MYERS CORNERS ROAD (C.R. 93)
TOWN OF WAPPINGER
DUTCHESS COUNTY, NEW YORK
TAX PARCEL: 135689-6258-04-976478 & 032492

MYERS RUN SUBDIVISION

STORMWATER POLLUTION PREVENTION PLAN

Prepared for:

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I INTRODUCTION

BACKGROUND

According to the New York State Department of Environmental Conservation website, http://www.dec.ny.gov/;

> New York State has a state program which has been approved by the United States Environmental Protection Agency for the control of wastewater and stormwater discharges in accordance with the Clean Water Act. Under New York State law the program is known as the State Pollutant Discharge Elimination System (SPDES) and is broader in scope than that required by the Clean Water Act in that it controls point source discharges to groundwater as well as surface waters.

On January 29th, 2020, NYSDEC issued a new Stormwater Phase II permit. Proposed construction projects that involve one acre or more of land disturbance must obtain SPDES permit coverage through either an individual permit or the new General Construction Permit (GP 0-20-001).

This general permit is issued pursuant to Article 17, Titles 7, 8 and Article 70 of the ECL. An *owner or operator* may obtain coverage under this general permit by submitting a Notice of Intent ("NOI") to the Department. The NOI provides information to NYSDEC on the project, assures that a Stormwater Pollution Prevention Plan has been prepared, and is in place in accordance with the requirements of GP 0-20-001. Under GP-0-20-001 no more than five acres of land disturbance may occur at any time without written approval from the NYSDEC.

Retention of Records is mandatory for five (5) years. SWPPP and associated construction logbook must remain on-site and available for review by regulatory personnel at all times during normal business hours.

Prior submitting a Notice of Termination ("NOT") at the end of construction, the owner or operator has a mechanism in place that requires operation and maintenance of the stormwater practices in accordance with the operation and maintenance plan, such as a deed covenant in the owner or operator's deed of record per the General Permit.

OBJECTIVES

> *The purpose of this report is to perform a comprehensive drainage analysis of the site in compliance with GP 0-20-001 utilizing the "**New York State Standards and Specifications for Erosion & Sediment Control"** and the "**New York State Stormwater Management Design Manual"** to determine if any adverse offsite effects are caused by the construction of this proposed project. The report shall also recommend specific stormwater management practices that will mitigate these impacts, provide the required **Phase II Storm Water Quality Treatment**, and propose **Best Management Practices** to minimize soil erosion from the proposed construction.*

Proposed Erosion and sediment control mitigating measures include practices such as seeding and mulching, silt fence, stabilized construction entrance, stock piles, dust control and daily inspection and maintenance. Upon implementation of these mitigating measures as outlined in this report and the "***New York State Standards and Specifications for Erosion & Sediment Control***", the existing properties and adjoining owners are protected during construction.

> *The proposed stormwater mitigation for this project is provided by bioretention and rain gardens. These practices shall be designed to provide runoff reduction and treat the stormwater runoff prior to reaching the surrounding properties.*

PROJECT OVERVIEW

This project is 12 lot single family residential subdivision on two lots to be combined for 22.9 +/- acre site on the west side of Myers Corners Road (County Rte 93), just southwest of Hi View Road in the Town of Wappinger, Dutchess County, New York. The lot currently is currently undeveloped wooded land.

The following are the geographic coordinates for the project in NYTM units from the NYSDEC Stormwater Interactive Map website: UTM 18 E: 595168, N: 4606628 or Latitude of 41.606°N and Longitude of 73.858°W. The rectangular lot is approximately 860 feet along Myers Corners Road and approximately 875 feet deep. Municipal water and individual on-site wastewater disposal systems will serve the lots. See location map in Appendix 1 sheets A.

The proposed bioretention and rain gardens will provide treatment and control of storm water runoff and runoff reduction. To protect the site from erosion and sediment during construction seeding and mulching, silt fence, stabilized construction entrance, stock piles, dust control, and daily inspection and maintenance will all be implemented.

The various runoff reduction techniques were evaluated to determine which were applicable to this project. See Appendix 1, Sheet B for summary.

II SITE DESCRIPTION

The 22.9 acre site is situated on the south side of Myers Corners Road (CR104) in the Town of Wappinger. Topography at this site is moderately sloped from south to north. The site is surrounded by residential developments. See location map in Appendix 1 sheets A.

FLOOD PLAIN

FEMA has established a national standard for flood protection. The standard is the 1-percent annual chance (100-year) flood. According to the FEMA Map Numbers 36027C0476E, Effective Date May 2, 2012 the majority of the site is in Flood Hazard Zone X, outside the 0.2% annual chance (500-year) floodplain. A small portion along the eastern boundary is in Zone A, 1% Annual Chance Without Base flood Elevation Appendix 1 Sheet C

STREAMS

Branch 2B of the Wappinger Creek starts in the northeast corner of the site and flows north under Myers Corners Road through a DCDPW culvert. Appendix 1 Sheet D

WETLANDS

There is Federal (ACOE) Wetland along the eastern boundary. This is also a town water resource. Appendix 1 Sheet D.

CRITICAL ENVIRONMENTAL AREA

The site is not in a state listed Critical Environmental Area

HISTORIC PLACES

The project site is not in an Archeologically Sensitive Area. The site does not contain any registered buildings. Map per the CRIS website is in Appendix 1, Sheet G.

SOILS WITHIN WATERSHED

The predominate soils found on the site per USDA NRCS Web Soil Survey are Canandaigua silt loam (Ca) and Dutchess-Cardigan complex (DwB and DwC). The Ca soil has a natural drainage class of somewhat poorly drained and a HSG of C/D. The Dw soil has a natural drainage class of well drained and a HSG of B. The location of the different soil types and specific soil information are in Appendix 1, Sheet F.

Soils have different soil parameters pertaining to erosion and there susceptibility thereto. These parameters are referred to as soil erosion factors or K. The soil Erosion Factor (K) indicates the susceptibility of a soil to sheet and rill erosion by water. For all other factors being equal, the higher the K value the more susceptible the soil is to sheet and rill erosion by water. The K value for the proposed development area is 0.32 to 0.49

All soils in the county are at some level susceptible to erosion and as such projects will include erosion and sediment control measures. The erosion and sediment control practices for this project are outlined in section VI Proposed Erosion and Sediment Control Plan later in this report.

WATERSHED DESCRIPTIONS

The site drains primarily from south to north. There are existing 3 culverts under Myers Corners Road. These culverts are Design Point 1 (DP1) – the eastern culvert also receives runoff from a large offsite area; Design Point 2 (DP2) – the center culvert; Design Point 3 (DP 3) – the west culvert. A small portion drains to a low area on the southwest property line. This is Design Point 4 (DP4).

PRE-DEVELOPMENT WATERSHEDS

Map in Appendix 1, Sheet H

Pre 1A

This 11.7 acre watershed is on the east side of the site and contains wetlands and stream. The wooded watershed drains from the north property line to the stream culvert under Myers Corners Road in the northeast corner of the site, DP1.

Pre 1B

This 110 acre watershed is north and east of the site and contains wetlands and stream and neighboring residential developments. The watershed drains from the north to northeast and the stream and west to the stream culvert under Myers Corners Road in the north east corner of the site, DP1.

Pre 2

This 9.3 acre watershed in the middle of the property. The area has wooded and open land. This area flows from south to north to the culvert under Myers Corners Road in the middle of the frontage, DP2.

Pre 3

This 1.0 acre watershed in the northwestern corner of the site. The area is wooded. This area flows north ane east to the existing culvert under Myers Corners Road in the western portion of the frontage, DP3.

Pre 4

This 0.9 acre watershed in the southwestern corner. The area is wooded. This area flows to the existing low area on the property line with an adjoining lot, DP4.

III PROJECT DESCRIPTION

Proposed is a 12 lot single family residential subdivision with new town road, municipal water, and individual lot on-site wastewater sewage disposal.

POST-DEVELOPMENT WATERSHEDS

Map in Appendix 1, Sheet I

Pst 1A

This 10.1 acre watershed is on the east side of the site and contains wetlands and stream and new houses with rain gardens, driveways with rain gardens and absorption fields. The wooded watershed drains from the north property line to the stream culvert under Myers Corners Road in the northeast corner of the site, DP1.

Pst 1B

This 110 acre watershed is north and east of the site and contains wetlands and stream and neighboring residential developments. The watershed drains from the north to northeast and the stream and west to the stream culvert under Myers Corners Road in the north east corner of the site, DP1.

Pst 2A

This1.2 acre watershed is on the middle of the site and contains the eastern side of the new road, driveways with rain gardens and absorption fields. This subshed was part of area draining to the pre-development DP2. Now the subshed drains to the new bioretention and then to the stream culvert under Myers Corners Road in the northeast corner of the site, DP1.

Pst 2B

This 1.7 acre watershed is on the middle of the site and contains the western side of the new road, driveways with rain gardens and roofs with rain gardens. This subshed was part of area draining to the pre-development DP2. Now the subshed drains to the new bioretention and then to the stream culvert under Myers Corners Road in the northeast corner of the site, DP1.

Pst 2C

This 0.3 acre watershed is on the middle of the site and contains woods and absorption field. This subshed was part of area draining to the pre-development DP2. Now the subshed drains to the stream culvert under Myers Corners Road in the northeast corner of the site, DP1.

Pst 2D

This 0.2 acre watershed is along Myers Corners Road. The area a small portion of the new road and lawn area below the new bioretention area. This area flows from east to west to the culvert under Myers Corners Road in the middle of the frontage, DP2.

Pst 2E

This 0.4 acre watershed is along Myers Corners Road. The area a small portion of the new road, driveway with rain gardens and house with rain gardens. This area flows from east to west to the culvert under Myers Corners Road in the middle of the frontage, DP2.

Pst 2F

This 7.2 acre watershed in the middle of the site containing new houses with rain gardens, driveways with rain gardens and aborption fields. This area flows from south to north to the culvert under Myers Corners Road in the middle of the frontage, DP2.

Pst 3

This 1.0 acre watershed in the northwestern corner of the site. The area is wooded excepted for a new absorption field. This area flows north ane east to the existing culvert under Myers Corners Road in the western portion of the frontage, DP3.

Pst 4

This 0.9 acre watershed in the southwestern corner. The area is wooded. This area flows to the existing low area on the property line with an adjoining lot, DP4.

IV STORM WATER MANAGEMENT PLAN

Planning and Selection

Step 1: Site Planning - See Planning Table in Appendix 1, Sheet B – The on-site wastewater treatment systems and zoning requirements for lot dimensions limits the configurations of the lots and stormwater practices.

Step 2: Water Quality Volume (WQv) – The required water quality volume for is calculated to be 7332 cu. ft. (0.17 af). The Total WQv provided by the Bioretention and Rain Gardens is 2780 cu. ft. (0.06 af). Values from NYSDEC Runoff Reduction Worksheets NOI Questions and Bioretention and Rain Garden calculation sheets. The NYSDEC Runoff Reduction Worksheets automatically present in the total water quality volume provided for the NOI Questions the sum of the required volume and not the provided volume calculated within the work sheets. The Summary Table and NOI Questions have been revised to reflect the total provided.

Calculations are in Appendix 3, Bioretention and Rain Garden Worksheets and NOI Questions.

Step 3: Apply Runoff Reduction Techniques (RRv) – The proposed Bioretention and Rain Gardens are green practices with runoff reduction. The Bioretention is a standard stormwater management practice with runoff reduction capacity. The bioretention, which will have an underdrain, will be located in HSG C areas.

The runoff reduction volume provided by both practices is 100% of the provided water quality volume per NYSDEC Storm Water Manual, Table 3-5. Worksheets and Summary in Appendix 3

The provided Runoff Reduction Volume 7332 cf (0.17 af) is equal to the required Water Quality Volume 7331 cf (0.17 af). Therefore 100% of the runoff reduction is met.

Calculations are in Appendix 3.

Step 4: Minimum RRv – The minimum Runoff Reduction Volume is calculated to be 2922 cu. ft. (0.07 af). The provided RRv exceeds the minimum. Calculations are in Appendix 3.

Step 5: Standard Practices to Address Remaining water Quality Volume – Additional practices are not required as the total required water quality volume was met with the proposed treatment practices.

Step 6: Volume and Peak Rate Control – The post development runoff rate is controlled by the bioretention and diverting runoff between watersheds. The stormwater system is designed for the roofs and driveways to drain to rain gardens. The road will drain to a plunge pool as pretreatment before treatment and control in the bioretention area. The overflow from the bioretention, outlet structure will go to the stream.

In order to evaluate the proposed project properly and to develop a storm water management plan a hydrologic analysis was undertaken. The site was evaluated by reviewing aerial maps of the area, onsite topography and Dutchess County maps. The watershed areas for both the existing and post developed site were determined and evaluated. The watershed limits and the path of stormwater runoff are shown on the maps in Appendix 1, sheets H and I. Off-site areas that drain through the site were included in the evaluation.

Once the watershed areas are determined the peak stormwater runoff from both the pre-developed and post developed site are calculated and compared.

The goal of stormwater management is to develop a plan to mitigate the change in stormwater flow and to minimize the potential for soil erosion associated with the proposed project. Watersheds were described previously in detail within section II and III of this report and are shown on the maps included within Appendix 1. Tabular information by sub-catchment, including but not limited to acres of total impervious area, acres of pervious area, times of concentrations, and curve numbers is provided in the attached Hydro CAD summary reports in Appendix 4.

CRITERIA:

DESIGN STORM	1, 25 and 100 year, 24-hour storm event
RAINFALL DATA	Extreme Precipitation in New York & New England, Northeast Regional Climate Center and Natural Resources Conservation Service, http://precip.eas.cornell.edu (see Appendix 4) The rainfall data has been converted to Mass Curves by the HydroCAD program for the computer modeling.

1 YEAR-24 HR STORM	2.62 INCHES
10 YEAR-24 HR STORM	4.67 INCHES
100 YEAR-24 HR STORM	8.22 INCHES

METHODOLOGY:

- Software program utilized to model the storm runoff was HydroCAD version 10
  - NRCS Curve Number procedure to calculate storm runoff from the proposed site
  - NRCS TR 20 procedure to calculate Storm Runoff Hydrograph from proposed site
  - NRCS procedure for calculating time of concentration (TR 55 worksheet 3)

DISCUSSION OF RESULTS

The runoff model results for both pre and post conditions can be found in Appendix 4. The hydrologic analysis performed showed that development of this site would not increase the peak discharge offsite.

The following table displays the comparison of the peak discharges offsite for pre-development and post-development conditions of the evaluation.

PRE - POST COMPARISON						
SUBSHED	AREA	CN	Tc	1-YR	10-YR	100-YR
	AC		MINUTES	CFS	CFS	CFS
PRE						
PRE 1A	11.7	66	33.8	2	10	28
PRE 1B	110	70	90	15	64	172
PRE 1 / DP1	121.7	66	90	**16**	**67**	**182**
PRE 2 / DP2	9.3	61	22.7	**1**	**7**	**23**
PRE 3 / DP3	1.0	60	20.1	**0**	**1**	**3**
PRE 4 / DP4	0.9	60	14.2	**0**	**1**	**3**
EXISTING LOW AREA - SW		PEAK ELEVATION		330.1	330.5	331.0
PRE	**132.9**		**90.0**	**17**	**76**	**211**
POST						
SUBSHED	AREA	CN	Tc	1-YR	10-YR	100-YR
	AC		MINUTES	CFS	CFS	CFS
POST 1A	10.1	68	33.8	2	9	26
POST 1B	110	70	90	15	64	172
POST 2A	1.2	64	1	0	2	7
POST 2B	1.7	65	1	1	4	10
POST 2C	0.3	60	1	0	0	1
DP1	123.3		90	**16**	**67**	**182**
PRETREATMENT ELEVATION				293.6	293.9	294.3
BIORETENTION ELEVATION				293.5	293.7	294.3
POST 2D	0.2	66	6	0	0	1
POST 2E	0.4	66	15	0	0	1
POST 2F	7.2	62	20.9	1	6	19
DP 2				**1**	**6**	**21**
POST 3 / DP3	1.0	60	20.1	**0**	**1**	**3**
POST 4 / DP4	0.9	60	14.2	**0**	**1**	**3**
EXISTING LOW AREA - SW		PEAK ELEVATION		330.1	330.5	331.0
POST	**132.9**		**90.0**	**17**	**75**	**209**

a. STREAM BANK PROTECTION (Cp)
This criterion is designed to protect stream channels from erosion by providing 24-hour extended detention of the one-year, 24-hour storm event.

The required Channel Protection Volume is provided by Runoff Reduction Volume equal to the required water quality volume. ***CRITERIA MET TO STANDARD***

b. OVER BANK PROTECTION (Qp)
This criterion is intended to prevent an increase in the frequency and magnitude of out of bank flooding generated by urban development. This criterion requires storage to attenuate the post development flow for the 10-year 24-hour peak discharge rate to predevelopment rates.
See Peak Discharge Table above ***CRITERIA MET TO STANDARD***

c. EXTREME FLOOD CONDITION (Qf)
The intent of this criterion is to prevent an increase of the risk of flooding from large storm events, maintain the boundaries of the 100-year floodplain and protect the physical integrity of Stormwater management practices. The criterion requires that storage be provided to attenuate the 100-year 24-hour peak discharge rate to pre-developed rates.
See Peak Discharge Table above ***CRITERIA MET TO STANDARD***

V PROPOSED PHASE II WATER QUALITY TREATMENT

On January 29, 2020, NYSDEC issued a new Stormwater Phase II permit for construction activity. Proposed construction projects that involve one acre or more of land disturbance must obtain SPDES permit coverage through either an individual permit or the new General Construction Permit (GP 0-20-001). To obtain coverage under the General Permit, the operator of construction activity must file a completed Notice of Intent with the NYSDEC. The project has been developed to meet the design criteria needed to file a NOI and a Stormwater Pollution Prevention Plan (SWPPP), which is the purpose and intent of this report.
Under the general permit, a project shall be designed in accordance with the following manuals:

"New York State Stormwater Management Design Manual"
"New York State Standards and Specifications for Erosion & Sediment Control"

To comply with requirements for stormwater quality treatment, unified stormwater sizing criteria were used and a list of acceptable Stormwater management practices were developed and provided in accordance with the *"New York State Stormwater Management Design Manual"*.

The NOI provides information to NYSDEC on the project, assures that a Stormwater Pollution Prevention Plan has been prepared, and is in place in accordance with the requirements of GP 0-20-001. The electronic submission NOI form (eNOI) can be found at www.dec.ny.gov/chemical/43133html#Forms

Storm water shall be treated as specified on page 8 in the permit as stated below:

Maintaining Water Quality- It shall be a violation of this general permit and the Environmental Conservation Law ("ECL") for any discharge to either cause or contribute to a violation of water quality standards as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and regulations of the State of New York such as:

1. *There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions.*
2. *There shall be no increase in suspended, colloidal and settable solids that will cause deposition or impair the waters for their best usages; and*
3. *There shall be no residue from oil and floating substances, or visible oil film, or globules of grease.*

This section of the report will address the water quality treatment from the site after the construction phase of the project is concluded. Erosion and sediment control during construction will be discussed in section VI.

ACCEPTABLE STORMWATER MANAGEMENT PRACTICES

"*New York State Stormwater Management Design Manual*" provides a list of management practices which are acceptable means of treatment and runoff reduction. The following management practices will be utilized in this design to achieve the require water quality treatment.

A. Sheet flow to vegetated filter strips (NYSDEC SMDM 5.3.2)

Vegetated filter strips and undisturbed natural areas are used to treat and control runoff. Vegetated filter strips are often maintained grass buffers between impervious areas and natural areas. (Wetland buffer)

Landscaping: Good grass or plant cover chosen for the soil and sun exposure. Natural cover is also acceptable.

Maintenance: Bare patches and dead plants should be reseed or replaced as soon as possible. Area of erosion should be repaired when discovered. The rills or channels form, methods of spreading the inflow to return to sheet flow should be installed. (Unmowed area of wetland buffer will act as filter strips for additional pretreament by removing sediment)

B. Bioretention and Rain Gardens (NYSDEC SMDM F-5 & 5.3.7)

Stormwater filtering systems capture and temporarily store the water quality volume and pass it through a filter bed of sand, organic matter, or soil. Specified as a standard practice in the "New York State Stormwater Management Design Manual," a bioretention area is a shallow stormwater basin or landscaped area that treats stormwater as it flows through plants and a soil matrix. Any remaining stormwater is then returned to the storm drain system. The practice is often located in parking lot islands, and can also be used to treat other areas.

Landscaping: Plants for the landscaping plan will be chosen from the native plant list in appendix H of the "Nys Stormwater Management Design Manual," a list developed by applied ecological services inc. In a brochure called "Build Your Own Rain Gardens," and/or a plant list available through Native Landscapes in Pawling, NY.

Maintenance: Treatment area plants and components should be repaired or replaced when needed. A 6 inch stone drop should be provided and maintained at any pipe inlet. Mulch should be replaced annually. Full inspections shall take place yearly. Full inspections involve checking all components of the bioretention area thoroughly. If a repair is necessary, it shall be initiated in a timely fashion. No equipment shall be driven on bioretention or rain garden area. Hand tools only.

E. Rooftop disconnection (NYSDEC SMDM 5.3.5)

Disconnecting rooftops is allowing the runoff from roofs to flow overland to a filtration or infiltration area. This allows for the initial treatment prior to the practice and slows down the runoff rate.

F. Soil restoration (NYSDEC SMDM 5.1.6)

Soil restoration is required where soils have been disturbed and will be vegetated. For this project, the majority of the heavy traffic disturbance will be in areas that will be building or parking area. Minimal soil disturbance will occur in proposed vegetated areas. The common practice in preparing an area for landscape is to loosen the soil and apply topsoil. The native soil in bioretention areas is removed and replaced with enhanced soil. The need for full soil restoration is not warranted for the disturbed, proposed vegetated areas. If excessive compaction occurs during construction, mitigation including, but not limited to deep ripping and de-compaction as outlined in the NYSDEC Stormwater Manual, section 5.1.6, may be ordered by the site engineer.

VI PROPOSED SEDIMENT AND EROSION CONTROL PLAN

An erosion and sediment control plan has been developed for this project and can be found in Appendix 2 of this report. The purpose of this plan is to outline procedures for installing and maintaining the erosion and sediment control structures to be constructed on this site. The type of structures and practices for this site will be seeding and mulching, silt fence, stabilized construction entrance, stock piles, dust control, and daily inspection and maintenance.

The proposed project has the potential for soil erosion due to vegetation being removed and soil cut and fill operations. Soils are moderately susceptible to detachment and they produce moderate runoff. All soils in Dutchess County are at some level susceptible to erosion and as such projects should include erosion and sediment control measures. The erosion and sediment control practices for this project are outlined below.

EROSION AND SEDIMENT CONTROL PRACTICES

During construction erosion control devices will be constructed and used to minimize soil erosion during each phase of the project. In order for the erosion control structures to work properly, they must be installed properly and maintained. Regular inspection and maintenance of erosion control devices is also essential to the efficiency of the entire system. Daily inspection and maintenance of all erosion and sediment control practices shall be performed by the contractor. Inspections shall also be performed once a week by a qualified person. The proposed practices for this site are described below. The Erosion and Sediment Control Plan and Details can be found in Appendix 2.

Stabilized construction access: To collect sediment from trucks exiting the site. A construction entrance shall be installed off the existing shared access drive.

Silt Fence Barriers: Silt fence shall be placed on slopes immediately downstream of all construction areas Silt fence are to be placed parallel with contours.

Stock Piles: Topsoil will be placed in a location that will not interfere with construction and will be protected with a silt fence placed around its perimeter. The topsoil shall be stabilized by covering with tarps or seed and hay when not in use.

Daily Inspection: Daily inspection and maintenance of the erosion and sediment control structures as listed in this section is essential to insuring their continued functionality. Each practice must be inspected and maintained on a daily basis by the contractor to keep all of the structures in working order.

Dust Control: To control the amount of dust produced by construction at the site dust control measures such as watering will be implemented.

Sediment Trap: A sediment trap is a shallow depression created to pool water from construction sites. The water is stored temporarily giving the sediment time to settle out prior to over flowing the high flow weir and entering downstream waters. Sediment traps are not proposed but will be installed if needed or as ordered by engineer during construction.

Additional Practices: Other erosion and sediment control practices may be required during construction. These additional practices shall be per *"New York State Standards and Specifications for Erosion and Sediment Control"*, most current edition and as ordered by the engineer.

In addition to the above mentioned practices the following will be done:

Construction equipment and supplies will be staged in an area so designated. The area will be protected by placing appropriate silt fencing and additional erosion control devices as needed to minimize erosion. Construction chemicals shall be stored in secured areas so that they will not be spilled and become a source of ground water pollution. A spill response plan shall be developed by the contractor to address the case of an incidental spill. This plan shall include prevention and cleanup. The NYS Spill Hotline is 1-800-457-7362.

To control litter from the site the contractor shall police the area every day and pick up all litter that blows onto the construction area. Litter brought onto the site by the contactor shall be placed in appropriate garbage containers and emptied as needed. To further reduce the migration of litter into the wetland a silt fence will be installed as the first item of work.

Top soil and other materials excavated shall either be stockpiled and protected by seeding and mulching within seven days or removed from the site immediately. The stockpiles shall also have silt fence barriers

or tubular sediment control devices (if placed in paved areas) around the entire foot print. Stockpiles shall be located in areas where they will not affect construction nor in the wetland.

Seeding and mulching all disturbed areas as soon as possible. In areas where soil disturbance activities has been temporarily or permanently ceased, temporary and/or permanent soil stabilization measures shall be installed and/or implemented within seven days from the date the soil disturbance activities ceased. Seed mix for this site can be found on the Erosion and Sediment Control Plan.

Materials that may be used and temporarily stored onsite as the project is constructed may include, but are not limited to the following:

- Crushed stone
- Select back fill
- Sand
- Ductile Iron Pipe
- Corrugated Metal Pipe
- Reinforced Concrete Pipe
- High Density Polyethylene Pipe
- PVC Pipe
- Concrete mix
- Pre cast concrete structures
- Brick
- Wood
- Silt fence material
- Filtrexx Silt Soxx material
- Geotextile Fabric
- Construction equipment
- Trucks
- Asphalt
- Construction Materials

INSTALLATION GUIDELINES

In order to assure that the erosion control structures will work there must be an assurance that they are installed properly. In order to accomplish this all erosion control must be installed as per the final erosion control plan and in accordance with the project Engineer. A certified professional shall inspect the erosion control. No work shall be started on the site until the erosion control is in place and accepted.

The sequence of erosion and sediment control for this project will be installed as follows:

Before Construction

1. The site owner or operator shall hire a professional engineer or certified professional in erosion and sediment control to perform all inspections during construction as required by NYSDEC SPDES General Permit for Stormwater Discharges from construction activities “GP 0-20-001”. Any changes in design during construction must be done by a Professional Engineer.
2. Conduct a pre-construction meeting with client, contractor and site Civil Engineer or qualified professional in erosion and sediment control and Town of Wappinger to review the site and the erosion control plan as well as sequence of work as it pertains to applicable erosion control measures.
3. All contractors and sub contractors must sign the contractor certification form prior to the start of construction.
4. Contact site Civil Engineer or CPESC for inspection of erosion control measures before starting any clearing and or site construction.

5. Establish limits of disturbance for proposed clearing and grading. Install orange construction fence as applicable.

The construction of the new town road shall follow the sequence of work as outlined below:

Contractor shall perform daily inspection and repair of erosion and sediment control practices. Weekly inspection of site by a certified professional with all recommendations implemented immediately.

1. Install construction entrance as first item of work to prevent dust and debris from being tracked onto the surrounding roads and drives.
2. Installation of silt fence as shown or needed to capture sediment from proposed construction. Silt fence shall be installed per the accepted erosion and sediment control plan as well as in locations deemed necessary during construction inspections of the site. Silt fence shall be installed along the contours.
3. Protect proposed bioretention area, rain gardsns and septic systems from construction activities as much as possible to reduce the amount of soil restoration required in completing areas.
4. Perform grading, excavation and related construction activities. Topsoil shall be removed from proposed graded areas and stored at applicable locations so as not to interfere with the construction operations. Possible locations for topsoil stockpiles are shown on the erosion control plan.
5. Once an area is cut or filled, it shall be stabilized by seeding and mulching.
6. Install water, electric, phone, cable, other utilities in coordination with other site work.
7. Bioretention and rain gardens shall not be placed until the remainder of the earth disturbance in upstream areas is complete and permanently stabilized to keep sediment from entering media. If Bioretention must be constructed before upslope stabilized, then runoff shall be diverted around the bioretention into the detention basin until upslope areas are stabilized.
8. As construction proceeds, all disturbed areas shall be paved, seeded, or planted as specified on the plans in a timely manner to prevent unnecessary erosion.
9. Restore soil in disturbed areas where pervious finish cover is proposed; especially bioretention and rain garden areas. Intensive restoration methods may be required if excess compaction occurred during construction. Compaction may be caused by construction equipment, stockpiles, storage of pallets, personal vehicles, construction trailers, etc. Soil restoration will be done to the satisfaction of the inspecting engineer.
10. Installation of bioretention and rain gardens.
11. Upon completion of construction activities, upon stabilization of site soils, and upon final approval by the site and municipal inspector, temporary erosion control devices shall be removed.

This sequence is to be applied to each lot except substitute Rain Garden for Bioretention. Each lot is to be maintained such that no sediment leaves the lot.

MAINTENANCE PLAN FOR EROSION CONTROL DEVICES

Temporary Erosion Control Devices

These structures shall include all erosion control devices that will be installed and utilized during the construction of the site. These shall include devices such as silt fences, diversions swales, stabilized construction entrances, sediment basins, and all other temporary erosion and sediment control measures as outlined in this SWPPP or requested by the project Engineer.

Erosion control devices shall be installed in accordance with the schedule of installation. Once the devices are installed and inspected to assure that they are installed properly, the devices must be maintained in order to assure that they will continue to function properly. In order to do so the following list of procedures shall be followed during the construction phase of the project:

- Daily inspection and maintenance shall be performed by the site contractor.

- All erosion control devices shall be inspected at least once a week by a certified professional and within one business day notify the owner or operator and contractor of any corrective actions needed. The contractor must start implementing corrective actions within one business day and complete them in a reasonable time frame per NYSDEC permit GP 0-20-001.
- All erosion control devices shall be maintained in good working order. If a repair is necessary, it will be initiated within 24 hours of report.
- Silt fence will be inspected for depth of sediment, tears, to see if the outer mesh is securely attached to the fence post, no gaps under the siltsoxx, and to see that the fence post are firmly in the ground. Built up sediment will be removed when it reaches one-third the height.
- Temporary seeding will be inspected for bare spots, washouts, and healthy growth. If required additional seeding shall be performed. Acceptable coverage is defined as 80% coverage over the entire pervious area per Appendix A of GP 0-20-001.
- A maintenance report will be prepared by the qualified professional once a week and kept on file at the site.
- All individuals performing the site inspection shall be familiar with the erosion control plan and be trained in all the inspection and maintenance practices necessary for keeping the erosion and sediment controls used onsite in good working condition.

Temporary erosion and sediment control devices shall be inspected and maintained by both the contractor and the owner.

PHASE PLAN

Under GP 0-20-001 no more than five acres of land disturbance may occur at any time without written approval from the NYSDEC. The total area of disturbance is greater than 5 acres therefore phasing is required. Phasing is natural with this type of project as not all of the lots are usually developed at the same time. Phasing requirement note is on the Erosion and Sediment Control Plan, sheet 10.

VII CONCLUSION

The construction of this development will require several mitigation measures be implemented in order to mitigate both stormwater runoff rates and erosion and sediment control.

Erosion Control During Construction
The mitigating measures are the erosion control devices such as seeding and mulching, silt fence, stock piles, dust control, construction entrance and daily inspection and maintenance. Upon implementation of these mitigating measures as outlined in this SWPPP and the "***New York State Standards and Specifications for Erosion & Sediment Control***", the adjoining owners are protected during construction.

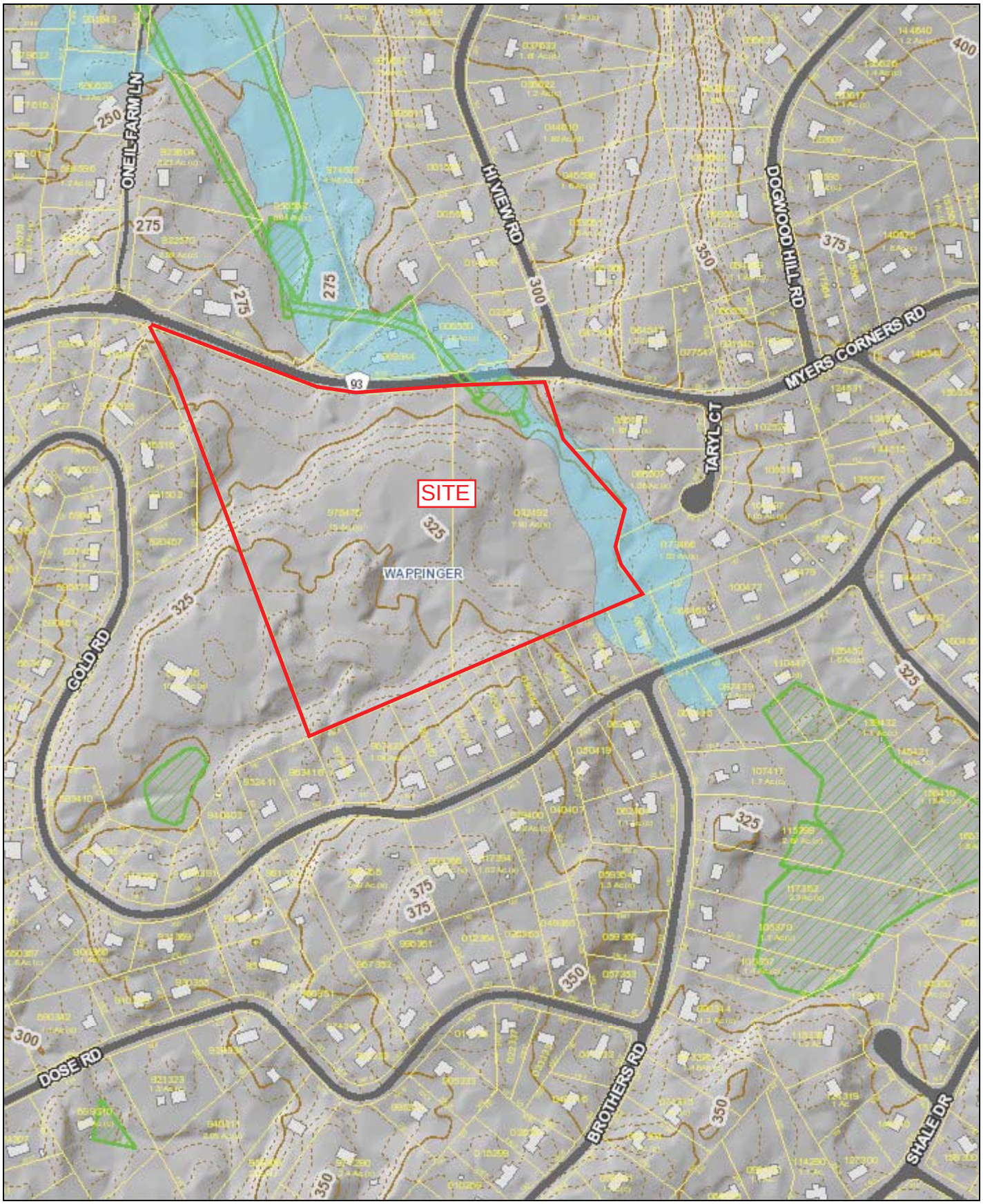
Stormwater Treatment After Construction
Proposed stormwater treatment practices will treat the water quality volume as required by GP 0-20-001. To comply with requirements for stormwater quality and unified stormwater sizing criteria a list of acceptable Stormwater management practices were developed and provided in accordance with the ***"New York State Stormwater Management Design Manual"***. Utilized for this site is Bioretention and Rain gardens.

The use of bioretention and rain gardens will provide water quality treatment of all of the stormwater runoff from the new development. Upon completion of construction, these measures will meet or exceed the pollutant removal standards required by the Phase II Stormwater Permit prior to any discharge to the existing storm sewer systems.

Reduction in runoff of the water quality volume will be accomplished through the bioretention and rain gardens. Utilizing the proposed erosion and sediment control measures and stormwater treatment practices, will result in this project complying with the NYSDEC GP 0-20-001 permit requirements and will protect the adjoining property owners and the wetland.

APPENDIX 1
SITE INFORMATION

Sheet A	Location Map
Sheet B	NYSDEC Runoff Reduction Planning Table
Sheet C	Flood Plain Map – FEMA
Sheet D	DEC-Environmental Resource Map
Sheet E	DEC-Stormwater Interactive Map
Sheet F	NRCS Soil Information
Sheet G	NYS Archeological CRIS Map
Sheet H	Watershed Map-Pre Development
Sheet I	Watershed Map-Post Development



Dutchess County
New York

MYERS RUN, T/Wappinger

Dutchess County, NY

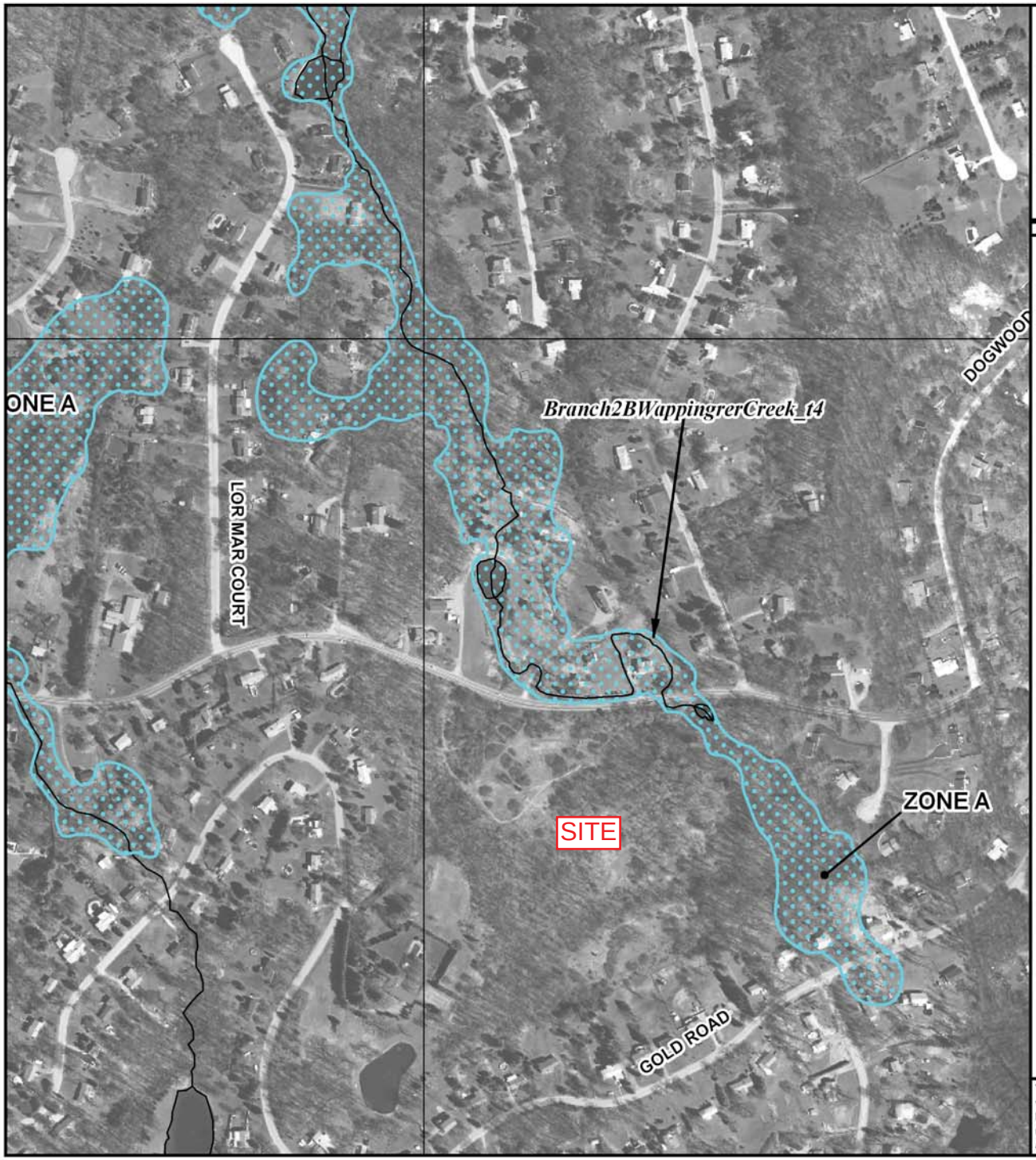
Printed by:
ParcelAccess

0 220 440 ft

ParcelAccess
Internet
5/2/2021

Planning

Practice	Description	Application
Preservation of Undisturbed Areas	Delineate and place into permanent conservation undisturbed forests, native vegetated areas, riparian corridors, wetlands, and natural terrain.	Considered & Not Applied
Preservation of Buffers	Define, delineate and preserve naturally vegetated buffers along perennial streams, rivers, shorelines and wetlands.	N/A
Reduction of Clearing and Grading	Limit clearing and grading to the minimum amount needed for roads, driveways, foundations, utilities and stormwater management facilities.	Considered & Applied
Locating Development in Less Sensitive Areas	Avoid sensitive resource areas such as floodplains, steep slopes, erodible soils, wetlands, mature forests and critical habitats by locating development to fit the terrain in areas that will create the least impact.	N/A
Open Space Design	Use clustering, conservation design or open space design to reduce impervious cover, preserve more open space and protect water resources.	Considered & Applied
Soil Restoration	Restore the original properties and porosity of the soil by deep till and amendment with compost to reduce the generation of runoff and enhance the runoff reduction performance of post construction practices.	Considered & Applied
Roadway Reduction	Minimize roadway widths and lengths to reduce site impervious area	Considered & Applied
Sidewalk Reduction	Minimize sidewalk lengths and widths to reduce site impervious area	Considered & Applied
Driveway Reduction	Minimize driveway lengths and widths to reduce site impervious area	Considered & Applied
Cul-de-sac Reduction	Minimize the number of cul-de-sacs and incorporate landscaped areas to reduce their impervious cover.	N/A
Building Footprint Reduction	Reduce the impervious footprint of residences and commercial buildings by using alternate or taller buildings while maintaining the same floor to area ratio.	Considered & Applied
Parking Reduction	Reduce imperviousness on parking lots by eliminating unneeded spaces, providing compact car spaces and efficient parking lanes, minimizing stall dimensions, using porous pavement surfaces in overflow parking areas, and using multi-storied parking decks where appropriate.	Considered & Applied



MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 M

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0476E

FIRM

FLOOD INSURANCE RATE MAP

for DUTCHESS COUNTY, NEW YORK
(ALL JURISDICTIONS)

CONTAINS:

COMMUNITY	NUMBER
EAST FISHKILL, TOWN OF	361336
WAPPINGER, TOWN OF	361387

PANEL 476 OF 602
MAP SUFFIX: E
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

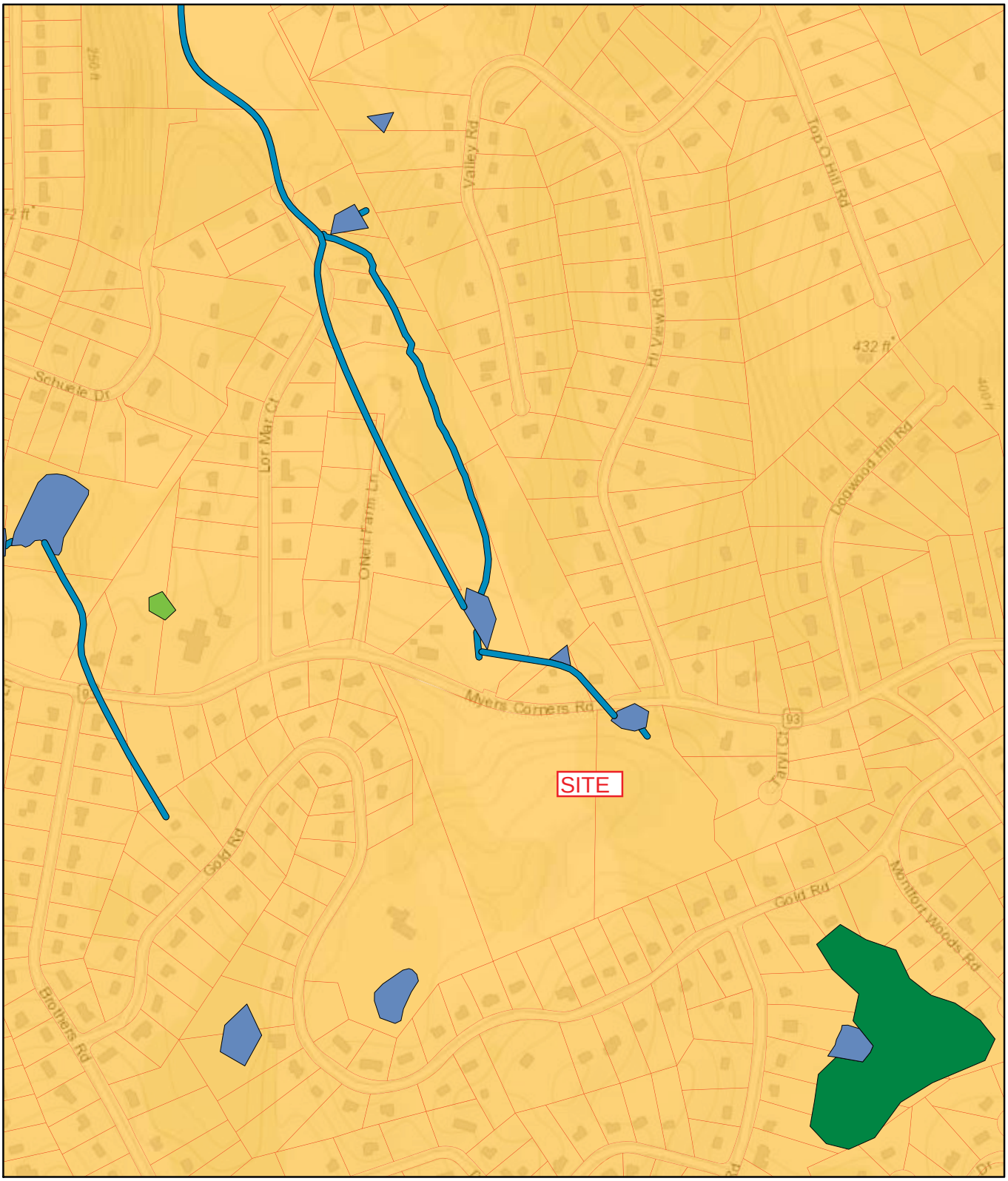
MAP NUMBER
36027C0476E

EFFECTIVE DATE
MAY 2, 2012

Federal Emergency Management Agency

This is an official FIRMette showing a portion of the above-referenced flood map created from the MSC FIRMette Web tool. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For additional information about how to make sure the map is current, please see the Flood Hazard Mapping Updates Overview Fact Sheet available on the FEMA Flood Map Service Center home page at https://msc.fema.gov.

MYERS RUN SUBDIVISION, T/Wappinger, Dutchess County



May 2, 2021

1:9,028

0 0.05 0.1 0.2 mi

0 0.07 0.15 0.3 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

NYS Department of Environmental Conservation
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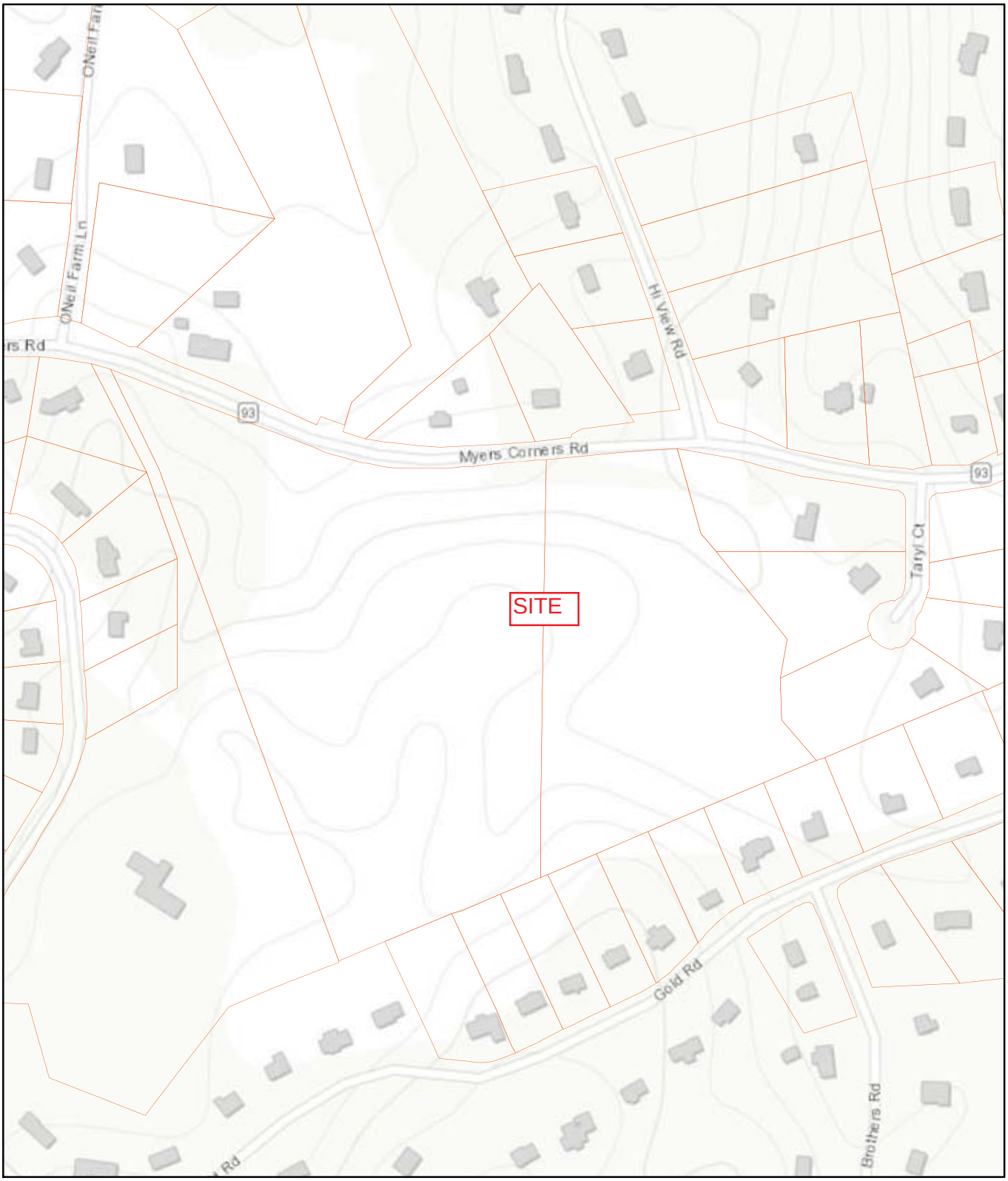
MYERS RUN SUBDIVISION, T/Wappinger, Dutchess County



May 2, 2021

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

NYS Department of Environmental Conservation
Not a legal document

Hydrologic Soil Group—Dutchess County, New York
(MYERS RUN, T/Wappinger)

Map Scale: 1:3,000 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Dutchess County, New York
Survey Area Data: Version 17, Jun 11, 2020

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

Date(s) aerial images were photographed: Oct 7, 2013—Feb 26, 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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Ca	Canandaigua silt loam, neutral substratum	C/D	4.5	19.6%
DwC	Dutchess-Cardigan complex, rolling, rocky	B	18.4	80.3%
Ue	Udorthents, wet substratum	B	0.0	0.1%
Totals for Area of Interest			**22.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

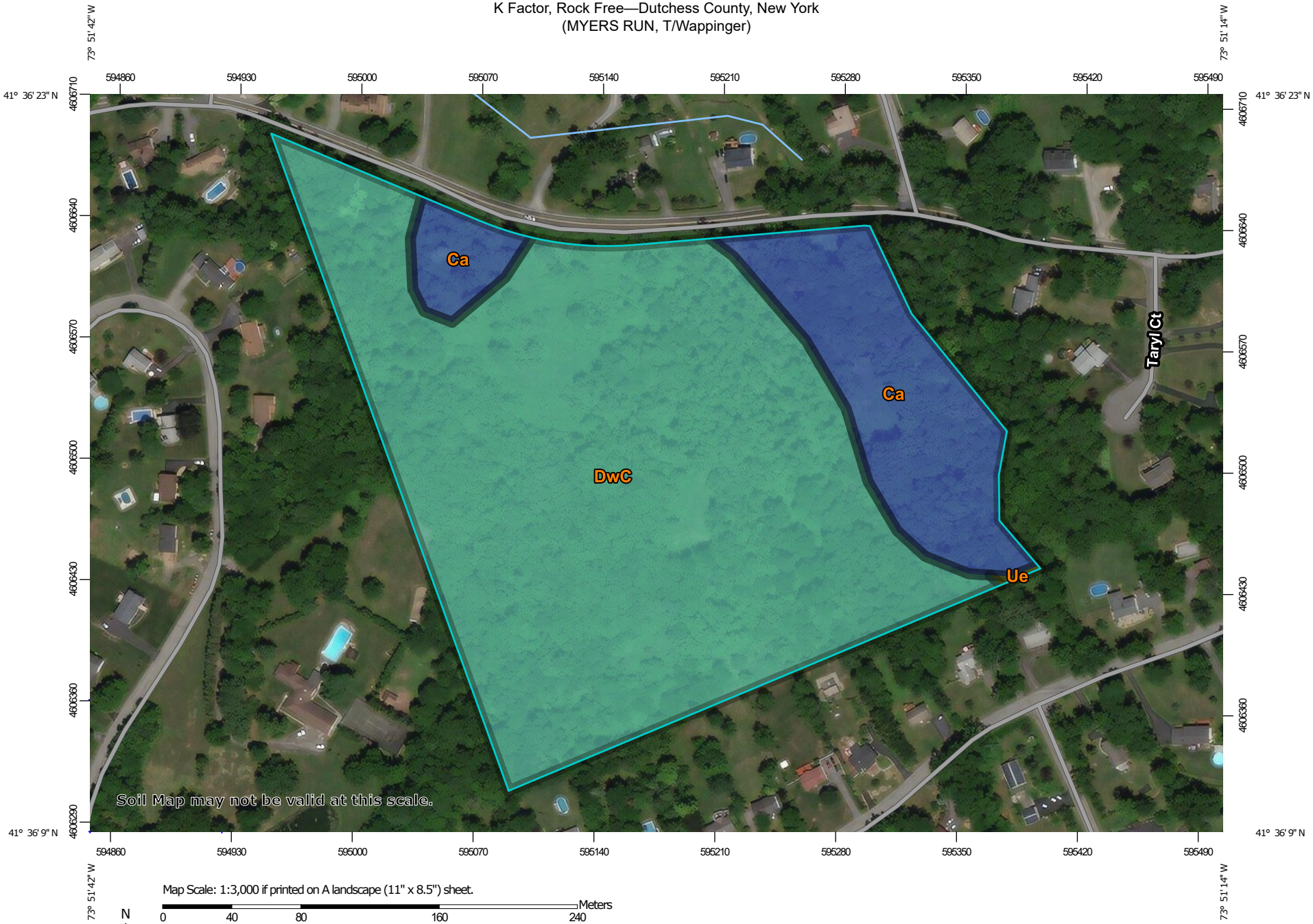
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

K Factor, Rock Free—Dutchess County, New York
(MYERS RUN, T/Wappinger)



Map Scale: 1:3,000 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

.02
.05
.10
.15
.17
.20
.24
.28
.32
.37
.43
.49
.55
.64
Not rated or not available

Soil Rating Lines

.02
.05
.10
.15
.17
.20
.24
.28
.32
.37
.43
.49
.55
.64
Not rated or not available

Soil Rating Points

.02
.05
.10
.15
.17
.20
.24
.28
.32
.37
.43
.49
.55
.64
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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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)

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

Soil Survey Area: Dutchess County, New York
Survey Area Data: Version 17, Jun 11, 2020

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

Date(s) aerial images were photographed: Oct 7, 2013—Feb 26, 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.

K Factor, Rock Free

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Ca	Canandaigua silt loam, neutral substratum	.49	4.5	19.6%
DwC	Dutchess-Cardigan complex, rolling, rocky	.32	18.4	80.3%
Ue	Udorthents, wet substratum	.20	0.0	0.1%
Totals for Area of Interest			**22.9**	**100.0%**

Description

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

"Erosion factor Kf (rock free)" indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Factor K does not apply to organic horizons and is not reported for those layers.

Rating Options

Aggregation Method: Dominant Condition

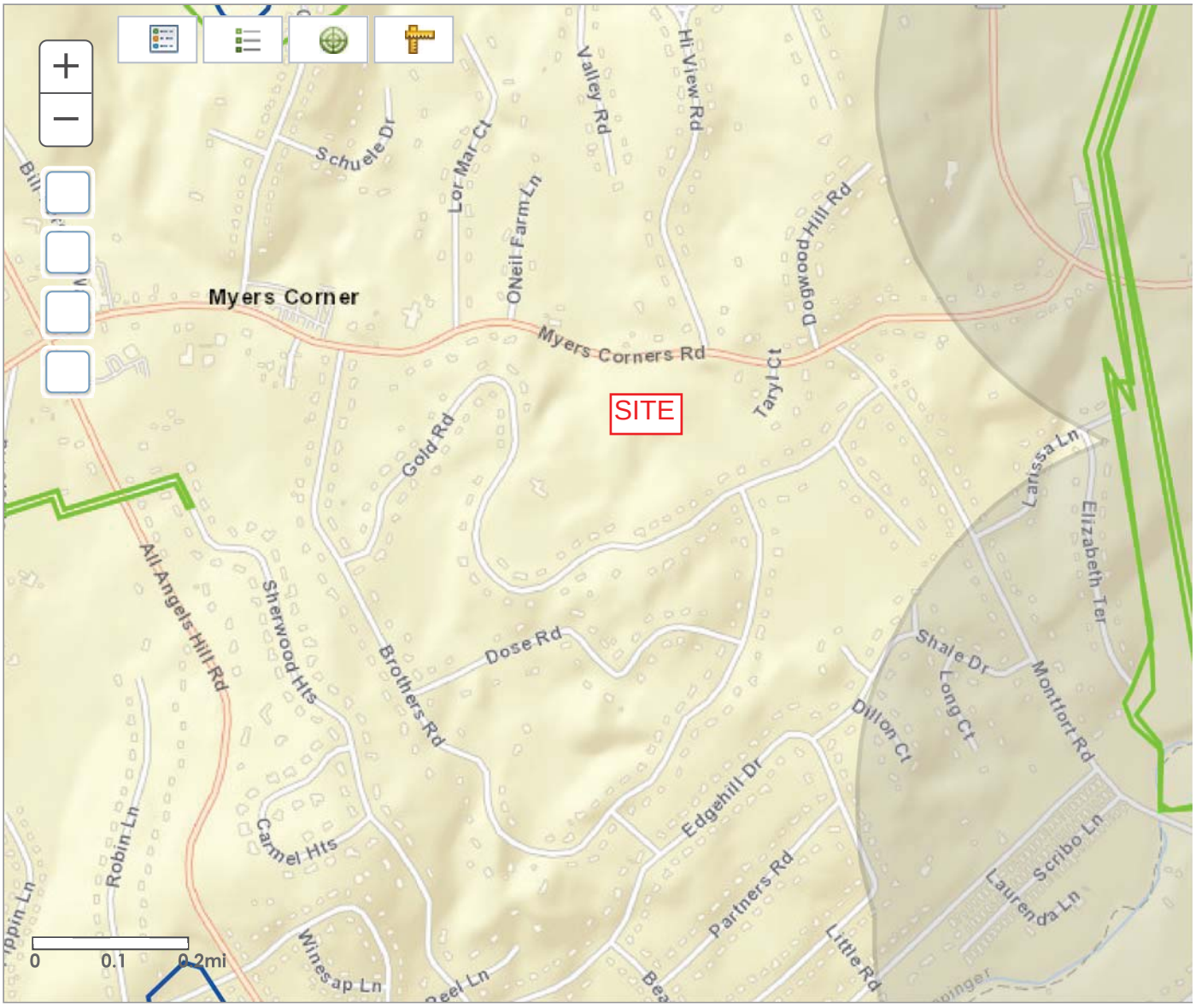
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)

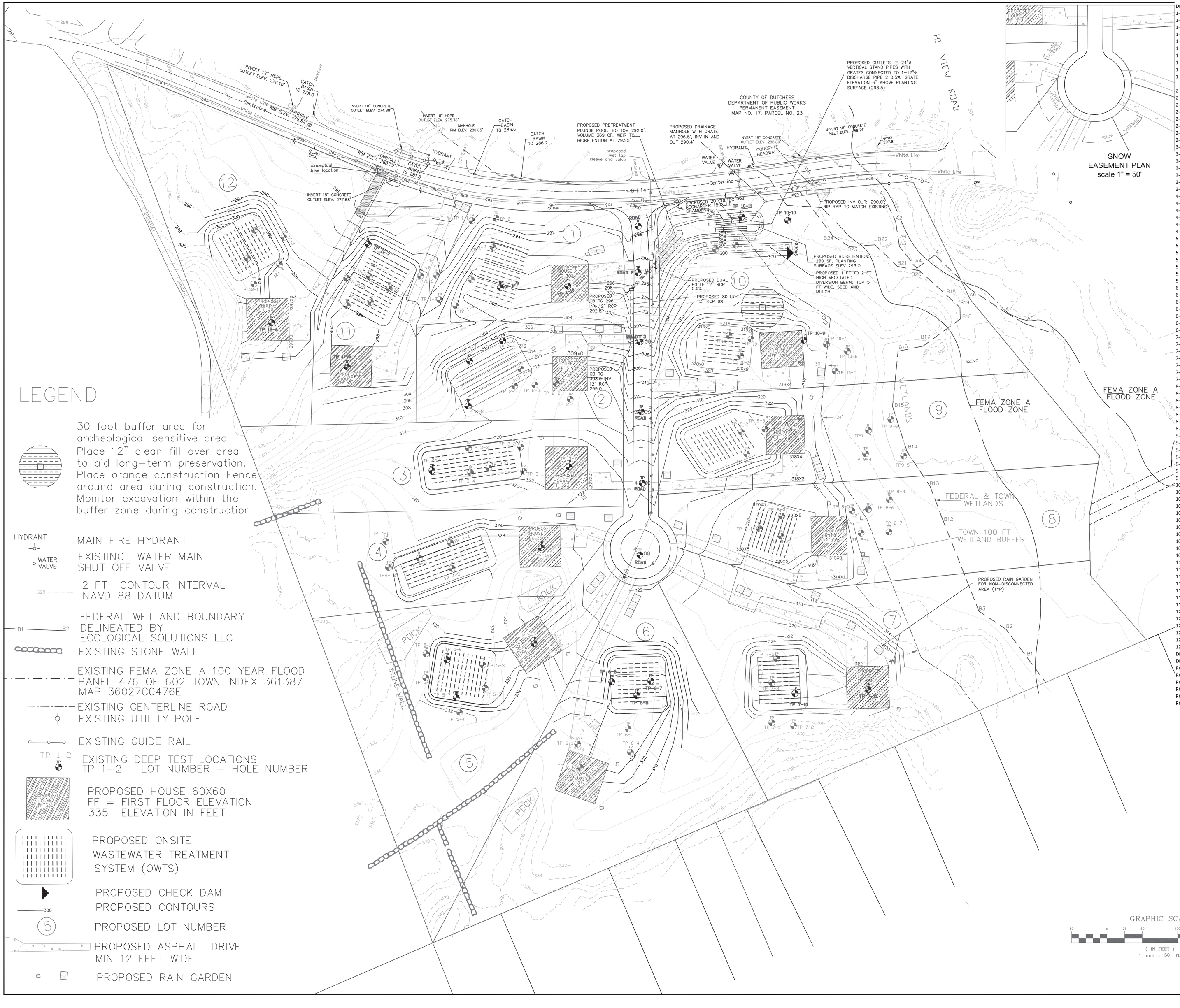
CRIS Cultural Resource Information System

HOME SUBMIT SEARCH COMMUNICATE



APPENDIX 2
STORMWATER, EROSION AND SEDIMENT CONTROL PLAN AND DETAILS

3	Subdivision Grading Plan
7	Erosion and Sediment Control Plan
8	Site Details
10	Erosion Control Details



SNOW EASEMENT PLAN
scale 1" = 50'

DEEP TEST	DEPTH	ROCK	WATER	SOIL TYPE
1-1	0	0		ROCK
1-2	4.2	4.2	NA	GRAVEL SILT LOAM
1-3	3.95	3.95	NA	GRAVEL SILT LOAM
1-4	5.1	5.1	NA	GRAVEL SILT LOAM
1-5	0	0	NA	ROCK
1-6	0	0	NA	ROCK
1-7	3.5	3.5	NA	GRAVEL SILT LOAM
1-8	1.5	1.5	NA	SILT LOAM
1-9	3.5	3.5	NA	GRAVEL SILT LOAM
1-10	2.5	2.5	NA	GRAVEL SILT LOAM
2-1	2.9	2.9		GRAVEL SILT LOAM
2-2	2.8	2.8	NA	GRAVEL SILT LOAM
2-3	0	0	NA	ROCK
2-4	3.9	3.9	NA	GRAVEL SILT LOAM
2-5	2.8	2.8	NA	GRAVEL SILT LOAM
2-6	3.2	3.2	NA	GRAVEL SILT LOAM
2-7	4	4	NA	GRAVEL SILT LOAM
2-8	4	4	NA	GRAVEL SILT LOAM
3-1	4.9	4.9	NA	GRAVEL SILT LOAM
3-2	2.9	2.9	NA	GRAVEL SILT LOAM
3-3	4	4	NA	GRAVEL SILT LOAM
3-4	4.4	4.4	NA	GRAVEL SILT LOAM
3-5	5.8	5.8	NA	GRAVEL SILT LOAM
3-6	3	3	3	GRAVEL SILT LOAM
3-7	3.5	3.5	NA	GRAVEL SILT LOAM
4-1	0	0	NA	ROCK
4-2	5.4	5.4	NA	GRAVEL SILT LOAM
4-3	4.3	4.3	NA	GRAVEL SILT LOAM
4-4	3.9	3.9	NA	GRAVEL SILT LOAM
4-5	4	4	NA	GRAVEL SILT LOAM
4-6	2	2	NA	GRAVEL SILT LOAM
5-1	0	0	NA	ROCK
5-2	4.3	4.3	NA	GRAVEL SILT LOAM
5-3	2	2	NA	GRAVEL SILT LOAM
5-4	0	0	NA	GRAVEL SILT LOAM
5-5	4.9	4.9	NA	GRAVEL SILT LOAM
5-6	5.1	5.1	NA	GRAVEL SILT LOAM
5-7	2.5	2.5	NA	GRAVEL SILT LOAM
6-1	3.9	3.9	NA	GRAVEL SILT LOAM
6-2	1.2	1.2	NA	GRAVEL SILT LOAM
6-4	0	0	NA	GRAVEL SILT LOAM
6-5	0	0	NA	GRAVEL SILT LOAM
6-6	2.5	2.5	NA	GRAVEL SILT LOAM
6-7	3.6	3.6	NA	GRAVEL SILT LOAM
6-8	2.2	2.2	NA	GRAVEL SILT LOAM
7-1	4.5	4.5	NA	GRAVEL SILT LOAM
7-2	5	5	NA	GRAVEL SILT LOAM
7-3	3.5	3.5	NA	GRAVEL SILT LOAM
7-5	3.8	3.8	NA	GRAVEL SILT LOAM
7-9	4.1	4.1	NA	GRAVEL SILT LOAM
7-10	8	8	NA	GRAVEL SILT LOAM
7-11	8	8	NA	GRAVEL SILT LOAM
8-1	2.8	2.85	NA	GRAVEL SILT LOAM
8-2	5.7	5.7	3.2	GRAVEL SILT LOAM
8-3	4.8	4.8	NA	GRAVEL SILT LOAM
8-4	2.5	2.5	NA	GRAVEL SILT LOAM
8-5	0	0	3.2	ROCK
8-7	2.5	2.5	NA	GRAVEL SILT LOAM
8-8	0	0	NA	GRAVEL SILT LOAM
9-1	3	3	NA	GRAVEL SILT LOAM
9-2	2	2	NA	GRAVEL SILT LOAM
9-3	4.8	4.8	NA	GRAVEL SILT LOAM
9-4	4	4	2.7	GRAVEL SILT LOAM
9-5	4.5	4.5	1.4	GRAVEL SILT LOAM
9-6	6.2	6.2	3.2	GRAVEL SILT LOAM
9-7	6	6	5.1	GRAVEL SILT LOAM
10-1	6.3	6.3	NA	GRAVEL SILT LOAM
10-2	6.1	6.1	NA	GRAVEL SILT LOAM
10-3	5.1	5.1	NA	GRAVEL SILT LOAM
10-4	6.6	6.6	NA	GRAVEL SILT LOAM
10-5	6.5	6.5	NA	GRAVEL SILT LOAM
10-6	5.6	5.6	NA	GRAVEL SILT LOAM
10-7	6.8	6.8	NA	GRAVEL SILT LOAM
10-8	5.8	5.8	NA	GRAVEL SILT LOAM
10-9	9	9	NA	GRAVEL SILT LOAM
10-10	5	5	NA	GRAVEL SILT LOAM
10-11	3.5	3.5	NA	GRAVEL SILT LOAM
11-1	2.75	2.75	NA	GRAVEL SILT LOAM
11-2	3.8	3.8	NA	GRAVEL SILT LOAM
11-3	3	3	NA	GRAVEL SILT LOAM
11-4	2	2	NA	GRAVEL SILT LOAM
11-5	2	2	NA	GRAVEL SILT LOAM
11-6	3.5	3.5	NA	GRAVEL SILT LOAM
11-7	7	7	NA	GRAVEL SILT LOAM
12-1	5.1	5.1	NA	GRAVEL SILT LOAM
12-2	0	0	NA	GRAVEL SILT LOAM
12-3	4.3	4.3	NA	GRAVEL SILT LOAM
12-4	4.8	4.8	NA	GRAVEL SILT LOAM
12-5	0	0	NA	ROCK
12-6	8	NA	NA	GRAVEL SILT LOAM
DRIVE 1	3.5	3.5	NA	GRAVEL SILT LOAM
DRIVE 2	4	4	NA	GRAVEL SILT LOAM
ROAD 1	5.5	5.5	5	GRAVEL SILT LOAM
ROAD 2	7	7	7	GRAVEL SILT LOAM
ROAD 3	6.5	8	NA	GRAVEL SILT LOAM
ROAD 4	7	7	7	GRAVEL SILT LOAM
ROAD 5	6	6	5	GRAVEL SILT LOAM
ROAD 6	5.5	5.5	NA	GRAVEL SILT LOAM

LEGEND

30 foot buffer area for archeological sensitive area Place 12" clean fill over area to aid long-term preservation. Place orange construction Fence around area during construction. Monitor excavation within the buffer zone during construction.

HYDRANT — MAIN FIRE HYDRANT

WATER VALVE — EXISTING WATER MAIN SHUT OFF VALVE

328 — 2 FT CONTOUR INTERVAL NAVD 88 DATUM

B1 — B2 — FEDERAL WETLAND BOUNDARY DELINEATED BY ECOLOGICAL SOLUTIONS LLC

EXISTING STONE WALL

EXISTING FEMA ZONE A 100 YEAR FLOOD PANEL 476 OF 602 TOWN INDEX 361387 MAP 36027C0476E

EXISTING CENTERLINE ROAD

EXISTING UTILITY POLE

EXISTING GUIDE RAIL

TP 1-2 — EXISTING DEEP TEST LOCATIONS TP 1-2 LOT NUMBER - HOLE NUMBER

PROPOSED HOUSE 60X60 FF = FIRST FLOOR ELEVATION 335 ELEVATION IN FEET

PROPOSED ONSITE WASTEWATER TREATMENT SYSTEM (OWTS)

PROPOSED CHECK DAM

300 — PROPOSED CONTOURS

5 — PROPOSED LOT NUMBER

PROPOSED ASPHALT DRIVE MIN 12 FEET WIDE

PROPOSED RAIN GARDEN

Date	Sheet
01/25/21	SH 3 OF 10

REVISIONS

REVISION	DATE		BY
1	05/10/21	revised sewage	JPB
2	06/17/21	revised drainage	JPB
3	07/07/21	revised drainage	JPB
4	08/18/22	add additional cb & bioretention chambers	MKZ

SUBDIVISION GRADING PLAN

MYERS RUN
MYERS CORNERS ROAD
TOWN OF WAPPINGER
NY

STATE OF NEW YORK · JOSEPH PAUL BERGER · N.Y. LICENSE · LICENSED PROFESSIONAL ENGINEER

BERGER ENGINEERING AND SURVEYING
100 FULTON AVE.
POUGHKEEPSIE N.Y. 12603
(845) 471 - 7383
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GENERAL NOTES FOR EROSION AND SEDIMENT CONTROL

1. 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 SOIL DISTURBANCE, AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.

2. 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 SILT FENCES SHALL BE CLOSELY MONITORED AND SHALL BE REMOVED PROMPTLY WHEN MAXIMUM LEVELS ARE REACH OR WHEN 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.

3. THE LOCATION AND INSTALLATION TIMES OF THE SEDIMENT CAPTURING DEVICES SHALL BE ORDERED BY THE ENGINEER, AND IN ACCORDANCE WITH THE STANDARDS SET FORTH IN THIS PLAN.

4. ALL TOPSOIL NOT TO BE USED FOR FINAL GRADING SHALL BE REMOVED FROM THE SITE IMMEDIATELY AND PLACED IN A STABILIZED STOCKPILE OR FILL AREA. ALL TOP SOIL THAT IS REQUIRED FOR FINAL GRADING AND STORED ON THE SITE SHALL BE LIMED, FERTILIZED, AND TEMPORARILY SEEDED AND MULCHED WITHIN 14 DAYS.

5. ANY DISTURBED AREAS THAT WILL BE LEFT EXPOSED FOR MORE THEN 21 DAYS AND NOT SUBJECT TO CONSTRUCTION TRAFFIC, SHALL IMMEDIATELY RECEIVE TEMPORARY SEEDING. MULCH SHALL BE USED IF THE SEASON PREVENTS THE ESTABLISHMENT OF COVER. DISTURBED AREAS SHALL BE LIMED AND FERTILIZED PRIOR TO TEMPORARY SEEDING.

6. THE CONTRACTOR SHALL KEEP THE ROADWAYS WITHIN THE PROJECT AREA CLEAR OF SOIL AND DEBRIS AND IS RESPONSIBLE FOR ANY STREET CLEANING NECESSARY DURING THE COURSE OF THE PROJECT.

7. SEDIMENT AND EROSION CONTROL DEVICES SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE DRAINAGE AREA HAS BEEN PROPERLY STABILIZED BY PERMANENT MEASURES.

8. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF "NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL".

EROSION CONTROL SEQUENCE

1. THE SITE OWNER OR AUTHORIZED REPRESENTATIVE SHALL BE RESPONSIBLE CHECKING ON CONTRACTORS MAINTENANCE OF EROSION AND SEDIMENT CONTROL PRACTICES.

2. CONTACT SITE CIVIL ENGINEER INSPECTION OF EROSION CONTROL MEASURES BEFORE STARTING ANY SITE CONSTRUCTION.

3. ESTABLISH LIMITS OF DISTURBANCE FOR PROPOSED CONSTRUCTION.

4. INSTALLATION OF SILT FENCE AS SHOWN OR NEEDED TO CAPTURE SEDIMENT FROM PROPOSED CONSTRUCTION. SILT FENCE SHALL BE INSTALLED PER THE ACCEPTED EROSION AND SEDIMENT CONTROL PLAN AS WELL AS IN LOCATIONS DEEMED NECESSARY DURING CONSTRUCTION INSPECTIONS OF THE SITE. SILT FENCE SHALL BE INSTALLED ALONG THE CONTOURS.

5. INSTALL SILT FENCE OR CONSTRUCTION FENCE AROUND AREAS TO BE BIORETENTION OR RAIN GARDENS TO PROTECT FROM DISTURBANCE AND COMPACTION DURING CONSTRUCTION. IF AREAS FOR BIORETENTION OR RAIN GARDENS IS DISTURBED, SOIL RESTORATION WILL BE REQUIRED.

6. PERFORM GRADING, EXCAVATION, AND RELATED CONSTRUCTION ACTIVITIES. TOPSOIL SHALL BE REMOVED FROM CUT AREAS AND STORED ON APPLICABLE LOCATIONS SO AS NOT TO INTERFERE WITH THE FILLING OPERATIONS AND TO PROTECT THE WETLANDS. LOCATIONS FOR TOPSOIL STOCKPILES ARE SHOWN ON THE EROSION CONTROL PLAN.

7. CONTRACTOR SHALL PERFORM DAILY INSPECTION AND REPAIR OF EROSION AND SEDIMENT CONTROL PRACTICES. WEEKLY INSPECTION OF SITE BY THE OWNER WITH ALL RECOMMENDATIONS IMPLEMENTED IMMEDIATELY.

8. ONCE AN AREA IS CUT OR FILLED, IT SHALL BE STABILIZED BY SEEDING AND MULCHING.

9. AS CONSTRUCTION PROCEEDS, ALL DISTURBED AREAS SHALL BE PAVED, SEEDED, OR PLANTED AS SPECIFIED ON THE PLANS IN A TIMELY MANNER TO PREVENT UNNECESSARY EROSION.

10. AFTER UPSLOPE AREAS ARE PERMANENTLY STABILIZED OR DISTURBANCE OF BIORETENTION OR RAIN GARDEN AREAS IS COMPLETE, CONSTRUCT BIORETENTION OR RAIN GARDENS.

11. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, UPON STABILIZATION OF SITE SOILS, TEMPORARY EROSION CONTROL DEVICES SHALL BE REMOVED.

EROSION CONTROL INSTALLATION AND MAINTENANCE

I. INTRODUCTION
THE PURPOSE OF THIS PLAN IS TO OUTLINE PROCEDURES FOR MAINTAINING THE EROSION CONTROL STRUCTURES CONSTRUCTED ON THE SITE. THE TYPE OF STRUCTURES FOR THIS SITE WILL BE TEMPORARY FOR USE DURING CONSTRUCTION.

II EROSION CONTROL STRUCTURES
SILT FENCE STRUCTURES WILL BE USED TO MINIMIZE SOIL EROSION DURING THE CONSTRUCTION PHASE OF THE PROJECT. IN ORDER FOR THE EROSION CONTROL STRUCTURES TO WORK PROPERLY THEY MUST BE INSTALLED PROPERLY AND MAINTAINED. INSPECTIONS SHALL BE PERFORMED PERIODICALLY AS STATED BELOW AND SHALL BE PERFORMED AFTER ANY MAJOR STORM EVENT. SILT FENCE TO BE INSTALLED PARALLEL WITH CONTOURS.

III INSTALLATION GUIDELINES

IN ORDER TO ASSURE THAT THE EROSION CONTROL STRUCTURES WILL WORK THERE MUST BE AN ASSURANCE THAT THEY ARE INSTALLED PROPERLY. IN ORDER TO ACCOMPLISH THIS ALL EROSION CONTROL MUST BE INSTALLED AS PER THE DETAILS ON THIS PLAN. THE EROSION CONTROL SHALL BE INSPECTED BY BY A PROFESSIONAL ENGINEER OR CERTIFIED PROFESSIONAL. NO WORK SHALL BE STARTED ON THE SITE UNTIL THE EROSION CONTROL IS IN PLACE AND ACCEPTED.

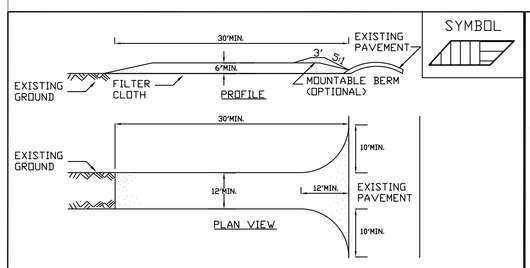
IV. MAINTENANCE PLAN FOR EROSION CONTROL DEVICES
1. TEMPORARY EROSION CONTROL DEVICES
THESE STRUCTURES SHALL INCLUDE ALL EROSION CONTROL DEVICES THAT WILL BE INSTALLED AND UTILIZED DURING THE CONSTRUCTION OF THE SITE. THESE SHALL INCLUDE DEVICES SUCH AS SILT FENCES, STOCK PILES, AND CHECK DAMS.
A. ALL EROSION CONTROL DEVICES SHALL BE MAINTAINED IN GOOD WORKING ORDER; IF A REPAIR IS NECESSARY, IT WILL BE INITIATED WITHIN 24 HOURS OF REPORT.
3. BUILT UP SEDIMENT WILL BE REMOVED FROM SILT FENCE WHEN IT HAS REACHED ONE-THIRD THE HEIGHT OF THE FENCE
4. SILT FENCE WILL BE INSPECTED FOR DEPTH OF SEDIMENT , TEARS, TO SEE IF THE FABRIC IS SECURELY ATTACHED TO THE FENCE POST, AND TO SEE THAT THE FENCE POST ARE FIRMLY IN THE GROUND.
5. TEMPORARY SEEDING WILL BE INSPECTED FOR BARE SPOTS, WASHOUTS, AND HEALTHY GROWTH.
6. ALL INDIVIDUALS PERFORMING THE SITE INSPECTION SHALL BE FAMILIAR WITH THE EROSION CONTROL PLAN AND BE TRAINED IN ALL THE INSPECTION AND MAINTENANCE PRACTICES NECESSARY FOR KEEPING THE EROSION AND SEDIMENT CONTROLS USED ONSITE IN GOOD WORKING CONDITION.

SEEDING AND MULCHING

ANY DISTURBED AREAS THAT WILL BE LEFT EXPOSED FOR MORE THAN 21 DAYS AND NOT SUBJECT TO CONSTRUCTION TRAFFIC, SHALL IMMEDIATELY RECEIVE SEEDING AND MULCHING. DISTURBED AREAS SHALL BE LIMITED AND BE COVER WITH A LAYER OF TOPSOIL PRIOR TO SEEDING. SEEDING WILL BE INSPECTED FOR BARE SPOTS, WASH OUTS, AND HEALTHY GROWTH. IF REQUIRED ADDITIONAL SEEDING SHALL BE PERFORMED. THE SEED MIX SPECIFIED FOR THIS SITE IS FROM THE NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL, TABLE 3.2 (SITE CHOICE 1A) WHICH IS AS FOLLOWS:

	Pure Live Seed Values	
SPECIES (% by weight)	lbs/1000SF	lbs/acre
50% perennial ryegrass	1.5 – 2.0	65 – 87
50% Kentucky bluegrass blend	1.5 – 2.0	65 – 88
	3.0 – 4.0	130 – 175

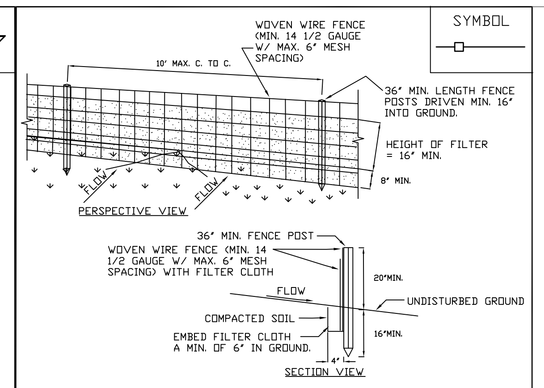
OR USE SEED MIX SPECIFIED BY SITE ARCHITECT OR LANDSCAPE ARCHITECT.



CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – USE 2" 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. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, 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.

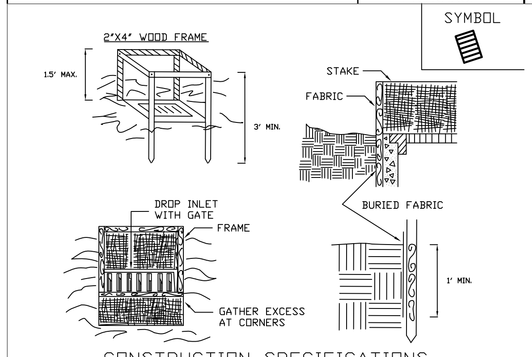
STABILIZED CONSTRUCTION ENTRANCE



CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 12 1/2 GAUGE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

SILT FENCE



CONSTRUCTION SPECIFICATIONS

1. FILTER FABRIC SHALL HAVE AN EOS OF 40-85. BURLAP MAY BE USED FOR SHORT TERM APPLICATIONS.
2. CUT FABRIC FROM A CONTINUOUS ROLL TO ELIMINATE JOINTS. IF JOINTS ARE NEEDED THEY WILL BE OVERLAPPED TO THE NEXT STAKE.
3. STAKE MATERIALS WILL BE STANDARD 2" x 4" WOOD OR EQUIVALENT. METAL WITH A MINIMUM LENGTH OF 3 FEET.
4. SPACE STAKES EVENLY AROUND INLET 3 FEET APART AND DRIVE A MINIMUM 18 INCHES DEEP. SPANS GREATER THAN 3 FEET MAY BE BRIDGED WITH THE USE OF WIRE MESH BEHIND THE FILTER FABRIC FOR SUPPORT.
5. FABRIC SHALL BE EMBEDDED 1 FOOT MINIMUM BELOW GROUND AND BACKFILLED. IT SHALL BE SECURELY FASTENED TO THE STAKES AND FRAME.
6. A 2" x 4" WOOD FRAME SHALL BE COMPLETED AROUND THE CREST OF THE FABRIC FOR OVER FLOW STABILITY.

MAXIMUM DRAINAGE AREA 1 ACRE

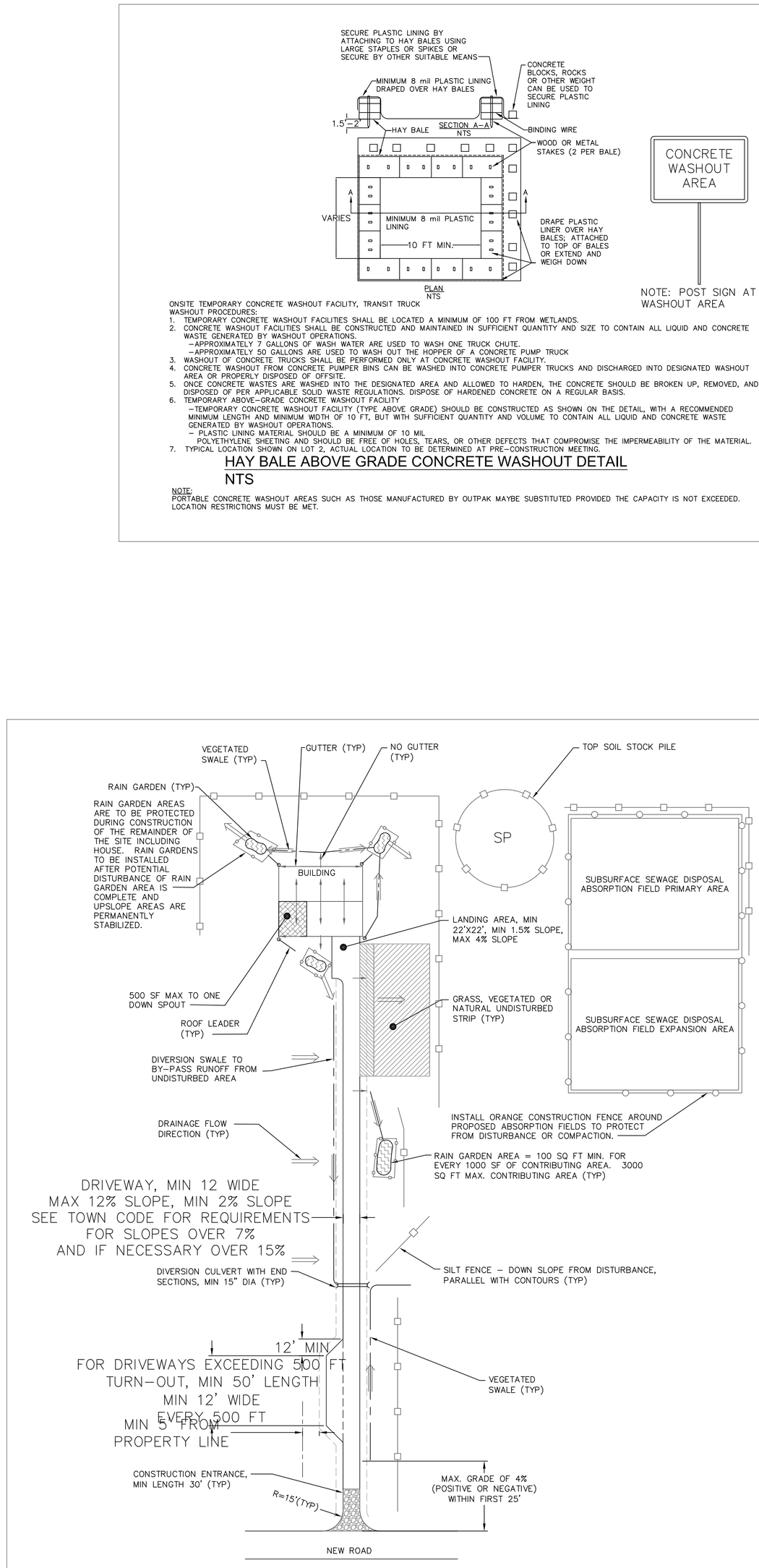
FILTER FABRIC DROP INLET PROTECTION

CONSTRUCTION SPECIFICATIONS

1. ALL GRADED OR DISTURBED AREAS INCLUDING SLOPES SHALL BE PROTECTED DURING CLEARING AND CONSTRUCTION IN ACCORDANCE WITH THE APPROVED SEDIMENT CONTROL PLAN UNTIL THEY ARE PERMANENTLY STABILIZED.
2. ALL SEDIMENT CONTROL PRACTICES AND MEASURES SHALL BE CONSTRUCTED, APPLIED AND MAINTAINED IN ACCORDANCE WITH THE APPROVED SEDIMENT CONTROL PLAN AND THE "STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL IN DEVELOPING AREAS".
3. TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED IN AMOUNT NECESSARY TO COMPLETE FINISHED GRADING OF ALL EXPOSED AREAS.
4. AREAS TO BE FILLED SHALL BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS OR OTHER OBJECTIONABLE MATERIAL.
5. AREAS WHICH ARE TO BE TOPSOILED SHALL BE SCARIFIED TO A MINIMUM DEPTH OF FOUR INCHES PRIOR TO PLACEMENT OF TOPSOIL.
6. ALL FILLS SHALL BE COMPACTED AS REQUIRED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES AND CONDUITS, ETC. SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.
7. ALL FILL TO BE PLACED AND COMPACTED IN LAYERS NOT TO EXCEED 9 INCHES IN THICKNESS.
8. EXCEPT FOR APPROVED LANDFILLS, FILL MATERIAL SHALL BE FREE OF FROZEN PARTICLES, BRUSH, ROOTS, SOD, OR OTHER FOREIGN OR OTHER OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY FILLS.
9. FROZEN MATERIALS OR SOFT, MUCKY OR HIGHLY COMPRESSIBLE MATERIALS SHALL NOT BE INCORPORATED IN FILLS.
10. FILL SHALL NOT BE PLACED ON SATURATED OR FROZEN SURFACES.
11. ALL BENCHES SHALL BE KEPT FREE OF SEDIMENT DURING ALL PHASES OF DEVELOPMENT.
12. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE HANDLED IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION FOR SUBSURFACE DRAIN OR OTHER APPROVED METHOD.
13. ALL GRADED AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY FOLLOWING FINISHED GRADING.
14. STOCKPILES, BORROW AREAS AND SPOIL AREAS SHALL BE SHOWN ON THE PLANS AND SHALL BE SUBJECT TO THE PROVISIONS OF THIS STANDARD AND SPECIFICATION.

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

LANDGRADING SPECIFICATIONS



TYPICAL LOT STORM WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL PLAN
NOT TO SCALE

POST CONSTRUCTION STORMWATER OPERATION AND MAINTENANCE

A. VEGETATED SWALE (NYSDEC SMDM 5.3.3)

A VEGETATED SWALE IS AN OPEN, VEGETATED CHANNEL OR DEPRESSION EXPLICITLY DESIGNED TO DETAIN AND PROMOTE THE INFILTRATION OF STORMWATER RUNOFF INTO THE UNDERLYING SOILS. THE AMOUNT OF RUNOFF REDUCTION IS DEPENDENT TO THE UNDERLYING SOIL. FOR SYSTEMS IN HYDRAULIC SOIL GROUPS A AND B, A REDUCTION VALUE OF 20% MAY BE USED. C AND D SOILS ARE ALLOWED A 10% REDUCTION UNLESS THE SOIL IS MODIFIED. FOR MODIFIED C SOILS, A 15% REDUCTION IS ALLOWED. FOR MODIFIED D SOILS, A 12% REDUCTION IS ALLOWED.

LANDSCAPING

LANDSCAPING OF THE SWALE WILL INVOLVE GRASS SEEDING IN COMPLIANCE WITH THE STANDARDS OUTLINED ON THE EROSION AND SEDIMENT CONTROL PLAN FOR THIS SITE.

CHECK DAMS

WHERE SWALE SLOPES ARE GREATER THAN 4% OR WHERE ADDITIONAL DETENTION IS DESIRED, STONE CHECK DAMS CAN BE INSTALLED TO SLOW DOWN THE FLOW AND PROVIDE DETENTION. THIS WILL ALSO ALLOW FOR GREATER INFILTRATION AND TREATMENT. (NO CHECK DAMS PROPOSED FOR THIS PROJECT UNLESS ORDERED BY ENGINEER DURING CONSTRUCTION.)

MAINTENANCE

SEDIMENT BUILD-UP WITHIN THE BOTTOM OF THE CHANNEL SHALL BE REMOVED WHEN SEDIMENT DEPTH REACHES 2 INCHES. VEGETATION SHOULD BE MOWED AS REQUIRED DURING THE GROWING SEASON TO MAINTAIN GRASS HEIGHTS BETWEEN 4 AND 6 INCHES. MOWING TO BE DONE BY LOT OWNER.

FULL INSPECTIONS SHALL TAKE PLACE YEARLY. FULL INSPECTIONS INVOLVE CHECKING FOR SEDIMENT, EROSION, POOR VEGETATION GROWTH AND EXCESSIVE PONDING. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED IN A TIMELY FASHION. REMOVE SEDIMENT BUILD UP.

SWALE ACROSS EACH DRIVEWAY SHALL BE PAVED AND MAINTAINED AS SHOWN ON THE SWPPP, OR IT SHALL BE REWORKED TO CONFORM, AND THAT CERTIFYING THE DRIVEWAY CONSTRUCTION AND MAINTENANCE SHALL BE INCLUDED IN THE ANNUAL REPORT TO THE TOWN.

B SHEET FLOW TO VEGETATED FILTER STRIPS (NYSDEC SMDM 5.3.2)

VEGETATED FILTER STRIPS AND UNDISTURBED NATURAL AREAS ARE USED TO TREAT AND CONTROL RUNOFF. VEGETATED FILTER STRIPS ARE OFTEN MAINTAINED GRASS BUFFERS BETWEEN IMPERVIOUS AREAS AND NATURAL AREAS.

LANDSCAPING

GOOD GRASS OR PLANT COVER CHOSEN FOR THE SOIL AND SUN EXPOSURE. NATURAL COVER IS ALSO ACCEPTABLE.

MAINTENANCE

BARE PATCHES AND DEAD PLANTS SHOULD BE RESEED OR REPLACED AS SOON AS POSSIBLE. AREA OF EROSION SHOULD BE REPAIRED WHEN DISCOVERED. THE RILLS OR CHANNELS FORM, METHODS OF SPREADING THE INFLOW TO RETURN TO SHEET FLOW SHOULD BE INSTALLED. (VEGETATED FILTER STRIPS ARE PROPOSED FOR THIS PROJECT. LAWNS AND UNMOWED AREA WILL ACT AS FILTER STRIPS FOR ADDITIONAL PRETREATMENT BY REMOVING SEDIMENT)

C. LEVEL SPREADER / PERMEABLE BERM

STORMWATER SYSTEM CAPTURES AND TEMPORARILY STORES THE FLOW AND THEN ALLOWS FOR A GRADUAL RELEASE AS SHEET FLOW. THE PERMEABLE BERM IS OFTEN LOCATED AT THE TOE OF SLOPE AND BEFORE VEGETATED FILTER STRIPS, RIPARIAN BUFFERS OR BEFORE LEAVING PROPERTY.

MAINTENANCE
MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE OWNER. FULL INSPECTIONS SHALL TAKE PLACE YEARLY. FULL INSPECTIONS INVOLVE CHECKING ALL COMPONENTS. REMOVAL OF SEDIMENT AND DEBRIS. RESHAPING STONE BERM. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED IN A TIMELY FASHION.

D BIORETENTION AND RAIN GARDENS (NYSDEC SMDM F-5 & 5.3.7)

STORMWATER FILTERING SYSTEMS CAPTURE AND TEMPORARILY STORE THE WATER QUALITY VOLUME AND PASS IT THROUGH A FILTER BED OF SAND, ORGANIC MATTER, OR SOIL SPECIFIED AS A STANDARD PRACTICE IN THE "NEW YORK STATE STORMWATER MANAGEMENT DESIGN MANUAL," A BIORETENTION AREA IS A SHALLOW STORMWATER BASIN OR LANDSCAPED AREA THAT TREATS STORMWATER AS IT FLOWS THROUGH PLANTS AND A SOIL MATRIX. ANY REMAINING STORMWATER IS THEN RETURNED TO THE STORM DRAIN SYSTEM. THE PRACTICE IS OFTEN LOCATED IN PARKING LOT ISLANDS, AND CAN ALSO BE USED TO TREAT OTHER AREAS.

LANDSCAPING: PLANTS FOR THE LANDSCAPING PLAN WILL BE CHOSEN FROM THE NATIVE PLANT LIST IN APPENDIX H OF THE "NYS STORMWATER MANAGEMENT DESIGN MANUAL," A LIST DEVELOPED BY APPLIED ECOLOGICAL SERVICES INC. IN A BROCHURE CALLED "BUILD YOUR OWN RAIN GARDENS," AND/OR A PLANT LIST AVAILABLE THROUGH NATIVE LANDSCAPES IN PAWLING, NY.

MAINTENANCE: TREATMENT AREA PLANTS AND COMPONENTS SHOULD BE REPAIRED OR REPLACED WHEN NEEDED. A 6 INCH STONE DROP SHOULD BE PROVIDED AND MAINTAINED AT ANY PIPE INLET. MULCH SHOULD BE REPLACED ANNUALLY. FULL INSPECTIONS SHALL TAKE PLACE YEARLY. FULL INSPECTIONS INVOLVE CHECKING ALL COMPONENTS OF THE BIORETENTION AREA THOROUGHLY. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED IN A TIMELY FASHION. NO EQUIPMENT SHALL BE DRIVEN ON BIORETENTION OR RAIN GARDEN AREA. HAND TOOLS ONLY.

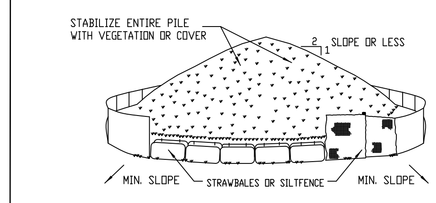
E. ROOFTOP DISCONNECTION (NYSDEC SMDM 5.3.5)

DISCONNECTING ROOFTOPS IS ALLOWING THE RUNOFF FROM ROOFS TO FLOW OVERLAND TO A FILTRATION OR INFILTRATION AREA. THIS ALLOWS FOR THE INITIAL TREATMENT PRIOR TO THE PRACTICE AND SLOWS DOWN THE RUNOFF RATE.

F. SOIL RESTORATION (NYSDEC SMDM 5.1.6)

SOIL RESTORATION IS REQUIRED WHERE SOILS HAVE BEEN DISTURBED AND WILL BE VEGETATED. FOR THIS PROJECT, THE MAJORITY OF THE HEAVY TRAFFIC DISTURBANCE WILL BE IN AREAS THAT WILL BE BUILDING OR PARKING AREA. MINIMAL SOIL DISTURBANCE WILL OCCUR IN PROPOSED VEGETATED AREAS. THE COMMON PRACTICE IN PREPARING AN AREA FOR LANDSCAPE IS TO LOOSEN THE SOIL AND APPLY TOPSOIL. THE NATIVE SOIL IN BIORETENTION AREAS IS REMOVED AND REPLACED WITH ENHANCED SOIL. THE NEED FOR FULL SOIL RESTORATION IS NOT WARRANTED FOR THE DISTURBED, PROPOSED VEGETATED AREAS. IF EXCESSIVE COMPACTION OCCURS DURING CONSTRUCTION, MITIGATION INCLUDING, BUT NOT LIMITED TO DEEP RIPPING AND DE-COMPACTION AS OUTLINED IN THE NYSDEC STORMWATER MANUAL, SECTION 5.1.6, MAY BE ORDERED BY THE SITE ENGINEER.

SYMBOL (SP)



INSTALLATION NOTES

1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 1:2.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH EITHER SILT FENCING OR STRAWBALES, THEN STABILIZED WITH VEGETATION OR COVERED.
4. SEE SPECIFICATIONS (THIS MANUAL) FOR INSTALLATION OF SILTFENCE.

STOCK PILE

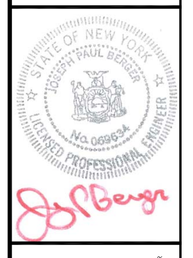
REVISION	DATE	REVISIONS	BY
1	00/00/21	revised swales	JSB
2	00/00/21	revised swales	JSB
3	02/02/22	revised swales	JSB
4	02/18/22	update additional ds and bio chambers	MKZ

Date 01/5/21

Sheet SH 7 of 10

DETAILS FOR EROSION CONTROL

MYERS RUN
MYERS CORNERS ROAD
TOWN OF WAPPINGER NY



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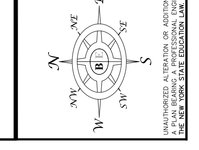
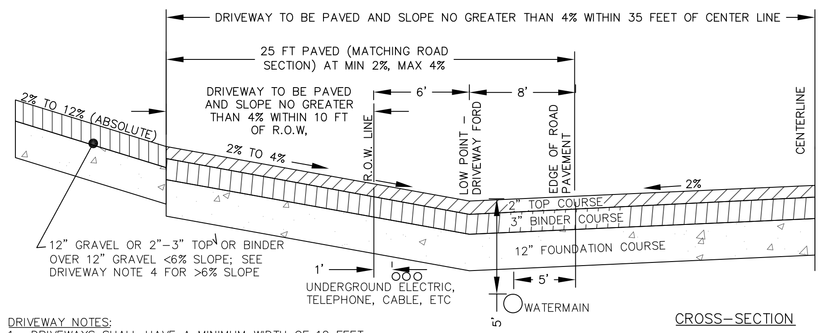
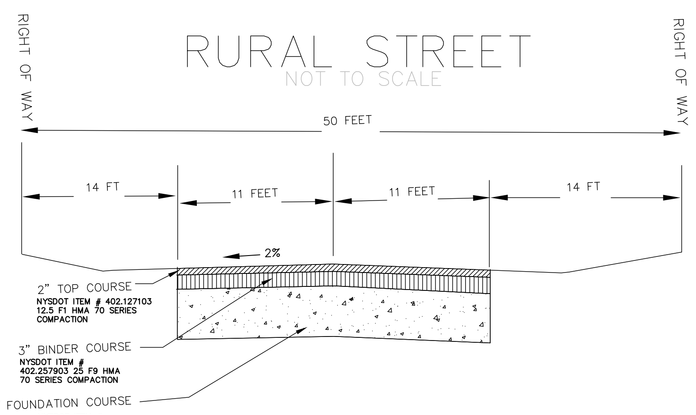
bergerengg@gmail.com

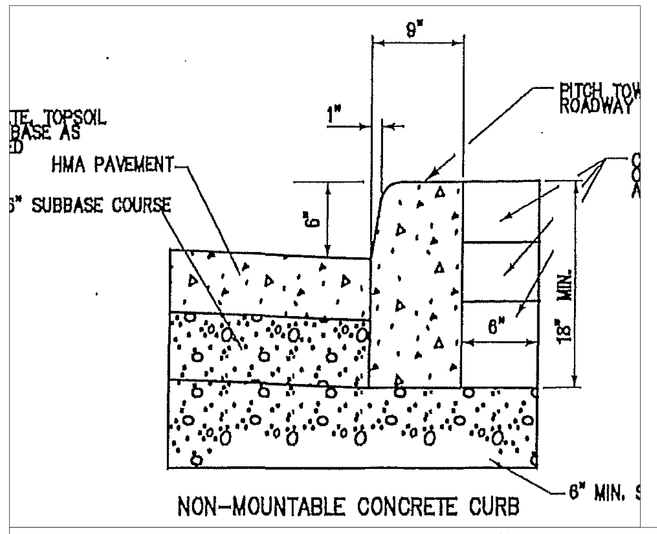


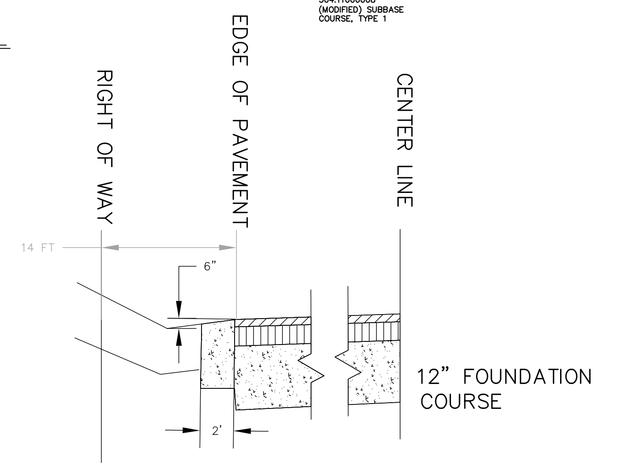


DRIVEWAY NOTES:
1. DRIVEWAYS SHALL HAVE A MINIMUM WIDTH OF 12 FEET.
2. GRADE WITHIN 25 FEET OF EDGE OF ROAD SHALL BE NO LESS THAN 2% AND NO GREATER THAN 4% (ABSOLUTE)
3. FIRST 25 FEET SHALL BE PAVED AS PER ROAD SECTION.
4. ANY DRIVEWAY WITH A GRADE OF 6% OR GREATER SHALL BE PAVED IN ITS ENTIRETY. PAVEMENT SECTION BEYOND FIRST 25 FEET SHALL BE 3" COMPACTED TOP OR BINDER ASPHALT OVER 12" COMPACTED SUBBASE
5. MAXIMUM GRADE BEYOND FIRST 25 FEET FROM EDGE OF ROAD IS 12%

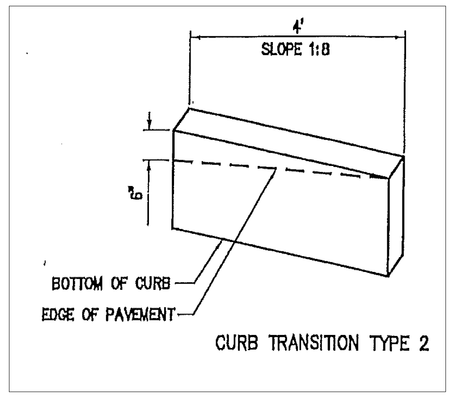
DRIVEWAY INTERSECTION DETAIL
NOT TO SCALE







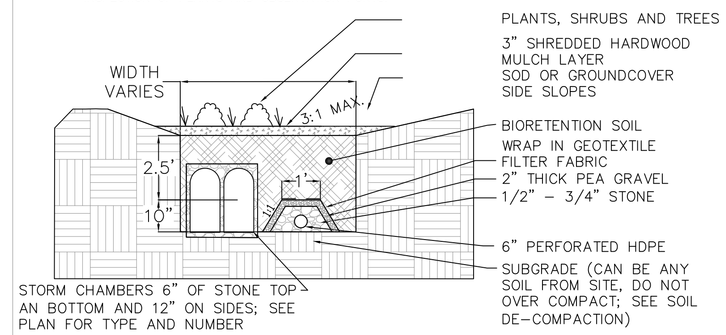
SHOULDER DETAIL
NOT TO SCALE



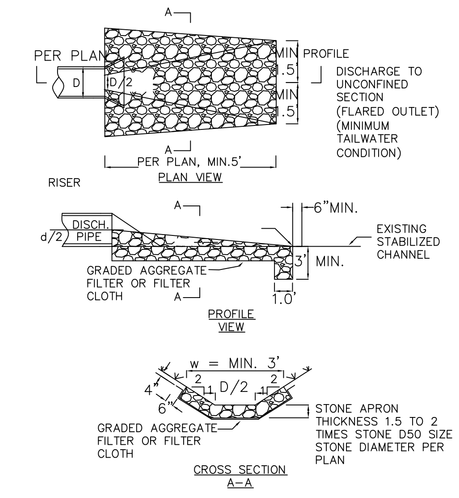
BIORETENTION PLANTING SCHEDULE

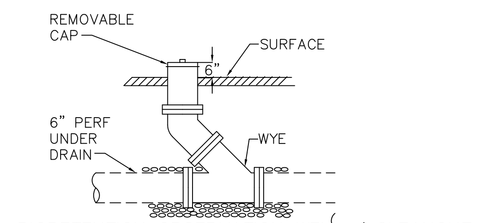
Abbrev.	Scientific Name	Common Name	Min Planting Size	Spacing
Shrubs				
CA	Clethra alnifolia	Sweet Pepperbush	18" Tubling	5 ft o.c.
CS	Cornus stolonifera	Red-Osier Dogwood	18" Tubling	5 ft o.c.
HV	Hamemelis virginiana	Witch Hazel	18" Tubling	5 ft o.c.
IV	Ilex verticillata	Winterberry	18" Tubling	5 ft o.c.
VD	Viburnum dentatum	Arrowwood	18" Tubling	5 ft o.c.
Herbaceous				
AG	Andropogon geradi	Big Bluestem	SP #4	2 ft o.c.
AN	Aster novae-angliae	New England Aster	SP #4	2 ft o.c.
EM	Eupatorium maculatum	Spotted Joe-Pye Weed	SP #4	2 ft o.c.
LC	Lobelia cardinalis	Cardinal flower	SP #4	2 ft o.c.
LS	Lobelia siphatica	Great Blue Lobelia	SP #4	2 ft o.c.
MF	Monarda fistulosa	Wild Bergamot	SP #4	2 ft o.c.
MW	Asclepias (Native varieties)	Milkweed	Plug	2 ft o.c.
PV	Panicum virgatum	Swicth Grass	Plug	2 ft o.c.

NOTES:
1. PLANT THROUGHOUT BIORETENTION AREA IN VARIED, MIXED ARRANGEMENTS WITH CONSIDERATION OF PLANT GROWTH SIZES, COLORS AND APPEARANCE.
2. IF LARGER PLANTS ARE PLANTED, SPACING CAN INCREASE PROPORTIONALLY.
3. OTHER NATIVE, NON-INVASIVE PLANTS MAY BE USED WITH APPROVAL BY ENGINEER AND TOWN PRIOR TO PURCHASE.
4. PLACE FLAT STONES ON MULCH TO ALLOW WALKING ACCESS THROUGH BIORETENTION FOR INSPECTION OF PLANTS AND OBSERVATION PORTS.

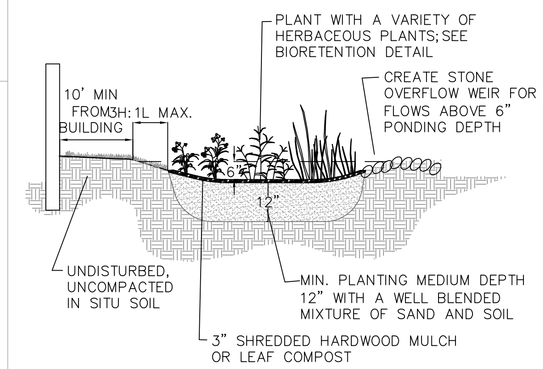


BIORETENTION AREA [BIO]
NOT TO SCALE



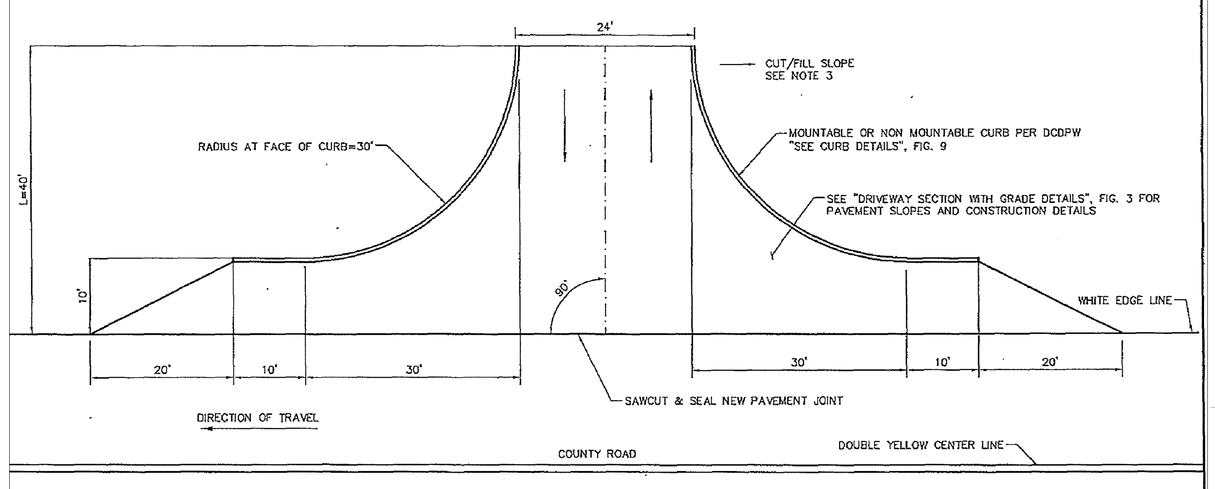


BIORETENTION OBSERVATION WELL / CLEANOUT
NOT TO SCALE



RAIN GARDEN
NOT TO SCALE

SUBDIVISION AND LOCAL ROADS DETAIL
NOT TO SCALE



NOTES:

1. DRAINAGE FROM PRIVATE PROPERTY SHALL NOT BE ALLOWED TO FLOW ONTO COUNTY HIGHWAY. IF NECESSARY, PERMITEE WILL BE REQUIRED TO INSTALL DRAINAGE SYSTEM AT PROPOSED DRIVEWAY(S).

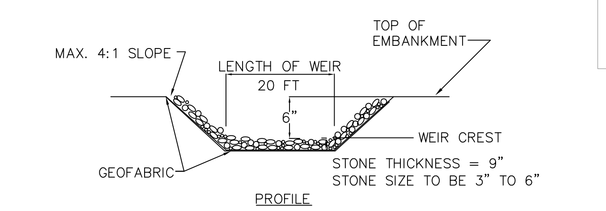
2. 2. CUT/FILL SLOPES SHALL BE CONSTRUCTED NO STEEPER THAN 2 HORIZONTAL TO 1 VERTICAL (2:1). DCDPW SHALL EVALUATE CUT/FILL SLOPES FOR ACCEPTABILITY.

ENTRANCE PAVING:
1.5" COMPACTED HMA TOP COURSE
3" COMPACTED HMA BINDER COURSE
4" COMPACTED HMA BASE COURSE (2 LIFTS)
12" COMPACTED SUB-BASE COURSE

DUTCHESS COUNTY
DEPARTMENT OF PUBLIC WORKS
HIGHWAY WORK PERMIT POLICY

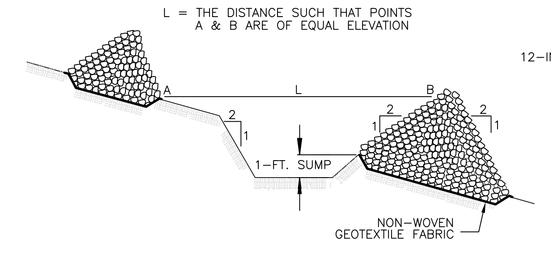
SUBDIVISION AND LOCAL ROADS DETAIL

DATE: MAY 1, 2014 | FIG. 8

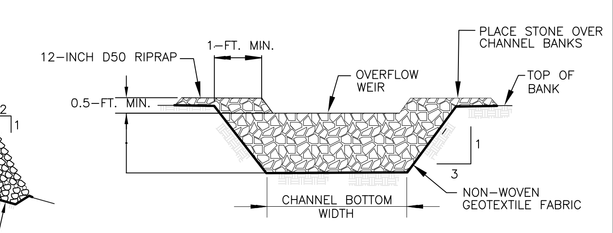


BIORETENTION WEIR OUTFALL DETAIL
NOT TO SCALE

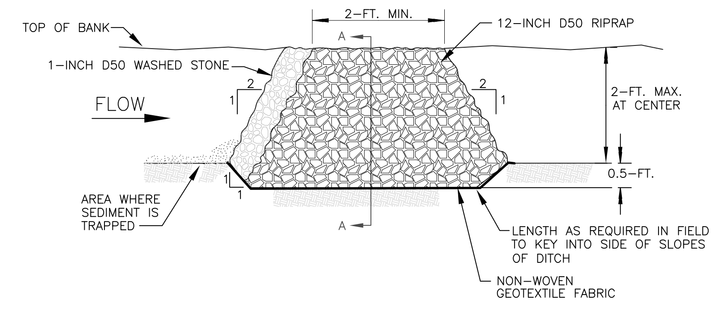
SPACING BETWEEN DITCH CHECK



CROSS SECTION A-A THRU STONE DITCH CHECK

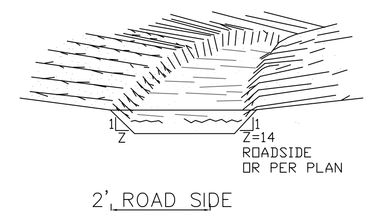


TYPICAL DITCH CHECK SECTION



PLAN SYMBOL

ROCK DITCH CHECK
NOT TO SCALE



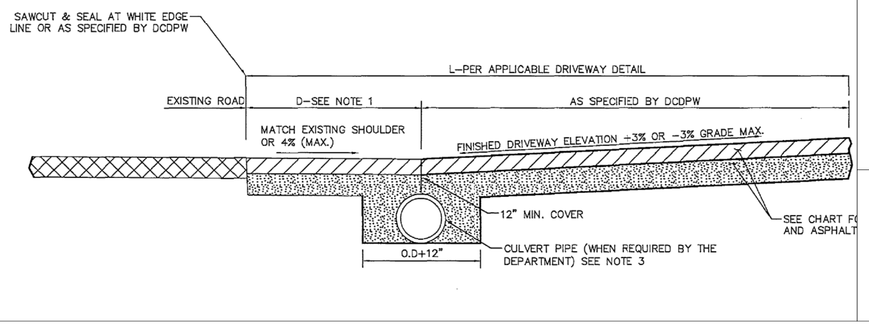
2', ROAD SIDE OR PER PLAN
TRAPEZOIDAL CROSS SECTION

CONSTRUCTION SPECIFICATIONS

1. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE WATERWAY.
2. THE WATERWAY SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN, AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
3. FILLS SHALL BE COMPACTED AS NEEDED TO PREVENT UNEQUAL SETTLEMENT THAT WOULD CAUSE DAMAGE IN THE COMPLETE WATERWAY.
4. ALL EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE WATERWAY.
5. STABILIZATION SHALL BE DONE ACCORDING TO THE APPROPRIATE STANDARD AND SPECIFICATIONS FOR VEGETATIVE PRACTICES.
   5.A. SEEDING AND MULCHING MAY BE USED FOR THE ESTABLISHMENT OF THE VEGETATION. IT IS RECOMMENDED THAT, WHEN CONDITIONS PERMIT, TEMPORARY WATERWAYS OR OTHER MEANS SHOULD BE USED TO PREVENT WATER FROM ENTERING THE WATERWAY DURING THE ESTABLISHMENT OF THE VEGETATION.
6. BLEND TO DRIVEWAY CROSS SECTION

GRASSED WATERWAY
NO TO SCALE

DRIVEWAY SECTION WITH GRADE DETAIL
NOT TO SCALE



ASPHALT AND SUBBASE COURSE THICKNESS		
	SUBBASE	ASPHALT
AGRICULT./FIELD ENTRANCE	4"	N/A
SINGLE RESIDENTIAL DRIVEWAY	4"	3"
COMMON RESIDENT. DRIVEWAY	6"	4"
MINOR COMMERCIAL DRIVEWAY	6"	4"

* ALL DRIVEWAY MATERIAL COURSES ARE FINISHED, COMPACTED THICKNESS AND SHALL CONFORM TO NYSDOT PAVEMENT MATERIAL SPECIFICATIONS.

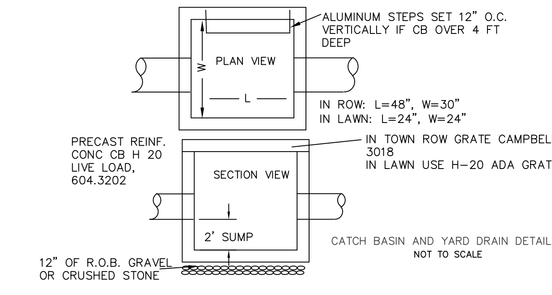
NOTES:

1. FOR RESIDENTIAL DRIVEWAYS, D=6' OR DISTANCE TO DITCH. FOR COMMERCIAL/SUBDIVISION DRIVEWAYS D=20'

2. ASPHALT IS TO BE PLACED IN 2" MAX. LIFTS.

3. CULVERT PIPE IS TO BE MADE OF REINFORCED CONCRETE OR SMOOTH INTERIOR CORRUGATED PLASTIC PIPE WITH A MIN. DIAMETER OF 12" AND 1% (MIN.) PITCH.

4. IF A DRIVEWAY PIPE IS REQUIRED END SECTIONS MUST BE INSTALLED.



REVISION	DATE	REVISIONS	BY
1	05/20/21	revised drawings	JPB
2	06/17/21	revised drawings	JPB
3	07/07/21	revised drawings	JPB
4	02/16/22	update additional dt and fdn diameters	MKZ

Date 01/5/21

Sheet SH 8 of 10

GENERAL SITE DETAILS

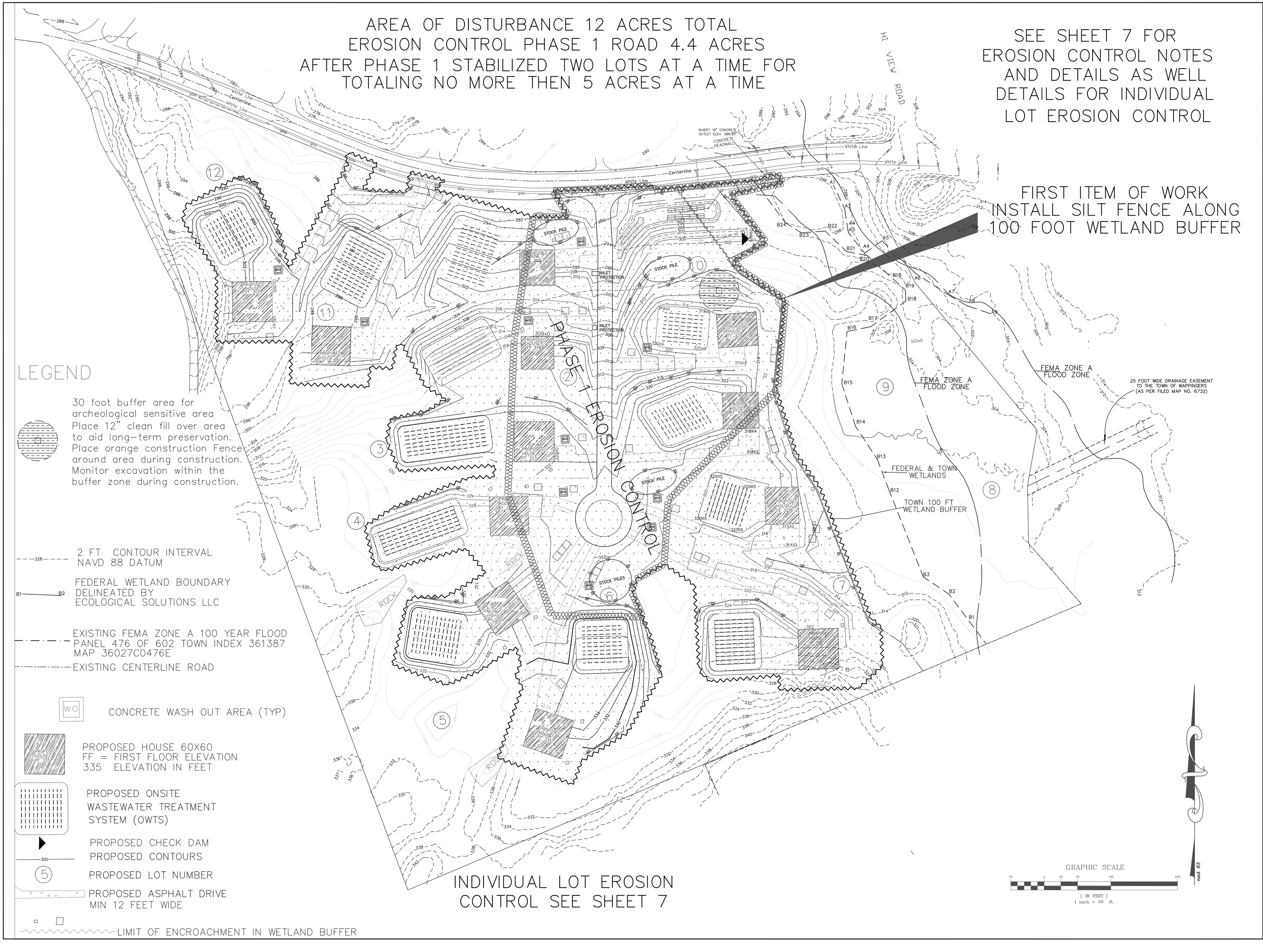
MYERS RUN
MYERS CORNERS ROAD
TOWN OF WAPPINGER NY

BERGER ENGINEERING AND SURVEYING
100 FULTON AVE.
POUGHKEEPSIE N.Y. 12603
(845) 471 - 7383
bergerengg@gmail.com

AREA OF DISTURBANCE 12 ACRES TOTAL
EROSION CONTROL PHASE 1 ROAD 4.4 ACRES
AFTER PHASE 1 STABILIZED TWO LOTS AT A TIME FOR
TOTALING NO MORE THEN 5 ACRES AT A TIME

SEE SHEET 7 FOR
EROSION CONTROL NOTES
AND DETAILS AS WELL
DETAILS FOR INDIVIDUAL
LOT EROSION CONTROL

FIRST ITEM OF WORK
INSTALL SILT FENCE ALONG
100 FOOT WETLAND BUFFER



INDIVIDUAL LOT EROSION
CONTROL SEE SHEET 7

LEGEND

30 foot buffer area for archeological sensitive area Place 12" clean fill over area to aid long-term preservation. Place orange construction Fence around area during construction. Monitor excavation within the buffer zone during construction.

2 FT CONTOUR INTERVAL NAVD 88 DATUM

FEDERAL WETLAND BOUNDARY DELINEATED BY ECOLOGICAL SOLUTIONS LLC

EXISTING FEMA ZONE A 100 YEAR FLOOD PANEL 476 OF 602 TOWN INDEX 361387 MAP 36027C0476E

EXISTING CENTERLINE ROAD

CONCRETE WASH OUT AREA (TYP)

PROPOSED HOUSE 60X60
FF = FIRST FLOOR ELEVATION
335 ELEVATION IN FEET

PROPOSED ONSITE WASTEWATER TREATMENT SYSTEM (OWTS)

PROPOSED CHECK DAM

PROPOSED CONTOURS

PROPOSED LOT NUMBER

PROPOSED ASPHALT DRIVE MIN 12 FEET WIDE

LIMIT OF ENCROACHMENT IN WETLAND BUFFER

Date	Sheet
01/25/21	SH 10 OF 10

R.N.	DATE	REVISIONS	BY
1	05/30/21	revised drawings	JPB
2	06/07/21	revised drawings	JPB
3	07/07/22	revised drawings	JPB
4	08/18/22	add additional dr. & br. chambers	MKZ

EROSION CONTROL PLAN

MYERS RUN
MYERS CORNERS ROAD
TOWN OF WAPPINGER NY

STATE OF NEW YORK
JOSEPH PAUL BERGER
No. 069904
LICENSED PROFESSIONAL ENGINEER

BERGER ENGINEERING AND SURVEYING
100 FULTON AVE.
POUGHKEEPSIE N.Y. 12603
(845) 471 - 7383
bergeceng@gmail.com

APPENDIX 3
WATER QUALITY AND RUNOFF REDUCTION CALCULATIONS

Version 1.8 Total Water Quality Volume Calculation

Last Updated: 11/09/2015 WQv(acre-feet) = [(P)(Rv)(A)] /12

Is this project subject to Chapter 10 of the NYS Design Manual (i.e. WQv is equal to post-development 1 year runoff volume)?.....	No

Design Point:	1	
P=	1.40	*inch*

Manually enter P, Total Area and Impervious Cover.

Breakdown of Subcatchments

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Description
1	0.41	0.41	100%	0.95	1,995	Rain Garden-All Houses
2	0.80	0.80	100%	0.95	3,862	Rain Garden-All Driveways
3	0.40	0.30	75%	0.73	1,474	Bioretention
4						
5						
6						
7						
8						
9						
10						
Subtotal (1-30)	1.61	1.51	94%	0.89	**7,331**	**Subtotal 1**
Total	1.61	1.51	94%	0.89	**7,331**	**Initial WQv**

Identify Runoff Reduction Techniques By Area

Technique	Total Contributing Area *(Acre)*	Contributing Impervious Area *(Acre)*	Notes
Conservation of Natural Areas	0.00	0.00	*minimum 10,000 sf*
Riparian Buffers	0.00	0.00	*maximum contributing length 75 feet to 150 feet*
Filter Strips	0.00	0.00	
Tree Planting	0.00	0.00	*Up to 100 sf directly connected impervious area may be subtracted per tree*
Total	**0.00**	**0.00**	

Recalculate WQv after application of Area Reduction Techniques

	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Runoff Coefficient Rv	WQv *(ft^3)*
"<<Initial WQv"	1.61	1.51	94%	0.89	7,331
Subtract Area	0.00	0.00			
WQv adjusted after Area Reductions	**1.61**	**1.51**	94%	0.89	7,331
Disconnection of Rooftops		0.41			
Adjusted WQv after Area Reduction and Rooftop Disconnect	1.61	1.10	68%	0.66	**5,441**
WQv reduced by Area Reduction techniques					1,890

Runoff Reduction Volume and Treated volumes						
	Runoff Reduction Techiques/Standard SMPs		**Total Contributing Area**	**Total Contributing Impervious Area**	**WQv Reduced (RRv)**	**WQv Treated**
			(acres)	**(acres)**	**cf**	**cf**
Area/Volume Reduction	Conservation of Natural Areas	RR-1	0.00	0.00		
	Sheetflow to Riparian Buffers/Filter Strips	RR-2	0.00	0.00		
	Tree Planting/Tree Pit	RR-3	0.00	0.00		
	Disconnection of Rooftop Runoff	RR-4		0.41		
	Vegetated Swale	RR-5	0.00	0.00	0	
	Rain Garden	RR-6	1.21	0.80	3968	
	Stormwater Planter	RR-7	0.00	0.00	0	
	Rain Barrel/Cistern	RR-8	0.00	0.00	0	
	Porous Pavement	RR-9	0.00	0.00	0	
	Green Roof (Intensive & Extensive)	RR-10	0.00	0.00	0	
Standard SMPs w/RRv Capacity	Infiltration Trench	I-1	0.00	0.00	0	0
	Infiltration Basin	I-2	0.00	0.00	0	0
	Dry Well	I-3	0.00	0.00	0	0
	Underground Infiltration System	I-4				
	Bioretention & Infiltration Bioretention	F-5	0.40	0.30	1474	0
	Dry swale	O-1	0.00	0.00	0	0
Standard SMPs	Micropool Extended Detention (P-1)	P-1				
	Wet Pond (P-2)	P-2				
	Wet Extended Detention (P-3)	P-3				
	Multiple Pond system (P-4)	P-4				
	Pocket Pond (p-5)	P-5				
	Surface Sand filter (F-1)	F-1				
	Underground Sand filter (F-2)	F-2				
	Perimeter Sand Filter (F-3)	F-3				
	Organic Filter (F-4	F-4				
	Shallow Wetland (W-1)	W-1				
	Extended Detention Wetland (W-2	W-2				
	Pond/Wetland System (W-3)	W-3				
	Pocket Wetland (W-4)	W-4				
	Wet Swale (O-2)	O-2				
	Totals by Area Reduction	→	0.00	0.41	1890	
	Totals by Volume Reduction	→	1.21	0.80	3968	
	Totals by Standard SMP w/RRV	→	0.40	0.30	1474	0
	Totals by Standard SMP	→	0.00	0.00		0
	Totals (Area + Volume + all SMPs)	→	1.61	1.51	7332	0
	Impervious Cover √	okay				
	Total Area √	okay				

Infiltrating Bioretention Worksheet

(For use on HSG A or B Soils without underdrains)

WQv ≤ VSM + VDL + (DP x ARG)

VSM = ARG x DSM x nSM

VDL (optional) = ARG x DDL x nDL

Design Point:	**1**

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
3	0.40	0.30	0.75	0.73	1473.78	1.40	Bioretention
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	75%	0.73	1,474	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.					0	*ft^3*	

Infiltrating Bioretention Parameters				
Treatment Volume	WQv	1,474	*ft^3*	
Enter depth of soil Media	DSM	2.50	*ft*	*2.5 - 4 ft*
Enter depth of drainage	DDL	0.50	*ft*	*≥ 0.5 ft*
Enter ponding depth above surface	DP	0.5	*ft*	*≤ 0.5*
Enter porosity of Soil Media	nSM	0.20		*≥20%*
Enter porosity of Drainage	nDL	0.40		*≥ 40%*
Required Bioretention Area	ARG	1228	*sf*	
Bioretention Area Provided		1230	*ft2*	
Native Soil Infiltration Rate		0.50	*in/hr*	*Okay*
Are you using underdrains?		No		
Total Volume Provided		1,476	*ft^3*	*Sum of storage Volume Provided in each layer*

Determine Runoff Reduction			
Runoff Reduction	1474	***ft^3***	***This is 100% of storage volume provided or WQv whichever is less***
Volume Treated	0	*ft^3*	*This is the portion of the WQv that is not reduced in the practice*
Sizing √	*OK*		*Check to be sure Area provided ≥ Af*

Disconnection of Roof Tops

Design Point:	1		
Enter Site Data For Drainage Area to be Treated by Practice			
Catchment Number	**Impervious Area To Be Disconnected** *(Acres)*		**Description**
1	0.41		Disconnection of Rooftops
Design Elements			
Is another area based practice applied to this area?	*No*		
Soil Type	B		
Has an evaluation by licensed or certified professional determined if soil enhancement & spreading device needed to provide sheet flowover grass surfaces?	*Yes*	*Y/N*	*required for C or D soils.*
Hotspot Area?	*No*		
Length of flow path from Impervious Surfaces	75	*ft*	*75 feet maximum*
Distance of downspouts from impervious areas	10	*ft*	*>10 feet*
Contributing Area of Rooftop to Downspout	500	*sf*	*Okay*
Contributing Area of Rooftop	2000	*sf*	*500 sf maximum. Up to 2000 sf with suitable flow dispersion technique*
Method of flow dispersion	rock inlet		*required If area to downspout >500 sf*
Flow length thru vegetated channel, swale or filter	75	*ft*	*vegetated area must be equal to or greater than the length of contributing impervious area*
Slope of vegetated area receiving flow	5	*%*	*Average slope ≤5%*
Will overflow occur to undesignated Areas?	*No*		
Are All Criteria in Section 5.3.5 met?	*Yes*		
Area Reduction Adjustments			
Subtract	**0.41**	***Acres from the Total Impervious Area of Sub-catchment Number***	**1**

Rain Garden Worksheet

WQv ≤ VSM + VDL + (DP x ARG)
VSM = ARG x DSM x nSM
VDL (optional) = ARG x DDL x nDL

Design Point:	1						
Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
1	0.41	0.41	1.00	0.95	1995.00	1.40	Rain Garden-All Houses
Enter Impervious Area Reduced by Disconnection of Rooftops		0.41	0%	0.05	105	<<WQv after adjusting for Disconnected Rooftops	

Soil Information				
Soil Group	B			
Using Underdrains	*No*	*Okay*		
Infiltration Rate	0.50	*in/hour*	*Okay*	
Rain Garden Parameters				
Enter number of Rain Gardens		24		
Enter area of each Rain Garden		10		
Enter Rain Garden Surface area	ARG	240	*sf*	
Enter depth of Soil Media	DSM	1.00	*ft*	*1 to 1.50*
Enter depth of drainage layer	DDL	0.50	*ft*	*≥ 0.50 ft*
Enter ponding depth above surface	DP	0.50	*ft*	*≤ 0.50*
Enter porosity of Soil Media	nSM	0.20		*≥20%, enter as a decimal*
Enter porosity of Drainage Layer	nDL	0.40		*≥ 40%, enter as a decimal*
Volume Provided In Soil Media	VSM	48	*ft^3*	
Volume Provided in Drainage Layer	VDL	48	*ft^3*	
Volume Provided In Ponding Area		120	*ft^3*	
Total Volume Provided		216	*ft^3*	
Determine Runoff Reduction				
Percent Reduction		100%		
Runoff Reduction		**105**	***ft^3***	
WQv ≤ VSM + VDL + (DP x ARG) √		OK		

WQv ≤ VSM + VDL + (DP x ARG)

Rain Garden Worksheet

VSM = ARG x DSM x nSM

VDL (optional) = ARG x DDL x nDL

Design Point:	1						
Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
2	0.80	0.80	1.00	0.95	3862.32	1.40	Rain Garden-All Driveways
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	100%	0.95	3,862	<<WQv after adjusting for Disconnected Rooftops	
Soil Information							
Soil Group		B					
Using Underdrains		*No*	*Okay*				
Infiltration Rate		0.50	*in/hour*				
Rain Garden Parameters							
Enter number of Rain Gardens			40				
Enter area of each Rain Garden			110				
Enter Rain Garden Surface		ARG	4,400	*sf*			
Enter depth of Soil Media		DSM	1.00	*ft*	*1 to 1.5*		
Enter depth of drainage layer		DDL	0.50	*ft*	*≥ 0.5 ft*		
Enter ponding depth above surface		DP	0.50	*ft*	*≤ 0.5*		
Enter porosity of Soil Media		nSM	0.20		*≥20%, enter as a decimal*		
Enter porosity of Drainage Layer		nDL	0.40		*≥ 40%, enter as a decimal*		
Volume Provided In Soil Media		VSM	880	*ft^3*			
Volume Provided in Drainage Layer		VDL	880	*ft^3*			
Volume Provided In Ponding Area			2,200	*ft^3*			
Total Volume Provided			3,960	*ft^3*			
Determine Runoff Reduction							
Percent Reduction			100%				
Runoff Reduction			**3,862**	***ft^3***			
WQv ≤ VSM + VDL + (DP x ARG) √			OK				

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A		55%
B	1.51	40%
C		30%
D		20%
Total Area	1.51322314	
Calculate the Minimum RRv		
S =	**0.40**	
Impervious =	1.51	*acre*
Precipitation	1.4	*in*
Rv	0.95	
Minimum RRv	**2,922**	***ft3***
	0.07	af

NOI QUESTIONS

#	NOI Question	Reported Value	
		cf	af
28	Total Water Quality Volume (WQv) Required	7331	*0.168*
30	Total RRV Provided	7332	*0.168*
31	Is RRv Provided ≥WQv Required?	Yes	
32	Minimum RRv	2922	*0.067*
32a	Is RRv Provided ≥ Minimum RRv Required?	Yes	
33a	Total WQv Treated	0	*0*
34	Sum of Volume Reduced & Treated	7332	*0.168*
34	Sum of Volume Reduced and Treated	7332	*0.168*
35	Is Sum RRv Provided and WQv Provided ≥WQv Required?	Yes	

Apply Peak Flow Attenuation			
36	Channel Protection	*Cpv*	
37	Overbank	*Qp*	
37	Extreme Flood Control	*Qf*	
	Are Quantity Control requirements met?	*Yes*	Plan Completed

APPENDIX 4
HYDROCAD OUTPUT REPORTS

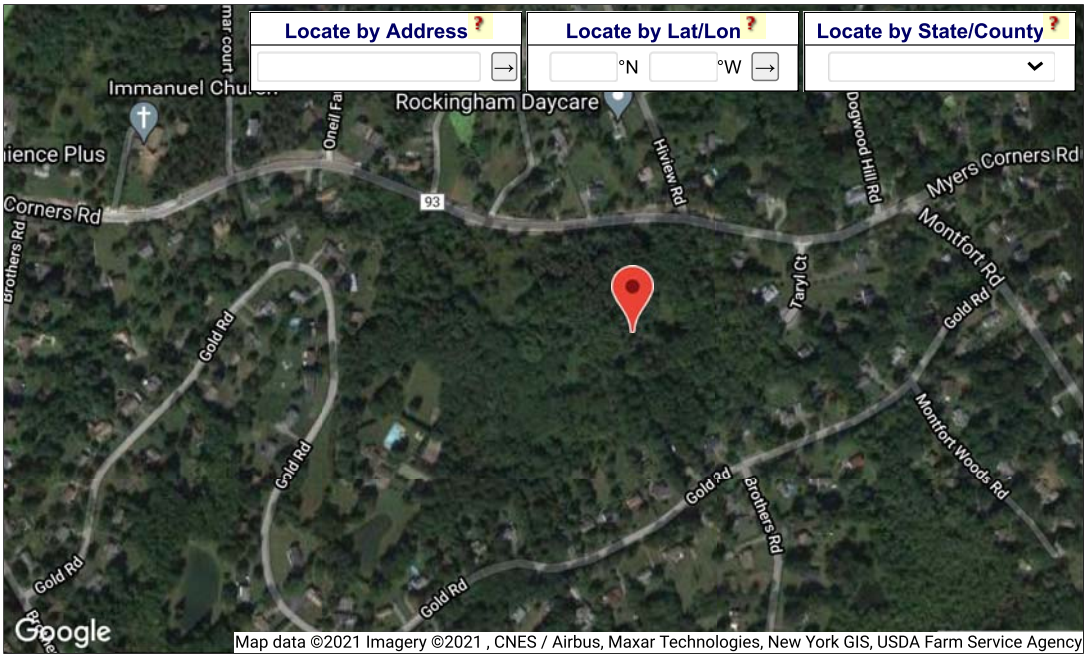
About this Project **Data & Products** **Daily Monitoring** **Documentation**

Select Product

- Extreme Precipitation Tables - HTML
- Extreme Precipitation Tables - Text/CSV
- Partial Duration Series - by Point
- Partial Duration Series - by Station
- Distribution Curves - Graphical
- Distribution Curves - Text/TBL
- Intensity Frequency Duration Graphs
- Precipitation Frequency Duration Graphs
- GIS Data Files
- Regional/State Maps

Select Location Double-click the map to place a marker, or enter address or latitude/longitude.

Locate by Address | Locate by Lat/Lon (°N °W) | Locate by State/County



Select Options

Smoothing	Delivery
No	Popup

Submit

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This project is a joint collaboration between:

Northeast Regional Climate Center (NRCC) **Natural Resources Conservation Service (NRCS)**

Contact: precip@cornell.edu

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	No
State	New York
Location	
Longitude	73.857 degrees West
Latitude	41.605 degrees North
Elevation	0 feet
Date/Time	Mon, 26 Apr 2021 17:17:27 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.32	0.50	0.61	0.82	1.00	1.20	**1yr**	0.87	1.17	1.37	1.73	2.18	2.62	2.94	**1yr**	2.32	2.83	3.28	3.97	4.58	**1yr**
2yr	0.38	0.59	0.73	0.98	1.21	1.44	**2yr**	1.05	1.41	1.63	2.10	2.64	3.16	3.56	**2yr**	2.79	3.42	3.92	4.63	5.27	**2yr**
5yr	0.45	0.70	0.87	1.19	1.51	1.78	**5yr**	1.31	1.74	2.02	2.60	3.27	3.94	4.51	**5yr**	3.49	4.34	4.99	5.77	6.52	**5yr**
10yr	0.52	0.80	0.99	1.39	1.79	2.09	**10yr**	1.55	2.04	2.38	3.05	3.85	4.67	5.40	**10yr**	4.13	5.19	5.99	6.82	7.66	**10yr**
25yr	0.63	0.96	1.19	1.71	2.25	2.58	**25yr**	1.94	2.52	2.95	3.78	4.77	5.84	6.85	**25yr**	5.17	6.59	7.63	8.51	9.49	**25yr**
50yr	0.73	1.11	1.38	1.98	2.67	3.04	**50yr**	2.30	2.97	3.47	4.45	5.62	6.93	8.21	**50yr**	6.13	7.90	9.17	10.06	11.17	**50yr**
100yr	0.85	1.28	1.60	2.31	3.17	3.57	**100yr**	2.74	3.49	4.10	5.24	6.62	8.22	9.85	**100yr**	7.27	9.47	11.03	11.90	13.16	**100yr**
200yr	0.98	1.48	1.87	2.71	3.78	4.20	**200yr**	3.26	4.11	4.83	6.17	7.80	9.74	11.81	**200yr**	8.62	11.36	13.28	14.09	15.50	**200yr**
500yr	1.21	1.79	2.31	3.35	4.77	5.22	**500yr**	4.11	5.10	6.02	7.68	9.70	12.22	15.04	**500yr**	10.81	14.46	16.97	17.61	19.25	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.41	0.50	0.67	0.82	1.02	**1yr**	0.71	1.00	1.25	1.56	1.96	2.42	2.56	**1yr**	2.15	2.47	2.67	3.68	3.67	**1yr**
2yr	0.37	0.57	0.70	0.95	1.18	1.39	**2yr**	1.02	1.36	1.58	2.01	2.54	3.05	3.47	**2yr**	2.70	3.33	3.81	4.52	5.13	**2yr**
5yr	0.42	0.64	0.80	1.10	1.40	1.63	**5yr**	1.21	1.59	1.84	2.37	2.95	3.68	4.17	**5yr**	3.26	4.01	4.63	5.33	6.05	**5yr**
10yr	0.47	0.72	0.89	1.24	1.60	1.82	**10yr**	1.38	1.78	2.07	2.65	3.29	4.21	4.78	**10yr**	3.73	4.59	5.33	6.03	6.81	**10yr**
25yr	0.54	0.82	1.02	1.45	1.91	2.10	**25yr**	1.65	2.06	2.38	2.98	3.79	5.02	5.70	**25yr**	4.44	5.48	6.44	7.09	7.96	**25yr**
50yr	0.60	0.91	1.14	1.64	2.20	2.34	**50yr**	1.90	2.29	2.66	3.32	4.23	5.73	6.51	**50yr**	5.07	6.26	7.46	8.00	8.96	**50yr**
100yr	0.68	1.02	1.28	1.85	2.53	2.63	**100yr**	2.19	2.57	2.99	3.70	4.73	6.54	7.44	**100yr**	5.79	7.16	8.62	9.03	10.06	**100yr**
200yr	0.76	1.15	1.46	2.11	2.94	2.93	**200yr**	2.54	2.87	3.34	4.13	5.28	7.46	8.50	**200yr**	6.60	8.17	9.99	10.19	11.29	**200yr**
500yr	0.91	1.35	1.74	2.53	3.60	3.42	**500yr**	3.10	3.34	3.91	4.77	6.11	8.90	10.12	**500yr**	7.88	9.73	12.14	11.94	13.09	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.36	0.55	0.68	0.91	1.12	1.34	**1yr**	0.97	1.31	1.50	1.93	2.40	2.87	3.19	**1yr**	2.54	3.07	3.52	4.22	4.91	**1yr**
2yr	0.40	0.62	0.76	1.03	1.27	1.52	**2yr**	1.10	1.48	1.73	2.20	2.77	3.26	3.70	**2yr**	2.89	3.56	4.07	4.81	5.45	**2yr**
5yr	0.49	0.75	0.94	1.29	1.64	1.93	**5yr**	1.41	1.89	2.22	2.86	3.61	4.23	4.90	**5yr**	3.75	4.71	5.39	6.26	7.04	**5yr**
10yr	0.58	0.89	1.11	1.55	2.00	2.34	**10yr**	1.73	2.29	2.70	3.51	4.43	5.19	6.08	**10yr**	4.59	5.84	6.71	7.66	8.57	**10yr**
25yr	0.73	1.11	1.38	1.97	2.60	3.03	**25yr**	2.24	2.96	3.52	4.72	5.82	6.84	8.11	**25yr**	6.06	7.79	8.96	10.01	11.14	**25yr**
50yr	0.87	1.32	1.64	2.36	3.18	3.70	**50yr**	2.74	3.61	4.31	5.84	7.16	8.42	10.11	**50yr**	7.45	9.72	11.17	12.28	13.62	**50yr**
100yr	1.04	1.56	1.96	2.83	3.88	4.51	**100yr**	3.35	4.41	5.28	7.25	8.80	10.38	12.62	**100yr**	9.18	12.13	13.94	15.06	16.63	**100yr**
200yr	1.23	1.85	2.35	3.40	4.74	5.48	**200yr**	4.09	5.36	6.48	8.98	10.83	12.79	15.76	**200yr**	11.32	15.16	17.40	18.52	20.37	**200yr**
500yr	1.57	2.33	3.00	4.36	6.19	7.12	**500yr**	5.35	6.96	8.48	11.96	14.27	16.87	21.19	**500yr**	14.93	20.37	23.36	24.35	26.72	**500yr**

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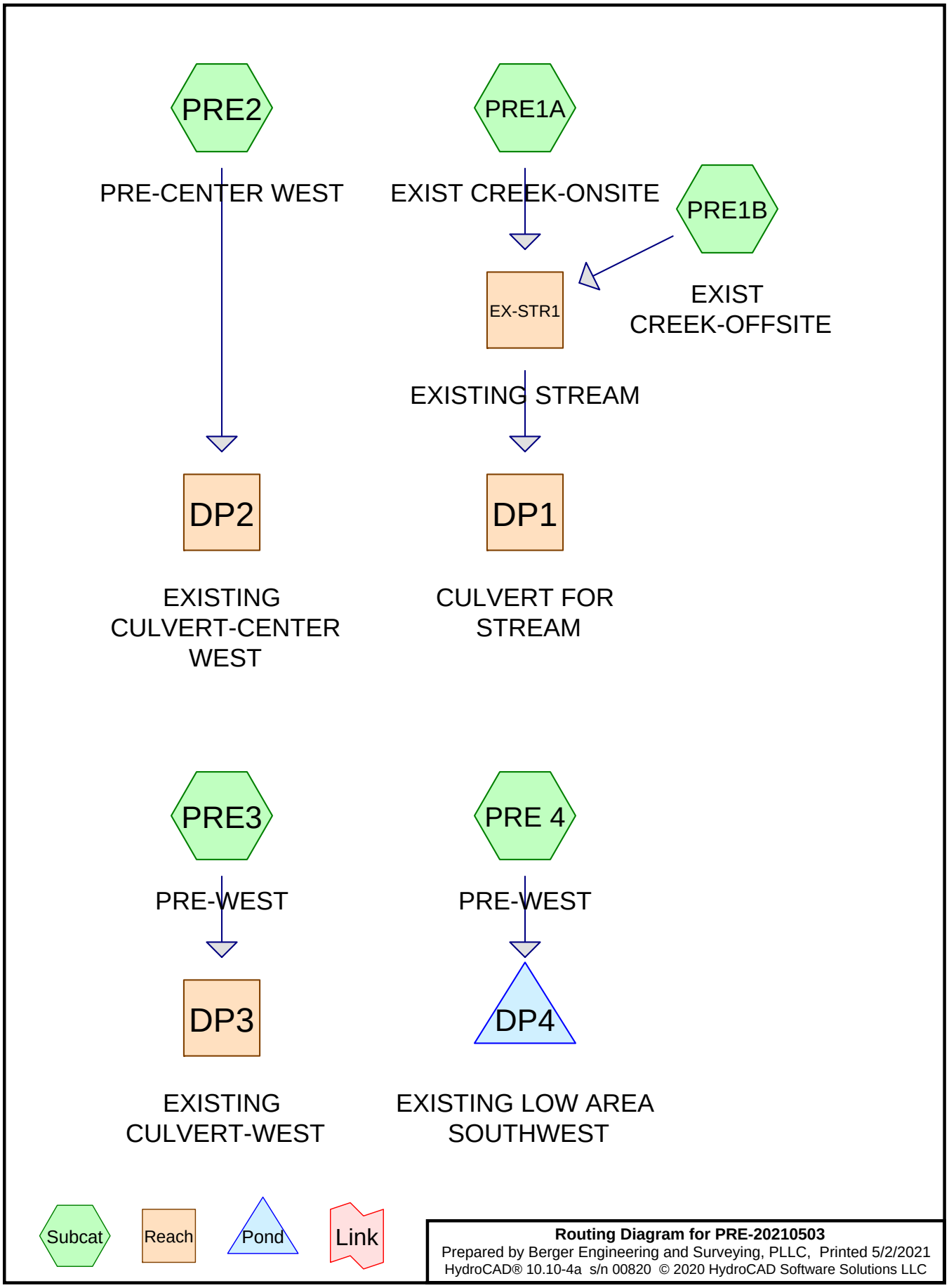
PRE-DEVELOPMENT HYDROCAD OUTPUT REPORTS



Routing Diagram for PRE-20210503
Prepared by Berger Engineering and Surveying, PLLC, Printed 5/2/2021
HydroCAD® 10.10-4a s/n 00820 © 2020 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PRE 4: PRE-WEST Runoff Area=0.900 ac 0.00% Impervious Runoff Depth=0.21"
Flow Length=247' Tc=14.2 min CN=60 Runoff=0 cfs 0.016 af

Subcatchment PRE1A: EXIST Runoff Area=11.700 ac 0.00% Impervious Runoff Depth=0.37"
Flow Length=1,262' Tc=33.8 min CN=66 Runoff=2 cfs 0.366 af

Subcatchment PRE1B: EXIST Runoff Area=110.000 ac 0.00% Impervious Runoff Depth=0.51"
Tc=90.0 min CN=70 Runoff=15 cfs 4.710 af

Subcatchment PRE2: PRE-CENTER WEST Runoff Area=9.300 ac 0.00% Impervious Runoff Depth=0.23"
Flow Length=931' Tc=22.7 min CN=61 Runoff=1 cfs 0.180 af

Subcatchment PRE3: PRE-WEST Runoff Area=1.000 ac 0.00% Impervious Runoff Depth=0.21"
Flow Length=297' Tc=20.1 min CN=60 Runoff=0 cfs 0.017 af

Reach DP1: CULVERT FOR STREAM Inflow=16 cfs 5.075 af
Outflow=16 cfs 5.075 af

Reach DP2: EXISTING CULVERT-CENTER Avg. Flow Depth=0.16' Max Vel=6.49 fps Inflow=1 cfs 0.180 af
18.0" Round Pipe n=0.012 L=48.0' S=0.0583 '/' Capacity=27 cfs Outflow=1 cfs 0.180 af

Reach DP3: EXISTING CULVERT-WEST Avg. Flow Depth=0.07' Max Vel=2.37 fps Inflow=0 cfs 0.017 af
12.0" Round Pipe n=0.012 L=63.0' S=0.0222 '/' Capacity=6 cfs Outflow=0 cfs 0.017 af

Reach EX-STR1: EXISTING STREAM Avg. Flow Depth=0.62' Max Vel=1.82 fps Inflow=16 cfs 5.075 af
n=0.100 L=284.0' S=0.0387 '/' Capacity=6,236 cfs Outflow=16 cfs 5.075 af

Pond DP4: EXISTING LOW AREA SOUTHWEST Peak Elev=330.11' Storage=680 cf Inflow=0 cfs 0.016 af
Outflow=0 cfs 0.000 af

Total Runoff Area = 132.900 ac Runoff Volume = 5.288 af Average Runoff Depth = 0.48"
100.00% Pervious = 132.900 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment PRE 4: PRE-WEST

Runoff = 0 cfs @ 12.45 hrs, Volume= 0.016 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 1-yr Rainfall=2.62"

Area (ac)	CN	Description
0.000	56	Brush, Fair, HSG B
0.900	60	Woods, Fair, HSG B
0.000	77	Brush, Fair, HSG D
0.000	79	Woods, Fair, HSG D
0.900	60	Weighted Average
0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.8	147	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.2	247	Total			

Summary for Subcatchment PRE1A: EXIST CREEK-ONSITE

Runoff = 2 cfs @ 12.57 hrs, Volume= 0.366 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 1-yr Rainfall=2.62"

Area (ac)	CN	Description
0.600	56	Brush, Fair, HSG B
7.500	60	Woods, Fair, HSG B
0.300	77	Brush, Fair, HSG D
3.300	79	Woods, Fair, HSG D
11.700	66	Weighted Average
11.700		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
22.4	1,162	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
33.8	1,262	Total			

Summary for Subcatchment PRE1B: EXIST CREEK-OFFSITE

Runoff = 15 cfs @ 13.31 hrs, Volume= 4.710 af, Depth= 0.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 1-yr Rainfall=2.62"

Area (ac)	CN	Description
60.000	65	Woods/grass comb., Fair, HSG B
50.000	76	Woods/grass comb., Fair, HSG C
110.000	70	Weighted Average
110.000		100.00% Pervious Area

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

Summary for Subcatchment PRE2: PRE-CENTER WEST

Runoff = 1 cfs @ 12.57 hrs, Volume= 0.180 af, Depth= 0.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 1-yr Rainfall=2.62"

Area (ac)	CN	Description
2.700	56	Brush, Fair, HSG B
5.700	60	Woods, Fair, HSG B
0.200	77	Brush, Fair, HSG D
0.700	79	Woods, Fair, HSG D
9.300	61	Weighted Average
9.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
11.3	831	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.7	931	Total			

Summary for Subcatchment PRE3: PRE-WEST

Runoff = 0 cfs @ 12.57 hrs, Volume= 0.017 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 1-yr Rainfall=2.62"

Area (ac)	CN	Description
0.000	56	Brush, Fair, HSG B
1.000	60	Woods, Fair, HSG B
0.000	77	Brush, Fair, HSG D
0.000	79	Woods, Fair, HSG D
1.000	60	Weighted Average
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	77	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.6	220	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.1	297	Total			

Summary for Reach DP1: CULVERT FOR STREAM

Inflow Area = 121.700 ac, 0.00% Impervious, Inflow Depth = 0.50" for 1-yr event
Inflow = 16 cfs @ 13.34 hrs, Volume= 5.075 af
Outflow = 16 cfs @ 13.34 hrs, Volume= 5.075 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3

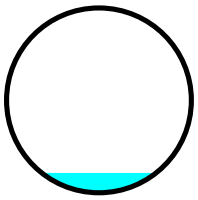
Summary for Reach DP2: EXISTING CULVERT-CENTER WEST

Inflow Area = 9.300 ac, 0.00% Impervious, Inflow Depth = 0.23" for 1-yr event
Inflow = 1 cfs @ 12.57 hrs, Volume= 0.180 af
Outflow = 1 cfs @ 12.57 hrs, Volume= 0.180 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 6.49 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.09 fps, Avg. Travel Time= 0.2 min

Peak Storage= 5 cf @ 12.57 hrs
Average Depth at Peak Storage= 0.16' , Surface Width= 0.92'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 27 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 48.0' Slope= 0.0583 '/'
Inlet Invert= 277.70', Outlet Invert= 274.90'



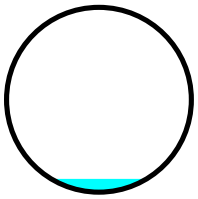
Summary for Reach DP3: EXISTING CULVERT-WEST

Inflow Area = 1.000 ac, 0.00% Impervious, Inflow Depth = 0.21" for 1-yr event
Inflow = 0 cfs @ 12.57 hrs, Volume= 0.017 af
Outflow = 0 cfs @ 12.58 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 2.37 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.55 fps, Avg. Travel Time= 0.7 min

Peak Storage= 2 cf @ 12.58 hrs
Average Depth at Peak Storage= 0.07' , Surface Width= 0.51'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6 cfs

12.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 63.0' Slope= 0.0222 '/'
Inlet Invert= 279.50', Outlet Invert= 278.10'



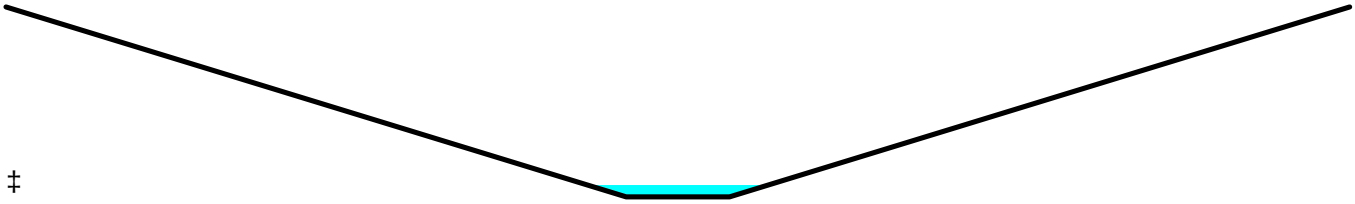
Summary for Reach EX-STR1: EXISTING STREAM

Inflow Area = 121.700 ac, 0.00% Impervious, Inflow Depth = 0.50" for 1-yr event
Inflow = 16 cfs @ 13.30 hrs, Volume= 5.075 af
Outflow = 16 cfs @ 13.34 hrs, Volume= 5.075 af, Atten= 0%, Lag= 2.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 1.82 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 1.03 fps, Avg. Travel Time= 4.6 min

Peak Storage= 2,444 cf @ 13.34 hrs
Average Depth at Peak Storage= 0.62' , Surface Width= 17.50'
Bank-Full Depth= 10.00' Flow Area= 700.0 sf, Capacity= 6,236 cfs

10.00' x 10.00' deep channel, n= 0.100 Very weedy reaches w/pools
Side Slope Z-value= 6.0 '/' Top Width= 130.00'
Length= 284.0' Slope= 0.0387 '/'
Inlet Invert= 301.00', Outlet Invert= 290.00'



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Summary for Pond DP4: EXISTING LOW AREA SOUTHWEST

Inflow Area =	0.900 ac,	0.00% Impervious,	Inflow Depth =	0.21"	for 1-yr event
Inflow =	0 cfs @	12.45 hrs, Volume=	0.016 af		
Outflow =	0 cfs @	0.00 hrs, Volume=	0.000 af, Atten= 100%, Lag= 0.0 min		
Primary =	0 cfs @	0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 330.11' @ 24.81 hrs Surf.Area= 6,315 sf Storage= 680 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	330.00'	20,772 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
330.00	5,894	370.0	0	0	5,894
332.00	15,658	562.0	20,772	20,772	20,164

Device	Routing	Invert	Outlet Devices
#1	Primary	331.00'	**30.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0 cfs @ 0.00 hrs HW=330.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0 cfs)

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PRE 4: PRE-WEST Runoff Area=0.900 ac 0.00% Impervious Runoff Depth=1.11"
Flow Length=247' Tc=14.2 min CN=60 Runoff=1 cfs 0.083 af

Subcatchment PRE1A: EXIST Runoff Area=11.700 ac 0.00% Impervious Runoff Depth=1.51"
Flow Length=1,262' Tc=33.8 min CN=66 Runoff=10 cfs 1.469 af

Subcatchment PRE1B: EXIST Runoff Area=110.000 ac 0.00% Impervious Runoff Depth=1.80"
Tc=90.0 min CN=70 Runoff=64 cfs 16.455 af

Subcatchment PRE2: PRE-CENTER WEST Runoff Area=9.300 ac 0.00% Impervious Runoff Depth=1.18"
Flow Length=931' Tc=22.7 min CN=61 Runoff=7 cfs 0.911 af

Subcatchment PRE3: PRE-WEST Runoff Area=1.000 ac 0.00% Impervious Runoff Depth=1.11"
Flow Length=297' Tc=20.1 min CN=60 Runoff=1 cfs 0.093 af

Reach DP1: CULVERT FOR STREAM Inflow=67 cfs 17.924 af
Outflow=67 cfs 17.924 af

Reach DP2: EXISTING CULVERT-CENTER Avg. Flow Depth=0.51' Max Vel=12.88 fps Inflow=7 cfs 0.911 af
18.0" Round Pipe n=0.012 L=48.0' S=0.0583 '/' Capacity=27 cfs Outflow=7 cfs 0.911 af

Reach DP3: EXISTING CULVERT-WEST Avg. Flow Depth=0.24' Max Vel=4.99 fps Inflow=1 cfs 0.093 af
12.0" Round Pipe n=0.012 L=63.0' S=0.0222 '/' Capacity=6 cfs Outflow=1 cfs 0.093 af

Reach EX-STR1: EXISTING STREAM Avg. Flow Depth=1.34' Max Vel=2.77 fps Inflow=67 cfs 17.924 af
n=0.100 L=284.0' S=0.0387 '/' Capacity=6,236 cfs Outflow=67 cfs 17.924 af

Pond DP4: EXISTING LOW AREA SOUTHWEST Peak Elev=330.53' Storage=3,636 cf Inflow=1 cfs 0.083 af
Outflow=0 cfs 0.000 af

Total Runoff Area = 132.900 ac Runoff Volume = 19.012 af Average Runoff Depth = 1.72"
100.00% Pervious = 132.900 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment PRE 4: PRE-WEST

Runoff = 1 cfs @ 12.17 hrs, Volume= 0.083 af, Depth= 1.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 10-yr Rainfall=4.67"

Area (ac)	CN	Description
0.000	56	Brush, Fair, HSG B
0.900	60	Woods, Fair, HSG B
0.000	77	Brush, Fair, HSG D
0.000	79	Woods, Fair, HSG D
0.900	60	Weighted Average
0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.8	147	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.2	247	Total			

Summary for Subcatchment PRE1A: EXIST CREEK-ONSITE

Runoff = 10 cfs @ 12.46 hrs, Volume= 1.469 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 10-yr Rainfall=4.67"

Area (ac)	CN	Description
0.600	56	Brush, Fair, HSG B
7.500	60	Woods, Fair, HSG B
0.300	77	Brush, Fair, HSG D
3.300	79	Woods, Fair, HSG D
11.700	66	Weighted Average
11.700		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
22.4	1,162	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
33.8	1,262	Total			

Summary for Subcatchment PRE1B: EXIST CREEK-OFFSITE

Runoff = 64 cfs @ 13.20 hrs, Volume= 16.455 af, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 10-yr Rainfall=4.67"

Area (ac)	CN	Description
60.000	65	Woods/grass comb., Fair, HSG B
50.000	76	Woods/grass comb., Fair, HSG C
110.000	70	Weighted Average
110.000		100.00% Pervious Area

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

Summary for Subcatchment PRE2: PRE-CENTER WEST

Runoff = 7 cfs @ 12.30 hrs, Volume= 0.911 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 10-yr Rainfall=4.67"

Area (ac)	CN	Description
2.700	56	Brush, Fair, HSG B
5.700	60	Woods, Fair, HSG B
0.200	77	Brush, Fair, HSG D
0.700	79	Woods, Fair, HSG D
9.300	61	Weighted Average
9.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
11.3	831	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.7	931	Total			

Summary for Subcatchment PRE3: PRE-WEST

Runoff = 1 cfs @ 12.26 hrs, Volume= 0.093 af, Depth= 1.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 10-yr Rainfall=4.67"

Area (ac)	CN	Description
0.000	56	Brush, Fair, HSG B
1.000	60	Woods, Fair, HSG B
0.000	77	Brush, Fair, HSG D
0.000	79	Woods, Fair, HSG D
1.000	60	Weighted Average
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	77	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.6	220	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.1	297	Total			

Summary for Reach DP1: CULVERT FOR STREAM

Inflow Area = 121.700 ac, 0.00% Impervious, Inflow Depth = 1.77" for 10-yr event
Inflow = 67 cfs @ 13.21 hrs, Volume= 17.924 af
Outflow = 67 cfs @ 13.21 hrs, Volume= 17.924 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3

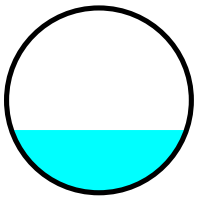
Summary for Reach DP2: EXISTING CULVERT-CENTER WEST

Inflow Area = 9.300 ac, 0.00% Impervious, Inflow Depth = 1.18" for 10-yr event
Inflow = 7 cfs @ 12.30 hrs, Volume= 0.911 af
Outflow = 7 cfs @ 12.30 hrs, Volume= 0.911 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 12.88 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 6.08 fps, Avg. Travel Time= 0.1 min

Peak Storage= 25 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.51' , Surface Width= 1.42'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 27 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 48.0' Slope= 0.0583 '/'
Inlet Invert= 277.70', Outlet Invert= 274.90'



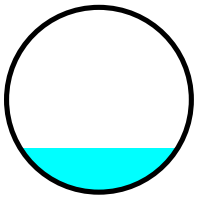
Summary for Reach DP3: EXISTING CULVERT-WEST

Inflow Area = 1.000 ac, 0.00% Impervious, Inflow Depth = 1.11" for 10-yr event
Inflow = 1 cfs @ 12.26 hrs, Volume= 0.093 af
Outflow = 1 cfs @ 12.27 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 4.99 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.36 fps, Avg. Travel Time= 0.4 min

Peak Storage= 9 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.24' , Surface Width= 0.85'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6 cfs

12.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 63.0' Slope= 0.0222 '/'
Inlet Invert= 279.50', Outlet Invert= 278.10'



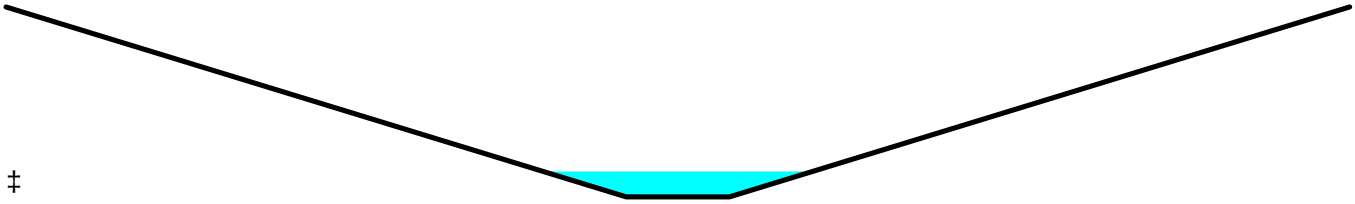
Summary for Reach EX-STR1: EXISTING STREAM

Inflow Area = 121.700 ac, 0.00% Impervious, Inflow Depth = 1.77" for 10-yr event
Inflow = 67 cfs @ 13.20 hrs, Volume= 17.924 af
Outflow = 67 cfs @ 13.21 hrs, Volume= 17.924 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 2.77 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 3.5 min

Peak Storage= 6,865 cf @ 13.21 hrs
Average Depth at Peak Storage= 1.34' , Surface Width= 26.07'
Bank-Full Depth= 10.00' Flow Area= 700.0 sf, Capacity= 6,236 cfs

10.00' x 10.00' deep channel, n= 0.100 Very weedy reaches w/pools
Side Slope Z-value= 6.0 '/' Top Width= 130.00'
Length= 284.0' Slope= 0.0387 '/'
Inlet Invert= 301.00', Outlet Invert= 290.00'



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Summary for Pond DP4: EXISTING LOW AREA SOUTHWEST

Inflow Area =	0.900 ac,	0.00% Impervious,	Inflow Depth =	1.11"	for 10-yr event
Inflow =	1 cfs @	12.17 hrs, Volume=	0.083 af		
Outflow =	0 cfs @	0.00 hrs, Volume=	0.000 af,	Atten= 100%,	Lag= 0.0 min
Primary =	0 cfs @	0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 330.53' @ 24.81 hrs Surf.Area= 8,005 sf Storage= 3,636 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	330.00'	20,772 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
330.00	5,894	370.0	0	0	5,894
332.00	15,658	562.0	20,772	20,772	20,164

Device	Routing	Invert	Outlet Devices
#1	Primary	331.00'	**30.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0 cfs @ 0.00 hrs HW=330.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0 cfs)

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PRE 4: PRE-WEST Runoff Area=0.900 ac 0.00% Impervious Runoff Depth=3.50"
Flow Length=247' Tc=14.2 min CN=60 Runoff=3 cfs 0.262 af

Subcatchment PRE1A: EXIST Runoff Area=11.700 ac 0.00% Impervious Runoff Depth=4.19"
Flow Length=1,262' Tc=33.8 min CN=66 Runoff=28 cfs 4.084 af

Subcatchment PRE1B: EXIST Runoff Area=110.000 ac 0.00% Impervious Runoff Depth=4.65"
Tc=90.0 min CN=70 Runoff=172 cfs 42.661 af

Subcatchment PRE2: PRE-CENTER WEST Runoff Area=9.300 ac 0.00% Impervious Runoff Depth=3.61"
Flow Length=931' Tc=22.7 min CN=61 Runoff=23 cfs 2.800 af

Subcatchment PRE3: PRE-WEST Runoff Area=1.000 ac 0.00% Impervious Runoff Depth=3.50"
Flow Length=297' Tc=20.1 min CN=60 Runoff=3 cfs 0.292 af

Reach DP1: CULVERT FOR STREAM Inflow=182 cfs 46.745 af
Outflow=182 cfs 46.745 af

Reach DP2: EXISTING Avg. Flow Depth=1.06' Max Vel=17.44 fps Inflow=23 cfs 2.800 af
18.0" Round Pipe n=0.012 L=48.0' S=0.0583 '/' Capacity=27 cfs Outflow=23 cfs 2.800 af

Reach DP3: EXISTING CULVERT-WEST Avg. Flow Depth=0.46' Max Vel=7.09 fps Inflow=3 cfs 0.292 af
12.0" Round Pipe n=0.012 L=63.0' S=0.0222 '/' Capacity=6 cfs Outflow=3 cfs 0.292 af

Reach EX-STR1: EXISTING STREAM Avg. Flow Depth=2.18' Max Vel=3.62 fps Inflow=182 cfs 46.745 af
n=0.100 L=284.0' S=0.0387 '/' Capacity=6,236 cfs Outflow=182 cfs 46.745 af

Pond DP4: EXISTING LOW AREA SOUTHWEST Peak Elev=331.02' Storage=8,117 cf Inflow=3 cfs 0.262 af
Outflow=0 cfs 0.080 af

Total Runoff Area = 132.900 ac Runoff Volume = 50.099 af Average Runoff Depth = 4.52"
100.00% Pervious = 132.900 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment PRE 4: PRE-WEST

Runoff = 3 cfs @ 12.16 hrs, Volume= 0.262 af, Depth= 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 100-yr Rainfall=8.22"

Area (ac)	CN	Description
0.000	56	Brush, Fair, HSG B
0.900	60	Woods, Fair, HSG B
0.000	77	Brush, Fair, HSG D
0.000	79	Woods, Fair, HSG D
0.900	60	Weighted Average
0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.8	147	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.2	247	Total			

Summary for Subcatchment PRE1A: EXIST CREEK-ONSITE

Runoff = 28 cfs @ 12.43 hrs, Volume= 4.084 af, Depth= 4.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 100-yr Rainfall=8.22"

Area (ac)	CN	Description
0.600	56	Brush, Fair, HSG B
7.500	60	Woods, Fair, HSG B
0.300	77	Brush, Fair, HSG D
3.300	79	Woods, Fair, HSG D
11.700	66	Weighted Average
11.700		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
22.4	1,162	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
33.8	1,262	Total			

Summary for Subcatchment PRE1B: EXIST CREEK-OFFSITE

Runoff = 172 cfs @ 13.19 hrs, Volume= 42.661 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 100-yr Rainfall=8.22"

Area (ac)	CN	Description
60.000	65	Woods/grass comb., Fair, HSG B
50.000	76	Woods/grass comb., Fair, HSG C
110.000	70	Weighted Average
110.000		100.00% Pervious Area

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

Summary for Subcatchment PRE2: PRE-CENTER WEST

Runoff = 23 cfs @ 12.28 hrs, Volume= 2.800 af, Depth= 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 100-yr Rainfall=8.22"

Area (ac)	CN	Description
2.700	56	Brush, Fair, HSG B
5.700	60	Woods, Fair, HSG B
0.200	77	Brush, Fair, HSG D
0.700	79	Woods, Fair, HSG D
9.300	61	Weighted Average
9.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
11.3	831	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.7	931	Total			

Summary for Subcatchment PRE3: PRE-WEST

Runoff = 3 cfs @ 12.24 hrs, Volume= 0.292 af, Depth= 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 100-yr Rainfall=8.22"

Area (ac)	CN	Description
0.000	56	Brush, Fair, HSG B
1.000	60	Woods, Fair, HSG B
0.000	77	Brush, Fair, HSG D
0.000	79	Woods, Fair, HSG D
1.000	60	Weighted Average
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	77	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.6	220	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.1	297	Total			

Summary for Reach DP1: CULVERT FOR STREAM

Inflow Area = 121.700 ac, 0.00% Impervious, Inflow Depth = 4.61" for 100-yr event
Inflow = 182 cfs @ 13.12 hrs, Volume= 46.745 af
Outflow = 182 cfs @ 13.12 hrs, Volume= 46.745 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3

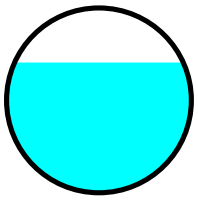
Summary for Reach DP2: EXISTING CULVERT-CENTER WEST

Inflow Area = 9.300 ac, 0.00% Impervious, Inflow Depth = 3.61" for 100-yr event
Inflow = 23 cfs @ 12.28 hrs, Volume= 2.800 af
Outflow = 23 cfs @ 12.28 hrs, Volume= 2.800 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 17.44 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 7.71 fps, Avg. Travel Time= 0.1 min

Peak Storage= 64 cf @ 12.28 hrs
Average Depth at Peak Storage= 1.06' , Surface Width= 1.37'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 27 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 48.0' Slope= 0.0583 '/'
Inlet Invert= 277.70', Outlet Invert= 274.90'



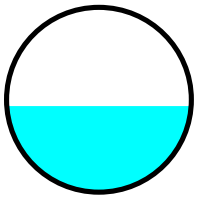
Summary for Reach DP3: EXISTING CULVERT-WEST

Inflow Area = 1.000 ac, 0.00% Impervious, Inflow Depth = 3.50" for 100-yr event
Inflow = 3 cfs @ 12.24 hrs, Volume= 0.292 af
Outflow = 3 cfs @ 12.25 hrs, Volume= 0.292 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 7.09 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.01 fps, Avg. Travel Time= 0.3 min

Peak Storage= 22 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.46' , Surface Width= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6 cfs

12.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 63.0' Slope= 0.0222 '/'
Inlet Invert= 279.50', Outlet Invert= 278.10'



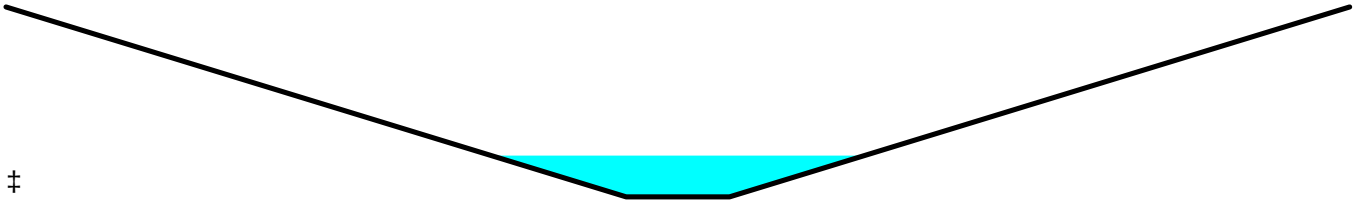
Summary for Reach EX-STR1: EXISTING STREAM

Inflow Area = 121.700 ac, 0.00% Impervious, Inflow Depth = 4.61" for 100-yr event
Inflow = 182 cfs @ 13.10 hrs, Volume= 46.745 af
Outflow = 182 cfs @ 13.12 hrs, Volume= 46.745 af, Atten= 0%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 3.62 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.66 fps, Avg. Travel Time= 2.9 min

Peak Storage= 14,248 cf @ 13.12 hrs
Average Depth at Peak Storage= 2.18' , Surface Width= 36.11'
Bank-Full Depth= 10.00' Flow Area= 700.0 sf, Capacity= 6,236 cfs

10.00' x 10.00' deep channel, n= 0.100 Very weedy reaches w/pools
Side Slope Z-value= 6.0 '/' Top Width= 130.00'
Length= 284.0' Slope= 0.0387 '/'
Inlet Invert= 301.00', Outlet Invert= 290.00'



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Summary for Pond DP4: EXISTING LOW AREA SOUTHWEST

Inflow Area =	0.900 ac,	0.00% Impervious,	Inflow Depth =	3.50"	for 100-yr event
Inflow =	3 cfs @	12.16 hrs, Volume=	0.262 af		
Outflow =	0 cfs @	15.79 hrs, Volume=	0.080 af,	Atten= 94%,	Lag= 217.8 min
Primary =	0 cfs @	15.79 hrs, Volume=	0.080 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 331.02' @ 15.79 hrs Surf.Area= 10,274 sf Storage= 8,117 cf

Plug-Flow detention time= 441.6 min calculated for 0.080 af (30% of inflow)
Center-of-Mass det. time= 286.3 min (1,155.6 - 869.4)

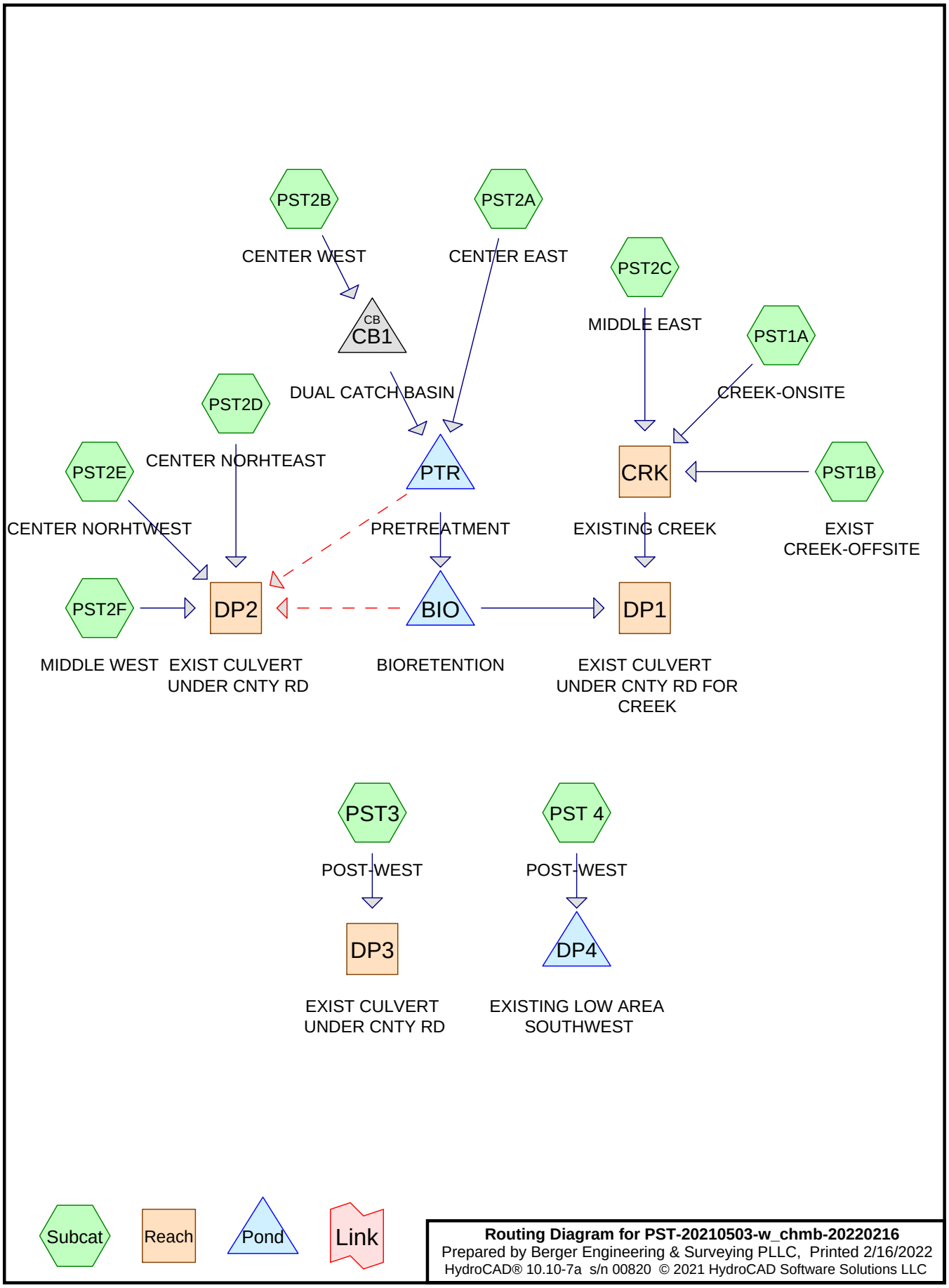
Volume	Invert	Avail.Storage	Storage Description
#1	330.00'	20,772 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
330.00	5,894	370.0	0	0	5,894
332.00	15,658	562.0	20,772	20,772	20,164

Device	Routing	Invert	Outlet Devices
#1	Primary	331.00'	**30.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0 cfs @ 15.79 hrs HW=331.02' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0 cfs @ 0.30 fps)

POST-DEVELOPMENT HYDROCAD OUTPUT REPORTS



Routing Diagram for PST-20210503-w_chmb-20220216
Prepared by Berger Engineering & Surveying PLLC, Printed 2/16/2022
HydroCAD® 10.10-7a s/n 00820 © 2021 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PST 4: POST-WEST Runoff Area=0.900 ac 0.00% Impervious Runoff Depth=0.21"
Flow Length=247' Tc=14.2 min CN=60 Runoff=0 cfs 0.016 af

Subcatchment PST1A: CREEK-ONSITE Runoff Area=10.100 ac 8.91% Impervious Runoff Depth=0.44"
Flow Length=1,262' Tc=33.8 min UI Adjusted CN=68 Runoff=2 cfs 0.372 af

Subcatchment PST1B: EXIST Runoff Area=110.000 ac 0.00% Impervious Runoff Depth=0.51"
Tc=90.0 min CN=70 Runoff=15 cfs 4.710 af

Subcatchment PST2A: CENTER EAST Runoff Area=1.200 ac 16.67% Impervious Runoff Depth=0.31"
Tc=1.0 min UI Adjusted CN=64 Runoff=0 cfs 0.031 af

Subcatchment PST2B: CENTER WEST Runoff Area=1.700 ac 23.53% Impervious Runoff Depth=0.34"
Tc=1.0 min UI Adjusted CN=65 Runoff=1 cfs 0.049 af

Subcatchment PST2C: MIDDLE EAST Runoff Area=0.300 ac 0.00% Impervious Runoff Depth=0.21"
Tc=1.0 min CN=60 Runoff=0 cfs 0.005 af

Subcatchment PST2D: CENTER Runoff Area=0.180 ac 27.78% Impervious Runoff Depth=0.37"
Tc=6.0 min UI Adjusted CN=66 Runoff=0 cfs 0.006 af

Subcatchment PST2E: CENTER Runoff Area=0.350 ac 28.57% Impervious Runoff Depth=0.37"
Tc=15.0 min UI Adjusted CN=66 Runoff=0 cfs 0.011 af

Subcatchment PST2F: MIDDLE WEST Runoff Area=7.240 ac 7.46% Impervious Runoff Depth=0.26"
Flow Length=856' Tc=20.9 min UI Adjusted CN=62 Runoff=1 cfs 0.156 af

Subcatchment PST3: POST-WEST Runoff Area=1.000 ac 0.00% Impervious Runoff Depth=0.21"
Flow Length=297' Tc=20.1 min CN=60 Runoff=0 cfs 0.017 af

Reach CRK: EXISTING CREEK Avg. Flow Depth=0.63' Max Vel=1.82 fps Inflow=16 cfs 5.086 af
n=0.100 L=284.0' S=0.0387 '/' Capacity=6,236 cfs Outflow=16 cfs 5.086 af

Reach DP1: EXIST CULVERT UNDER CNTY RD FOR CREEK Inflow=16 cfs 5.104 af
Outflow=16 cfs 5.104 af

Reach DP2: EXIST CULVERT UNDER CNTY RD Inflow=1 cfs 0.172 af
Outflow=1 cfs 0.172 af

Reach DP3: EXIST CULVERT UNDER CNTY RD Inflow=0 cfs 0.017 af
Outflow=0 cfs 0.017 af

Pond BIO: BIORETENTION Peak Elev=293.51' Storage=2,281 cf Inflow=0 cfs 0.069 af
Primary=0 cfs 0.017 af Secondary=0 cfs 0.000 af Outflow=0 cfs 0.017 af

Pond CB1: DUAL CATCH BASIN Peak Elev=293.56' Inflow=1 cfs 0.049 af
15.0" Round Culvert x 2.00 n=0.013 L=60.0' S=0.0060 '/' Outflow=1 cfs 0.049 af

Pond DP4: EXISTING LOW AREA SOUTHWEST Peak Elev=330.11' Storage=680 cf Inflow=0 cfs 0.016 af
Outflow=0 cfs 0.000 af

Pond PTR: PRETREATMENT Peak Elev=293.56' Storage=498 cf Inflow=1 cfs 0.080 af
Primary=0 cfs 0.069 af Secondary=0 cfs 0.000 af Outflow=0 cfs 0.069 af

Total Runoff Area = 132.970 ac Runoff Volume = 5.372 af Average Runoff Depth = 0.48"
98.35% Pervious = 130.780 ac 1.65% Impervious = 2.190 ac

Summary for Subcatchment PST 4: POST-WEST

Runoff = 0 cfs @ 12.45 hrs, Volume= 0.016 af, Depth= 0.21"
Routed to Pond DP4 : EXISTING LOW AREA SOUTHWEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 1-yr Rainfall=2.62"

Area (ac)	CN	Description
0.000	56	Brush, Fair, HSG B
0.900	60	Woods, Fair, HSG B
0.000	77	Brush, Fair, HSG D
0.000	79	Woods, Fair, HSG D
0.900	60	Weighted Average
0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.8	147	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.2	247	Total			

Summary for Subcatchment PST1A: CREEK-ONSITE

Runoff = 2 cfs @ 12.51 hrs, Volume= 0.372 af, Depth= 0.44"
Routed to Reach CRK : EXISTING CREEK

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 1-yr Rainfall=2.62"

	Area (ac)	CN	Adj	Description
	0.700	56		Brush, Fair, HSG B
	2.200	60		Woods, Fair, HSG B
	0.200	77		Brush, Fair, HSG D
	2.800	79		Woods, Fair, HSG D
	0.400	98		Unconnected roofs, HSG B
*	0.400	98		Unconnected driveway, HSG B
*	0.100	98		Roads
	3.300	61		>75% Grass cover, Good, HSG B
	10.100	69	68	Weighted Average, UI Adjusted
	9.200			91.09% Pervious Area
	0.900			8.91% Impervious Area
	0.800			88.89% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
22.4	1,162	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
33.8	1,262	Total			

Summary for Subcatchment PST1B: EXIST CREEK-OFFSITE

Runoff = 15 cfs @ 13.31 hrs, Volume= 4.710 af, Depth= 0.51"
Routed to Reach CRK : EXISTING CREEK

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 1-yr Rainfall=2.62"

Area (ac)	CN	Description
60.000	65	Woods/grass comb., Fair, HSG B
50.000	76	Woods/grass comb., Fair, HSG C
110.000	70	Weighted Average
110.000		100.00% Pervious Area

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

Summary for Subcatchment PST2A: CENTER EAST

Runoff = 0 cfs @ 12.00 hrs, Volume= 0.031 af, Depth= 0.31"
Routed to Pond PTR : PRETREATMENT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 1-yr Rainfall=2.62"

	Area (ac)	CN	Adj	Description
	0.000	56		Brush, Fair, HSG B
	0.000	60		Woods, Fair, HSG B
	0.000	77		Brush, Fair, HSG D
	0.000	79		Woods, Fair, HSG D
	0.000	98		Unconnected roofs, HSG B
*	0.100	98		Unconnected driveway, HSG B
*	0.100	98		Unconnected road, HSG B
	1.000	61		>75% Grass cover, Good, HSG B
	1.200	67	64	Weighted Average, UI Adjusted
	1.000			83.33% Pervious Area
	0.200			16.67% Impervious Area
	0.200			100.00% Unconnected

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

Summary for Subcatchment PST2B: CENTER WEST

Runoff = 1 cfs @ 12.00 hrs, Volume= 0.049 af, Depth= 0.34"
Routed to Pond CB1 : DUAL CATCH BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 1-yr Rainfall=2.62"

	Area (ac)	CN	Adj	Description
	0.000	56		Brush, Fair, HSG B
	0.100	60		Woods, Fair, HSG B
	0.000	77		Brush, Fair, HSG D
	0.000	79		Woods, Fair, HSG D
	0.200	98		Unconnected roofs, HSG B
*	0.100	98		Unconnected driveway, HSG B
*	0.100	98		Unconnected road, HSG B
	1.200	61		>75% Grass cover, Good, HSG B
	1.700	70	65	Weighted Average, UI Adjusted
	1.300			76.47% Pervious Area
	0.400			23.53% Impervious Area
	0.400			100.00% Unconnected

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

Summary for Subcatchment PST2C: MIDDLE EAST

Runoff = 0 cfs @ 12.10 hrs, Volume= 0.005 af, Depth= 0.21"
Routed to Reach CRK : EXISTING CREEK

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 1-yr Rainfall=2.62"

	Area (ac)	CN	Description
	0.000	56	Brush, Fair, HSG B
	0.200	60	Woods, Fair, HSG B
	0.000	77	Brush, Fair, HSG D
	0.000	79	Woods, Fair, HSG D
	0.000	98	Unconnected roofs, HSG B
*	0.000	98	Unconnected driveway, HSG B
*	0.000	98	Unconnected road, HSG B
	0.100	61	>75% Grass cover, Good, HSG B
	0.300	60	Weighted Average
	0.300		100.00% Pervious Area

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

Summary for Subcatchment PST2D: CENTER NORHTEAST

Runoff = 0 cfs @ 12.06 hrs, Volume= 0.006 af, Depth= 0.37"
Routed to Reach DP2 : EXIST CULVERT UNDER CNTY RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 1-yr Rainfall=2.62"

	Area (ac)	CN	Adj	Description
	0.000	56		Brush, Fair, HSG B
	0.000	60		Woods, Fair, HSG B
	0.000	77		Brush, Fair, HSG D
	0.000	79		Woods, Fair, HSG D
	0.000	98		Unconnected roofs, HSG B
*	0.000	98		Unconnected driveway, HSG B
*	0.050	98		Unconnected road, HSG B
	0.130	61		>75% Grass cover, Good, HSG B
	0.180	71	66	Weighted Average, UI Adjusted
	0.130			72.22% Pervious Area
	0.050			27.78% Impervious Area
	0.050			100.00% Unconnected

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

Summary for Subcatchment PST2E: CENTER NORHTWEST

Runoff = 0 cfs @ 12.22 hrs, Volume= 0.011 af, Depth= 0.37"
Routed to Reach DP2 : EXIST CULVERT UNDER CNTY RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 1-yr Rainfall=2.62"

	Area (ac)	CN	Adj	Description
	0.000	56		Brush, Fair, HSG B
	0.000	60		Woods, Fair, HSG B
	0.000	77		Brush, Fair, HSG D
	0.000	79		Woods, Fair, HSG D
	0.030	98		Unconnected roofs, HSG B
*	0.030	98		Unconnected driveway, HSG B
*	0.040	98		Unconnected road, HSG B
	0.250	61		>75% Grass cover, Good, HSG B
	0.350	72	66	Weighted Average, UI Adjusted
	0.250			71.43% Pervious Area
	0.100			28.57% Impervious Area
	0.100			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Rain Gardens**

Summary for Subcatchment PST2F: MIDDLE WEST

Runoff = 1 cfs @ 12.46 hrs, Volume= 0.156 af, Depth= 0.26"
Routed to Reach DP2 : EXIST CULVERT UNDER CNTY RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 1-yr Rainfall=2.62"

	Area (ac)	CN	Adj	Description
	0.700	56		Brush, Fair, HSG B
	3.000	60		Woods, Fair, HSG B
	0.000	77		Brush, Fair, HSG D
	0.200	79		Woods, Fair, HSG D
	0.360	98		Unconnected roofs, HSG B
*	0.180	98		Unconnected driveway, HSG B
*	0.000	98		Unconnected road, HSG B
	2.800	61		>75% Grass cover, Good, HSG B
	7.240	63	62	Weighted Average, UI Adjusted
	6.700			92.54% Pervious Area
	0.540			7.46% Impervious Area
	0.540			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
9.5	756	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.9	856	Total			

Summary for Subcatchment PST3: POST-WEST

Runoff = 0 cfs @ 12.57 hrs, Volume= 0.017 af, Depth= 0.21"
Routed to Reach DP3 : EXIST CULVERT UNDER CNTY RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 1-yr Rainfall=2.62"

Area (ac)	CN	Description
0.000	56	Brush, Fair, HSG B
0.800	60	Woods, Fair, HSG B
0.000	77	Brush, Fair, HSG D
0.000	79	Woods, Fair, HSG D
0.200	61	>75% Grass cover, Good, HSG B
1.000	60	Weighted Average
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	77	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.6	220	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.1	297	Total			

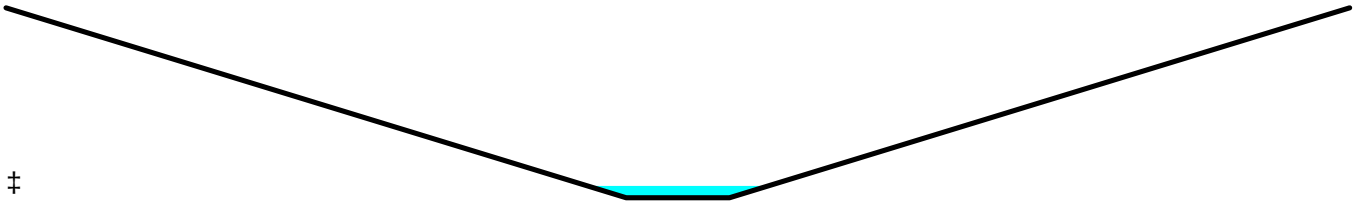
Summary for Reach CRK: EXISTING CREEK

Inflow Area = 120.400 ac, 0.75% Impervious, Inflow Depth = 0.51" for 1-yr event
Inflow = 16 cfs @ 13.30 hrs, Volume= 5.086 af
Outflow = 16 cfs @ 13.34 hrs, Volume= 5.086 af, Atten= 0%, Lag= 2.4 min
Routed to Reach DP1 : EXIST CULVERT UNDER CNTY RD FOR CREEK

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 1.82 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 1.03 fps, Avg. Travel Time= 4.6 min

Peak Storage= 2,445 cf @ 13.34 hrs
Average Depth at Peak Storage= 0.63' , Surface Width= 17.50'
Bank-Full Depth= 10.00' Flow Area= 700.0 sf, Capacity= 6,236 cfs

10.00' x 10.00' deep channel, n= 0.100 Very weedy reaches w/pools
Side Slope Z-value= 6.0 '/' Top Width= 130.00'
Length= 284.0' Slope= 0.0387 '/'
Inlet Invert= 301.00', Outlet Invert= 290.00'



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Summary for Reach DP1: EXIST CULVERT UNDER CNTY RD FOR CREEK

Inflow Area = 123.300 ac, 1.22% Impervious, Inflow Depth = 0.50" for 1-yr event
Inflow = 16 cfs @ 13.34 hrs, Volume= 5.104 af
Outflow = 16 cfs @ 13.34 hrs, Volume= 5.104 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3

Summary for Reach DP2: EXIST CULVERT UNDER CNTY RD

Inflow Area = 7.770 ac, 8.88% Impervious, Inflow Depth = 0.27" for 1-yr event
Inflow = 1 cfs @ 12.43 hrs, Volume= 0.172 af
Outflow = 1 cfs @ 12.43 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3

Summary for Reach DP3: EXIST CULVERT UNDER CNTY RD

Inflow Area = 1.000 ac, 0.00% Impervious, Inflow Depth = 0.21" for 1-yr event
Inflow = 0 cfs @ 12.57 hrs, Volume= 0.017 af
Outflow = 0 cfs @ 12.57 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3

Summary for Pond BIO: BIORETENTION

Inflow Area = 2.900 ac, 20.69% Impervious, Inflow Depth = 0.29" for 1-yr event
Inflow = 0 cfs @ 12.22 hrs, Volume= 0.069 af
Outflow = 0 cfs @ 19.55 hrs, Volume= 0.017 af, Atten= 87%, Lag= 439.7 min
Primary = 0 cfs @ 19.55 hrs, Volume= 0.017 af
Routed to Reach DP1 : EXIST CULVERT UNDER CNTY RD FOR CREEK
Secondary = 0 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach DP2 : EXIST CULVERT UNDER CNTY RD

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 293.51' @ 19.55 hrs Surf.Area= 2,314 sf Storage= 2,281 cf

Plug-Flow detention time= 541.0 min calculated for 0.017 af (25% of inflow)
Center-of-Mass det. time= 312.7 min (1,295.5 - 982.8)

Volume	Invert	Avail.Storage	Storage Description
#1	292.00'	4,147 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
#2A	290.25'	576 cf	**14.50'W x 54.00'L x 2.54'H Field A** 1,990 cf Overall - 551 cf Embedded = 1,439 cf x 40.0% Voids
#3A	290.75'	551 cf	**Cultec R-150XLHD** x 20 Inside #2 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 4 rows
		5,273 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
292.00	10	5.0	0	0	10
293.00	1,230	190.0	450	450	2,882
294.00	1,850	200.0	1,529	1,980	3,249
295.00	2,500	230.0	2,167	4,147	4,298

Device	Routing	Invert	Outlet Devices
#1	Primary	290.75'	**15.0" Round Culvert** L= 150.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 290.75' / 290.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	293.50'	**24.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Secondary	294.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0 cfs @ 19.55 hrs HW=293.51' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0 cfs of 6 cfs potential flow)
└─**2=Orifice/Grate** (Weir Controls 0 cfs @ 0.34 fps)

Secondary OutFlow Max=0 cfs @ 0.00 hrs HW=290.25' TW=0.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir** (Controls 0 cfs)

Summary for Pond CB1: DUAL CATCH BASIN

Inflow Area = 1.700 ac, 23.53% Impervious, Inflow Depth = 0.34" for 1-yr event
Inflow = 1 cfs @ 12.00 hrs, Volume= 0.049 af
Outflow = 1 cfs @ 12.00 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.0 min
Primary = 1 cfs @ 12.00 hrs, Volume= 0.049 af
Routed to Pond PTR : PRETREATMENT

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 293.56' @ 12.22 hrs
Flood Elev= 296.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	292.50'	**15.0" Round Culvert X 2.00** L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 292.50' / 292.14' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=1 cfs @ 12.00 hrs HW=292.89' TW=292.74' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1 cfs @ 1.46 fps)

Summary for Pond DP4: EXISTING LOW AREA SOUTHWEST

Inflow Area = 0.900 ac, 0.00% Impervious, Inflow Depth = 0.21" for 1-yr event
Inflow = 0 cfs @ 12.45 hrs, Volume= 0.016 af
Outflow = 0 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 330.11' @ 24.81 hrs Surf.Area= 6,315 sf Storage= 680 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	330.00'	20,772 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
330.00	5,894	370.0	0	0	5,894
332.00	15,658	562.0	20,772	20,772	20,164

Device	Routing	Invert	Outlet Devices
#1	Primary	331.00'	**30.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0 cfs @ 0.00 hrs HW=330.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0 cfs)

Summary for Pond PTR: PRETREATMENT

Inflow Area = 2.900 ac, 20.69% Impervious, Inflow Depth = 0.33" for 1-yr event
Inflow = 1 cfs @ 12.00 hrs, Volume= 0.080 af
Outflow = 0 cfs @ 12.22 hrs, Volume= 0.069 af, Atten= 64%, Lag= 13.1 min
Primary = 0 cfs @ 12.22 hrs, Volume= 0.069 af
Routed to Pond BIO : BIORETENTION
Secondary = 0 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach DP2 : EXIST CULVERT UNDER CNTY RD

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 293.56' @ 12.22 hrs Surf.Area= 513 sf Storage= 498 cf

Plug-Flow detention time= 98.1 min calculated for 0.069 af (87% of inflow)
Center-of-Mass det. time= 37.0 min (982.8 - 945.8)

Volume	Invert	Avail.Storage	Storage Description
#1	292.00'	1,535 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
292.00	124	0	0
294.00	622	746	746
295.00	955	789	1,535

Device	Routing	Invert	Outlet Devices
#1	Primary	293.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	294.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0 cfs @ 12.22 hrs HW=293.56' TW=290.39' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0 cfs @ 0.58 fps)

Secondary OutFlow Max=0 cfs @ 0.00 hrs HW=292.00' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0 cfs)

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PST 4: POST-WEST Runoff Area=0.900 ac 0.00% Impervious Runoff Depth=1.11"
Flow Length=247' Tc=14.2 min CN=60 Runoff=1 cfs 0.083 af

Subcatchment PST1A: CREEK-ONSITE Runoff Area=10.100 ac 8.91% Impervious Runoff Depth=1.65"
Flow Length=1,262' Tc=33.8 min UI Adjusted CN=68 Runoff=9 cfs 1.387 af

Subcatchment PST1B: EXIST Runoff Area=110.000 ac 0.00% Impervious Runoff Depth=1.80"
Tc=90.0 min CN=70 Runoff=64 cfs 16.455 af

Subcatchment PST2A: CENTER EAST Runoff Area=1.200 ac 16.67% Impervious Runoff Depth=1.37"
Tc=1.0 min UI Adjusted CN=64 Runoff=2 cfs 0.137 af

Subcatchment PST2B: CENTER WEST Runoff Area=1.700 ac 23.53% Impervious Runoff Depth=1.44"
Tc=1.0 min UI Adjusted CN=65 Runoff=4 cfs 0.204 af

Subcatchment PST2C: MIDDLE EAST Runoff Area=0.300 ac 0.00% Impervious Runoff Depth=1.11"
Tc=1.0 min CN=60 Runoff=0 cfs 0.028 af

Subcatchment PST2D: CENTER Runoff Area=0.180 ac 27.78% Impervious Runoff Depth=1.51"
Tc=6.0 min UI Adjusted CN=66 Runoff=0 cfs 0.023 af

Subcatchment PST2E: CENTER Runoff Area=0.350 ac 28.57% Impervious Runoff Depth=1.51"
Tc=15.0 min UI Adjusted CN=66 Runoff=0 cfs 0.044 af

Subcatchment PST2F: MIDDLE WEST Runoff Area=7.240 ac 7.46% Impervious Runoff Depth=1.24"
Flow Length=856' Tc=20.9 min UI Adjusted CN=62 Runoff=6 cfs 0.748 af

Subcatchment PST3: POST-WEST Runoff Area=1.000 ac 0.00% Impervious Runoff Depth=1.11"
Flow Length=297' Tc=20.1 min CN=60 Runoff=1 cfs 0.093 af

Reach CRK: EXISTING CREEK Avg. Flow Depth=1.34' Max Vel=2.76 fps Inflow=67 cfs 17.870 af
n=0.100 L=284.0' S=0.0387 '/' Capacity=6,236 cfs Outflow=67 cfs 17.870 af

Reach DP1: EXIST CULVERT UNDER CNTY RD FOR CREEK Inflow=67 cfs 18.149 af
Outflow=67 cfs 18.149 af

Reach DP2: EXIST CULVERT UNDER CNTY RD Inflow=6 cfs 0.814 af
Outflow=6 cfs 0.814 af

Reach DP3: EXIST CULVERT UNDER CNTY RD Inflow=1 cfs 0.093 af
Outflow=1 cfs 0.093 af

Pond BIO: BIORETENTION Peak Elev=293.67' Storage=2,534 cf Inflow=6 cfs 0.330 af
Primary=3 cfs 0.278 af Secondary=0 cfs 0.000 af Outflow=3 cfs 0.278 af

Pond CB1: DUAL CATCH BASIN Peak Elev=293.98' Inflow=4 cfs 0.204 af
15.0" Round Culvert x 2.00 n=0.013 L=60.0' S=0.0060 '/' Outflow=4 cfs 0.204 af

Pond DP4: EXISTING LOW AREA SOUTHWEST Peak Elev=330.53' Storage=3,636 cf Inflow=1 cfs 0.083 af
Outflow=0 cfs 0.000 af

Pond PTR: PRETREATMENT Peak Elev=293.88' Storage=673 cf Inflow=6 cfs 0.341 af
Primary=6 cfs 0.330 af Secondary=0 cfs 0.000 af Outflow=6 cfs 0.330 af

Total Runoff Area = 132.970 ac Runoff Volume = 19.202 af Average Runoff Depth = 1.73"
98.35% Pervious = 130.780 ac 1.65% Impervious = 2.190 ac

Summary for Subcatchment PST 4: POST-WEST

Runoff = 1 cfs @ 12.17 hrs, Volume= 0.083 af, Depth= 1.11"
Routed to Pond DP4 : EXISTING LOW AREA SOUTHWEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 10-yr Rainfall=4.67"

Area (ac)	CN	Description
0.000	56	Brush, Fair, HSG B
0.900	60	Woods, Fair, HSG B
0.000	77	Brush, Fair, HSG D
0.000	79	Woods, Fair, HSG D
0.900	60	Weighted Average
0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.8	147	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.2	247	Total			

Summary for Subcatchment PST1A: CREEK-ONSITE

Runoff = 9 cfs @ 12.44 hrs, Volume= 1.387 af, Depth= 1.65"
Routed to Reach CRK : EXISTING CREEK

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 10-yr Rainfall=4.67"

	Area (ac)	CN	Adj	Description
	0.700	56		Brush, Fair, HSG B
	2.200	60		Woods, Fair, HSG B
	0.200	77		Brush, Fair, HSG D
	2.800	79		Woods, Fair, HSG D
	0.400	98		Unconnected roofs, HSG B
*	0.400	98		Unconnected driveway, HSG B
*	0.100	98		Roads
	3.300	61		>75% Grass cover, Good, HSG B
	10.100	69	68	Weighted Average, UI Adjusted
	9.200			91.09% Pervious Area
	0.900			8.91% Impervious Area
	0.800			88.89% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
22.4	1,162	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
33.8	1,262	Total			

Summary for Subcatchment PST1B: EXIST CREEK-OFFSITE

Runoff = 64 cfs @ 13.20 hrs, Volume= 16.455 af, Depth= 1.80"
Routed to Reach CRK : EXISTING CREEK

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 10-yr Rainfall=4.67"

Area (ac)	CN	Description
60.000	65	Woods/grass comb., Fair, HSG B
50.000	76	Woods/grass comb., Fair, HSG C
110.000	70	Weighted Average
110.000		100.00% Pervious Area

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

Summary for Subcatchment PST2A: CENTER EAST

Runoff = 2 cfs @ 12.00 hrs, Volume= 0.137 af, Depth= 1.37"
Routed to Pond PTR : PRETREATMENT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 10-yr Rainfall=4.67"

	Area (ac)	CN	Adj	Description
	0.000	56		Brush, Fair, HSG B
	0.000	60		Woods, Fair, HSG B
	0.000	77		Brush, Fair, HSG D
	0.000	79		Woods, Fair, HSG D
	0.000	98		Unconnected roofs, HSG B
*	0.100	98		Unconnected driveway, HSG B
*	0.100	98		Unconnected road, HSG B
	1.000	61		>75% Grass cover, Good, HSG B
	1.200	67	64	Weighted Average, UI Adjusted
	1.000			83.33% Pervious Area
	0.200			16.67% Impervious Area
	0.200			100.00% Unconnected

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

Summary for Subcatchment PST2B: CENTER WEST

Runoff = 4 cfs @ 12.00 hrs, Volume= 0.204 af, Depth= 1.44"
Routed to Pond CB1 : DUAL CATCH BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 10-yr Rainfall=4.67"

	Area (ac)	CN	Adj	Description
	0.000	56		Brush, Fair, HSG B
	0.100	60		Woods, Fair, HSG B
	0.000	77		Brush, Fair, HSG D
	0.000	79		Woods, Fair, HSG D
	0.200	98		Unconnected roofs, HSG B
*	0.100	98		Unconnected driveway, HSG B
*	0.100	98		Unconnected road, HSG B
	1.200	61		>75% Grass cover, Good, HSG B
	1.700	70	65	Weighted Average, UI Adjusted
	1.300			76.47% Pervious Area
	0.400			23.53% Impervious Area
	0.400			100.00% Unconnected

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

Summary for Subcatchment PST2C: MIDDLE EAST

Runoff = 0 cfs @ 12.00 hrs, Volume= 0.028 af, Depth= 1.11"
Routed to Reach CRK : EXISTING CREEK

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 10-yr Rainfall=4.67"

	Area (ac)	CN	Description
	0.000	56	Brush, Fair, HSG B
	0.200	60	Woods, Fair, HSG B
	0.000	77	Brush, Fair, HSG D
	0.000	79	Woods, Fair, HSG D
	0.000	98	Unconnected roofs, HSG B
*	0.000	98	Unconnected driveway, HSG B
*	0.000	98	Unconnected road, HSG B
	0.100	61	>75% Grass cover, Good, HSG B
	0.300	60	Weighted Average
	0.300		100.00% Pervious Area

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

Summary for Subcatchment PST2D: CENTER NORHTEAST

Runoff = 0 cfs @ 12.04 hrs, Volume= 0.023 af, Depth= 1.51"
Routed to Reach DP2 : EXIST CULVERT UNDER CNTY RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 10-yr Rainfall=4.67"

	Area (ac)	CN	Adj	Description
	0.000	56		Brush, Fair, HSG B
	0.000	60		Woods, Fair, HSG B
	0.000	77		Brush, Fair, HSG D
	0.000	79		Woods, Fair, HSG D
	0.000	98		Unconnected roofs, HSG B
*	0.000	98		Unconnected driveway, HSG B
*	0.050	98		Unconnected road, HSG B
	0.130	61		>75% Grass cover, Good, HSG B
	0.180	71	66	Weighted Average, UI Adjusted
	0.130			72.22% Pervious Area
	0.050			27.78% Impervious Area
	0.050			100.00% Unconnected

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

Summary for Subcatchment PST2E: CENTER NORHTWEST

Runoff = 0 cfs @ 12.18 hrs, Volume= 0.044 af, Depth= 1.51"
Routed to Reach DP2 : EXIST CULVERT UNDER CNTY RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 10-yr Rainfall=4.67"

	Area (ac)	CN	Adj	Description
	0.000	56		Brush, Fair, HSG B
	0.000	60		Woods, Fair, HSG B
	0.000	77		Brush, Fair, HSG D
	0.000	79		Woods, Fair, HSG D
	0.030	98		Unconnected roofs, HSG B
*	0.030	98		Unconnected driveway, HSG B
*	0.040	98		Unconnected road, HSG B
	0.250	61		>75% Grass cover, Good, HSG B
	0.350	72	66	Weighted Average, UI Adjusted
	0.250			71.43% Pervious Area
	0.100			28.57% Impervious Area
	0.100			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Rain Gardens**

Summary for Subcatchment PST2F: MIDDLE WEST

Runoff = 6 cfs @ 12.28 hrs, Volume= 0.748 af, Depth= 1.24"
Routed to Reach DP2 : EXIST CULVERT UNDER CNTY RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 10-yr Rainfall=4.67"

	Area (ac)	CN	Adj	Description
	0.700	56		Brush, Fair, HSG B
	3.000	60		Woods, Fair, HSG B
	0.000	77		Brush, Fair, HSG D
	0.200	79		Woods, Fair, HSG D
	0.360	98		Unconnected roofs, HSG B
*	0.180	98		Unconnected driveway, HSG B
*	0.000	98		Unconnected road, HSG B
	2.800	61		>75% Grass cover, Good, HSG B
	7.240	63	62	Weighted Average, UI Adjusted
	6.700			92.54% Pervious Area
	0.540			7.46% Impervious Area
	0.540			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
9.5	756	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.9	856	Total			

Summary for Subcatchment PST3: POST-WEST

Runoff = 1 cfs @ 12.26 hrs, Volume= 0.093 af, Depth= 1.11"
Routed to Reach DP3 : EXIST CULVERT UNDER CNTY RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 10-yr Rainfall=4.67"

Area (ac)	CN	Description
0.000	56	Brush, Fair, HSG B
0.800	60	Woods, Fair, HSG B
0.000	77	Brush, Fair, HSG D
0.000	79	Woods, Fair, HSG D
0.200	61	>75% Grass cover, Good, HSG B
1.000	60	Weighted Average
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	77	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.6	220	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.1	297	Total			

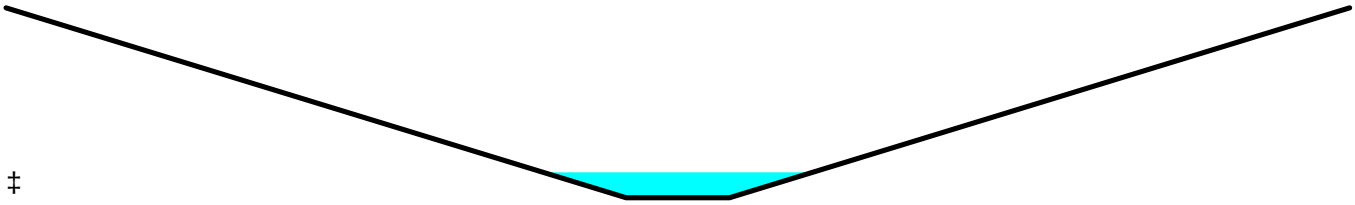
Summary for Reach CRK: EXISTING CREEK

Inflow Area = 120.400 ac, 0.75% Impervious, Inflow Depth = 1.78" for 10-yr event
Inflow = 67 cfs @ 13.20 hrs, Volume= 17.870 af
Outflow = 67 cfs @ 13.21 hrs, Volume= 17.870 af, Atten= 0%, Lag= 0.7 min
Routed to Reach DP1 : EXIST CULVERT UNDER CNTY RD FOR CREEK

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 2.76 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 3.5 min

Peak Storage= 6,851 cf @ 13.21 hrs
Average Depth at Peak Storage= 1.34' , Surface Width= 26.05'
Bank-Full Depth= 10.00' Flow Area= 700.0 sf, Capacity= 6,236 cfs

10.00' x 10.00' deep channel, n= 0.100 Very weedy reaches w/pools
Side Slope Z-value= 6.0 '/' Top Width= 130.00'
Length= 284.0' Slope= 0.0387 '/'
Inlet Invert= 301.00', Outlet Invert= 290.00'



‡

Summary for Reach DP1: EXIST CULVERT UNDER CNTY RD FOR CREEK

Inflow Area = 123.300 ac, 1.22% Impervious, Inflow Depth = 1.77" for 10-yr event
Inflow = 67 cfs @ 13.21 hrs, Volume= 18.149 af
Outflow = 67 cfs @ 13.21 hrs, Volume= 18.149 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3

Summary for Reach DP2: EXIST CULVERT UNDER CNTY RD

Inflow Area = 7.770 ac, 8.88% Impervious, Inflow Depth = 1.26" for 10-yr event
Inflow = 6 cfs @ 12.26 hrs, Volume= 0.814 af
Outflow = 6 cfs @ 12.26 hrs, Volume= 0.814 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3

Summary for Reach DP3: EXIST CULVERT UNDER CNTY RD

Inflow Area = 1.000 ac, 0.00% Impervious, Inflow Depth = 1.11" for 10-yr event
Inflow = 1 cfs @ 12.26 hrs, Volume= 0.093 af
Outflow = 1 cfs @ 12.26 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3

Summary for Pond BIO: BIORETENTION

Inflow Area = 2.900 ac, 20.69% Impervious, Inflow Depth = 1.37" for 10-yr event
Inflow = 6 cfs @ 12.00 hrs, Volume= 0.330 af
Outflow = 3 cfs @ 12.04 hrs, Volume= 0.278 af, Atten= 50%, Lag= 2.5 min
Primary = 3 cfs @ 12.04 hrs, Volume= 0.278 af
Routed to Reach DP1 : EXIST CULVERT UNDER CNTY RD FOR CREEK
Secondary = 0 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach DP2 : EXIST CULVERT UNDER CNTY RD

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 293.67' @ 12.04 hrs Surf.Area= 2,415 sf Storage= 2,534 cf

Plug-Flow detention time= 109.8 min calculated for 0.278 af (84% of inflow)
Center-of-Mass det. time= 35.9 min (926.6 - 890.7)

Volume	Invert	Avail.Storage	Storage Description
#1	292.00'	4,147 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
#2A	290.25'	576 cf	**14.50'W x 54.00'L x 2.54'H Field A** 1,990 cf Overall - 551 cf Embedded = 1,439 cf x 40.0% Voids
#3A	290.75'	551 cf	**Cultec R-150XLHD** x 20 Inside #2 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 4 rows
		5,273 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
292.00	10	5.0	0	0	10
293.00	1,230	190.0	450	450	2,882
294.00	1,850	200.0	1,529	1,980	3,249
295.00	2,500	230.0	2,167	4,147	4,298

Device	Routing	Invert	Outlet Devices
#1	Primary	290.75'	**15.0" Round Culvert** L= 150.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 290.75' / 290.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	293.50'	**24.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Secondary	294.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3 cfs @ 12.04 hrs HW=293.67' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 3 cfs of 7 cfs potential flow)
└─**2=Orifice/Grate** (Weir Controls 3 cfs @ 1.35 fps)

Secondary OutFlow Max=0 cfs @ 0.00 hrs HW=290.25' TW=0.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir** (Controls 0 cfs)

Summary for Pond CB1: DUAL CATCH BASIN

Inflow Area = 1.700 ac, 23.53% Impervious, Inflow Depth = 1.44" for 10-yr event
Inflow = 4 cfs @ 12.00 hrs, Volume= 0.204 af
Outflow = 4 cfs @ 12.00 hrs, Volume= 0.204 af, Atten= 0%, Lag= 0.0 min
Primary = 4 cfs @ 12.00 hrs, Volume= 0.204 af
Routed to Pond PTR : PRETREATMENT

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 293.98' @ 12.00 hrs
Flood Elev= 296.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	292.50'	**15.0" Round Culvert X 2.00** L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 292.50' / 292.14' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=4 cfs @ 12.00 hrs HW=293.97' TW=293.88' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 4 cfs @ 1.54 fps)

Summary for Pond DP4: EXISTING LOW AREA SOUTHWEST

Inflow Area = 0.900 ac, 0.00% Impervious, Inflow Depth = 1.11" for 10-yr event
Inflow = 1 cfs @ 12.17 hrs, Volume= 0.083 af
Outflow = 0 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 330.53' @ 24.81 hrs Surf.Area= 8,005 sf Storage= 3,636 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	330.00'	20,772 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
330.00	5,894	370.0	0	0	5,894
332.00	15,658	562.0	20,772	20,772	20,164

Device	Routing	Invert	Outlet Devices
#1	Primary	331.00'	**30.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0 cfs @ 0.00 hrs HW=330.00' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0 cfs)

Summary for Pond PTR: PRETREATMENT

Inflow Area = 2.900 ac, 20.69% Impervious, Inflow Depth = 1.41" for 10-yr event
Inflow = 6 cfs @ 12.00 hrs, Volume= 0.341 af
Outflow = 6 cfs @ 12.00 hrs, Volume= 0.330 af, Atten= 3%, Lag= 0.1 min
Primary = 6 cfs @ 12.00 hrs, Volume= 0.330 af
Routed to Pond BIO : BIORETENTION
Secondary = 0 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach DP2 : EXIST CULVERT UNDER CNTY RD

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 293.88' @ 12.00 hrs Surf.Area= 592 sf Storage= 673 cf

Plug-Flow detention time= 24.9 min calculated for 0.330 af (97% of inflow)
Center-of-Mass det. time= 7.9 min (890.7 - 882.8)

Volume	Invert	Avail.Storage	Storage Description
#1	292.00'	1,535 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
292.00	124	0	0
294.00	622	746	746
295.00	955	789	1,535

Device	Routing	Invert	Outlet Devices
#1	Primary	293.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	294.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=6 cfs @ 12.00 hrs HW=293.88' TW=293.42' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 6 cfs @ 1.53 fps)

Secondary OutFlow Max=0 cfs @ 0.00 hrs HW=292.00' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0 cfs)

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PST 4: POST-WEST Runoff Area=0.900 ac 0.00% Impervious Runoff Depth=3.50"
Flow Length=247' Tc=14.2 min CN=60 Runoff=3 cfs 0.262 af

Subcatchment PST1A: CREEK-ONSITE Runoff Area=10.100 ac 8.91% Impervious Runoff Depth=4.42"
Flow Length=1,262' Tc=33.8 min UI Adjusted CN=68 Runoff=26 cfs 3.721 af

Subcatchment PST1B: EXIST Runoff Area=110.000 ac 0.00% Impervious Runoff Depth=4.65"
Tc=90.0 min CN=70 Runoff=172 cfs 42.661 af

Subcatchment PST2A: CENTER EAST Runoff Area=1.200 ac 16.67% Impervious Runoff Depth=3.96"
Tc=1.0 min UI Adjusted CN=64 Runoff=7 cfs 0.396 af

Subcatchment PST2B: CENTER WEST Runoff Area=1.700 ac 23.53% Impervious Runoff Depth=4.07"
Tc=1.0 min UI Adjusted CN=65 Runoff=10 cfs 0.577 af

Subcatchment PST2C: MIDDLE EAST Runoff Area=0.300 ac 0.00% Impervious Runoff Depth=3.50"
Tc=1.0 min CN=60 Runoff=1 cfs 0.087 af

Subcatchment PST2D: CENTER Runoff Area=0.180 ac 27.78% Impervious Runoff Depth=4.19"
Tc=6.0 min UI Adjusted CN=66 Runoff=1 cfs 0.063 af

Subcatchment PST2E: CENTER Runoff Area=0.350 ac 28.57% Impervious Runoff Depth=4.19"
Tc=15.0 min UI Adjusted CN=66 Runoff=1 cfs 0.122 af

Subcatchment PST2F: MIDDLE WEST Runoff Area=7.240 ac 7.46% Impervious Runoff Depth=3.73"
Flow Length=856' Tc=20.9 min UI Adjusted CN=62 Runoff=19 cfs 2.249 af

Subcatchment PST3: POST-WEST Runoff Area=1.000 ac 0.00% Impervious Runoff Depth=3.50"
Flow Length=297' Tc=20.1 min CN=60 Runoff=3 cfs 0.292 af

Reach CRK: EXISTING CREEK Avg. Flow Depth=2.17' Max Vel=3.61 fps Inflow=181 cfs 46.469 af
n=0.100 L=284.0' S=0.0387 '/' Capacity=6,236 cfs Outflow=181 cfs 46.469 af

Reach DP1: EXIST CULVERT UNDER CNTY RD FOR CREEK Inflow=182 cfs 47.319 af
Outflow=182 cfs 47.319 af

Reach DP2: EXIST CULVERT UNDER CNTY RD Inflow=21 cfs 2.495 af
Outflow=21 cfs 2.495 af

Reach DP3: EXIST CULVERT UNDER CNTY RD Inflow=3 cfs 0.292 af
Outflow=3 cfs 0.292 af

Pond BIO: BIORETENTION Peak Elev=294.19' Storage=3,478 cf Inflow=12 cfs 0.925 af
Primary=7 cfs 0.849 af Secondary=4 cfs 0.024 af Outflow=11 cfs 0.873 af

Pond CB1: DUAL CATCH BASIN Peak Elev=295.06' Inflow=10 cfs 0.577 af
15.0" Round Culvert x 2.00 n=0.013 L=60.0' S=0.0060 '/' Outflow=10 cfs 0.577 af

Pond DP4: EXISTING LOW AREA SOUTHWEST Peak Elev=331.02' Storage=8,117 cf Inflow=3 cfs 0.262 af
Outflow=0 cfs 0.080 af

Pond PTR: PRETREATMENT Peak Elev=294.33' Storage=970 cf Inflow=17 cfs 0.973 af
Primary=12 cfs 0.925 af Secondary=5 cfs 0.037 af Outflow=16 cfs 0.962 af

Total Runoff Area = 132.970 ac Runoff Volume = 50.430 af Average Runoff Depth = 4.55"
98.35% Pervious = 130.780 ac 1.65% Impervious = 2.190 ac

Summary for Subcatchment PST 4: POST-WEST

Runoff = 3 cfs @ 12.16 hrs, Volume= 0.262 af, Depth= 3.50"
Routed to Pond DP4 : EXISTING LOW AREA SOUTHWEST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 100-yr Rainfall=8.22"

Area (ac)	CN	Description
0.000	56	Brush, Fair, HSG B
0.900	60	Woods, Fair, HSG B
0.000	77	Brush, Fair, HSG D
0.000	79	Woods, Fair, HSG D
0.900	60	Weighted Average
0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.8	147	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.2	247	Total			

Summary for Subcatchment PST1A: CREEK-ONSITE

Runoff = 26 cfs @ 12.43 hrs, Volume= 3.721 af, Depth= 4.42"
Routed to Reach CRK : EXISTING CREEK

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 100-yr Rainfall=8.22"

	Area (ac)	CN	Adj	Description
	0.700	56		Brush, Fair, HSG B
	2.200	60		Woods, Fair, HSG B
	0.200	77		Brush, Fair, HSG D
	2.800	79		Woods, Fair, HSG D
	0.400	98		Unconnected roofs, HSG B
*	0.400	98		Unconnected driveway, HSG B
*	0.100	98		Roads
	3.300	61		>75% Grass cover, Good, HSG B
	10.100	69	68	Weighted Average, UI Adjusted
	9.200			91.09% Pervious Area
	0.900			8.91% Impervious Area
	0.800			88.89% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
22.4	1,162	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
33.8	1,262	Total			

Summary for Subcatchment PST1B: EXIST CREEK-OFFSITE

Runoff = 172 cfs @ 13.19 hrs, Volume= 42.661 af, Depth= 4.65"
Routed to Reach CRK : EXISTING CREEK

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 100-yr Rainfall=8.22"

Area (ac)	CN	Description
60.000	65	Woods/grass comb., Fair, HSG B
50.000	76	Woods/grass comb., Fair, HSG C
110.000	70	Weighted Average
110.000		100.00% Pervious Area

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

Summary for Subcatchment PST2A: CENTER EAST

Runoff = 7 cfs @ 12.00 hrs, Volume= 0.396 af, Depth= 3.96"
Routed to Pond PTR : PRETREATMENT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 100-yr Rainfall=8.22"

	Area (ac)	CN	Adj	Description
	0.000	56		Brush, Fair, HSG B
	0.000	60		Woods, Fair, HSG B
	0.000	77		Brush, Fair, HSG D
	0.000	79		Woods, Fair, HSG D
	0.000	98		Unconnected roofs, HSG B
*	0.100	98		Unconnected driveway, HSG B
*	0.100	98		Unconnected road, HSG B
	1.000	61		>75% Grass cover, Good, HSG B
	1.200	67	64	Weighted Average, UI Adjusted
	1.000			83.33% Pervious Area
	0.200			16.67% Impervious Area
	0.200			100.00% Unconnected

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

Summary for Subcatchment PST2B: CENTER WEST

Runoff = 10 cfs @ 12.00 hrs, Volume= 0.577 af, Depth= 4.07"
Routed to Pond CB1 : DUAL CATCH BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 100-yr Rainfall=8.22"

	Area (ac)	CN	Adj	Description
	0.000	56		Brush, Fair, HSG B
	0.100	60		Woods, Fair, HSG B
	0.000	77		Brush, Fair, HSG D
	0.000	79		Woods, Fair, HSG D
	0.200	98		Unconnected roofs, HSG B
*	0.100	98		Unconnected driveway, HSG B
*	0.100	98		Unconnected road, HSG B
	1.200	61		>75% Grass cover, Good, HSG B
	1.700	70	65	Weighted Average, UI Adjusted
	1.300			76.47% Pervious Area
	0.400			23.53% Impervious Area
	0.400			100.00% Unconnected

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

Summary for Subcatchment PST2C: MIDDLE EAST

Runoff = 1 cfs @ 12.00 hrs, Volume= 0.087 af, Depth= 3.50"
Routed to Reach CRK : EXISTING CREEK

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 100-yr Rainfall=8.22"

	Area (ac)	CN	Description
	0.000	56	Brush, Fair, HSG B
	0.200	60	Woods, Fair, HSG B
	0.000	77	Brush, Fair, HSG D
	0.000	79	Woods, Fair, HSG D
	0.000	98	Unconnected roofs, HSG B
*	0.000	98	Unconnected driveway, HSG B
*	0.000	98	Unconnected road, HSG B
	0.100	61	>75% Grass cover, Good, HSG B
	0.300	60	Weighted Average
	0.300		100.00% Pervious Area

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

Summary for Subcatchment PST2D: CENTER NORHTEAST

Runoff = 1 cfs @ 12.04 hrs, Volume= 0.063 af, Depth= 4.19"
Routed to Reach DP2 : EXIST CULVERT UNDER CNTY RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 100-yr Rainfall=8.22"

	Area (ac)	CN	Adj	Description
	0.000	56		Brush, Fair, HSG B
	0.000	60		Woods, Fair, HSG B
	0.000	77		Brush, Fair, HSG D
	0.000	79		Woods, Fair, HSG D
	0.000	98		Unconnected roofs, HSG B
*	0.000	98		Unconnected driveway, HSG B
*	0.050	98		Unconnected road, HSG B
	0.130	61		>75% Grass cover, Good, HSG B
	0.180	71	66	Weighted Average, UI Adjusted
	0.130			72.22% Pervious Area
	0.050			27.78% Impervious Area
	0.050			100.00% Unconnected

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

Summary for Subcatchment PST2E: CENTER NORHTWEST

Runoff = 1 cfs @ 12.16 hrs, Volume= 0.122 af, Depth= 4.19"
Routed to Reach DP2 : EXIST CULVERT UNDER CNTY RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 100-yr Rainfall=8.22"

	Area (ac)	CN	Adj	Description
	0.000	56		Brush, Fair, HSG B
	0.000	60		Woods, Fair, HSG B
	0.000	77		Brush, Fair, HSG D
	0.000	79		Woods, Fair, HSG D
	0.030	98		Unconnected roofs, HSG B
*	0.030	98		Unconnected driveway, HSG B
*	0.040	98		Unconnected road, HSG B
	0.250	61		>75% Grass cover, Good, HSG B
	0.350	72	66	Weighted Average, UI Adjusted
	0.250			71.43% Pervious Area
	0.100			28.57% Impervious Area
	0.100			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, Rain Gardens**

Summary for Subcatchment PST2F: MIDDLE WEST

Runoff = 19 cfs @ 12.25 hrs, Volume= 2.249 af, Depth= 3.73"
Routed to Reach DP2 : EXIST CULVERT UNDER CNTY RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 100-yr Rainfall=8.22"

	Area (ac)	CN	Adj	Description
	0.700	56		Brush, Fair, HSG B
	3.000	60		Woods, Fair, HSG B
	0.000	77		Brush, Fair, HSG D
	0.200	79		Woods, Fair, HSG D
	0.360	98		Unconnected roofs, HSG B
*	0.180	98		Unconnected driveway, HSG B
*	0.000	98		Unconnected road, HSG B
	2.800	61		>75% Grass cover, Good, HSG B
	7.240	63	62	Weighted Average, UI Adjusted
	6.700			92.54% Pervious Area
	0.540			7.46% Impervious Area
	0.540			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.1000	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
9.5	756	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.9	856	Total			

Summary for Subcatchment PST3: POST-WEST

Runoff = 3 cfs @ 12.24 hrs, Volume= 0.292 af, Depth= 3.50"
Routed to Reach DP3 : EXIST CULVERT UNDER CNTY RD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NY-Dut-Wap-Lund-20210426 24-hr S1 100-yr Rainfall=8.22"

Area (ac)	CN	Description
0.000	56	Brush, Fair, HSG B
0.800	60	Woods, Fair, HSG B
0.000	77	Brush, Fair, HSG D
0.000	79	Woods, Fair, HSG D
0.200	61	>75% Grass cover, Good, HSG B
1.000	60	Weighted Average
1.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	77	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.6	220	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.1	297	Total			

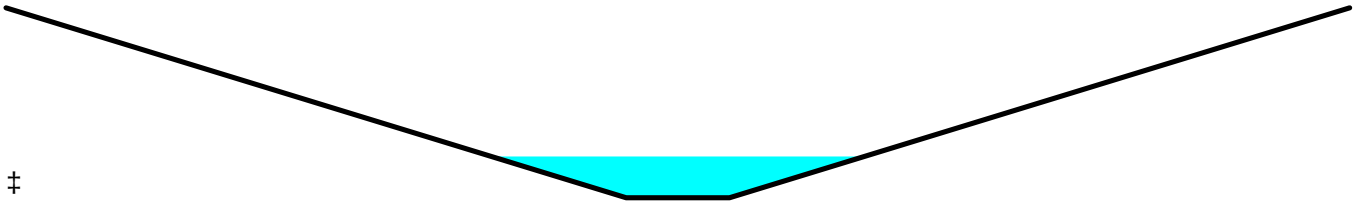
Summary for Reach CRK: EXISTING CREEK

Inflow Area = 120.400 ac, 0.75% Impervious, Inflow Depth = 4.63" for 100-yr event
Inflow = 181 cfs @ 13.10 hrs, Volume= 46.469 af
Outflow = 181 cfs @ 13.12 hrs, Volume= 46.469 af, Atten= 0%, Lag= 1.2 min
Routed to Reach DP1 : EXIST CULVERT UNDER CNTY RD FOR CREEK

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 3.61 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.66 fps, Avg. Travel Time= 2.9 min

Peak Storage= 14,195 cf @ 13.12 hrs
Average Depth at Peak Storage= 2.17' , Surface Width= 36.05'
Bank-Full Depth= 10.00' Flow Area= 700.0 sf, Capacity= 6,236 cfs

10.00' x 10.00' deep channel, n= 0.100 Very weedy reaches w/pools
Side Slope Z-value= 6.0 '/' Top Width= 130.00'
Length= 284.0' Slope= 0.0387 '/'
Inlet Invert= 301.00', Outlet Invert= 290.00'



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Summary for Reach DP1: EXIST CULVERT UNDER CNTY RD FOR CREEK

Inflow Area = 123.300 ac, 1.22% Impervious, Inflow Depth = 4.61" for 100-yr event
Inflow = 182 cfs @ 13.12 hrs, Volume= 47.319 af
Outflow = 182 cfs @ 13.12 hrs, Volume= 47.319 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3

Summary for Reach DP2: EXIST CULVERT UNDER CNTY RD

Inflow Area = 7.770 ac, 8.88% Impervious, Inflow Depth = 3.85" for 100-yr event
Inflow = 21 cfs @ 12.24 hrs, Volume= 2.495 af
Outflow = 21 cfs @ 12.24 hrs, Volume= 2.495 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3

Summary for Reach DP3: EXIST CULVERT UNDER CNTY RD

Inflow Area = 1.000 ac, 0.00% Impervious, Inflow Depth = 3.50" for 100-yr event
Inflow = 3 cfs @ 12.24 hrs, Volume= 0.292 af
Outflow = 3 cfs @ 12.24 hrs, Volume= 0.292 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3

Summary for Pond BIO: BIORETENTION

Inflow Area = 2.900 ac, 20.69% Impervious, Inflow Depth = 3.83" for 100-yr event
Inflow = 12 cfs @ 11.94 hrs, Volume= 0.925 af
Outflow = 11 cfs @ 12.00 hrs, Volume= 0.873 af, Atten= 5%, Lag= 3.9 min
Primary = 7 cfs @ 12.00 hrs, Volume= 0.849 af
Routed to Reach DP1 : EXIST CULVERT UNDER CNTY RD FOR CREEK
Secondary = 4 cfs @ 12.00 hrs, Volume= 0.024 af
Routed to Reach DP2 : EXIST CULVERT UNDER CNTY RD

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 294.19' @ 12.00 hrs Surf.Area= 2,752 sf Storage= 3,478 cf

Plug-Flow detention time= 45.1 min calculated for 0.873 af (94% of inflow)
Center-of-Mass det. time= 14.6 min (870.0 - 855.4)

Volume	Invert	Avail.Storage	Storage Description
#1	292.00'	4,147 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
#2A	290.25'	576 cf	**14.50'W x 54.00'L x 2.54'H Field A** 1,990 cf Overall - 551 cf Embedded = 1,439 cf x 40.0% Voids
#3A	290.75'	551 cf	**Cultec R-150XLHD** x 20 Inside #2 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 4 rows
		5,273 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
292.00	10	5.0	0	0	10
293.00	1,230	190.0	450	450	2,882
294.00	1,850	200.0	1,529	1,980	3,249
295.00	2,500	230.0	2,167	4,147	4,298

Device	Routing	Invert	Outlet Devices
#1	Primary	290.75'	**15.0" Round Culvert** L= 150.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 290.75' / 290.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	293.50'	**24.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Secondary	294.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=7 cfs @ 12.00 hrs HW=294.19' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 7 cfs @ 5.93 fps)
  └─**2=Orifice/Grate** (Passes 7 cfs of 24 cfs potential flow)

Secondary OutFlow Max=4 cfs @ 12.00 hrs HW=294.19' TW=0.00' (Dynamic Tailwater)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 4 cfs @ 1.03 fps)

Summary for Pond CB1: DUAL CATCH BASIN

Inflow Area = 1.700 ac, 23.53% Impervious, Inflow Depth = 4.07" for 100-yr event
Inflow = 10 cfs @ 12.00 hrs, Volume= 0.577 af
Outflow = 10 cfs @ 12.00 hrs, Volume= 0.577 af, Atten= 0%, Lag= 0.0 min
Primary = 10 cfs @ 12.00 hrs, Volume= 0.577 af
Routed to Pond PTR : PRETREATMENT

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 295.06' @ 12.00 hrs
Flood Elev= 296.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	292.50'	**15.0" Round Culvert X 2.00** L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 292.50' / 292.14' S= 0.0060 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=10 cfs @ 12.00 hrs HW=295.03' TW=294.33' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 10 cfs @ 3.95 fps)

Summary for Pond DP4: EXISTING LOW AREA SOUTHWEST

Inflow Area = 0.900 ac, 0.00% Impervious, Inflow Depth = 3.50" for 100-yr event
Inflow = 3 cfs @ 12.16 hrs, Volume= 0.262 af
Outflow = 0 cfs @ 15.79 hrs, Volume= 0.080 af, Atten= 94%, Lag= 217.8 min
Primary = 0 cfs @ 15.79 hrs, Volume= 0.080 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 331.02' @ 15.79 hrs Surf.Area= 10,274 sf Storage= 8,117 cf

Plug-Flow detention time= 441.6 min calculated for 0.080 af (30% of inflow)
Center-of-Mass det. time= 286.3 min (1,155.6 - 869.4)

Volume	Invert	Avail.Storage	Storage Description
#1	330.00'	20,772 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
330.00	5,894	370.0	0	0	5,894
332.00	15,658	562.0	20,772	20,772	20,164

Device	Routing	Invert	Outlet Devices
#1	Primary	331.00'	**30.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0 cfs @ 15.79 hrs HW=331.02' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0 cfs @ 0.30 fps)

Summary for Pond PTR: PRETREATMENT

Inflow Area = 2.900 ac, 20.69% Impervious, Inflow Depth = 4.03" for 100-yr event
Inflow = 17 cfs @ 12.00 hrs, Volume= 0.973 af
Outflow = 16 cfs @ 12.00 hrs, Volume= 0.962 af, Atten= 2%, Lag= 0.1 min
Primary = 12 cfs @ 11.94 hrs, Volume= 0.925 af
Routed to Pond BIO : BIORETENTION
Secondary = 5 cfs @ 12.00 hrs, Volume= 0.037 af
Routed to Reach DP2 : EXIST CULVERT UNDER CNTY RD

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 294.33' @ 12.00 hrs Surf.Area= 732 sf Storage= 970 cf

Plug-Flow detention time= 10.9 min calculated for 0.962 af (99% of inflow)
Center-of-Mass det. time= 4.5 min (850.2 - 845.7)

Volume	Invert	Avail.Storage	Storage Description
#1	292.00'	1,535 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
292.00	124	0	0
294.00	622	746	746
295.00	955	789	1,535

Device	Routing	Invert	Outlet Devices
#1	Primary	293.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	294.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=12 cfs @ 11.94 hrs HW=294.20' TW=293.96' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 12 cfs @ 1.69 fps)

Secondary OutFlow Max=5 cfs @ 12.00 hrs HW=294.33' TW=0.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 5 cfs @ 1.40 fps)