features of the property.

B. Planning:

1) After engineering plans (plot maps) are prepared, another field review should take place and

recommendations made for the vegetation to be saved. Minor adjustments in location of roads, dwellings, and utilities may be needed. Construction on steep slopes, erodible soils, wetlands, and streams should be avoided. Clearing limits should be delineated (See "Determine Limits of Clearing and Grading" on page 2.2).

2) Areas to be seeded and planted should be identified. Remaining vegetation should blend with their surroundings and/or provide special function such as a filter strip, buffer zone, or screen.

3) Trees and shrubs of special seasonal interest, such as flowering dogwood, red maple, striped maple, serviceberry, or shadbush, and valuable potential shade trees should be identified and marked for special protective treatment as appropriate.

4) Trees to be cut should be marked on the plans. If timber can be removed for salable products, a forester should be consulted for marketing advice.

5) Trees that may become a hazard to people, personal property, or utilities should be removed. These include trees that are weak-wooded, disease-prone, subject to windthrow, or those that have severely damaged root systems.

6) The vigor of remaining trees may be improved by a selective thinning. A forester should be consulted for implementing this practice.

2. Measures to Protect Vegetation

A. Limit soil placement over existing tree and shrub roots to a maximum of 3 inches. Soils with loamy texture and good structure should be used.

B. Use retaining walls and terraces to protect roots of trees and shrubs when grades are lowered. Lowered grades should start no closer than the dripline of the tree. For narrow-canopied trees and shrubs, the stem diameter in inches is converted to feet and doubled, such that a 10 inch tree should be protected to 20 feet.

C. Trenching across tree root systems should be the same minimum distance from the trunk, as in "B". Tunnels under root systems for underground utilities should start 18 inches or deeper below the normal ground surface. Tree roots which must be severed should be cut clean. Backfill material that will be in contact with the roots should be topsoil or a prepared planting soil mixture.

D. Construct sturdy fences, or barriers, of wood, steel, or other protective material around valuable

vegetation for protection from construction equipment. Place barriers far enough away from trees, but not less than the specifications in "B", so that tall equipment such as backhoes and dump trucks do not contact tree branches.

E. Construction limits should be identified and clearly marked to exclude equipment.

F. Avoid spills of oil/gas and other contaminants.

G. Obstructive and broken branches should be pruned properly. The branch collar on all branches whether living or dead should not be damaged. The 3 or 4 cut method should be used on all branches larger than two inches at the cut. First cut about one-third the way through the underside of the limb (about 6-12 inches from the tree trunk). Then (approximately an inch further out) make a second cut through the limb from the upper side. When the branch is removed, there is no splintering of the main tree trunk. Remove the stub. If the branch is larger than 5-6 inches in diameter, use the four cut system. Cuts 1 and 2 remain the same and cut 3 should be from the underside of the limb, on the outside of the branch collar. Cut 4 should be from the top and in alignment with the 3rd cut. Cut 3 should be 1/4 to 1/3 the way through the limb. This will prevent the bark from peeling down the trunk. Do not paint the cut surface.

H. Penalties for damage to valuable trees, shrubs, and herbaceous plants should be clearly spelled out in the contract.

PROTECTING TREES IN HEAVY USE AREAS

The compaction of soil over the roots of trees and shrubs by the trampling of recreationists, vehicular traffic, etc., reduces oxygen, water, and nutrient uptake by feeder roots. This weakens and may eventually kill the plants. Table 2.6 rates the "Susceptibility of Tree Species to Compaction."

Where heavy compaction is anticipated, apply and maintain a 3 to 4 inch layer of undecayed wood chips or 2 inches of No. 2 washed, crushed gravel. In addition, use of a wooden or plastic mat may be used to lessen compaction, if applicable.

Table 2.6
Susceptibility of Tree Species to Compaction¹

Resistant:

Box elder.....	<i>Acer negundo</i>	Willows.....	<i>Salix spp.</i>
Green ash.....	<i>Fraxinus pennsylvanica</i>	Honey locust.....	<i>Gleditsia triacanthos</i>
Red elm.....	<i>Ulmus rubra</i>	Eastern cottonwood.....	<i>Populus deltoides</i>
Hawthornes.....	<i>Crataegus spp.</i>	Swamp white oak.....	<i>Quercus bicolor</i>
Bur oak.....	<i>Quercus macrocarpa</i>	Hophornbeam.....	<i>Ostrya virginiana</i>
Northern white cedar....	<i>Thuja occidentalis</i>		

Intermediate:

Red maple.....	<i>Acer rubrum</i>	Sweetgum.....	<i>Liquidambar styraciflua</i>
Silver maple.....	<i>Acer saccharinum</i>	Norway maple.....	<i>Acer platanoides</i>
Hackberry.....	<i>Celtis occidentalis</i>	Shagbark hickory.....	<i>Carya ovata</i>
Black gum.....	<i>Nyssa sylvatica</i>	London plane.....	<i>Platanus x hybrida</i>
Red oak.....	<i>Quercus rubra</i>	Pin oak.....	<i>Quercus palustris</i>
Basswood.....	<i>Tilia americana</i>		

Susceptible:

Sugar maple.....	<i>Acer saccharum</i>	Austrian Pine.....	<i>Pinus nigra</i>
White pine.....	<i>Pinus strobus</i>	White ash.....	<i>Fraxinus americana</i>
Blue spruce.....	<i>Picea pungens</i>	Paper birch.....	<i>Betula papyrifera</i>
White oak.....	<i>Quercus alba</i>	Mountain ash.....	<i>Sorbus aucuparia</i>
Red pine.....	<i>Pinus resinosa</i>	Japanese maple.....	<i>Acer palmatum</i>

¹ If a tree species does not appear on the list, insufficient information is available to rate it for this purpose.

STANDARD AND SPECIFICATIONS FOR STABILIZED CONSTRUCTION ACCESS



Definition & Scope

A stabilized pad of aggregate underlain with geotextile located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk, or parking area. The purpose of stabilized construction access is to reduce or eliminate the tracking of sediment onto public rights-of-way or streets.

Conditions Where Practice Applies

A stabilized construction access shall be used at all points of construction ingress and egress.

Design Criteria

See Figure 2.1 on page 2.31 for details.

Aggregate Size: Use a matrix of 1-4 inch stone, or reclaimed or recycled concrete equivalent.

Thickness: Not less than six (6) inches.

Width: 12-foot minimum but not less than the full width of points where ingress or egress occurs. 24-foot minimum if there is only one access to the site.

Length: As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum would apply).

Geotextile: To be placed over the entire area to be covered with aggregate. Filter cloth will not be required on a single-family residence lot. Piping of surface water under entrance shall be provided as required. If piping is impossible, a mountable berm with 5:1 slopes will be permitted.

Criteria for Geotextile: The geotextile shall be woven or nonwoven fabric consisting only of continuous chain polymeric filaments or yarns of polyester. The fabric shall be

inert to commonly encountered chemicals, hydro-carbons, mildew, rot resistant, and conform to the fabric properties as shown:

Fabric Properties ³	Light Duty ¹ Roads Grade Sub- grade	Heavy Duty ¹ Haul Roads Rough Graded	Test Meth- od
Grab Tensile Strength (lbs)	200	220	ASTM D1682
Elongation at Failure (%)	50	60	ASTM D1682
Mullen Burst Strength (lbs)	190	430	ASTM D3786
Puncture Strength (lbs)	40	125	ASTM D751 Modified
Equivalent	40-80	40-80	US Std Sieve
Opening Size			CW-02215
Aggregate Depth	6	10	

¹Light Duty Road: Area sites that have been graded to subgrade and where most travel would be single axle vehicles and an occasional multi-axle truck. Acceptable materials are Trevira Spunbond 1115, Mirafi 100X, Typar 3401, or equivalent.

²Heavy Duty Road: Area sites with only rough grading, and where most travel would be multi-axle vehicles. Acceptable materials are Trevira Spunbond 1135, Mirafi 600X, or equivalent.

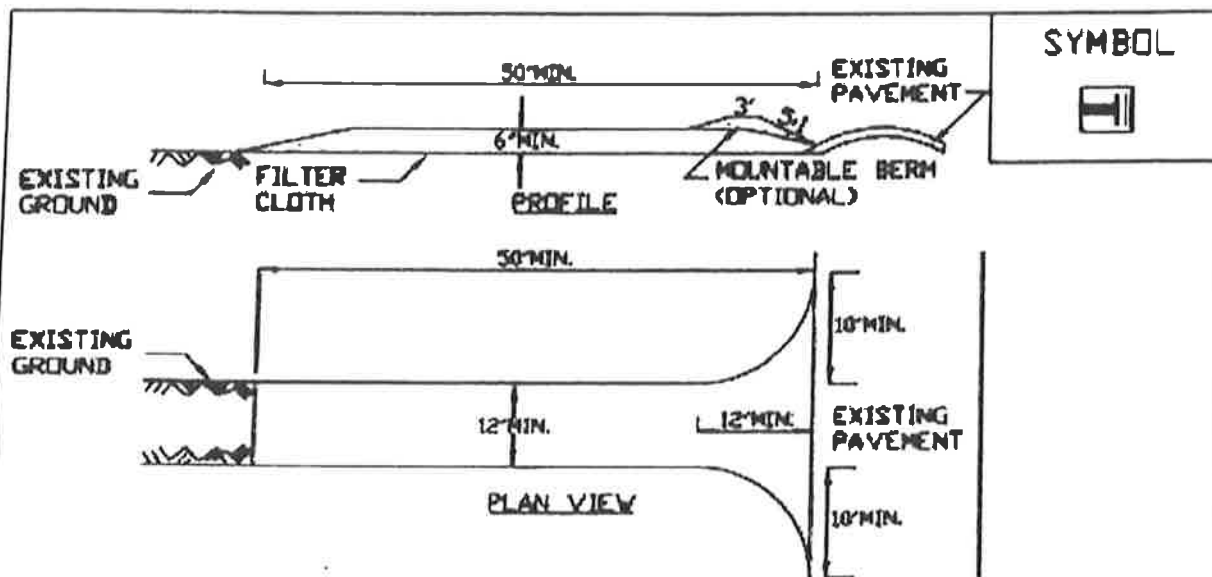
³Fabrics not meeting these specifications may be used only when design procedure and supporting documentation are supplied to determine aggregate depth and fabric strength.

Maintenance

The access shall be maintained in a condition which will prevent tracking of sediment onto public rights-of-way or streets. This may require periodic top dressing with additional aggregate. All sediment spilled, dropped, or washed onto public rights-of-way must be removed immediately.

When necessary, wheels must 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 aggregate, which drains into an approved sediment-trapping device. All sediment shall be prevented from entering storm drains, ditches, or watercourses.

**Figure 2.1
Stabilized Construction Access**



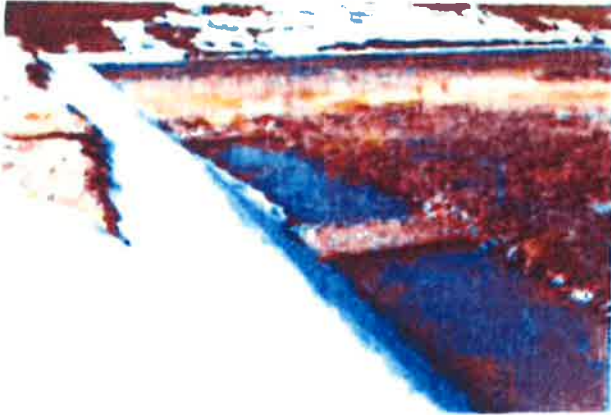
CONSTRUCTION SPECIFICATIONS

1. STONE SIZE - USE 1-4 INCH STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ACCESS SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 3:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

**STABILIZED
CONSTRUCTION
ACCESS**

STANDARD AND SPECIFICATIONS FOR WINTER STABILIZATION



Definition & Scope

A temporary site specific, enhanced erosion and sediment control plan to manage runoff and sediment at the site during construction activities in the winter months to protect off-site water resources.

Conditions Where Practice Applies

This standard applies to all construction activities involved with ongoing land disturbance and exposure between November 15th to the following April 1st.

Design Criteria

1. Prepare a snow management plan with adequate storage for snow and control of melt water, requiring cleared snow to be stored in a manner not affecting ongoing construction activities.
2. Enlarge and stabilize access points to provide for snow management and stockpiling. Snow management activities must not destroy or degrade installed erosion and sediment control practices.
3. A minimum 25 foot buffer shall be maintained from all perimeter controls such as silt fence. Mark silt fence with tall stakes that are visible above the snow pack.
4. Edges of disturbed areas that drain to a waterbody within 100 feet will have 2 rows of silt fence, 5 feet apart, installed on the contour.
5. Drainage structures must be kept open and free of snow and ice dams. All debris, ice dams, or debris from plowing operations, that restrict the flow of runoff and meltwater, shall be removed.
6. Sediment barriers must be installed at all appropriate

perimeter and sensitive locations. Silt fence and other practices requiring earth disturbance must be installed before the ground freezes.

7. Soil stockpiles must be protected by the use of established vegetation, anchored straw mulch, rolled stabilization matting, or other durable covering. A barrier must be installed at least 15 feet from the toe of the stockpile to prevent soil migration and to capture loose soil.
8. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures should be initiated by the end of the next business day and completed within three (3) days. Rolled erosion control blankets must be used on all slopes 3 horizontal to 1 vertical or steeper.
9. If straw mulch alone is used for temporary stabilization, it shall be applied at double the standard rate of 2 tons per acre, making the application rate 4 tons per acre. Other manufactured mulches should be applied at double the manufacturer's recommended rate.
10. To ensure adequate stabilization of disturbed soil in advance of a melt event, areas of disturbed soil should be stabilized at the end of each work day unless:
 - a. work will resume within 24 hours in the same area and no precipitation is forecast or;
 - b. the work is in disturbed areas that collect and retain runoff, such as open utility trenches, foundation excavations, or water management areas.
11. Use stone paths to stabilize access perimeters of buildings under construction and areas where construction vehicle traffic is anticipated. Stone paths should be a minimum 10 feet in width but wider as necessary to accommodate equipment.

Maintenance

The site shall be inspected frequently to ensure that the erosion and sediment control plan is performing its winter stabilization function. If the site will not have earth disturbing activities ongoing during the "winter season", all bare exposed soil must be stabilized by established vegetation, straw or other acceptable mulch, matting, rock, or other approved material such as rolled erosion control products. Seeding of areas with mulch cover is preferred but seeding alone is not acceptable for proper stabilization.

Compliance inspections must be performed and reports filed properly in accordance with the SWPPP for all sites under a winter shutdown.

References

1. **Northeastern Illinois Soil and Sedimentation Control Steering Committee.** October 1981. Procedures and Standards for Urban Soil Erosion and Sediment Control in Illinois.
2. **J.F. Rushing, V.M. Moore, J.S. Tingle, Q. Mason, and T. McCaffery,** 2005. **Dust Abatement Methods for Lines of Communication and Base Camps in Temperate Climates.** ERDC/GSL TR-05-23, October 2005.

STANDARD AND SPECIFICATIONS FOR ROCK OUTLET PROTECTION



Definition & Scope

A permanent section of rock protection placed at the outlet end of the culverts, conduits, or channels to reduce the depth, velocity, and energy of water, such that the flow will not erode the receiving downstream reach.

Conditions Where Practice Applies

This practice applies where discharge velocities and energies at the outlets of culverts, conduits, or channels are sufficient to erode the next downstream reach. This applies to:

1. Culvert outlets of all types.
2. Pipe conduits from all sediment basins, dry storm water ponds, and permanent type ponds.
3. New channels constructed as outlets for culverts and conduits.

Design Criteria

The design of rock outlet protection depends entirely on the location. Pipe outlet at the top of cuts or on slopes steeper than 10 percent, cannot be protected by rock aprons or riprap sections due to re-concentration of flows and high velocities encountered after the flow leaves the apron.

Many counties and state agencies have regulations and design procedures already established for dimensions, type and size of materials, and locations where outlet protection is required. Where these requirements exist, they shall be followed.

Tailwater Depth

The depth of tailwater immediately below the pipe outlet

must be determined for the design capacity of the pipe. If the tailwater depth is less than half the diameter of the outlet pipe, and the receiving stream is wide enough to accept divergence of the flow, it shall be classified as a Minimum Tailwater Condition; see Figure 3.16 on page 3.42 as an example. If the tailwater depth is greater than half the pipe diameter and the receiving stream will continue to confine the flow, it shall be classified as a Maximum Tailwater Condition; see Figure 3.17 on page 3.43 as an example. Pipes which outlet onto flat areas with no defined channel may be assumed to have a Minimum Tailwater Condition; see Figure 3.16 on page 3.42 as an example.

Apron Size

The apron length and width shall be determined from the curves according to the tailwater conditions:

Minimum Tailwater – Use Figure 3.16 on page 3.42

Maximum Tailwater – Use Figure 3.17 on page 3.43

If the pipe discharges directly into a well defined channel, the apron shall extend across the channel bottom and up the channel banks to an elevation one foot above the maximum tailwater depth or to the top of the bank, whichever is less.

The upstream end of the apron, adjacent to the pipe, shall have a width two (2) times the diameter of the outlet pipe, or conform to pipe end section if used.

Bottom Grade

The outlet protection apron shall be constructed with no slope along its length. There shall be no overfall at the end of the apron. The elevation of the downstream end of the apron shall be equal to the elevation of the receiving channel or adjacent ground.

Alignment

The outlet protection apron shall be located so that there are no bends in the horizontal alignment.

Materials

The outlet protection may be done using rock riprap, grouted riprap, or gabions. Outlets constructed on the bank of a stream or wetland shall not use grouted rip-rap, gabions or concrete.

Riprap shall be composed of a well-graded mixture of rock size so that 50 percent of the pieces, by weight, shall be larger than the d_{50} size determined by using the charts. A

well-graded mixture, as used herein, is defined as a mixture composed primarily of larger rock sizes, but with a sufficient mixture of other sizes to fill the smaller voids between the rocks. The diameter of the largest rock size in such a mixture shall be 1.5 times the d_{50} size.

Thickness

The minimum thickness of the riprap layer shall be 1.5 times the maximum rock diameter for d_{50} of 15 inches or less; and 1.2 times the maximum rock size for d_{50} greater than 15 inches. The following chart lists some examples:

D_{50} (inches)	d_{max} (inches)	Minimum Blanket Thick- ness (inches)
4	6	9
6	9	14
9	14	20
12	18	27
15	22	32
18	27	32
21	32	38
24	36	43

Rock Quality

Rock for riprap shall consist of field rock or rough unhewn quarry rock. The rock shall be hard and angular and of a quality that will not disintegrate on exposure to water or weathering. The specific gravity of the individual rocks shall be at least 2.5.

Filter

A filter is a layer of material placed between the riprap and the underlying soil surface to prevent soil movement into and through the riprap. Riprap shall have a filter placed under it in all cases.

A filter can be of two general forms: a gravel layer or a plastic filter cloth. The plastic filter cloth can be woven or non-woven monofilament yarns, and shall meet these base requirements: thickness 20-60 mils, grab strength 90-120 lbs; and shall conform to ASTM D-1777 and ASTM D-1682.

Gravel filter blanket, when used, shall be designed by comparing particle sizes of the overlying material and the base material. Design criteria are available in Standard and Specification for Anchored Slope and Channel Stabilization on page 4.7.

Gabions

Gabions shall be made of hexagonal triple twist mesh with heavily galvanized steel wire. The maximum linear dimension of the mesh opening shall not exceed 4 ½ inches and the area of the mesh opening shall not exceed 10 square inches.

Gabions shall be fabricated in such a manner that the sides, ends, and lid can be assembled at the construction site into a rectangular basket of the specified sizes. Gabions shall be of single unit construction and shall be installed according to manufacturer's recommendations.

The area on which the gabion is to be installed shall be graded as shown on the drawings. Foundation conditions shall be the same as for placing rock riprap, and filter cloth shall be placed under all gabions. Where necessary, key, or tie, the structure into the bank to prevent undermining of the main gabion structure.

Maintenance

Once a riprap outlet has been installed, the maintenance needs are very low. It should be inspected after high flows for evidence of scour beneath the riprap or for dislodged rocks. Repairs should be made immediately.

Design Procedure

1. Investigate the downstream channel to assure that nonerosive velocities can be maintained.
2. Determine the tailwater condition at the outlet to establish which curve to use.
3. Use the appropriate chart with the design discharge to determine the riprap size and apron length required. It is noted that references to pipe diameters in the charts are based on full flow. For other than full pipe flow, the parameters of depth of flow and velocity must be used to adjust the design discharges.
4. Calculate apron width at the downstream end if a flare section is to be employed.

Design Examples are demonstrated in Appendix B.

Construction Specifications

1. The subgrade for the filter, riprap, or gabion shall be prepared to the required lines and grades. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.
2. The rock or gravel shall conform to the specified grad-

ing limits when installed respectively in the riprap or filter.

3. Filter cloth shall be protected from punching, cutting, or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of cloth over the damaged part or by completely replacing the cloth. All overlaps, whether for repairs or for joining two pieces of cloth shall be a minimum of one foot.
4. Rock for the riprap or gabion outlets may be placed by equipment. Both shall each be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. The rock for riprap or gabion outlets shall be delivered and placed in a manner that will ensure that it is reasonably homogenous with the smaller rocks and spalls filling the voids between the larger rocks. Riprap shall be placed in a manner to prevent damage to the filter blanket or filter cloth. Hand placement will be required to the extent necessary to prevent damage to the permanent works.

Figure 3.16
Outlet Protection Design—Minimum Tailwater Condition Chart
(Design of Outlet Protection from a Round Pipe Flowing Full,
Minimum Tailwater Condition: $T_w < 0.5D_o$) (USDA - NRCS)

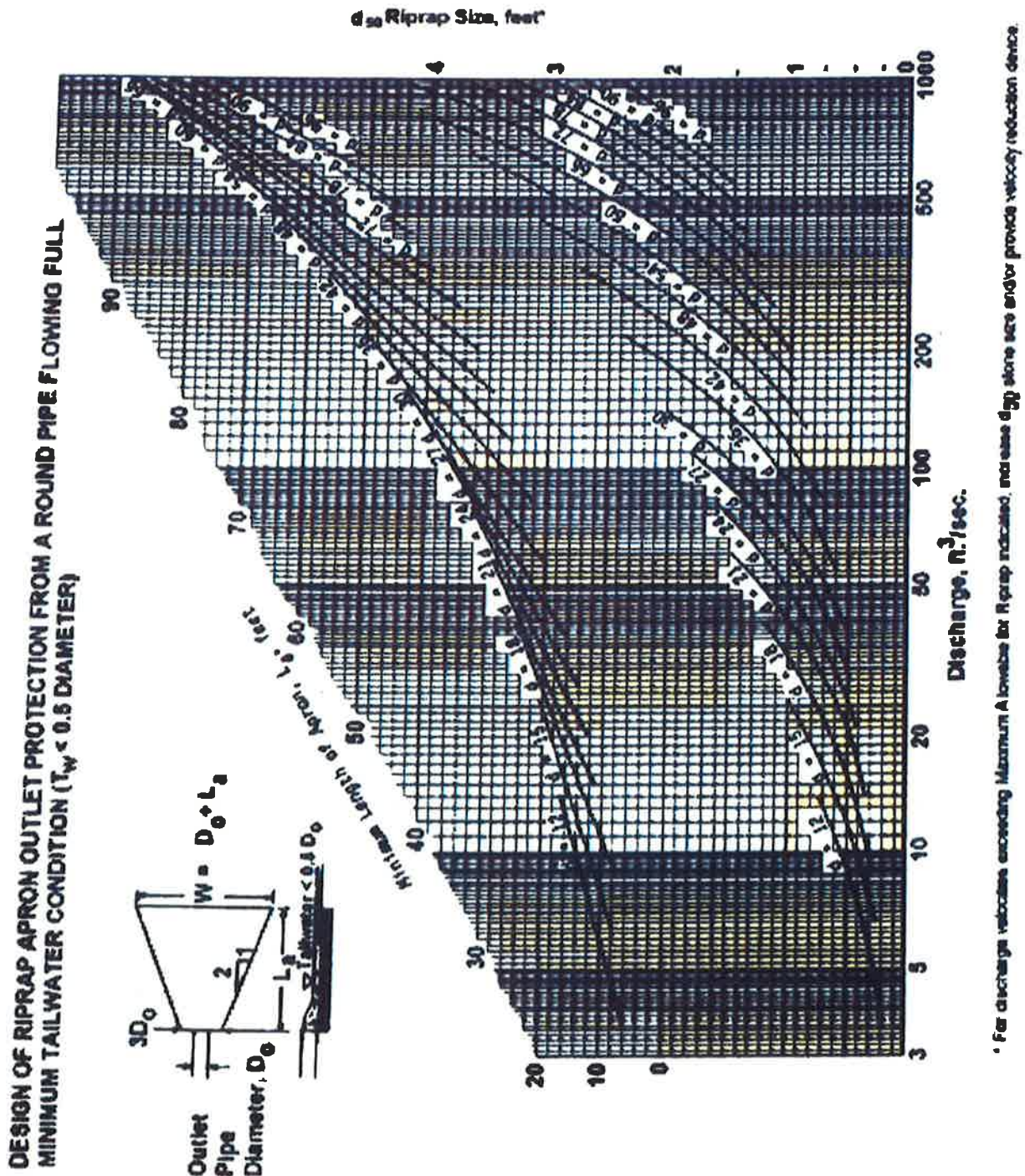
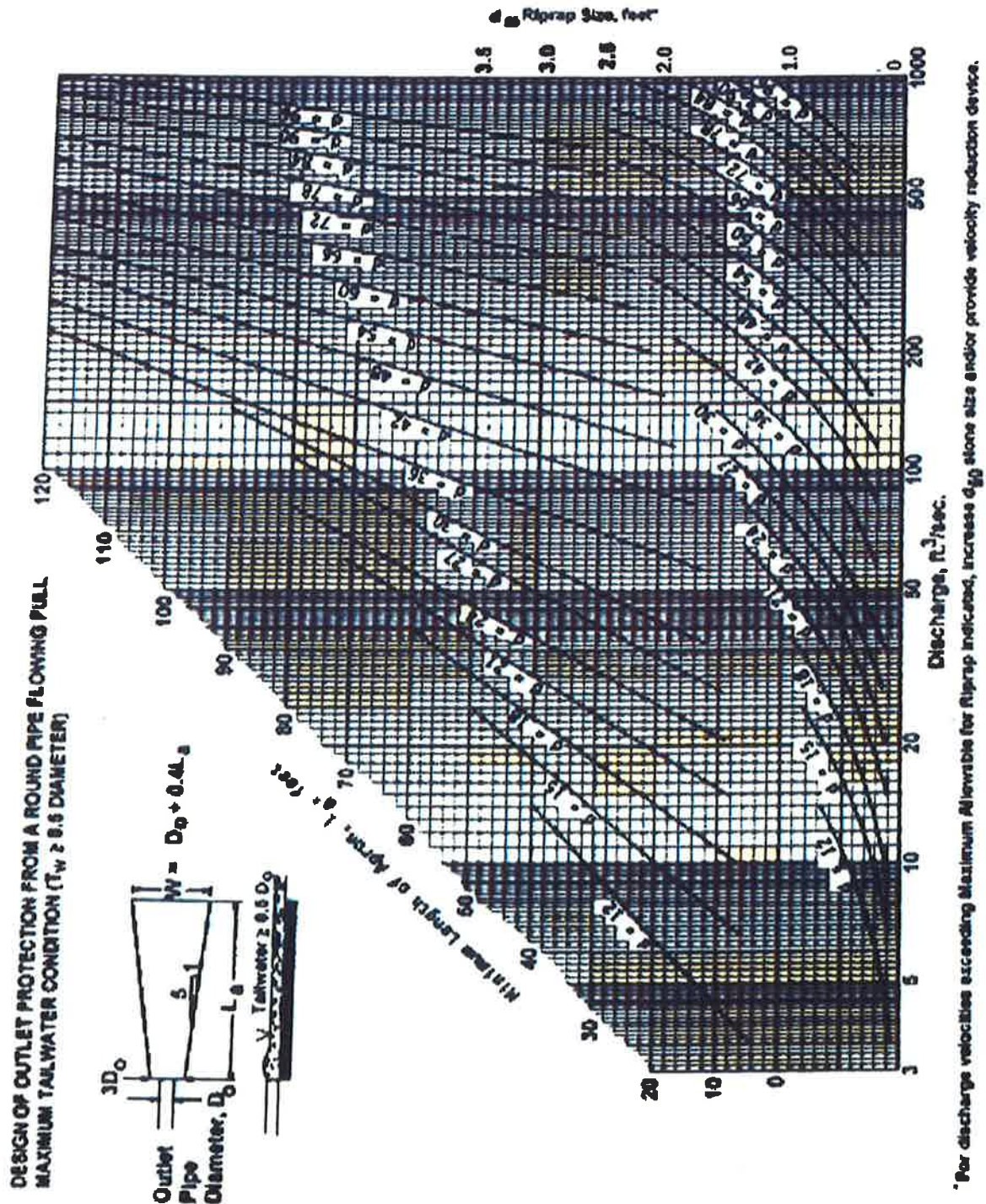
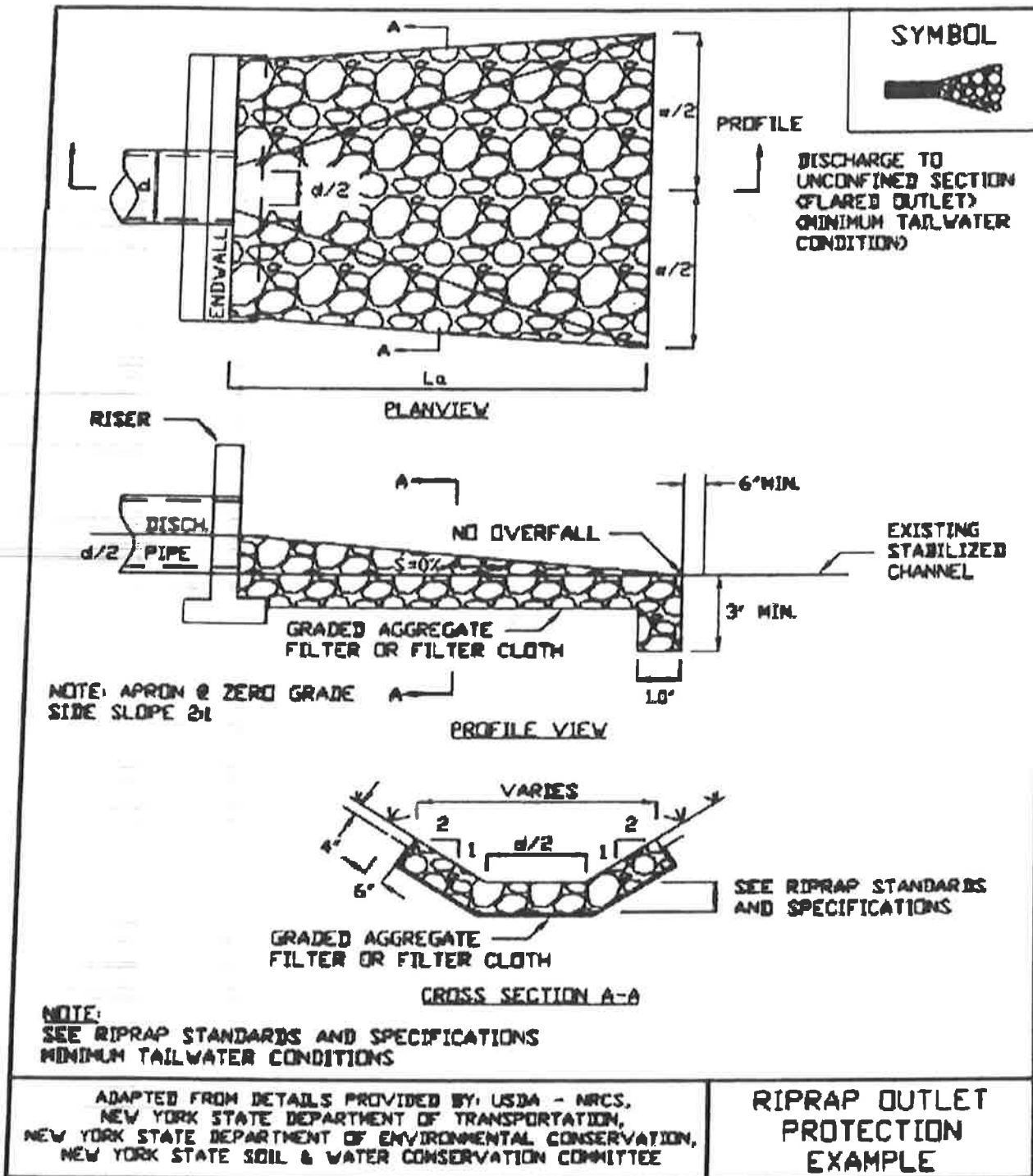


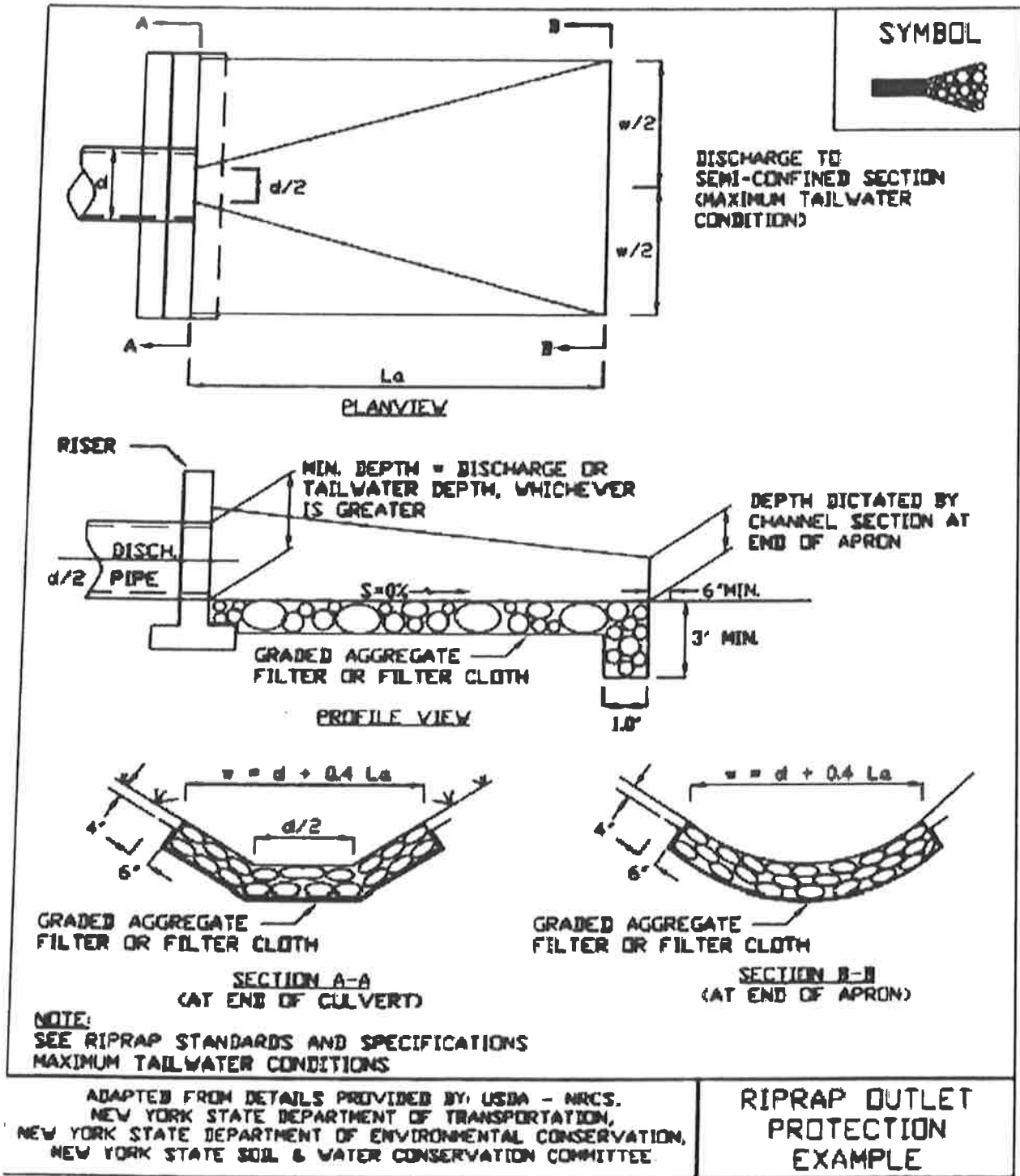
Figure 3.17
Outlet Protection Design—Maximum Tailwater Condition Chart
 (Design of Outlet Protection from a Round Pipe Flowing Full,
 Maximum Tailwater Condition: $T_w \geq 0.5D_o$) (USDA - NRCS)



**Figure 3.18
Riprap Outlet Protection Detail (1)**



**Figure 3.20
Riprap Outlet Protection Detail (3)**



STANDARD AND SPECIFICATIONS FOR ANCHORED STABILIZATION MATTING



Definition and Scope

A temporary or permanent protective covering placed on a prepared, seeded planting area that is anchored in place by staples or other means to aid in controlling erosion by absorbing rain splash energy and withstand overland flow as well as provide a microclimate to protect and promote seed establishment.

Conditions Where Practice Applies

Anchored stabilization mats are required for seeded earthen slopes steeper than 3 horizontal to 1 vertical, in vegetated channels where the velocity of the design flow exceeds the allowable velocity for vegetation alone (usually greater than 5 feet per second); on streambanks and shorelines where moving water is likely to erode newly seeded or planted areas; and in areas where wind prevents standard mulching with straw. This standard does not apply to slopes stabilized with sod, rock riprap or hard armor material.

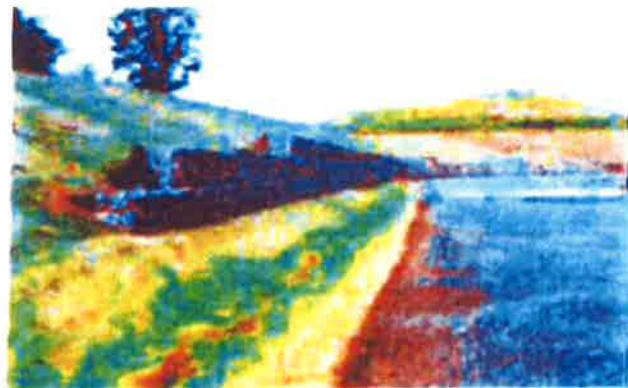
Design Criteria

Slope Applications - Anchored stabilization mats for use on slopes are primarily used as mulch blankets where the mesh material is within the blanket or as a netting over previously placed mulch. These stabilization mats are NOT effective in preventing slope failures.

1. Required on all slopes steeper than 3:1
2. Matting will be designed for proper longevity need and strength based on intended use.
3. All installation details and directions will be included on the site erosion and sediment control plan and will follow manufactures specifications.

Channel Applications - Anchored stabilization mats, for use in supporting vegetation in flow channels, are generally a non-degradable, three dimensional plastic structure which can be filled with soil prior to planting. This structure provides a medium for root growth where the matting and roots become intertwined forming a continuous anchor for the vegetated lining.

1. Channel stabilization shall be based on the tractive force method
2. For maximum design shear stresses less than 2 pounds per square foot, a temporary or bio-degradable mat may be used
3. The design of the final matting shall be based on the mats ability to resist the tractive shear stress at bank full flow
4. The installation details and procedures shall be included on the site erosion and sediment control plan and will follow manufacturers specifications



Construction Specifications

1. Prepare soil before installing matting by smoothing the surface, removing debris and large stone, and applying lime, fertilizer and seed. Refer to manufacturers installation details.
2. Begin at the top of the slope by anchoring the mat in a 6" deep x 6" wide trench. Backfill and compact the trench after stapling.
3. In channels or swales, begin at the downslope end, anchoring the mat at the bottom and top ends of the blanket. When another roll is needed, the upslope roll

should overlay the lower layer, shingle style, so that channel flows do not peel back the material.

4. Roll the mats down a slope with a minimum 4" overlap. Roll center mat in a channel in direction of water flow on bottom of the channel. Do not stretch blankets. Blankets shall have good continuous contact with the underlying soil throughout its entire length.
5. Place mats end over end (shingle style) with a 6" overlap, use a double row of staggered staples 4" apart to secure mats.
6. 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.
7. Mats on side slopes of a channel must be overlapped 4" over the center mat and stapled.
8. 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.
9. The terminal end of the mats must be anchored in a 6"x6" wide trench. Backfill and compact the trench after stapling.
10. Stapling and anchoring of blanket shall be done in accordance with the manufactures recommendations.

Maintenance

Blanketed areas shall be inspected weekly and after each runoff event until perennial vegetation is established to a minimum uniform 80% coverage throughout the blanketed area. Damaged or displaced blankets shall be restored or replaced within 2 calendar days.

STANDARD AND SPECIFICATIONS FOR MULCHING



Definition and Scope

Applying coarse plant residue or chips, or other suitable materials, to cover the soil surface to provide initial erosion control while a seeding or shrub planting is establishing. Mulch will conserve moisture and modify the surface soil temperature and reduce fluctuation of both. Mulch will prevent soil surface crusting and aid in weed control. Mulch can also be used alone for temporary stabilization in non-growing months. Use of stone as a mulch could be more permanent and should not be limited to non-growing months.

Conditions Where Practice Applies

On soils subject to erosion and on new seedings and shrub plantings. Mulch is useful on soils with low infiltration rates by retarding runoff.

Criteria

Site preparation prior to mulching requires the installation of necessary erosion control or water management practices and drainage systems.

Slope, grade and smooth the site to fit needs of selected mulch products.

Remove all undesirable stones and other debris to meet the needs of the anticipated land use and maintenance required.

Apply mulch after soil amendments and planting is accomplished or simultaneously if hydroseeding is used.

Select appropriate mulch material and application rate or material needs. Hay mulch shall not be used in wetlands or in areas of permanent seeding. Clean straw mulch is preferred alternative in wetland application. Determine local availability.

Select appropriate mulch anchoring material.

NOTE: The best combination for grass/legume establishment is straw (cereal grain) mulch applied at 2 ton/acre (90 lbs./1000sq. ft.) and anchored with wood fiber mulch (hydromulch) at 500 – 750 lbs./acre (11 – 17 lbs./1000 sq. ft.). The wood fiber mulch must be applied through a hydroseeder immediately after mulching.



47 Windmill Road

APPENDIX I

Project Plans

**Proposed Retaining Wall Design Prepared for Eisenberg Residence
47 Windmill Road Armonk, NY**

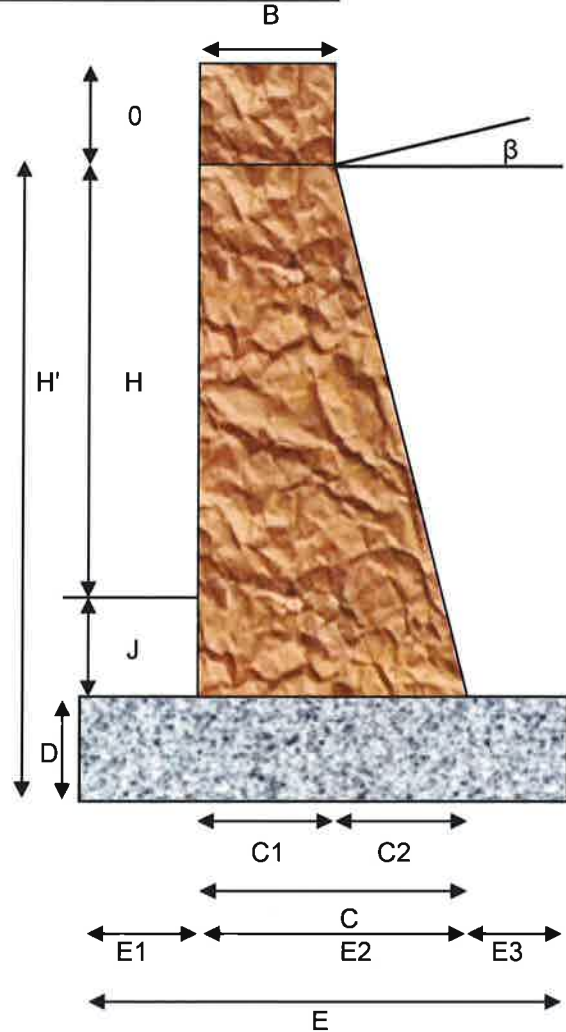
Prepared By **Site Design Consultants**
251 F Underhill Avenue Yorktown Heights, NY 10598

LOWER WALL

March 9, 2023

Design Parameters		
Top width, B	2.00	ft
Bottom width, C1	2.00	ft
Bottom width, C2	3.00	ft
Total Bottom width, C	3.00	ft
Footing depth, D	1.00	ft
Footing width, E1	2.00	ft
Footing width, E2	3.00	ft
Footing width, E3	2.00	ft
Total Footing width, E	7.00	ft
Exposed wall height, H	6.50	ft
Burried height, J	2.00	ft
Wall height (design), H'	9.50	ft
Gamma (H'/3)	3.17	ft
Unit weight of wall	170	pcf
Footing Material	Gravel	
Unit weight of footing	140	pcf
Back Angle, β	0	degrees
Unit weight of soil	125	pcf
Friction angle of soil, ϕ	30	degrees
Surcharge load	0	psf

Exposed Wall Height 6.5'



Pressure Calculations

$K_a =$	0.333333
$P_a =$	1880.208
$P_{ah} =$	1880.208
$P_{av} =$	2774.000
P_a surcharge =	0.000
P_{ah} surcharge =	0.000
P_{av} surcharge =	0.000

Resisting Moment

		Weight	Arm	Moment
Wall	Part 1	2890.00	3.00	8670.00
	Part 2	2167.50	5.00	10837.50
Footing		980.00	3.50	3430.00
P_{av}		2774.00	6.00	16644.00
Sum		8811.50		39581.5



**Proposed Retaining Wall Design Prepared for Eisenberg Residence
47 Windmill Road Armonk, NY**

Prepared By **Site Design Consultants**
251 F Underhill Avenue Yorktown Heights, NY 10598

UPPER WALL

March 9, 2023

Overturning Moment

	Pah	Arm	Moment
	1880.21	3.17	5953.99
Pah surcharge	0.00	4.75	0.00
Total overturning Moment		5953.99	

FS overturning

$M_{resisting} / M_{overturning} = 6.647892 > 1.50$ **OK**

Resisting Forces

$f = \tan(\phi) = 0.58$

$F_{resisting} = \text{Sum Weight} * f = 5087.322$

FS Sliding

$F_{resisting} / \text{Pah} = 2.705722 > 1.50$ **OK**

Eccentricity

$\bar{x} = \Sigma M_{toe} / \Sigma W$

$\bar{x} = 3.82$ CW moment is +

$e = B/2 - \bar{x}$

$e = -0.32 \leq L/6$ **OK**

Bowles pg 455

N.A.

Allowable Bearing Forces

$q_{allow} = 6000$ psf

$q_{actual} = P/A * (1 + 6e/L)$

$q_{actual} = 1600.082$ MIN

$q_{actual} = 917.4889$ MAX

FS Bearing

$q_{allow} / q_{actual} = 6.539588 > 2.0$ **OK**

**Proposed Retaining Wall Design Prepared for Eisenberg Residence
47 Windmill Road Armonk, NY**

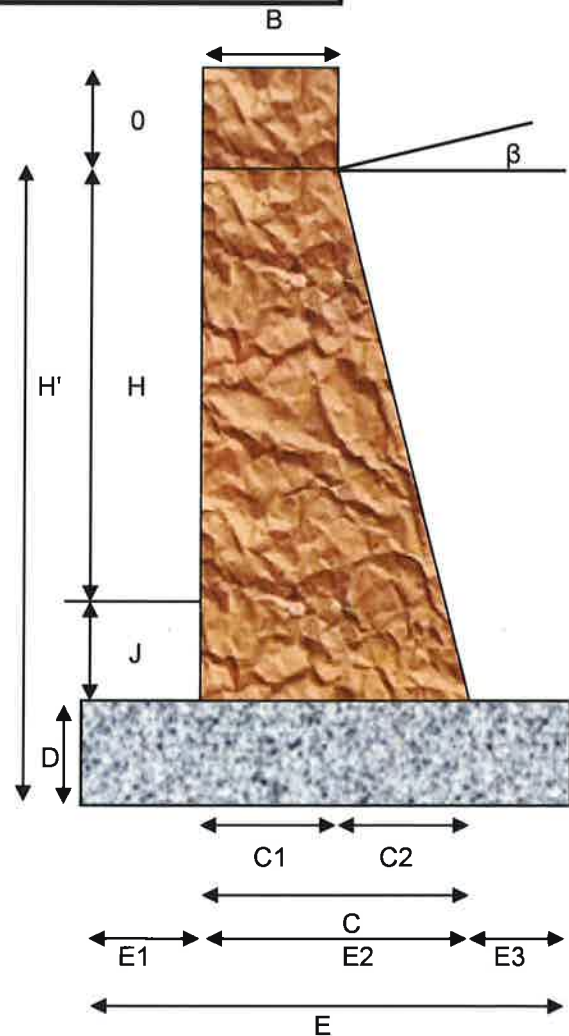
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$P_{av} =$	0.000
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P_{ah} surcharge =	0.000
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Resisting Moment

		Weight	Arm	Moment
Wall	Part 1	2890.00	3.00	8670.00
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Footing		980.00	3.50	3430.00
P_{av}		0.00	7.00	0.00
Sum		6037.50		22937.5

**Proposed Retaining Wall Design Prepared for Eisenberg Residence
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	Pah	Arm	Moment
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Pah surcharge	0.00	4.75	0.00
Total overturning Moment		5953.99	

FS overturning

$M_{resisting} / M_{overturning} = 3.852457 > 1.50$ **OK**

Resisting Forces

$f = \tan(\phi) = 0.58$

$F_{resisting} = \text{Sum Weight} * f = 3485.752$

FS Sliding

$F_{resisting} / P_{ah} = 1.853918 > 1.50$ **OK**

Eccentricity

$\bar{x} = \Sigma M_{toe} / \Sigma W$

$\bar{x} = 2.81$ CW moment is +

$e = B/2 - \bar{x}$

$e = 0.69 \leq L/6$ **OK**

Bowles pg 455

N.A.

Allowable Bearing Forces

$q_{allow} = 6000$ psf

$q_{actual} = P/A * (1 + 6e/L)$

$q_{actual} = 354.6131$ MIN

$q_{actual} = 1370.387$ MAX

FS Bearing

$q_{allow} / q_{actual} = 4.378326 > 2.0$ **OK**

STAFF REPORT - TOWN OF NORTH CASTLE PLANNING DEPARTMENT

February 16, 2023



APPLICATION NUMBER - NAME
#2022-011 – 47 Windmill Road

SBL
102.03-1-1

MEETING DATE
February 27, 2023

PROPERTY ADDRESS/LOCATION
47 Windmill Road

BRIEF SUMMARY OF REQUEST

House addition and retaining walls in excess of 6 feet in height, portions of which are located in a Town-regulated wetland buffer.



PENDING ACTION: Plan Review Town Board Referral Preliminary Discussion

EXISTING ZONING	EXISTING LAND USE	SURROUNDING ZONING & LAND USE	SITE IMPROVEMENTS	SIZE OF PROPERTY
R-1.5A One-Family Residence District (1.5 acre)	Residential Lot	Residential	Addition, driveway, retaining walls, and second curbcut	1.9 acres

PROPERTY HISTORY	COMPATIBILITY with the COMPREHENSIVE PLAN
1960 – Building Permit for house 1970 – CO issued for house addition	<ul style="list-style-type: none"> Continue to take neighborhood context into account in approving new single-family homes. Continue to protect natural resources and environmentally sensitive areas such as rivers, streams, lakes, ponds, wetlands, flood plains, aquifers, wildlife habitats, steep slopes and forested areas, significant trees, and woodlands, among others, from unnecessary and avoidable impacts. Continue strong protection of tree cover through the tree removal permitting process. Preserve the current overall development pattern of North Castle and its neighborhoods. Be sure new development responds to environmental constraints, particularly for preservation of the New York City watershed. Maintain the quality-of-life created by physical and natural attributes, by structuring development that promotes sound conservation measures. The Town should encourage residential development that is compatible in scale, density, and character with its neighborhood and natural environment.

STAFF RECOMMENDATIONS


1. It is recommended that the Planning Board and Conservation Board review the required wetlands permit.

<p><u>Procedural Comments</u></p> <ol style="list-style-type: none"> 1. The Proposed Action would be classified as a Type II Action pursuant to the State Environmental Quality Review Act (SEQRA). 2. A public hearing regarding the wetlands permit and site plan will need to be scheduled. 3. Pursuant to Section 340-5.B(1) of the Town Code, the Conservation Board is required to review the proposed wetland application and, within 45 days of receipt thereof, file a written report and its recommendation concerning the application with the Planning Board. Such report is required to evaluate the proposed regulated activity in terms of the findings, intent and standards of Chapter 340. 4. Pursuant to Section 12-18.A of the Town Code, all site development plans submitted to the Planning Board are required to be referred to the Architectural Review Board (ARB) for review and comment. 	<p><u>Staff Notes</u></p> <p>(11) construction or expansion of a single-family, a two-family or a three-family residence on an approved lot including provision of necessary utility connections...</p> <p>The Planning Board stated that a public hearing should be conducted after the Conservation Board and ARB have completed their review.</p> <p>The Conservation Board in a January 26, 2023 memo to the Planning Board recommended approval of the requested wetlands permit</p> <p>The Applicant received ARB approval at the January 18, 2023 meeting.</p>
<p><u>General Comments</u></p> <ol style="list-style-type: none"> 1. The Planning Board at the July 11, 2022 meeting determined that the Application appeared to be satisfactory and directed the Applicant to the ARB and Conservation Board for review. The Board noted that a public hearing should be scheduled after CB and ARB review. 2. The site plan depicts the construction of retaining walls in excess of 6 feet in height. All walls in excess of 6 feet in height require approval of the Planning Board pursuant to Section 355-15.G of the Town Code. The Applicant has revised the plan to eliminate a proposed garage bay, which reduces Town-regulated steep slope disturbance. 3. The site plan depicts 4,356 square feet of Town-regulated steep slope disturbance. The Planning Board will need to determine whether the proposed amount of Town-regulated steep slope disturbance is acceptable. 4. The site plan depicts 1969 square feet of new Town-regulated wetland buffer disturbance. The Applicant has prepared a 4,390 square foot mitigation plan. Conservation Board has recommended approval of the requested wetlands permit. 5. The site plan depicts the removal of 20 Town-regulated trees. The mitigation plan includes the planting of a total of 17 new deciduous and evergreen trees. 6. The Applicant should submit Gross Land Coverage and Gross Floor Area backup data exhibits for review. 7. The Applicant should submit updated elevations and should depict Building Height (average grade to weighted roof midpoint) and Maximum Exterior Wall Height (lowest grade to weighted roof midpoint). 8. The property is located in a floodplain. A floodplain development permit will be required from the Building Department. 9. The Applicant will need to demonstrate that the Westchester County Health Department has approved the use of the existing septic system with the proposed house modifications. 	

MEMORANDUM

TO: North Castle Planning Board

CC: Adam Kaufman, AICP
Joseph Riina, P.E.
Paul Eisenberg

FROM: John Kellard, P.E. 
Kellard Sessions Consulting
Consulting Town Engineers

DATE: July 7, 2022
Updated February 24, 2023

RE: Paul Eisenberg
47 Windmill Road
Section 102.03, Block 1, Lot 1

As requested, Kellard Sessions Consulting has reviewed the site plans submitted in conjunction with the above-referenced revised project. The applicant is proposing to construct new additions to an existing residence with site improvements, which include a new driveway within the front of the residence, new retaining walls and regrading of the rear yard. The property is ± 1.86 acres in size and located in the R 1.5-A Zoning District. The rear yard fronts on Long Pond and a watercourse/wetlands flows through the eastern portion of the site. Wetlands were delineated by Beth Evans Associates in October 2020. Portions of the site are designated FEMA Zone A 100-year floodplain. The applicant is proposing a stormwater infiltration system to mitigate the increased runoff.

Proposed improvements include a 1,690 s.f. garage addition, small addition within the rear, new rear deck expansion, new stone patio, new concrete patio, new rear yard retaining walls, filling and regrading of the rear yard, elimination of the existing curb cut and driveway and the construction of a new driveway and curb cut. Approximately 0.10 acres of steep slopes will be disturbed constructing the project.

GENERAL COMMENTS

- 1. Significant work is proposed within the rear yard in the general vicinity of the existing septic area. The applicant will need to accurately locate components of the septic system, as well as the designated septic expansion area to ensure that the improvements will not impact the system or expansion area.**

The application should be referred to the Westchester County Department of Health (WCHD) for their review and approval of both the proposed site improvements, as well as the proposed modifications to the interior of the residence.

2. **It appears from FEMA Flood Maps, portions of the project site are within the 100-year FEMA Zone A Floodplain. A Floodplain Development Permit will be required in accordance with Chapter 109 – Flood Damage Prevention of the Town Code.**
3. It appears that disturbances are proposed within the locally-regulated 100-foot wetland buffer. Disturbances appear to include construction of retaining walls, filling, new deck, portion of the new patio, driveway and stormwater practices which will occur within the setback.

A Wetland Mitigation Plan should be prepared by the applicant. Mitigation is required per Chapter 340, Wetlands and Watercourse Protection, of the Town Code, at a minimum ratio of 2:1.

The applicant should prepare a long-term mitigation monitoring plan to ensure the plantings thrive. The Planning Board should determine whether a mitigation bond is required to ensure completion of the mitigation plan and monitoring plan.

4. **The applicant provides a comparison of existing and proposed disturbances within the wetland buffer. The analysis should be expanded to include the total land disturbance required to construct the proposed project. This evaluation should include disturbances required to access the work area.**
5. **The applicant is proposing a two (2) tiered boulder retaining wall within the rear yard. The walls extend to a height of approximately 14 feet. The applicant will need to provide an engineered design wall which documents that the design was examined for overturning and sliding. The Design Engineer will need to inspect the wall during construction and certify to its conformance with the design. Please note such requirements on the Site Plan.**
6. It is extremely important to protect Long Pond from sediment runoff from the work area and steep slopes below. The applicant should consider additional controls which would provide greater protection than a single silt fence.

7. **The applicant will need to update the Stormwater Management Plan for the project which proposes Culotec infiltrators for storage of runoff. The applicant should provide details of the proposed outlet controls. Schedule on-site testing and provide stormwater design calculations sizing the treatment practice.**
8. **A driveway profile has been provided for the proposed driveway. The 4% vehicle platform area by the roadway should be extended, per the Town Code, for a distance of 10 feet past the property line or 35 feet from the roadway center line, whichever is greater. Please specify the location of the centerline of roadway, edge of pavement and property line.**
9. **The proposed southwest corner of the proposed garage addition will utilize approximately 8-10 feet of the garage foundation wall as a retaining wall, which will terminate on a steep slope below. The southwest wall will extend from an elevation of 498 to the roof ridge at elevation 528± feet. The first floor of the neighboring home to the west is located at approximate elevation 480± feet, approximately 48 feet below the roof line. The Board may want the applicant to better illustrate the relationship between the neighboring homes and address mitigation which can be implemented to reduce the visual impacts from the neighbor's home.**
10. **Please revise the slope on the Typical Driveway Detail.**
11. **Please update the proposed grading along the driveway showing a realistic shoulder along the proposed curbing.**
12. **The plan includes a note stating "All existing features within the limit of disturbance to be removed unless otherwise noted." The note needs to be more specific regarding removals within the disturbance limits.**
13. **Please correct the elevations on the Stormtech SC-160 Cross Section Detail.**
14. **Please show the relationship between the stormwater treatment practice, stormwater system rims and inverts, system inlets, system outlets and impervious soil layers.**

As additional information becomes available, we will continue our review. It is noted that an itemized response to all comments will facilitate completeness and efficiency of review.

PLAN REVIEWED, PREPARED BY ALP ENGINEERING, DATED SEPTEMBER 12, 2022:

- Mitigation Planting Plan (L-101)

North Castle Planning Board
Eisenberg – 47 Windmill Road
July 7, 2022
Updated February 24, 2023
Page 4 of 4

PLANS REVIEWED, PREPARED BY SITE DESIGN CONSULTANTS, DATED JUNE 27, 2022:

- Site Plan (Sheet 1 of 6)
- Existing Conditions (Sheet 2 of 6)
- Erosion & Sediment Control Plan (Sheet 3 of 6)
- E&SC Notes and Details (Sheet 4 of 6)
- Site Details (Sheet 5 of 6)
- Stormwater Details (Sheet 6 of 6)

JK/dc

https://kellardsessionsconsulti.sharepoint.com/sites/Kellard/Municipal/Northcastle/Corresp/018SitePlans/2023-02-24_NCPB_Eisenberg - 47 Windmill Road_Review Memo.docx