Engineering Report

STORMWATER MANAGEMENT AND POLLUTION PREVENTION PLAN

FORESTBURGH POND RESIDENTIAL SUBDIVISION PROJECT ROUTE 42 AND 48 TOWN OF FORESTBURGH COUNTY OF SULLIVAN STATE OF NEW YORK

PREPARED FOR:

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SULLIVAN COUNTY, NEW YORK

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1.0 BACKGROUND INFORMATION

1.1. Project Background.

Keystone Associates Architects, Engineers and Surveyors, LLC (Keystone) was retained by Mr. Alan M. Lord of New York Land and Lakes Development, LLC, 155 Main Street, Suite D, Oneonta, New York to complete a Stormwater Management and Pollution Prevention Plan (SWPPP) associated with land subdivision of a 570.57-acre property. The property is to be divided into 21 lots planned for single family home development. These lots are located in the Town of Forestburgh, Sullivan County, New York. Forestburgh Pond bisects the Property with Routes 42 and 48 determining the western and southern property boundaries, respectively (refer to Figure No. 1 - Location Map, Figure No. 2 – USGS Vicinity Map and Figure No. 3 – Aerial Photo).

1.2. Purpose of Stormwater Plan Report.

The purpose of this SWPPP is to quantify pre-development and post-development stormwater runoff characteristics (hydrologic and hydraulic conditions), to reduce peak stormwater discharge rates to pre-development rates, and to delineate the stormwater control practices required to prevent, minimize, or mitigate potential water quality and quantity impacts associated with stormwater disposal for the proposed single family homes. These impacts include but are not limited to increases in suspended solids, colloidal and settleable solids, residuals from oil and floating substances, and other potential pollutants.

The SWPPP includes the following:

1. Description of the existing site conditions including existing land use of the site, soil types, and location of surface waters.
2. Description of proposed site conditions including the site layout, addition of impervious surfaces, and changes to existing cover types.
3. Identification of discharge points and breakout of associated drainage areas.
4. Description of construction stormwater management controls and calculations necessary to reduce erosion, sediment and pollutants in stormwater discharge.
5. Description of post-construction stormwater management practices for runoff quality and quantity control, including the use of green infrastructure techniques.
6. Description of maintenance requirements.

In addition, this report identifies the submittals and signatures required to meet the regulatory requirements for a New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges for Construction Activities (refer to Appendix A - Stormwater Discharge Permit Information). Appendix A contains an overall Notice of Intent (NOI) Form to be filed by New York Land and Lakes Development, LLC and terminated immediately upon completion of Access Road improvements, a blank NOI to be filed by each lot owner, a sample Contractor Certification Statement Form and other permit signatory requirements. Refer to Section 1.6 and 6.1 for further details regarding NOI submittal and Contractor Certification Requirements.

1.3. Regulatory and Permit Requirements.

The Federal Water Pollution Control Act of 1972 (with amendments), also referred to as the Clean Water Act (CWA), provides that stormwater discharges associated with industrial activity from a point source (including discharges through a municipal separate storm sewer system) to waters of the United States are unlawful, unless authorized by a National Pollutant Discharge Elimination System (NPDES) permit. In New York, which is a NPDES-delegated state, this is accomplished through the administration of the SPDES program administered by the NYSDEC.

A discharge that is subject to the NPDES regulations may be eligible to obtain coverage under a general permit by submitting an NOI to the administrator of the program, the NYSDEC. The NOI's are to be submitted to their Albany, New York office. Except when in compliance with the General Permit, or with a duly authorized permit from NYSDEC, discharge of stormwater associated with industrial activity by any person shall be unlawful.

The General Permit (Permit No. GP-0-15-002, effective January 29, 2015) (refer to Appendix A – Stormwater Discharge Permit Information) may authorize all discharges of stormwater associated with construction activity (those sites or common plans of development or sale that will result in the disturbance of one or more acres total land area) and where stormwater discharges from a point source to waters of the United States including wetlands.

1.4. Project and Site Description.

This project involves subdividing a 570.57-acre parcel into 21 individual lots where single family homes are planned for construction. This area of development is referred to as Forestburgh Pond Residential Subdivision. The 21 lots range from approximately 3.6 acres to 185.21 acres. For purposes of this report, each lot has been proposed with a two-story 800 square foot home footprint with varying driveway lengths off of existing Access Roads as well as proposed lawns measuring up to 2.2 acres in size. The site layout was provided by the Client as shown on Sheet C050 – Overall Plan as well as C100, 110 and 120 – Lot Layout Plans provided in Appendix E. Note that the provided layouts are designed as typical home layouts anticipated at each lot, however actual layouts will be the responsibility of the individual lot owners.

1.4.1. Drainage, Stormwater Disposal and Natural Resources.

The project area was conservatively modeled as the entire property boundary and offsite drainage areas were not included. This overall area has been modeled as a single drainage area identified as the outlet of Forestburgh Pond near the intersection of Routes 42 and 48. A description of the pre-development drainage area is provided below.

Pre-development Drainage Area #1 (570.57 acres) includes approximately 537.44 acres of woods, 31.48 acres of water surface (ponds and creeks), 1.27 acres of existing Access Roads (Stag Forest Road and the Eastern Access Road) as well as 0.38 acres of existing structures which are currently utilized as the Forestburgh Whitetail Hunting Club grounds. The site generally drains into Forestburgh Pond which discharges through its dam structure to a culvert beneath the intersection of Routes 42 and 48 at the bottom corner of the property.

The NYSDEC Protection of Waters Program states that certain waters of the state are protected on the basis of their stream classification. Streams and small water bodies located in the course of a stream with a classification of AA, A or B, or with a classification of C with a standard of (T) for trout waters or (TS) for trout spawning waters are collectively referred to as "protected streams" and are subject to the stream protection provisions of the Protection of Waters regulations. Classification A indicates a best usage for a source of drinking water, swimming and other recreation and fishing. Classification C indicates waters supporting fisheries and non-contact activities. The on-site inlet stream to Forestburgh Pond is considered a Class B(t) stream and is subject to protections. Refer to Figure No. 4 – NYSDEC Environmental Resource Map. Note that such protections have been incorporated into the project's design since the low impact design of the development does not require stormwater detention, which can cause increases in water temperatures and negatively impact sensitive trout populations. As described below, stormwater detention has not been provided on-site and the Protection of Waters regulations have therefore been met.

A review of available data indicates that the property is not located within the radius of mapped rare plants and rare animals (refer to Figure No. 4 – NYSDEC Environmental Resource Map). However, there are mapped New York State regulated freshwater wetlands and federal regulated wetlands identified on the Property. Refer below to Section 1.4.3. Such areas are located well away from any proposed development areas. Based on this information, written permission to proceed from the NYSDEC Natural Heritage Program was not deemed warranted by Keystone and was therefore not requested.

According to the NYS Stormwater Interactive Mapper, the site is not located within a watershed improvement strategy area (refer to Figure No. 5 – NYS Stormwater Interactive Map).

1.4.2. Historic Places.

In accordance with Part 1(F)(8) of the SPDES General Permit, construction activities that have the potential to adversely affect a property that is listed or is eligible for listing on the State or National Register of Historic Places (including Archaeological sites) are ineligible for coverage under this permit, unless there are written agreements in place with the New York State Division for Historic Preservation of the Office of Parks, Recreation and Historic Preservation (OPRHP) or other governmental agencies to mitigate the effects, or there are local land use approvals evidencing the same. As such, a review of the New York State Cultural Resource Information System (CRIS) mapping was performed (refer to Figure No. 6 – NYS Cultural Resource Information Map).

Based on this review, portions of the Property nearest the Forest Stag Road entrance are located within a mapped archaeologically sensitive radius. As such, a formal CRIS submittal was performed on December 20, 2019. The New York State Historic Preservation Office accepted the initial submission as a new project submission, which is identified as Project No. 19PR08655.001. A follow up Effect Finding letter dated December 31, 2019 stated that "based upon this review, it is the opinion of OPRHP that no properties, including archaeological and/or historic resources, listed in or eligible for the New York State and National Registers of Historic Places will be impacted by this project." The SHPO Initial Submission Acceptance for Consultation Project documentation (email notification) and subsequent Effect Finding letter is provided in Appendix A.

1.4.3. Wetlands/Floodplains.

Based on the United States Fish & Wildlife Service National Wetland Inventory and New York State Department of Environmental Conservation's Environmental Resource Mapper online wetland mapping resource, there are mapped New York State regulated freshwater wetlands and federal regulated wetlands identified on the Property. As discussed above, such areas are located well away from any proposed development areas. Refer to Figure No. 7 – National Wetland Inventory Map. Although not anticipated, if an individual lot owner plans to develop their lot by disturbing an existing water course or wetland, that lot owner is responsible for complying with all applicable local, State and federal codes, rules, regulations and permit requirements.

According to the Federal Emergency Management Agency (FEMA) Community Map Number 36105C0615F, dated February 18, 2011, Town of Forestburgh, Sullivan County, New York, there Property is not located within a mapped flood zone (refer to Figure No. 8 – Flood Zone Map).

1.4.4. Soils.

According to the United States Department of Agriculture Natural Resource Conservation Service's online web soil survey, there are 26 different soil types as well as surface water within the drainage area. Refer to figure No. 9 – Soils Map for the locations of each soil classification. More detailed information for each soil type can be found in Appendix B – Soils Information. The drainage consists of 3.42 acres of Soil Group C and 567.15 acres of Hydrologic Soil Group D. Since there is a large variety of soil groups and 99.4% of the site is Hydrologic Group D, Group D was assumed throughout the entire site for the hydrology calculation. Since Group D is the most restrictive hydrologic soil group, this is a conservative assumption.

Table No. 1-1 Soil Types

Symbol	Name	% Slopes	SG	Depth To: GW	Depth To: BR	Perm. In/hr
Ad	Alden silt loam	0-3	C/D	0"	>80"	0.06-0.57
AlC	Arnot-Lordstown complex	0-15	C/D	>80"	20-40"	0.00
AlE	Arnot-Lordstown complex	15-35	C/D	>80"	20-40"	0.00
AoC	Arnot-Oquaga complex	0-15	C/D	>80"	20-40"	0.14-1.42
Ca	Carlisle muck	0-2	A/D	0"	>80"	0.20-5.95
Fu	Fluvaquents-Udifluvents complex	0-3	B/D	0"	>80"	0.06-19.98
LoB	Lordstown channery silt loam	0-3	C	>80"	20-40"	0.14-1.42
MrB	Morris loam	3-8	D	6-18"	10-22"	0.00-0.14
Ne	Neversink loam	0-3	C/D	0-6"	>80"	0.06-0.20
Nf	Neversink and Alden soils	0-3	C/D	0-6"	>80"	0.06-0.20
Pa	Palms much	0-2	B/D	0"	>80"	0.20-1.98
ScA	Scriba loam	0-3	D	6-18"	12-20"	0.06-0.20
ScB	Scriba loam	3-8	D	6-18"	12-20"	0.06-0.20
SeB	Scriba and Morris loams	2-8	D	6-18"	10-22"	0.00-0.14
SrB	Swartswood gravelly loam	3-8	C/D	18-26"	22-30"	0.06-0.57
SrC	Swartswood gravelly loam	8-15	C/D	18-26"	22-30"	0.06-0.57
SrD	Swartswood gravelly loam	15-25	C/D	18-26"	22-30"	0.06-0.57
SwE	Swartswood and Lackawanna soils	15-35	C	16-36"	17-36"	0.00-0.14
W	Water	0	N/A	N/A	N/A	N/A
Wd	Wayland soils complex	0-3	B/D	0-6"	>80"	0.14-14.17
WeB	Wellsboro gravelly loam	3-8	D	10-28"	12-30"	0.06-0.20
WeC	Wellsboro gravelly loam	8-15	D	10-28"	12-30"	0.06-0.20
WlC	Wellsboro and Wurtsboro soils	0-15	C/D	10-28"	12-30"	0.06-0.20
WuB	Wurtsboro loam	3-8	C/D	12-22"	20-28"	0.06-0.20

Legend/Definitions

BR = Bedrock

Channery = a soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis.

GW = Groundwater

NA = Not Available

Perm. = Permeability (based on upper soil horizons). Based on Sullivan County soils data.

SG = Soil Group

1.5. Existing (Pre-Development) Conditions.

The site is located at the northeast quadrant of the intersection between Routes 42 and 48 in the Town of Forestburgh. Route 42 defines the westernmost property boundary and Route 48 defines the southernmost property boundary. Forested lands are located to the north and east. Forestburgh Pond is centrally located within the Property. The Property is primarily undeveloped with few structures positioned off of Stag Forest Road and utilized as the Forestburgh Whitetail Hunting Club. As stated above, the project area was conservatively modeled as the entire property boundary and offsite drainage areas were not included. This overall area has been modeled as a single drainage area identified as the outlet of Forestburgh Pond near the intersection of Routes 42 and 48. Refer to Figure No. 10 – Pre-development Drainage Area Map.

1.6. Proposed Future (Post-Development) Conditions.

This project involves subdividing a 570.57-acre parcel into 21 individual lots where single family homes are planned for construction. Two (2) existing Access Roads will also be improved as part of the development. Remaining on-site lands include Forestburgh Pond (15.12 acres) as well as three other lots totaling another 14.29 acres. This area of development is referred to as the Forestburgh Pond Residential Subdivision. The 21 lots range from 3.6 acres to 185.21 acres. For purposes of this report, each lot has been proposed with a two story 800 square foot home footprint with a varying driveway length off of the existing Access Roads as well as proposed lawns anticipated between approximately 1.0 to 2.0 acres in size. The site layout was provided by the Client and modified based upon subsequent septic system design infiltration testing and is as shown on Sheet C050 – Overall Plan and Sheets C100, 110 and 120 – Lot Layout Plans provided in Appendix E. Post-development Drainage Area Mapping is shown on Figure No. 11.

Note that the provided lot layouts are designed as typical home layouts which have been anticipated at each lot. However, actual layouts and site construction is the responsibility of the individual lot owners and may require individual SWPPP modifications. The Runoff Reduction Volume (RRv) further described below, was calculated based upon the provided site layouts which includes a home footprint of 800 square feet with varying driveway lengths. Associated data including lot acreages, their associated limits of disturbance and the provided RRv for each lot and Access Road improvements are provided below in Table 1-2 – Individual Lot and Redevelopment Area Summary. As discussed below, the required RRv is provided on the NYSDEC RRv Worksheets (refer to Appendix C). As such, implementation of this SWPPP is intended to cover each of the 21 proposed home sites as well as existing Access Road improvements. The total Limit of Disturbance (LOD) has been estimated at 38.312 acres and includes offsets from proposed driveways, homes, associated septic systems and Access Road improvements. The anticipated Limits of Disturbance at each lot range from approximately 1.3 acres to 2.2 acres, however disturbances will vary across the site based on individual lot developments.

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared for the Forestburgh Residential Subdivision. Prior to any disturbance associated with Grantee's development of any lot within said subdivision, Grantee must prepare his/her own SWPPP modification specific to his/her particular lot and file an individual Notice of Intent (NOI). Said SWPPP must identify permanent post construction stormwater management practices. Associated Construction Duration Inspections (CDIs) must be performed in accordance with the SPDES General Permit (GP-0-015-002) requirements. This includes once weekly inspections for all site disturbances including lot disturbances of less than one (1) acre, and twice weekly inspections for any disturbances totaling greater than five (5) acres. These individual lot owner responsibilities will ensure that multiple site inspections are performed if the aggregate disturbance is greater than five (5) acres across the entire subdivision at any one time. An overall NOI will initially be submitted by the Owner for permit authorization (refer to Appendix A) however, once Access Road improvement are completed a Notice of Termination will immediately be submitted and all future permit coverage must be provided by individual lot owners as discussed above.

Table 1-2: Individual Lot and Redevelopment Area Summary

Lot #	Lot Size	LOD	House	Septic	Driveway	Grass Yard	Total Imp.	Available Rooftop Disconnect (RD)	Driveway Dry Swales with RD	Required WQv for Driveway	Provided RRv for Driveway	Home Bio without RD	Required WQv for Home	Provided RRv for Home
	Ac	Ac	Ac	Ac	Ac	Ac	Ac	Ac	FT x 8' Wide	CF	CF	SF	CF	CF
1	7.24	1.653	0.018	0.3	0.060	1.575	0.078	0.023	53	297	297	182 (4 Bio @ 7'x7'each)	85	85
2	28.48	1.676	0.018	0.3	0.048	1.609	0.066	0.049	8	238	238	182 (4 Bio @ 7'x7'each)	85	85
3	18.08	2.356	0.018	0.3	0.101	2.237	0.119	0.068	56	500	500	182 (4 Bio @ 7'x7'each)	85	85
4	11.47	1.703	0.018	0.3	0.050	1.636	0.068	0.049	11	248	248	182 (4 Bio @ 7'x7'each)	85	85
5	10.44	1.668	0.018	0.3	0.071	1.579	0.089	0.070	13	351	351	182 (4 Bio @ 7'x7'each)	85	85
6	9.61	2.169	0.018	0.3	0.068	2.083	0.086	0.028	57	337	337	182 (4 Bio @ 7'x7'each)	85	85
7	7.11	1.809	0.018	0.3	0.082	1.708	0.100	0.082	16	406	406	182 (4 Bio @ 7'x7'each)	85	85
8	3.6	0.251	0.018	0	0.017	0.215	0.035	0.017	4	84	84	182 (4 Bio @ 7'x7'each)	85	85
9	4.13	1.366	0.018	0.3	0.057	1.291	0.075	0.057	11	282	282	182 (4 Bio @ 7'x7'each)	85	85
10	3.89	1.360	0.018	0.3	0.081	1.261	0.099	0.079	15	401	401	182 (4 Bio @ 7'x7'each)	85	85
11	4.26	1.497	0.018	0.3	0.070	1.409	0.088	0.000	91	347	347	182 (4 Bio @ 7'x7'each)	85	85
12	5.1	1.581	0.018	0.3	0.086	1.477	0.104	0.000	112	426	426	182 (4 Bio @ 7'x7'each)	85	85
13	5.57	1.159	0.018	0.3	0.060	1.081	0.078	0.000	78	297	297	182 (4 Bio @ 7'x7'each)	85	85
14	8.5	2.155	0.018	0.3	0.079	2.058	0.097	0.078	15	391	391	182 (4 Bio @ 7'x7'each)	85	85
15	9.95	1.400	0.018	0.3	0.073	1.308	0.091	0.000	95	362	362	182 (4 Bio @ 7'x7'each)	85	85
16	16.12	1.535	0.018	0.3	0.059	1.457	0.077	0.027	47	292	292	182 (4 Bio @ 7'x7'each)	85	85
17	31.75	1.231	0.018	0.3	0.024	1.189	0.042	0.023	5	119	119	182 (4 Bio @ 7'x7'each)	85	85
18	159.42	1.566	0.018	0.3	0.013	1.535	0.031	0.007	10	64	64	182 (4 Bio @ 7'x7'each)	85	85
19	185.21	1.802	0.018	0.3	0.012	1.772	0.030	0.012	3	60	60	182 (4 Bio @ 7'x7'each)	85	85
20	3.95	1.739	0.018	0.3	0.065	1.656	0.083	0.035	46	322	322	182 (4 Bio @ 7'x7'each)	85	85
21	6.54	1.579	0.018	0.3	0.050	1.511	0.068	0.050	10	248	248	182 (4 Bio @ 7'x7'each)	85	85
Lot Total =		33.252	0.378	6	1.228	31.647	1.606			6,072	6,072		1,785	1,785

Surface Desc.	Lot Size	LOD	House	Septic	Impervious Area	Grassed Shoulder	Total Impervious for 25% WQv Redevelopment Treatment	Available Rooftop Disconnect (RD)	Roadway Dry Swales	Required WQv for Accessways	Provided RRv for Accessways
	Ac	Ac	Ac	Ac	Ac	Ac	Ac	Ac	FT x 8' Wide	CF	CF
ACCESS RD.	NA	3.380	NA	NA	0.846	2.534	(0.846*0.25) = 0.212	NA	275	1,050	1,050
STAG RD.	NA	1.680	NA	NA	0.420	1.260	(0.42*0.25) = 0.105	NA	137	524	524
NOI Total =		**38.312**					**2.872**	Is the Total Impervious Surface (Lot impervious surface plus total accessway impervious) in acres			
NOI Total =							**0.217**	Is the Total RRv Required (6,072 Driveways + 1,785 Homes + 1,050 Access + 524 Stag / 43,560) in acres			
NOI Total =							**0.217**	Is the Total RRv Provided (6,072 Driveways + 1,785 Homes + 1,050 Access + 524 Stag / 43,560) in acres			

2.0 STORMWATER MANAGEMENT PLANNING AND GREEN INFRASTRUCUTRE PRACTICES

2.1. Stormwater Management Planning.

To mitigate the overall hydrological impact to the surrounding area due to the proposed development, a green infrastructure approach for stormwater management was taken through the implementation of site planning techniques and runoff reduction techniques. The goal of this approach is to maintain, as much as possible, the pre-development hydrological conditions such as pre-construction infiltration, peak runoff flow and discharge volume as well as minimizing the concentrated flow in order to address treatment in a distributed manner prior to reaching the collection system. In so doing, the overall runoff produced will be minimized as will the need for collection, storage and treatment. In order to address this approach the following five-step process that is presented in the New York State Stormwater Management Design Manual was utilized.

1. Site planning to preserve natural features and reduce impervious cover,
2. Calculation of the water quality volume for the site,
3. Incorporation of green infrastructure techniques and standard Stormwater Management Practices (SMPs) with Runoff Reduction Volume (RRv) capacity,
4. Use of standard SMPs, where applicable, to treat the portion of water quality volume not addressed by green infrastructure techniques and standard SMPs with RRv capacity, and
5. Design of volume and peak rate control practices where required.

A summary of the Green Infrastructure (GI) planning tools found in the Stormwater Management Design Manual and an explanation as to how each was either implemented or found to be non-applicable are included in Section 2.2 (RRv/WQv), Sections 2.3 (Green Infrastructure Planning and Practices) and 2.4 (Green Infrastructure Techniques and Practices for Runoff Reduction). NOTE: These sections only provide a general overview of each practice; reference the NYS Stormwater Management Design Manual for complete standards, details, specifications, and design variations.

2.2. Runoff Reduction Volume (RRv) / Water Quality Volume (WQv).

This project involves the construction of new home and driveway impervious surfaces. In addition, the project includes the improvement of existing Access Roads (Forest Stag Road and the Eastern Access Road), which are subject to criteria identified in Chapter 9 of the New York State Stormwater Management Design Manual (Redevelopment Projects). For new construction projects, Runoff Reduction Volume (RRv) must be achieved through implementation of available green infrastructure techniques which promote infiltration, groundwater recharge, reuse, recycling, evaporation/evapotranspiration of 100 percent of the post-development Water Quality Volume (WQv). For redevelopment portions of the project, only 25% of the Total WQv from improved surfaces requires treatment using standard stormwater management practices. This is required to replicate pre-development hydrology by maintaining pre-construction infiltration, peak runoff flow, discharge volume, as well as minimizing concentrated flow before runoff reaches the collection system. The Water Quality Volume is the runoff during the initial stage of a storm event that contains most runoff-related contaminants (salt, sand, etc.) transported from land (particularly impervious surfaces). For new construction projects, if one hundred percent of the WQv cannot be treated, documentation must be provided justifying the evaluation of each of the green infrastructure planning and reduction techniques and identifying the specific limitations of the site and explaining why each of the techniques that are not used are technically infeasible. Projects that do not achieve one hundred percent runoff reduction must, at a minimum, reduce a percentage of the runoff from the proposed impervious areas on-site specified by the Specific Reduction Factor which is based on the hydrologic soil group present on the site and treat the remaining WQv using standard stormwater management practices. As indicated below, 100% of the Total WQv required has been provided through implementation of green infrastructure practices therefore 100% RRv will be provided, as encouraged.

The use of bioretention and dry swales as methods for treatment have been selected because they reduce the amount of grading and disturbance to the existing, natural land while still treating the water adequately, thus conserving as much of the existing land as possible. Also, specific infiltration testing is not required for these practices and the associated maintenance is considered only limited. In addition, in utilizing stormwater management practices as designed, it is assumed that a reduction in pollutant loading would occur with releasing the runoff generated from the storm event over 24 hours into green infrastructure practice(s) to allow for pollutant fallout and biological uptake.

Below provides a description of required and provided RRv for each home and driveway (new construction areas) as well as the improvement of the existing Access Roads (redevelopment areas). These criteria are shown on in the RRv Worksheets provided in Appendix C and in Appendix E – Stormwater Management Plans, Details and Specifications. Associated areas and RRv requirements are specifically listed in Table 1-2: Individual Lot and Redevelopment Area Summary and a WQv/RRv Summary Table is provide below in Table 2-1.

<u>New Construction Areas:</u>

Based on the site's careful planning to preserve natural features and reduction of impervious cover, applicable green infrastructure practices to treat RRv associated with newly constructed impervious areas include bioretention areas to treat each of the residences as well as dry swales to treat the associated driveways. Due to the low impact nature of the site development and limited slopes present on-site, the "rooftop disconnect" practice was utilized in the design of the driveway treatment where applicable across the development. Conservatively, such reductions were not accounted for as part of the home and Access Road improvements. Based on the site layouts, some lots were able to apply the "rooftop disconnect" practice to reduce 100% of the impervious driveway surface from the associated Total WQv calculations while others could reduce only a portion or none. Rooftop disconnect was applied where limited areas of impervious driveway surfaces were able to be disconnected by sheet flowing across a minimum of 25 feet of grassed or forested surfaces with slopes of less than five (5) percent. Applicable "rooftop disconnect" areas meeting requirements of Section 5.3.5 of the NYS Design Manual are shown on Sheets C100, 110 and 120 – Lot Layout Plans (refer to Appendix E). As indicated above, the associated rooftop disconnect areas (in acres) are specifically identified on Table 1-2.

For modeling purposes, since each home was modeled as a two story 800 square foot footprint, only one associated RRv Worksheet showing use of a 182 square foot bioretention area [equivalent to a quantity of four (4) by 49 square foot bioretention areas] at each home is provided. The calculations show that each of four (4) roof leaders can be directed to a 49 square foot (7' x 7') bioretention garden. If only two (2) roof leaders are provided, those areas can be doubled in size accordingly. This provides 100% treatment of the required 85 cubic foot RRv required at each home. As indicated above, the required WQv calculations are shown on the Green Infrastructure Worksheets provided in Appendix C as well as in Tables 1-2 and 2-1.

However, as each driveway lengths vary, so does the dry swale length requirements, therefore separate RRv Worksheets have been provided to show treatment at each driveway. Each dry swale has been modeled with an eight (8) foot wide as shown on the associated NYSDEC RRv Worksheets provided in Appendix C and in Appendix E – Stormwater Management Plans, Details and Specifications. Note that the maximum longitudinal slope is four (4) percent so limited grading may be required pending site layouts. The total length may be distributed across multiple dry swales as necessary for proper grading. As steep slopes are not generally encountered on-site, it appears that each lot can accommodate such practices. However, specific implementation and maintenance of such practices per the Design Manual criteria is the responsibility of each lot Owner as specific grading plans have not been prepared as part of this SWPPP. In summary, a dry swale has been designed at each lot to provide the total required RRv. Refer to Table 1-2 for specific dry swale lengths and required RRv at each lot. The proposed dry swale lengths provides 100% treatment of the total required 6,072 cubic feet RRv required for the lot driveways.

<u>Redevelopment Areas:</u>

In addition to the aforementioned new construction areas, this project involves the "re-development" of two existing Access Roads which have been identified as the Forest Stag Road entranceway off Route 42 and the Eastern Access Road entrance off Route 48 (Hartwood Road), which are subject to criteria identified in Chapter 9 of the New York State Stormwater Management Design Manual (Redevelopment Projects). Redevelopment of previously developed sites is encouraged from a watershed protection standpoint because it often provides an opportunity to conserve natural resources in less impacted areas by targeting development to areas with existing services and infrastructure. In projects such as this, redevelopment provides an opportunity to reduce pollutant discharges from older developed areas that were constructed without effective stormwater pollution controls. Because the technical standards contained elsewhere in the Manual were primarily intended for new development projects, compliance with the sizing criteria in full may present a challenge on projects that include redevelopment activities (i.e. size constraints, the need to tie in to the existing drainage infrastructure which may be at an elevation that does not provide enough head for certain stormwater management practices etc.). Although encouraged, meeting the RRv sizing criteria is not required for the redevelopment activity portion of a project. As detailed in Chapter 9 of the Design Manual, for redevelopment portions of the project, only 25% of the Total WQv from improved surfaces requires treatment using standard stormwater management practices.

Treatment of the required WQv from the existing Access Roads will also be achieved through implementation of dry swales. The computations for the required and provided water quality volume (WQv) for the proposed redevelopment areas are included in Appendix C and are summarized in Table No. 1-1. Note that Table 1-2 shows 100% treatment of only 25% of the impervious surfaces associated with the Access Road, therefore the associated worksheets provided in Attachment C answer the associated NOI questions appropriately. Drawings including location, size and details are provided in Appendix E – Stormwater Management Plans, Details, and Specifications. The proposed dry swale lengths provide 100% treatment of the total required 1,050 cubic feet RRv required for the Eastern Access Road and 524 cubic feet for Forest Stag Road.

Below is a summary of required and provided WQv and RRv for both the new construction and redevelopment areas on-site. .

Table No. 2-1 Runoff Reduction Volume & Water Quality Volume Control Summary

Description	WQv/RRv Required	RRv Provided	Meets Permit?
		(RRv/WQv)	
Area (cubic feet)	(cf)	(cf)	
Rooftop Bioretention	1,785	1,785	Yes
Driveway Dry Swales	6,072	6,072	Yes
East Access Road Dry Swales	1,050	1,050	Yes
Forest Stag Dry swales	524	524	Yes
Total (cubic feet)	9,431	9,431	Yes
Total (acre feet) [NOI]	0.217	0.217	Yes

The "Required" and "Provided" RRv & WQv values are identified in Table 1-2 as well as on the NYSDEC Runoff Reduction Worksheets provided in Appendix C. These values also match the NOI values provided in Appendix A.

2.3. Green Infrastructure Planning Practices.

2.3.1 Preservation of Natural Resources.

2.3.1.1 Preservation of Undisturbed Areas:

Delineate and place into permanent conservation undisturbed forests, native vegetated areas, riparian corridors, wetlands, and natural terrain. The project was designed as a low impact development with multi story residences to reduce the impervious footprint and limited driveway lengths off of existing impervious Access Roads in order to preserve undisturbed areas as best possible. Also the locations chosen for each home were selected to avoid any disturbance to wetlands, existing creeks, swales, pond or forests.

2.3.1.2 Preservation of Buffers:

Define, delineate and preserve naturally vegetated buffers along perennial streams, rivers, shorelines and wetlands. Buffer areas were preserved in the same manner as the preservation of undisturbed area.

2.3.1.3 Reduction of Clearing and Grading:
Limit clearing and grading to the minimum amount needed for roads, driveways, foundations, utilities and stormwater management facilities. The project was designed as a low impact development using existing impervious Access Roads which require only limited improvements.

2.3.1.4 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. The site and each home location was carefully selected to avoid any disturbance to wetlands, floodplains, steep slopes and to create the least amount of impact on the existing land as possible throughout the site.

2.3.1.5 Open Space Design:
Use clustering, conservation design or open space design to reduce impervious cover, preserve more open space and protect water resources. The site was strategically designed to use open space design in order to limit disturbance to sensitive areas, reduce clearing and grading requirements, and access routes in order to limit the need for new impervious surfaces, such as roadways.

2.3.1.6 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. Only limited soil disturbance is proposed beyond the proposed impervious areas. Any compacted areas surrounding the home, driveway and septic system should practice deep ripping and de-compaction prior to placing topsoil, seeding and mulching all disturbed areas.

2.3.2 Reduction of Impervious Cover.

2.3.2.1 Roadway Reduction:
Minimize roadway widths and lengths to reduce site impervious area. The project has been designed to utilize the existing roadway/Access Road infrastructure, eliminating the need for new roads and an increase in impervious area.

2.3.2.2 Sidewalk Reduction:
Minimize sidewalk widths and lengths to reduce site impervious area. Sidewalk reduction does not apply to this project because there are no sidewalks proposed for these individual single family homes.

2.3.2.3 Driveway Reduction:
Minimize driveway widths and lengths to reduce site impervious area. The new driveways are limited to the minimum widths and short lengths, therefore reducing further increases in impervious area.

2.3.2.4 Cul-de-sac Reduction:
Minimize the number of cul-de-sacs and incorporate landscaped areas to reduce their impervious area. There is no cul-de-sac construction or reconstruction work planned for this project therefore cul-de-sac reduction is not an applicable practice.

2.3.2.5 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. The size of the homes have been designed as two story homes limiting the structure's footprint. The site has been proposed as a residential development on large parcel acreages, therefore limiting increases in impervious areas as best as possible. Protective covenants also prohibit commercial development on-site.

2.3.2.6 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. The site has been proposed for residential purposes using minimum widths for driveways therefore, parking reduction is not applicable to this project.

2.4. Green Infrastructure Techniques and Standard Practices for Runoff Reduction.

2.4.1 Area Reduction Techniques.

2.4.1.1 Conservation of natural areas:
Retain the pre-development hydrologic and water quality characteristics of undisturbed natural areas, stream and wetland buffers by restoring and/or permanently conserving these areas on a site. The site layouts were positioned to conserve natural areas as best possible with limited clearing of forests surrounding the homesites. Also, the homes were developed away from the edges of the on-site Forestburgh Pond to reduce environmental impact.

2.4.1.2 Riparian Buffers / Filter Strips:
Undisturbed natural areas such as forested conservation areas and stream buffers or vegetated filter strips and riparian buffers can be used to treat and control stormwater runoff from some areas of a development project. The use of filter strips for this project was not considered applicable as use of such practices would result in additional tree clearing at each site. Instead other treatment practices such as bioretention and dry swales were designed.

2.4.1.3 Tree planting / tree box:
Plant or conserve trees to reduce stormwater runoff, increase nutrient uptake, and provide bank stabilization. Trees can be used for applications such as landscaping, stormwater management practice areas, conservation areas and erosion and sediment control. Careful planning has been implemented to protect existing trees and reduce the necessary tree clearing activities on-

site to the minimum amount needed. Tree planting is encouraged throughout the site as desired by the individual lot owners. A conservative amount of clearing was shown on the plans in order to conservatively model the need for detention associated with changes in pre to post curve numbers however the reduction of grassed lawns to the minimum amount practical by each lot owner is strongly encouraged.

2.4.1.4 Disconnection of rooftop runoff:
Direct runoff from residential rooftop areas and upland overland runoff flow to designated pervious areas to reduce runoff volumes and rates. Disconnection of rooftop runoff is applicable based on the natural landscape and layout of most lots. Based on the site layouts, some lots were able to reduce 100% of the impervious driveway surface from the associated calculations while others could reduce only a portion or none. Applicable "Rooftop Disconnect" areas meeting requirements of Section 5.3.5 of the NYS Design Manual (refer to Appendix E) are shown on Sheets C100, 110 and 120 – Lot Layout Plans. The associated areas (in acres) used to reduce percentages of impervious surfaces from the Total Water Quality Volume (WQv) calculations are included in Appendix C and identified on Table 1-2.

2.4.2 Volume Reduction Techniques.

2.4.2.1 Vegetated Swale:
Natural drainage paths, or properly designed vegetated channels, can be used instead of constructing underground storm sewers or concrete open channels to increase time of concentration, reduce the peak discharge, and provide infiltration. 100% of the required RRv was provided via bioretention and dry swales at each lot therefore use of vegetated swales was not applied.

2.4.2.2 Rain Garden:
Manage and treat small volumes of stormwater runoff using a conditioned planting soil bed and planting materials to filter runoff stored within a shallow depression. 100% of the required RRv was provided via bioretention and dry swales at each lot therefore use of raingardens was not applied. Use of bioretention was used instead of raingardens since bioretention with underdrain does not require infiltration testing.

2.4.2.3 Stormwater Planter:
Small landscaped stormwater treatment devices that can be designed as infiltration or filtering practices. Stormwater planters use soil infiltration and biogeochemical processes to decrease stormwater quantity and improve water quality. 100% of the required RRv was provided via bioretention and dry swales at each lot therefore use of stormwater planters was not applied.

2.4.2.4 Rain Tank / Cistern:
Capture and store stormwater runoff to be used for irrigation systems or filtered and reused for non-contact activities. 100% of the required RRv was provided via bioretention and dry swales at each lot therefore use of cisterns was not applied.

2.4.2.5 Porous Pavement:
Pervious types of pavements that provide an alternative to conventional paved surfaces, designed to infiltrate rainfall through the surface, thereby reducing stormwater runoff from a site and providing some pollutant uptake in the underlying soils. 100% of the required RRv was provided via bioretention and dry swales at each lot therefore use of porous pavement was not applied. Although porous pavement has not been incorporated within this design the use as alternatives to asphalt or concrete walks and driveways, is encouraged in the future where applicable.

2.4.2.6 Green Roof:
Capture runoff by a layer of vegetation and soil installed on top of a conventional flat or sloped roof. The rooftop vegetation allows evaporation and evapotranspiration processes to reduce volume and discharge rate of runoff entering conveyance system. 100% of the required RRv was provided via bioretention and dry swales at each lot therefore use of green roofs was not applied.

2.4.2.7 Infiltration Basin / Trench:
Infiltration basins and trenches are shallow excavations that are lined with filter fabric and filled with stone to create underground reservoirs for stormwater runoff. 100% of the required RRv was provided via bioretention and dry swales at each lot therefore use of infiltration practices was not applied.

2.4.2.8 Drywell:
Underground structures that are lined with filter fabric and back filled with stone to create reservoirs for stormwater runoff and allow infiltration into the surrounding soils from the bottom and sides. 100% of the required RRv was provided via bioretention and dry swales at each lot therefore use of drywells was not applied.

2.4.2.9 Bioretention:
Filtering systems that capture and temporarily store the WQv and pass it through a filter bed of sand, organic matter, or soil. Filtered runoff may be collected and returned to the conveyance system, or allowed to partially exfiltrate into the soil. Bioretention is used to treat 100% RRv from each residence rooftop.

2.4.2.10 Dry / Wet Swale:
Vegetated open channels that are explicitly designed to capture and treat the full WQv within dry or wet cells formed by check dams or other means. Dryswale(s) are being used to provide 100% RRv from all driveway and existing Access Road improvements.

3.0 COMPARISON OF PRE-DEVELOPMENT TO POST-DEVELOPMENT RUNOFF

3.1. Approach and Concept.

The addition of impervious surfaces may cause peak stormwater runoff rates and volumes to increase. Mitigation of associated impacts is achieved through utilization of stormwater management measures that achieve reduced runoff, reduced channel erosion, prevent overbank flooding, help control extreme floods and reduces pollutants as shown below and as shown in Appendix D – Hydrologic and Hydraulic Computations. In summary, since the limited increase in impervious cover does not increase the drainage area's curve number, the post-development peak stormwater runoff rates and volumes are equal to the pre-development peak runoff rates and volumes for the 1, 2, 10, 25, 50 and 100-year storm events for the modeled drainage area. Therefore, stormwater quantity mitigation practices are not required at any of the proposed lots. Further descriptions are provided as follows:

3.2. Methodologies.

Stormwater runoff calculations were performed using AutoCAD Civil-3D 2018 and HydroCAD Version 10.0 software (SCS TR-55 method) to determine pre- and post-development peak flows and/or stormwater management practices. Under the SCS TR-55 method, 1, 2, 10, 25, 50, and 100-year storm events were modeled for both the pre and post-development conditions based on the amount of rain anticipated during varying storm frequencies and routing through the existing and proposed drainage areas to a common discharge location(s). It should be noted that only the 1 year storm (Stream Channel Protection), 10 year storm (Overbank Protection) and the 100 year storm (Extreme Flood) are required to be modeled and accounted for in the state's Notice of Intent (NOI) form.

Storm frequencies are defined as the average frequency of occurrence of events having a given volume and duration. The storm frequencies used as a basis for computing peak rate of discharge with a duration of 24-hours is provided below in Table No. 3-1 Summary of Stormwater Hydrology. Values utilized are those provided National Oceanic and Atmospheric Administration (NOAA) for this project location as allowed in Chapter 4 of the NYS Stormwater Management Design Manual. Site specific NOAA data is also presented in Appendix D.

The project was modeled with a single drainage area, identified as Drainage Area 1 which is identified in Figure No. 10- Pre-Development Drainage Area Map and Figure No. 11 – Post-Development Drainage Area Map. Conservatively, the site boundary limits were modeled as the total drainage area and offsite drainage areas were not included. All drainage areas generally flow towards Forestburgh Pond and ultimately drain through its outfall towards a culvert near the Route 42 and 48 intersection.

The post drainage areas were modeled to match the existing drainage, with the exception of the proposed houses, driveways and septic systems. All houses and driveways were placed to avoid disturbances to existing creeks, ponds, wetlands and drainage swales. Thus the time of concertation paths were not altered. Pre and post hydrology boundaries are similar as proposed construction grades were also designed to match pre-conditions.

3.3. Calculations.

The pre and post-development drainage areas are determined and divided into subareas based on topography and conveyance facilities. Peak runoff rates are calculated based on times of concentration, soil conditions, surface cover types, and routing calculations for the existing and developed conditions. The total pre and post-development area is the same. For the hydrologic and hydraulic assumptions used and results calculated for pre- and post-development peak flows, refer to Appendix D - Hydrologic and Hydraulic Computations. Appendix D includes the input data, time of concentration (Tc), calculation of runoff curve number (CN), peak flows for each design storm event, pre-development and post-development hydrologic and hydraulic computations, and results for existing and proposed drainage areas for the proposed development for 1, 2, 10, 25, 50, and 100 year storm events. The pre-development and post-development drainage flows for the project are summarized in Table No. 3-1 Summary of Stormwater Hydrology.

The times of concentration (Tc) have been estimated to determine the time of the longest hydraulic route within each subarea being analyzed. These routes may include overland flow (sheet flow), shallow-concentrated flow, and/or channel or pipe flows (concentrated flow). Curve Numbers (Cn) are determined based on soils and cover conditions. Refer to Table No. 3-1 and Appendix D for determined values. Because of the large size of the site and low impact of design, the increased impervious areas from proposed homes and driveways did not increase the curve number. Therefore the site does not require stormwater detention or water quality treatment.

Below is a summary of the Pre and Post Condition Stormwater Hydrology:

Table 3-1 Summary of Stormwater Hydrology

Drainage Subarea 1				**Storm Event/Peak Flow (cfs)**					
Description	Area	CN	Tc	1-Yr.	2-Yr.	10-Yr.	25-Yr.	50-Yr.	100-Yr.
Rainfall (inches)	NA	NA	NA	2.53	3.12	4.87	5.96	6.78	7.64
Pre Drainage Area (DA)	570.57	80	41.3	241.74	519.76	1,105.95	1,491.16	1,785.74	2,098.35
Post Drainage Area (DA)	570.57	80	41.3	241.74	519.76	1,105.95	1,491.16	1,785.74	2,098.35
Difference: Post w/ Pond - Pre	0	0	0	0	0	0	0	0	0
Is Post Peak Runoff </= Pre Peak Runoff?				Yes	Yes	Yes	Yes	Yes	Yes

Tc is longest overall. CN is a weighted value.

Legend:
cfs = Cubic Feet per Second
CN = Runoff Curve Number
Tc = Time of Concentration
Area measured in Acres
Tc measured in hours
NA = Not Applicable

3.4. Channel Protection Volume (CPv).

Stream Channel Protection Volume Requirements (CPv) are designed to protect stream channels from erosion. In New York State this goal is accomplished by providing 24-hour extended detention of the one-year, 24-hour storm event, remained from runoff reduction. Trout waters may be exempted from the 24-hour extended detention requirement, with only 12 hours of extended detention required to meet this criterion. Also, the CPv requirement does not apply in certain conditions including the following: reduction of the entire CPv is achieved at a site through green infrastructure or infiltration systems or the site discharges directly to tidal waters or fifth order or larger streams.

As indicated above, the hydrology and hydraulic analysis for the project site shows that the post-construction 1-year 24 hour discharge rate and velocity is equal to the pre-construction discharge rate and stormwater detention will not be provided. Therefore, providing 24 hour detention of the 1-year storm to meet the channel protection criteria is not required.

3.5. Assumptions.

The assumptions used in assessing pre-development and post-development drainage conditions include:

1. Pre-development runoff curve numbers were based on cover conditions prior to any development.
2. Pre-development cover conditions were estimated based on a current orthographic photograph downloaded from the New York State Geographic Information Clearinghouse website as well as physical field observations made by representatives of Keystone during infiltration testing performed during the septic design phase.
3. The woods and other vegetative cover curve numbers were based on "fair" cover conditions, as defined in the runoff curve Table No's.
4. Cover conditions for post-development were based on the areas of the proposed homes, driveways and lawns, and the wooded areas to remain.

3.6. Summary of Permit Requirements.

As stated above in Section 3.1 and shown in Table 3-1, the impact of the proposed re-development project on the surrounding environment and adjacent properties is considered negligible. Since the limited increase in impervious cover does not increase the drainage area's curve number, the post-development peak stormwater runoff rates and volumes are equal to the pre-development peak runoff rates and volumes for the 1, 2, 10, 25, 50 and 100-year storm events for the modeled drainage area. Since post-construction water quantity control and associated stream channel protection volume treatment are therefore not required; and water quality control will be provided by the use of bioretention areas and dry swales to treat the required Runoff Reduction Volume; the requirements for application under the New York State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities will be met for the project.

4.0 STORMWATER MANAGEMENT

4.1. Stormwater Management Facilities.

Plans and specifications for the Stormwater management and erosion and sediment control systems are included in Appendix E - Stormwater Management Plans, Details, and Specifications.

The stormwater management facilities are generally described as temporary erosion and sediment control facilities during construction (such as stabilized construction entrance, and/or silt fences etc.), and permanent stormwater control facilities after construction (such as land grading, swales, culverts, channels, and/or revegetation etc.).

5.0 EROSION AND SEDIMENT CONTROL

5.1. Erosion and Sediment Control Plan.

A key component of the SWPPP is the Erosion and Sediment Control Plan (E&SC Plan). Erosion and Sediment Control for Small Homesite Construction is provided as Appendix G. These illustrations set forth the measures to be implemented before the start of construction, and throughout the entire construction phase. The implementation of these measures must be monitored and maintained during construction in accordance with the SPDES regulations. Stabilization of the site shall also comply with the conditions and requirements set forth therein and further established by the local municipality, if any. Refer to Appendix A for a copy of the SPDES Permit No. GP-0-15-002.

The purpose of the E&SC Plan is to minimize the erosion of disturbed soil and to prevent the migration of sediment into surface waters and off-site properties during construction and until the site has received final stabilization. The E&SC plan accomplishes that purpose through reducing runoff velocities, limiting the area of disturbed soils at any one time, and rapidly stabilizing disturbed soils. This plan contains specifications for erosion controls and associated construction details designed to mitigate potential impacts associated with erosion and sedimentation.

E&SC measures should be discussed following a pre-construction conference with appropriate agency and project staff. In addition, the Applicant must engage a qualified professional to oversee implementation of the SWPPP, including the specific E&SC Plan component. Implementation of the E&SC Plan would be based on New York State's Standards and Specifications for Erosion and Sediment Control, latest addition.

During construction, areas of active disturbance must be limited to less than five (5) acres at any time unless otherwise approved by the NYSDEC.

5.2. Temporary Erosion and Sediment Control Facilities.

Temporary erosion and sediment control facilities to be used during construction by the construction contractor are provided in Appendix G – Erosion and Sediment Control for Small Homesite Construction. In general, the temporary erosion and sediment control facilities to be used at the site during construction may include, but are not necessarily limited to:

1. Stabilized construction entrance(s),
2. Silt fences,
3. Grading,
4. Check dams,
5. Dust control,
6. Mulching, and
7. Topsoil and seeding.

2. Temporary erosion and sediment control for individual homesites is to be in accordance with the New York Standards and Specifications for Erosion and Sediment Control, Section 9 which is included in Appendix G – Erosion and Sediment Control Plan for Small Homesite Construction. Generally, individual homesite construction will require stabilized construction entrances and silt fence to be installed downgradient of disturbed soil or soil stockpile areas. Any Access Road improvements may also require silt fence as necessary.

5.3. Permanent Erosion and Sediment Control Facilities.

Permanent erosion and sediment control facilities are provided in Appendix E – Stormwater Management Plans, Details, and Specifications. In general, the permanent erosion and sediment control facilities may include, but are not necessarily limited to:

1. Land grading,
2. Grassed swales and channels,
3. Culverts,
4. Revegetation of all disturbed areas.

5.4. Site Inspections / Winter Site Stabilization.

Site inspections and winter site stabilization must be conducted in accordance with the SPDES General Permit provided in Appendix A. The guidance below has been incorporated into the SWPPP to address such requirements. Construction Duration Inspections (CDIs) must be performed in accordance with the SPDES General Permit (GP-0-015-002) requirements. This project requires once weekly inspections for all lot disturbances including lot disturbances of less than one (1) acre, and twice weekly inspections for any disturbances totaling greater than five (5) acres. These individual lot owner responsibilities will ensure that multiple site inspections are performed if the aggregate disturbance is greater than five (5) acres across the entire subdivision at any one time.

At the end of the construction season when soil disturbance activities will be finalized or suspended until the following spring, it may be desirable to reduce the frequency of the required inspections. If the soil disturbance is completely suspended and the site is properly stabilized, an owner/operator may reduce the Construction Duration Inspection frequency but shall maintain a minimum of monthly inspections in all situations, even when there is total winter shutdown. Weekly or twice weekly inspections must resume no later than March 15 unless otherwise directed by the NYSDEC.

6.0 IMPLEMENTATION SCHEDULE AND MAINTENANCE

6.1. Implementation Schedule (Sequence of Operations).

The following schedule (sequence of operations) for erosion and sediment control facilities shall be implemented by each individual lot owner:

1. Obtain plan approval and building permit from municipal and regulatory agencies for project and for each lot as required.
2. This Stormwater Pollution Prevention Plan (SWPPP) has been prepared for the Forestburgh Pond Residential Subdivision. Prior to any disturbance associated with Grantee's development of any lot within said subdivision, Grantee must prepare his/her own SWPPP modification specific to his/her particular lot and file an individual Notice of Intent (NOI). Said SWPPP must identify permanent post construction stormwater management practices. Associated Construction Duration Inspections (CDIs) must be performed in accordance with the SPDES General Permit (GP-0-015-002) requirements. This includes once weekly inspections for all site disturbances including lot disturbances of less than one (1) acre, and twice weekly inspections for any disturbances totaling greater than five (5) acres. These individual lot owner responsibilities will ensure that multiple site inspections are performed if the aggregate disturbance is greater than five (5) acres across the entire subdivision at any one time.
3. Each lot must install an on-site mailbox with combination lock (preferred) and appropriate combination access signage or other storage method to hold the SWPPP, Notice of Intent, Permit Authorization Notice, and Construction Duration Inspection Reports.
4. Hold Pre-construction Conference.
5. Each lot's selected Contractor(s) shall sign a Contractor's Certification Statement binding them to obligations of the Forestburgh Pond Residential Subdivision and any SWPPP Modification associated with that individual lot's construction activities. Blank copies are provided in the SWPPP's Appendix A.
6. Install temporary stabilized construction entrance/exits as required.
7. Install fabric silt fence.
8. Clear/grub site.
9. Construct temporary drainage swales and concrete washout area.
10. Strip and stockpile topsoil, rough grade site.
11. Prepare subgrade and construct subbase course for drive.
12. Prepare foundation and build home.
13. Construct utilities.
14. Construct final drainage grassed swales .
15. Construct final surface courses for drives.
16. Construct final bioretention areas and dry swales.
17. Topsoil: fine grade: and seed, fertilize and mulch all disturbed areas.

18. Inspect all erosion and sediment controls weekly and after rainfall events and repair as required.
19. Water vegetation as required.
20. After the sites are stabilized and at least 80% vegetation has become established, remove all temporary erosion control measures including silt fence, concrete washout areas, construction entrances, etc.
21. Upon final stabilization, each lot owner must submit a Notice of Termination (NOT) form for Stormwater Discharges Associated with Construction Activity under the SPDES General Permit. Note that a deed covenant will be required to ensure the perpetuity of that lot's associated bioretention areas and dry swale(s) or other stormwater management practice(s), as applicable.

The site owner/operator(s), developer(s), and contractor(s) shall be responsible for development and implementation of appropriate temporary and permanent erosion and sediment control features on the parcel in compliance with all applicable rules, regulations, permits, project plans and specifications, and the Stormwater Management and Pollution Prevention Plan during construction. Following construction, the parcel owner/operator is responsible for permanent erosion and sediment control features. Documentation of installation of stormwater management and erosion and sediment control practices should be in accordance with the Stormwater Construction Site Logbooks (Appendix F) prepared for each lot.

The Construction Site Logbook including signed NOI, NOI acknowledgement letter, Contractor's Certification Statements, Stormwater Management and Pollution Prevention Plan, and weekly SWPPP inspections shall be kept on-site and up to date at all times during construction. The Stormwater Construction Site Logbooks shall be placed in on-site mailboxes accessible to authorities at all times.

All litter shall be cleaned up by the end of each working day and properly disposed of. All debris shall be stored neatly until it can be removed and properly disposed of. All chemicals shall be properly applied according to directions and properly stored in appropriate containers when not in use.

6.2. Record Keeping During Construction.

The stormwater record keeping requirements and report forms are included in Appendix F – Stormwater Construction Site Logbook. According to the permit, the owner or operator shall retain a copy of their NOI , NOI acknowledgment letter, SWPPP modification, and any inspection reports that were prepared in conjunction with the permit for a period of five years from the date that the site achieves final stabilization. Also, the contractor and subcontractors engaged in work affecting stormwater drainage at the site shall sign a contractor certification statement prior to undertaking any construction activity at the site, binding them to terms and conditions of the associated SWPPP. Blank copies of the contractor certification statements are provided in Appendix A. Signed copies should be retained on-site within a Stormwater Construction Site Logbooks, to be prepared separately for each lot owner. The logbooks should also be maintained to address record keeping such as contractor's "trained individual(s)" designations, final inspection reporting and notice of termination documentation. Properly completing the forms contained in the logbooks will meet the inspection requirements for the NYSDEC SPDES General Permit for Construction

Activities. The logbook and completed forms and associated SWPPP shall be kept on-site at all times during construction and made available to authorities upon request.

6.3. Construction and Waste Materials and Spill Controls.

Construction materials expected to be temporarily stored on-site while the site is under construction include concrete, wood, metal, and plastics, and other miscellaneous materials. They shall be covered by water resistant coverings to prevent contact with rainwater and they shall be stored off the ground (on pallets for example) to prevent contact with stormwater runoff. Soil materials such as fill and topsoil stockpiles shall be surrounded with silt fence for erosion control.

Waste materials expected to be temporarily stored on the site during the construction of the driveways may include wood and brush from clearing operations, soil from driveway grading operations, trimmings from geotextile soil stabilization materials, excess concrete and asphalt from curb and pavement construction, and other miscellaneous waste materials such as wood, metal and plastic trimmings, etc. associated with construction.

Temporary excess soil material stockpiles shall have silt fence installed at the toe of slope for erosion control. Wood, stumps and brush shall be removed from the site and disposed of in a legal manner and must not be buried on-site unless approved by proper authority. Excess soils shall be removed from the site and disposed of in a legal manner unless fill location is provided by owner. Miscellaneous waste materials shall be stored in waste containers such as dumpsters or other appropriate containers which are periodically emptied by certified waste haulers or taken to an approved landfill or disposal site.

Excess concrete shall be dumped in a pre-determined location where materials are contained and cannot leach into waterways or storm sewer systems. Materials shall then be disposed in a legal manner unless approved fill location is provided by owner.

All petroleum spills that occur within New York State (NYS) must be reported to the NYS Spill Hotline (1-800-457-7362) within two (2) hours of discovery, except spills which meet all of the following criteria:

1. The quantity is known to be less than five (5) gallons; and
2. The spill is contained and under the control of the spiller; and
3. The spill has not and will not reach the State's water or any land; and
4. The spill is cleaned up within two (2) hours of discovery.

A spill is considered to have not impacted land if it occurs and is contained on a paved surface such as asphalt or concrete. A spill in a soil or gravel parking lot that is considered to have impacted land and is a reportable release.

6.4. Short and Long Term Maintenance.

The lot owner/operator will be responsible for maintaining those facilities located within its property boundaries and designated easements, if any.

Short term maintenance shall occur during construction and for a post-construction period of one (1) year, to be followed by long term maintenance activities. All maintenance of any vegetation, constructed cuts, fills, pavements, drainage features, and/or stormwater management practices is the responsibility of the lot owner. Maintenance scheduling is provided below in Table No. 6-1.

Short term maintenance for all below listed practices should be performed weekly and after rainfall events during construction followed by monthly during the first year after construction.

Long term maintenance for all below listed practices should be performed monthly during the first year after cease of construction activities and at least once annually thereafter. More frequent maintenance inspections (if required) are identified below.

6.4.1. Vegetated areas of stormwater facilities (berms, slopes, swales, etc.) are to be maintained as follows:

1. Maintenance activities for vegetation include mowing, fertilizing, watering, pruning, fire controls in dry weather, weed and pest control, reseeding, and repairs as necessary to maintain a vigorous, dense vegetative cover. Maintain appropriate grass height to prevent erosion. A grass height of four (4) to six (6) inch range is optimal.
2. Maintain side slopes, and
3. Repair erosion by regrading, fill, and/or reseeding as necessary.

6.4.2. Grassed swales, Open Channels and/or Stone Check Dams are to be maintained as follows:

1. The system shall be cleaned of any silt build-up as required to provide for free flow of stormwater. Sediment/grit build up must not exceed 25% of the original volume. The stone check dams (if installed) shall also be cleaned of any silt as required, providing for free flow of stormwater. The sediment shall be placed in a manner that it will not erode from the site and should not be deposited downstream from an embankment, or adjacent to a stream or floodplain.
2. Maintenance activities for vegetation include mowing, fertilizing, watering, pruning, fire controls in dry weather, weed and pest control, reseeding, and repairs as necessary to maintain a vigorous, dense vegetative cover. Maintain appropriate grass height to prevent erosion. A grass height of four (4) to six (6) inch range is optimal.

6.4.3. Culverts are to be maintained as follows:

1. The culvert system shall be cleaned of any silt build-up as required to provide for free flow of stormwater. Sediment/grit build up must not exceed 25% of the original volume. The sediment shall be placed in a manner that it will not erode from the site and should not be deposited downstream from an embankment, or adjacent to a stream or floodplain.

6.4.4. Dry swales are to be maintained as follows:

1. All damage caused by soil erosion and construction equipment should be repaired immediately.
2. Sediment and/or grit build up must not exceed 25% of the original volume. The stone check dams (if installed) shall also be cleaned of any silt as required, providing for free flow of stormwater. The sediment shall be placed in a manner that it will not erode from the site and should not be deposited downstream from an embankment, or adjacent to a stream or floodplain.

6.4.5. Bioretention areas are to be maintained as follows:

1. All planting areas shall be kept free of weeds. Weeding should be conducted three (3) times per year (spring, summer and fall).
2. Mulching should be conducted during the spring of each year. Mulch should be spread in a uniform manner. Do not apply mulch greater than 3-4 inches thick.
3. Visually inspect for any bare areas of vegetation, the presence of invasive species, dead vegetation, signs of excessive drought, disease, nutrient deficiency and pest problems. Also inspect planting areas for signs of soil compaction, soil subsidence, excessive salt deposits and standing water. Also inspect areas that may experience erosion or increased sediment deposits which would inhibit infiltration. Repair as necessary.
4. During the first year after plant installation water in the absence of rainfall in order to maintain a rate of one (1) inch of water per week. During year two (2) and three (3), water as needed (generally up to one-half inch of water per week) during the first 4-6 weeks of the growing season, and then only during extended periods of drought and only when the ground is not frozen. During year four (4) and beyond, water to supplement rainfall only during extended periods of drought and only when the ground is not frozen.
5. Prune, thin and shape all shrubs, perennials, herbaceous plants and grasses according to standard professional horticultural and arboricultural practices.
6. Replace plant material as necessary to maintain conformance with the provided detail(s).

6.5. Maintenance Schedule.

A broad schedule for maintaining the stormwater control facilities is summarized in Table No. 6-1 Maintenance Schedule. More frequent inspections and/or maintenance may be required as detailed above in Section 6.4.

Table No. 6-1 Maintenance Schedule

	Construction Period		Short Term (1-Year)		Long Term	
Stormwater Practice	Inspect Sched.	Mow or Clean	Inspect Sched.	Mow or Clean	Inspect Sched.	Mow or Clean
Vegetated Areas (slopes, swales, etc.)	weekly	2+"	Monthly	2+"	Semi-Annually	2+"
Grass Swales	weekly	2+"	Monthly	2+"	Semi-Annually	2+"
Culverts	weekly	As Req.	Monthly	As Req.	Semi-Annually	As Req.
Dry Swales & Bioretention Areas	weekly	2+"	Monthly	2+"	Semi-Annually	2+" - Maintain Dense Turf/Vegetative Cover

REFERENCES

New York Land and Lakes Development LLC, October 2019 Sketch Map of Forestburgh Pond Residential Subdivision, Caswell Road, Town of Dryden, Tompkins County, New York State.

New York State Department of Environmental Conservation. January 29, 2015. New York State Department of Environmental Conservation SPDES General Permit for Stormwater Discharges from Construction Activity, Permit No. GP-0-15-002 (effective date January 29, 2015; expiration date January 28, 2020).

New York State Department of Environmental Conservation. January 2015. New York State Stormwater Management Design Manual. Empire State Chapter, Soil and Water Conservation Society c/o Cayuga County SWCS, Auburn, New York.

New York State Department of Environmental Conservation. November 2016. New York State Standards and Specifications for Erosion and Sediment Control. Empire State Chapter, Soil and Water Conservation Society, Albany, New York.

New York State (NYS) Geographic Information System (GIS): www.nysgis.state.ny.us.

NYS Environmental Resource Mapper service: www.dec.ny.gov/imsmaps/erm/viewer.htm

NYS Stormwater Interactive Mapper service: www.dec.ny.gov/imsmaps/stormwater/viewer.htm

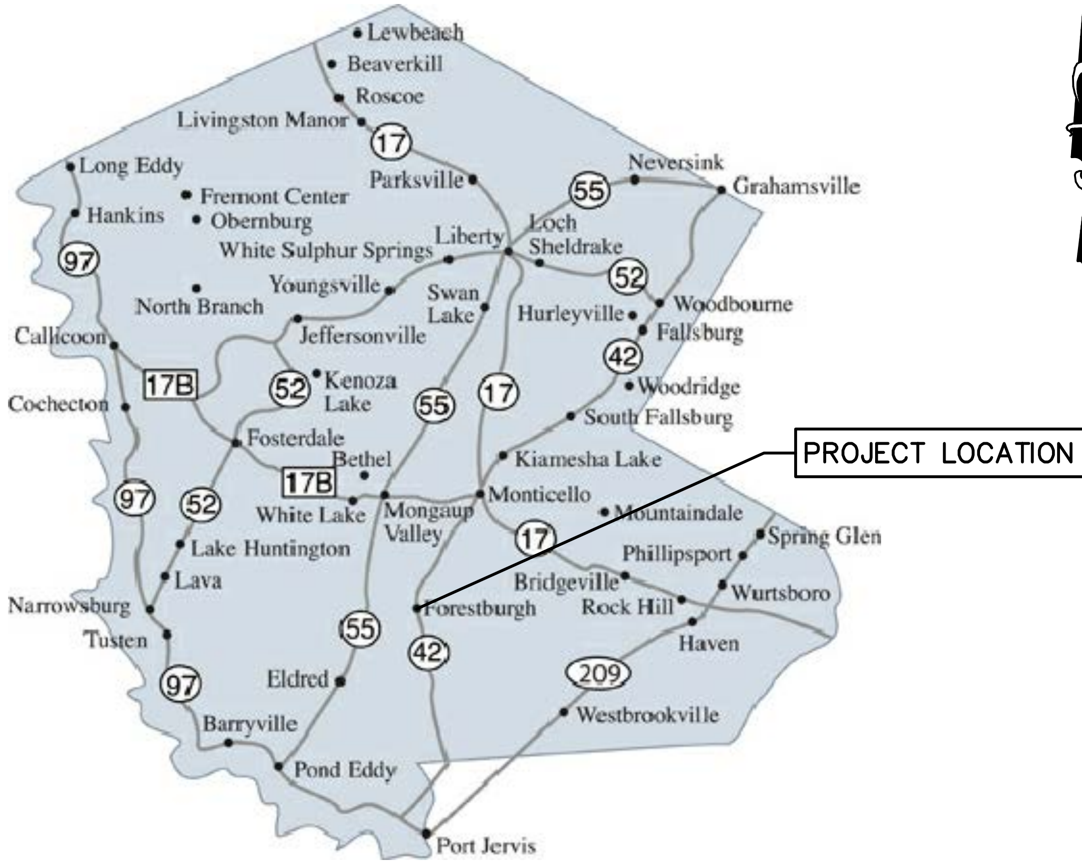
United States Department of Agriculture Natural Resources Conservation Service's Web Soil Survey. www.websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

Soil Survey Sullivan County New York. July 1989. USDA/Cornell University. Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

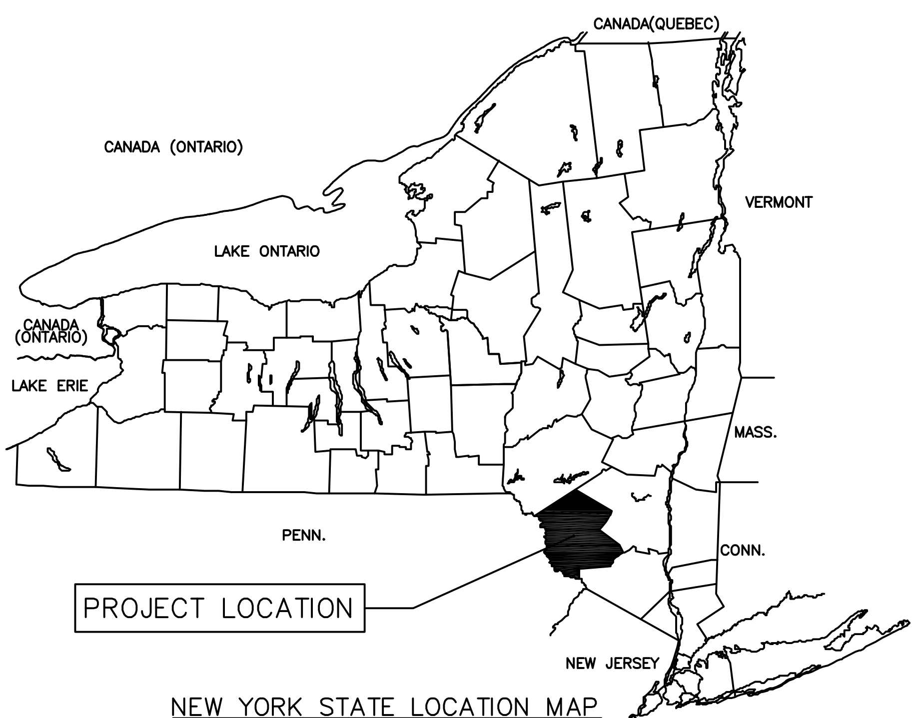
Federal Emergency Management Service (FEMA) online map service center. www.msc.fema.gov

United States Fish and Wildlife Service (USF&W) National Wetlands Inventory (NWI) – Wetlands online mapper service: www.wetlandsfws.er.usgs.gov

FIGURES



SULLIVAN COUNTY LOCATION MAP
NOT TO SCALE



NEW YORK STATE LOCATION MAP
NOT TO SCALE

KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

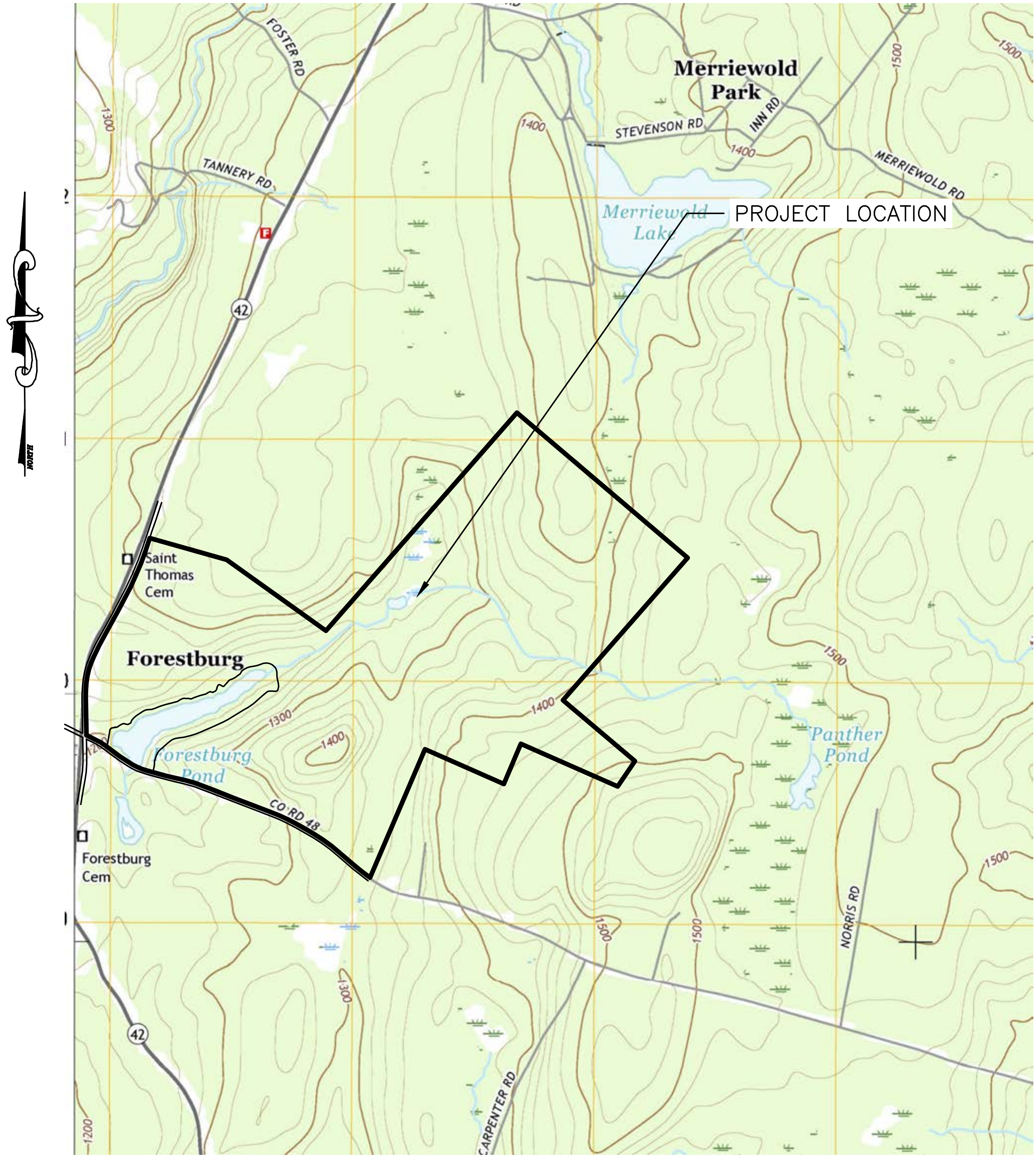
FORESTBURGH POND
NYS ROUTE 42

TOWN OF FORESTBURGH
SULLIVAN COUNTY NEW YORK STATE

KEYSTONE PROJECT #0392.12119

FIGURE NO. 1

LOCATION MAP



SCALE: 1" = 2,000'

QUAD NAME:
HARTWOOD, NY
2016

KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

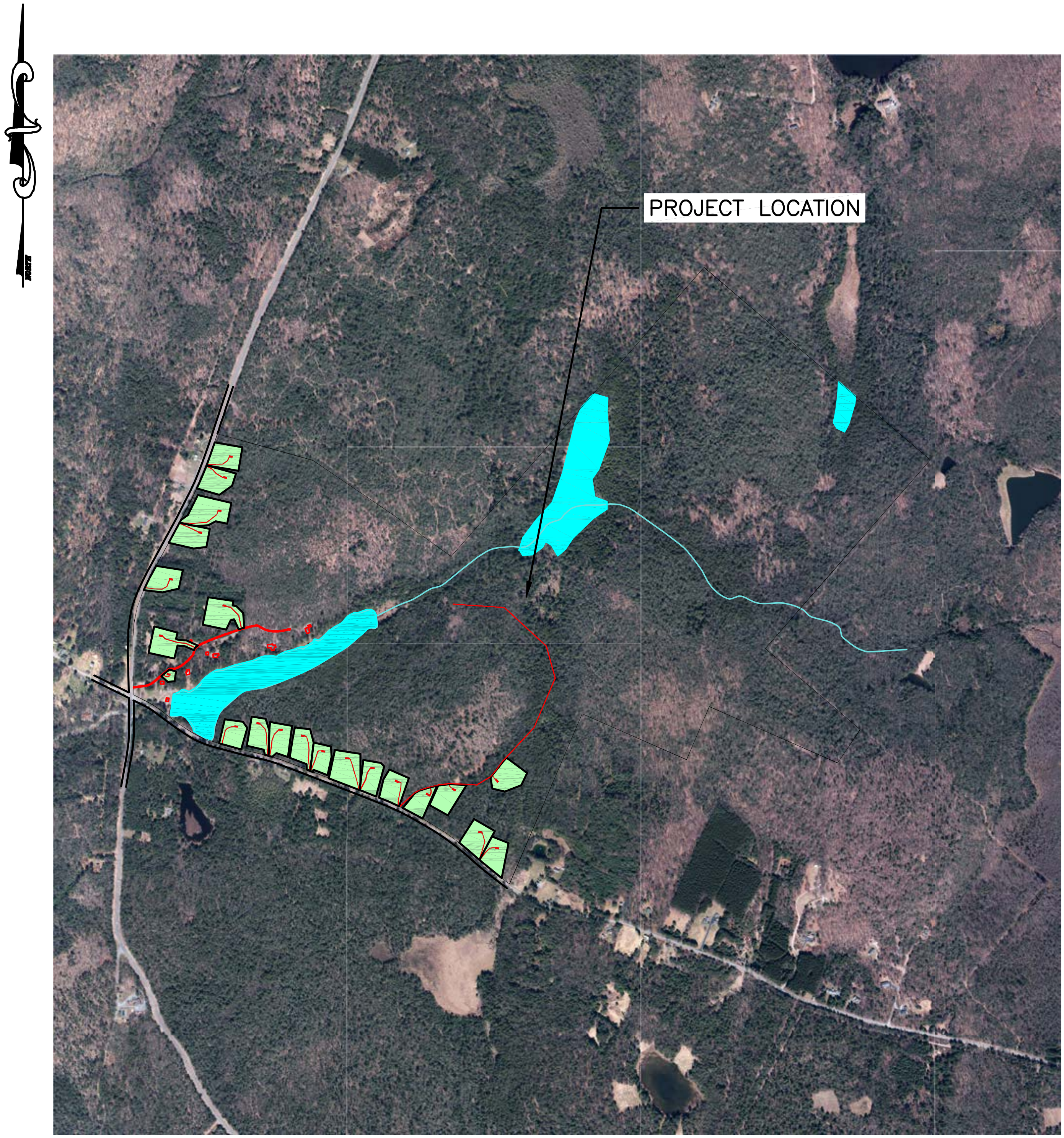
FORESTBURGH POND
NYS ROUTE 42

TOWN OF FORESTBURGH
SULLIVAN COUNTY NEW YORK STATE

KEYSTONE PROJECT #0392.12119

FIGURE NO. 2

USGS VICINITY MAP



SCALE: 1" = 1500'

KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

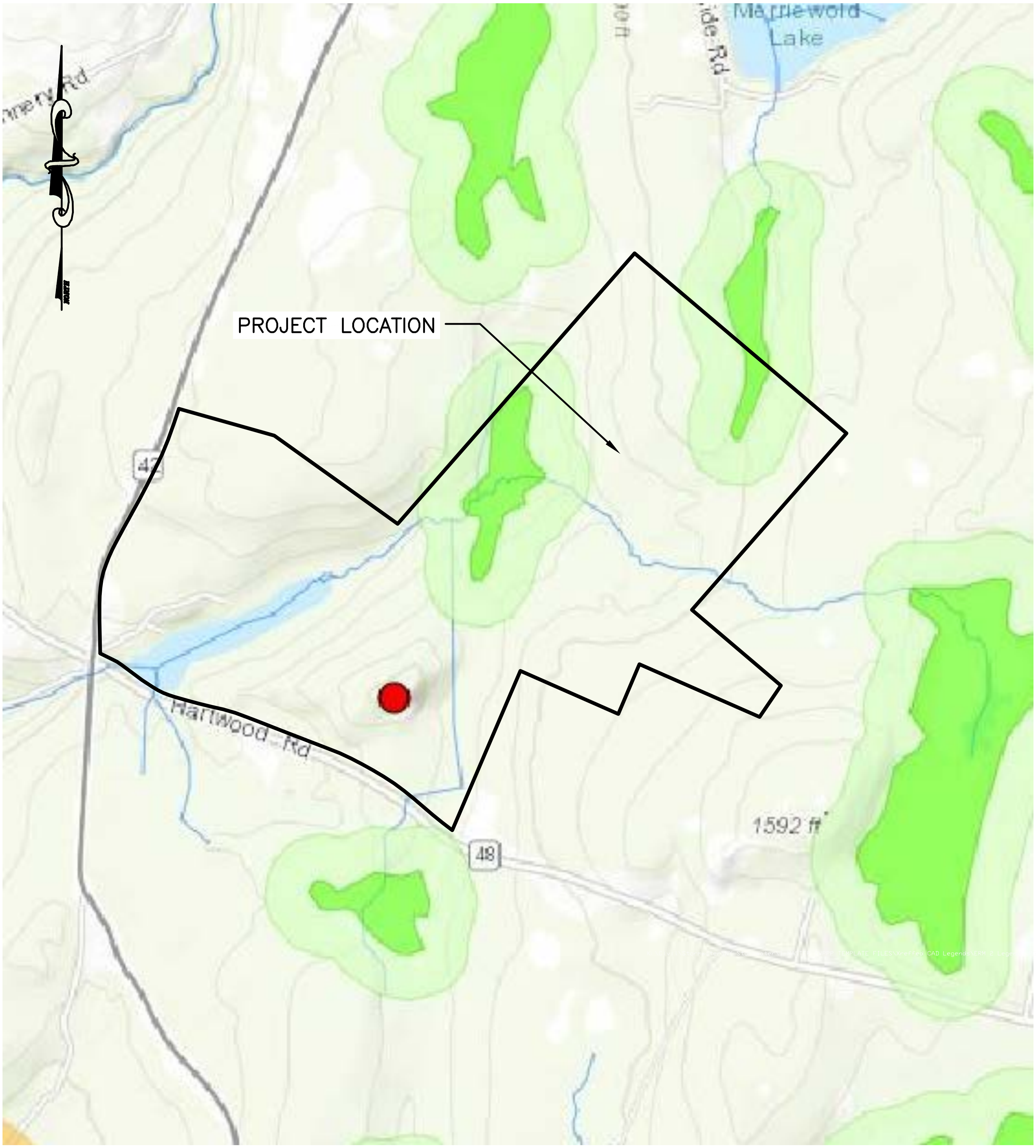
FORESTBURGH POND
NYS ROUTE 42

TOWN OF FORESTBURGH
SULLIVAN COUNTY NEW YORK STATE

KEYSTONE PROJECT #0392.12119

FIGURE NO. 3

AERIAL PHOTO



SCALE: 1" = 1500'

KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

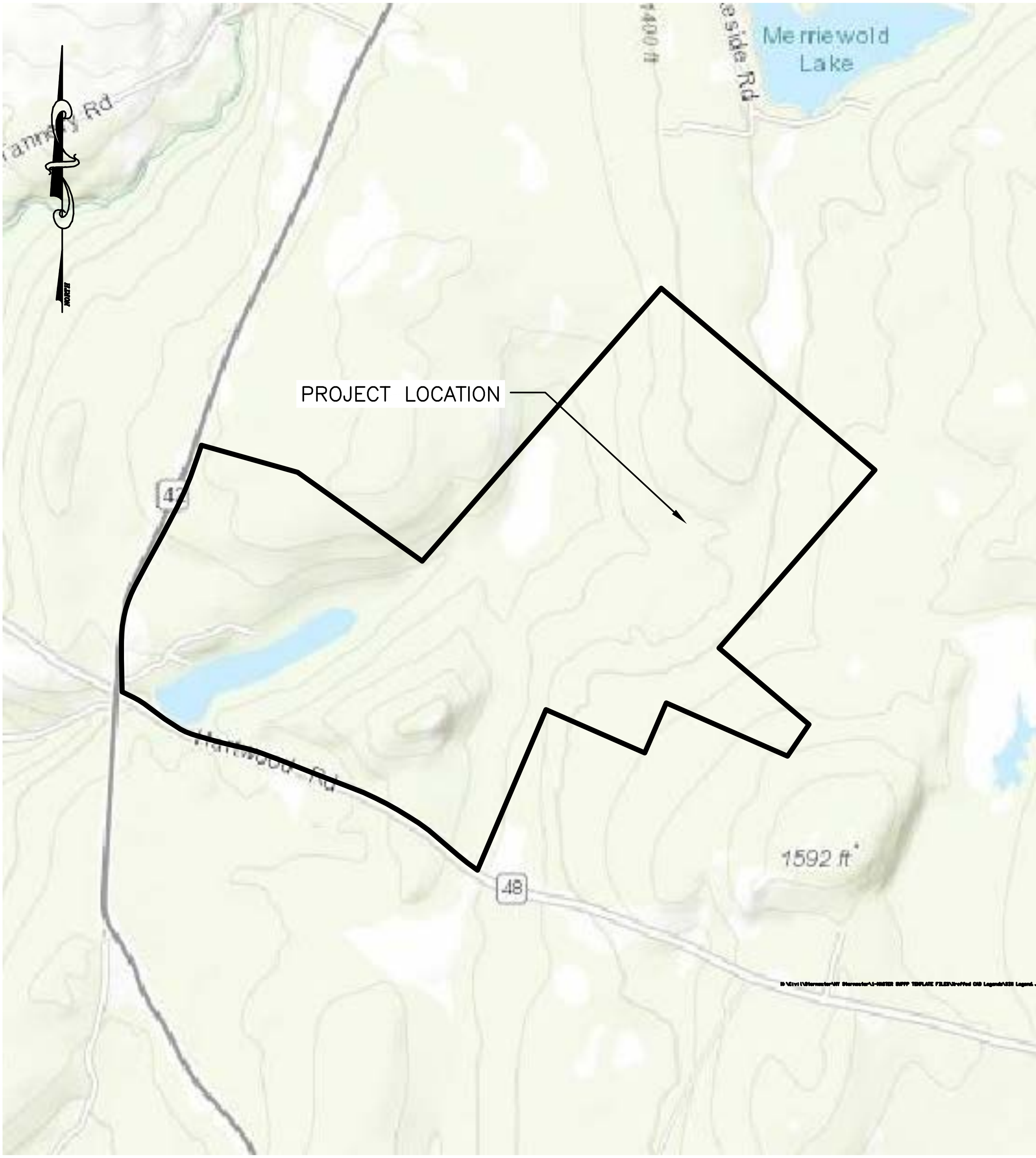
FORESTBURGH POND
NYS ROUTE 42

TOWN OF FORESTBURGH
SULLIVAN COUNTY NEW YORK STATE

KEYSTONE PROJECT #0392.12119

FIGURE NO. 4

NYSDEC
ENVIRONMENTAL
RESOURCE MAP



SCALE: 1" = 1500'

KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

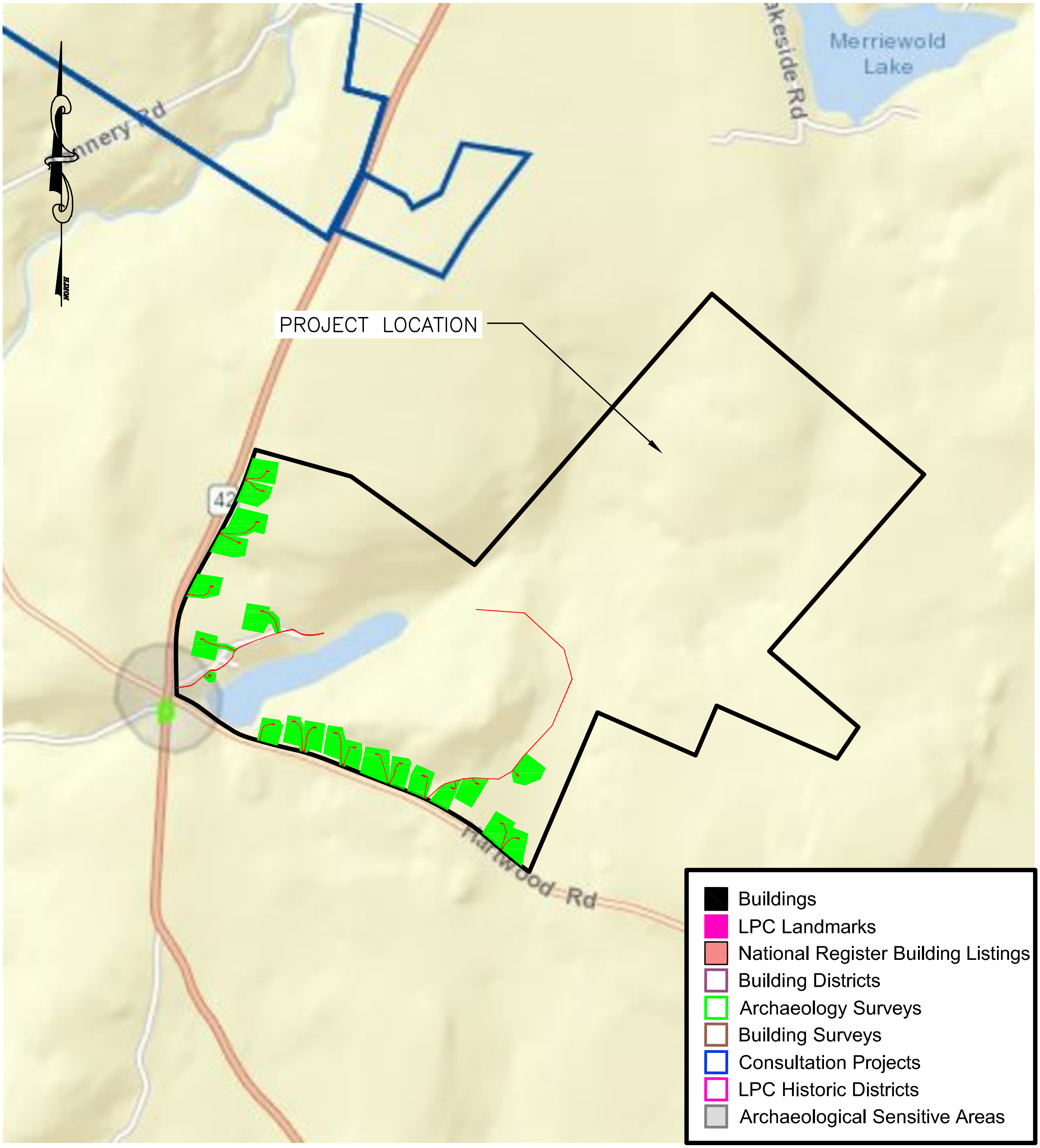
FORESTBURGH POND
NYS ROUTE 42

TOWN OF FORESTBURGH
SULLIVAN COUNTY NEW YORK STATE

KEYSTONE PROJECT #0392.12119

FIGURE NO. 5

NYSDEC STORMWATER INTERACTIVE MAP



SCALE: 1" = 1500'

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ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

FORESTBURGH POND
NYS ROUTE 42

TOWN OF FORESTBURGH
SULLIVAN COUNTY NEW YORK STATE

KEYSTONE PROJECT #0392.12119

FIGURE NO. 6

NYS
CULTURAL RESOURCE
INFORMATION MAP

SCALE: 1" = 1500'

KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

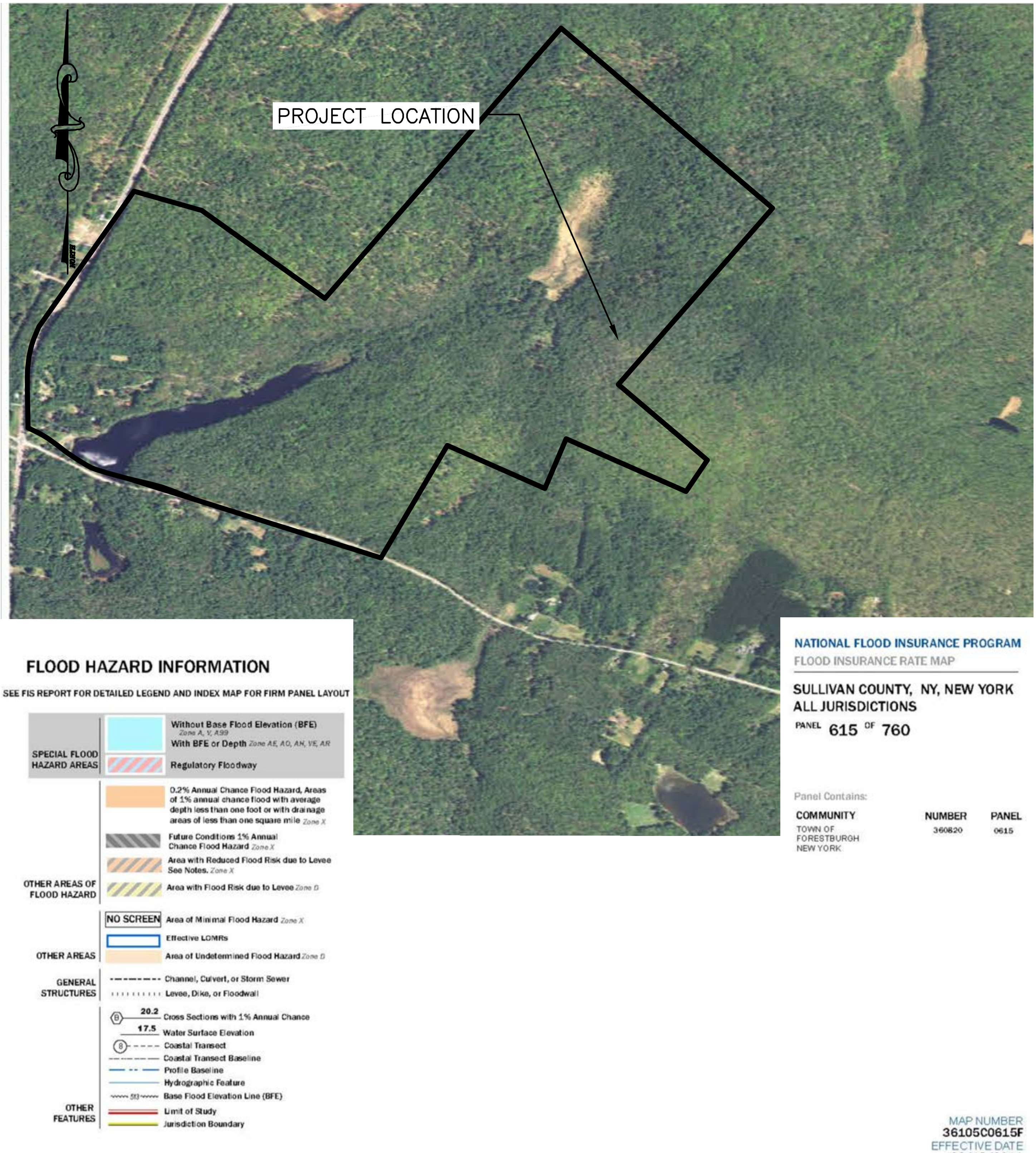
FORESTBURGH POND
NYS ROUTE 42

TOWN OF FORESTBURGH
SULLIVAN COUNTY NEW YORK STATE

KEYSTONE PROJECT #0392.12119

FIGURE NO. 7

NATIONAL WETLAND INVENTORY MAP



SCALE: 1" = 1500'

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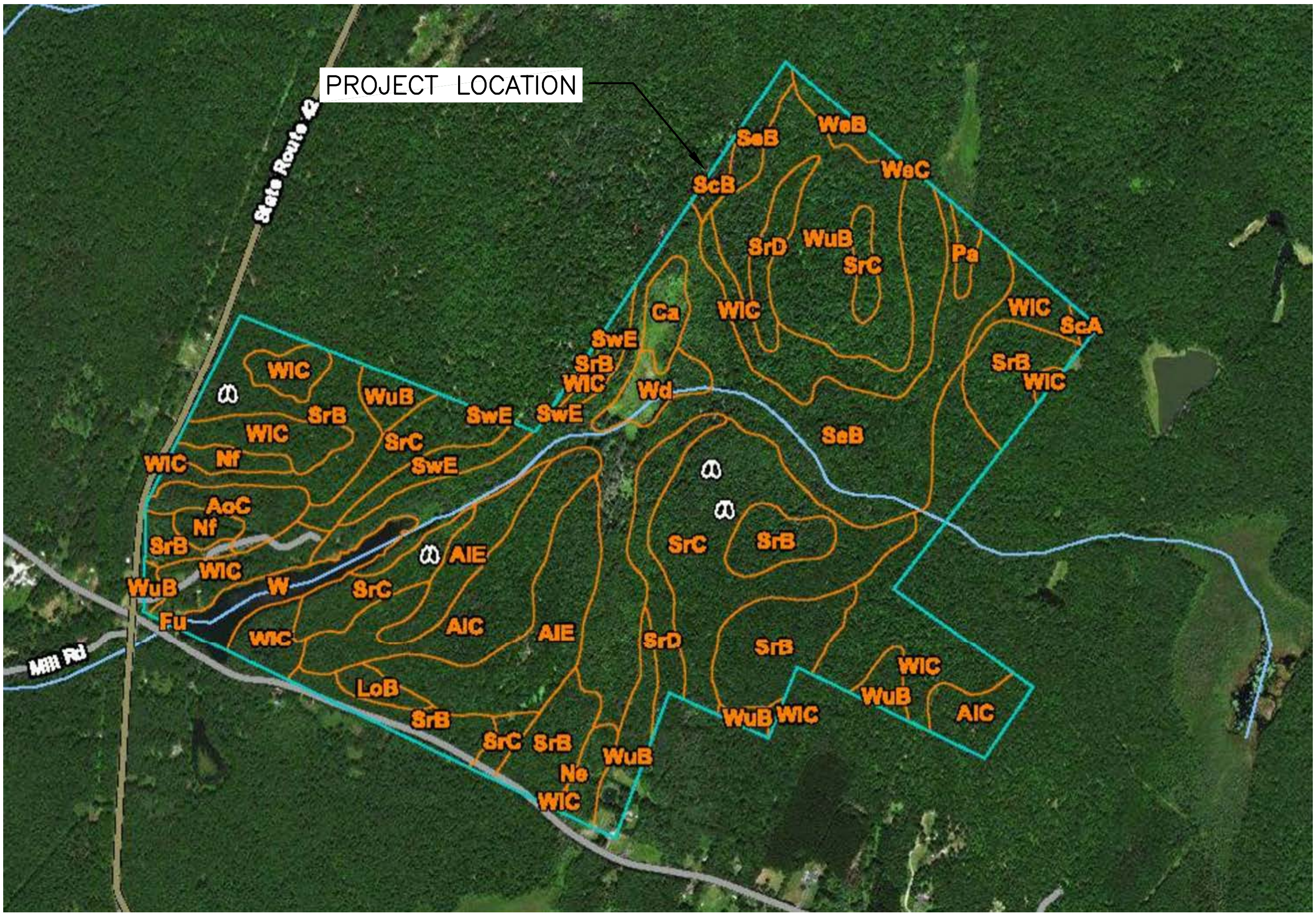
FORESTBURGH POND
NYS ROUTE 42

TOWN OF FORESTBURGH
SULLIVAN COUNTY NEW YORK STATE

KEYSTONE PROJECT #0392.12119

FIGURE NO. 8

FLOOD ZONE MAP



SCALE: 1" = 1500'

KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

FORESTBURGH POND
NYS ROUTE 42

TOWN OF FORESTBURGH
SULLIVAN COUNTY NEW YORK STATE

KEYSTONE PROJECT #0392.12119

FIGURE NO. 9

SOILS MAP

PRE DRAINAGE AREA		
WATER SURFACE SOIL GROUP D (CN=98)	=	31.48 ACRES
EXISTING STRUCTURES (CN=98)	=	0.38 ACRES
ACCESS ROADS (CN = 98)	=	1.27 ACRES
WOODS SOIL GROUP D (CN=79)	=	537.44 ACRES
TOTAL AREA (SITE)	=	570.57 ACRES
Tc pre (SITE)	=	41.3 MINS
CN pre (SITE)	=	80
FLOW DIRECTION	=	⟶

WATER SURFACE

WOODS

NOT FOR CONSTRUCTION

GRAPHIC SCALE

500 0 250 500 1,000 2,000

(IN FEET)
1 inch = 500 ft.

58 Exchange Street
Binghamton, New York 13901
Phone: 607.722.1100
Fax: 607.722.2515
Email: info@keyscomp.com
www.keyscomp.com

KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

NO. | REVISIONS AND DESCRIPTIONS | DATE

FORESTBURGH POND
NYS ROUTE 42

TOWN OF FORESTBURGH — SULLIVAN COUNTY, NY

PRE-DEVELOPMENT DRAINAGE AREA MAP

SHEET NO.
FIGURE NO. 10

PROJECT NO.
0392.12119

DATE: 12/30/2019

CAD FILE NO.: 0392.12119-SWPPP Figures

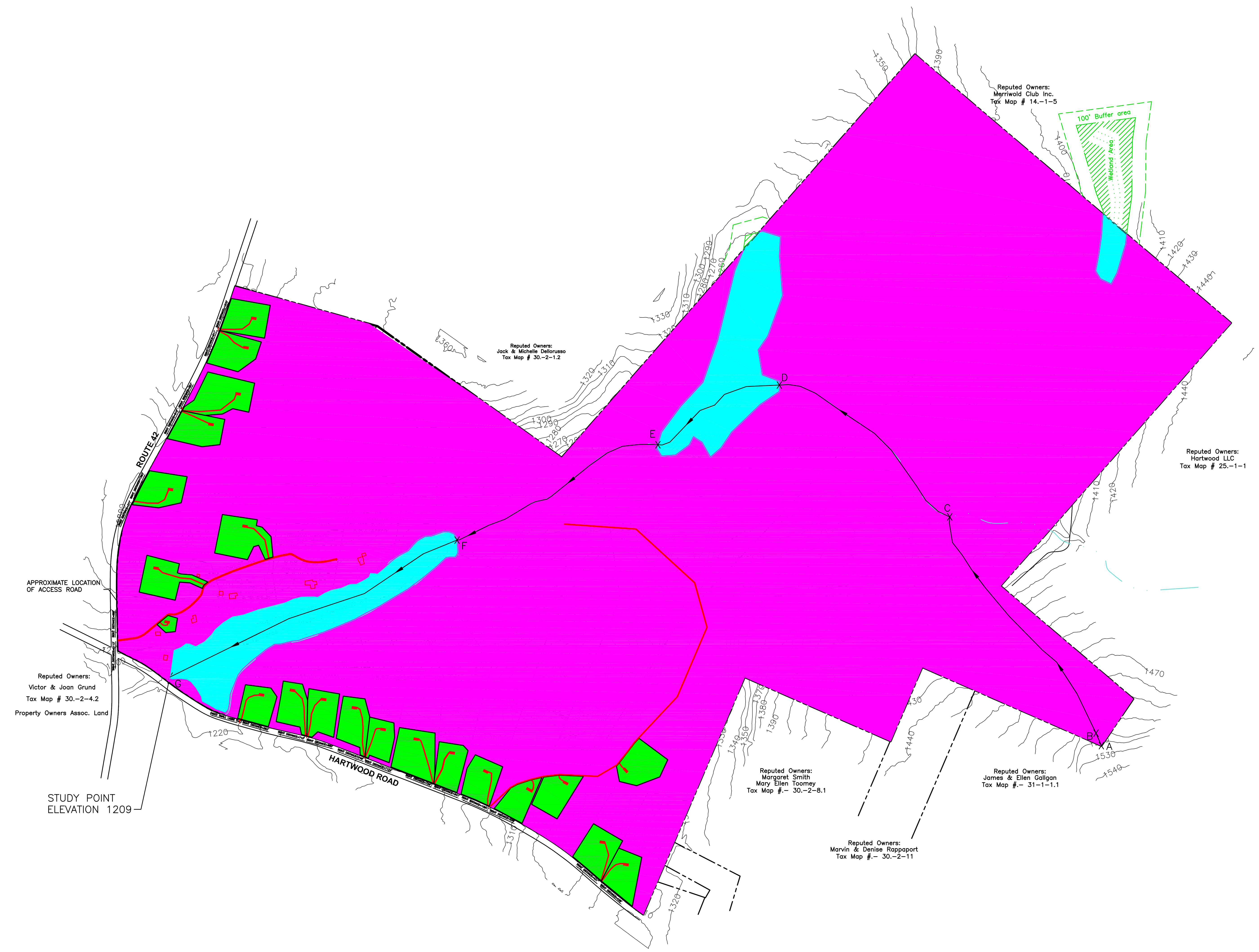
POST DRAINAGE AREA		
WATER SURFACE SOIL GROUP D (CN=98)	=	31.48 ACRES
NEW RESIDENTIAL HOMES (CN=98)	=	0.378 ACRES
NEW RESIDENTIAL DRIVEWAYS (CN=98)	=	1.23 ACRES
NEW GRASSED LAWNS (CN=80)	=	31.65 ACRES
EXISTING STRUCTURES (CN=98)	=	0.38 ACRES
ACCESS ROADS (CN=98)	=	1.27 ACRES
GRASS ALONG ACCESS ROADS (CN=80)	=	3.79 ACRES
WOODS SOIL GROUP D (CN=79)	=	500.40 ACRES
TOTAL AREA (SITE)	=	570.57 ACRES
Tc post (SITE)	=	41.3 MINS
CN post (SITE)	=	80
FLOW DIRECTION	=	→

IMPERVIOUS

WATER SURFACE

RESIDENTIAL

WOODS



NOT FOR CONSTRUCTION

NORTH

GRAPHIC SCALE

500 0 250 500 1,000 2,000

(IN FEET)
1 inch = 500 ft.

KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC
58 Exchange Street
Binghamton, New York 13901
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Fax: 607.722.2515
Email: info@keyscomp.com
www.keyscomp.com

NO. REVISIONS AND DESCRIPTIONS DATE

FORESTBURGH POND NYS ROUTE 42

TOWN OF FORESTBURGH SULLIVAN COUNTY, NY

POST-DEVELOPMENT DRAINAGE AREA MAP

SHEET NO. FIGURE NO. 11

PROJECT NO. 0392.12119

DATE 12/30/2019

CAD FILE NO. 0392.12119-SWPPP Figures

APPENDIX A
STORMWATER DISCHARGE PERMIT INFORMATION

0644089821

NOTICE OF INTENT

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

NYR | | | | | | (for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-15-002

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

-IMPORTANT-
RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)
New York Land and Lakes Development, LLC

Owner/Operator Contact Person Last Name (NOT CONSULTANT)
Lord

Owner/Operator Contact Person First Name
Alan

Owner/Operator Mailing Address
155 Main Street, Suite D

City
Oneonta

State
NY

Zip
13820 -

Phone (Owner/Operator)
607 3 558 0 6068

Fax (Owner/Operator)
- -

Email (Owner/Operator)
alord@nylandandlakes.com

FED TAX ID
16 1 7557000 (not required for individuals)

6401089828

Project Site Information

Project/Site Name
Forestburgh Pond Residential Subdivision

Street Address (NOT P.O. BOX)
Route 42 and 48

Side of Street
● North ○ South ○ East ○ West

City/Town/Village (THAT ISSUES BUILDING PERMIT)
Town of Forestburgh

State	Zip	County	DEC Region
NY	12777-	Sullivan	3

Name of Nearest Cross Street
Intersection of Route 42 and 48

Distance to Nearest Cross Street (Feet)
0

Project In Relation to Cross Street
● North ○ South ○ East ○ West

Tax Map Numbers
Section-Block-Parcel
30-2-6.2

Tax Map Numbers
30-2-6.2

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you **must** go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i"(identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)	Y Coordinates (Northing)
521116	4599967

2. What is the nature of this construction project?

● **New Construction**

○ **Redevelopment with increase in impervious area**

○ **Redevelopment with no increase in impervious area**

4107089829

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use

- ○ FOREST
- ○ PASTURE/OPEN LAND
- ○ CULTIVATED LAND
- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY
- ○ PARKING LOT
- ○ OTHER

Post-Development Future Land Use

- ○ SINGLE FAMILY HOME
- ● SINGLE FAMILY SUBDIVISION — Number of Lots: 21
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ MUNICIPAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY (water, sewer, gas, etc.)
- ○ PARKING LOT
- ○ CLEARING/GRADING ONLY
- ○ DEMOLITION, NO REDEVELOPMENT
- ○ WELL DRILLING ACTIVITY *(Oil, Gas, etc.)
- ○ OTHER

***Note**: for gas well drilling, non-high volume hydraulic fractured wells only

4. In accordance with the larger common plan of development or sale, enter the total project site area; the total area to be disturbed; existing impervious area to be disturbed (for redevelopment activities); and the future impervious area constructed within the disturbed area. (Round to the nearest tenth of an acre.)

Total Site Area	Total Area To Be Disturbed	Existing Impervious Area To Be Disturbed	Future Impervious Area Within Disturbed Area
5 7/6 0/7 .0 6. 6	3 8 3 3/8 . 3	1 . 3 1 . 3	2 . 9 2 . 9

5. Do you plan to disturb more than 5 acres of soil at any one time? ○ Yes ● No

6. Indicate the percentage of each Hydrologic Soil Group(HSG) at the site.

A	B	C	D
%	%	%	100 %

7. Is this a phased project? ○ Yes ○ No

8. Enter the planned start and end dates of the disturbance activities.

Start Date 01/15/2019 - **End Date** / /

9. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.

Name

Forestburgh Pond

9a. Type of waterbody identified in Question 9?

- ○ Wetland / State Jurisdiction On Site (Answer 9b)
- ○ Wetland / State Jurisdiction Off Site
- ○ Wetland / Federal Jurisdiction On Site (Answer 9b)
- ○ Wetland / Federal Jurisdiction Off Site
- ○ Stream / Creek On Site
- ○ Stream / Creek Off Site
- ○ River On Site
- ○ River Off Site
- ✔ Lake On Site
- ○ Lake Off Site
- ○ Other Type On Site
- ○ Other Type Off Site

9b. How was the wetland identified?

- ○ Regulatory Map
- ○ Delineated by Consultant
- ○ Delineated by Army Corps of Engineers
- ○ Other (identify)

10. Has the surface waterbody(ies) in question 9 been identified as a 303(d) segment in Appendix E of GP-0-15-002? ○ **Yes** ● **No**

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-15-002? ○ **Yes** ● **No**

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? **If no, skip question 13.** ○ **Yes** ● **No**

13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? **If Yes, what is the acreage to be disturbed?** ○ **Yes** ○ **No**

14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area? ○ **Yes** ● **No**

15.	Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)?	○ Yes ● No ○ Unknown

16. What is the name of the municipality/entity that owns the separate storm sewer system?

17.	Does any runoff from the site enter a sewer classified as a Combined Sewer?	○ Yes ● No ○ Unknown
18.	Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law?	○ Yes ● No
19.	Is this property owned by a state authority, state agency, federal government or local government?	○ Yes ● No
20.	Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.)	○ Yes ● No
21.	Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)?	● Yes ○ No
22.	Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)? **If No, skip questions 23 and 27-39.**	● Yes ○ No
23.	Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual?	● Yes ○ No

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- ○ **Professional Engineer (P.E.)**
- ○ **Soil and Water Conservation District (SWCD)**
- ○ **Registered Landscape Architect (R.L.A)**
- ✔ **Certified Professional in Erosion and Sediment Control (CPESC)**
- ○ **Owner/Operator**
- ○ **Other**

SWPPP Preparer
Keystone Associates

Contact Name (Last, Space, First)
O'Connor, Timothy

Mailing Address
58 Exchange Street

City
Binghamton

State
NY

Zip
13901 -

Phone
607-722-1100

Fax
607-722-2515

Email
toconnor@keyscomp.com

SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-15-002. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name
Timothy

MI
M

Last Name
O'Connor

Signature
Timothy M. O'Connor

Date
01/10/2020

25. Has a construction sequence schedule for the planned management practices been prepared? ◉ Yes ○ No

26. Select **all** of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural

- ○ Check Dams
- ○ Construction Road Stabilization
- ✔ Dust Control
- ○ Earth Dike
- ○ Level Spreader
- ○ Perimeter Dike/Swale
- ○ Pipe Slope Drain
- ○ Portable Sediment Tank
- ○ Rock Dam
- ○ Sediment Basin
- ○ Sediment Traps
- ✔ Silt Fence
- ✔ Stabilized Construction Entrance
- ○ Storm Drain Inlet Protection
- ○ Straw/Hay Bale Dike
- ○ Temporary Access Waterway Crossing
- ○ Temporary Stormdrain Diversion
- ✔ Temporary Swale
- ○ Turbidity Curtain
- ○ Water bars

Biotechnical

- ○ Brush Matting
- ○ Wattling

Vegetative Measures

- ○ Brush Matting
- ○ Dune Stabilization
- ○ Grassed Waterway
- ✔ Mulching
- ✔ Protecting Vegetation
- ○ Recreation Area Improvement
- ✔ Seeding
- ○ Sodding
- ○ Straw/Hay Bale Dike
- ○ Streambank Protection
- ○ Temporary Swale
- ✔ Topsoiling
- ○ Vegetating Waterways

Permanent Structural

- ○ Debris Basin
- ○ Diversion
- ○ Grade Stabilization Structure
- ✔ Land Grading
- ○ Lined Waterway (Rock)
- ○ Paved Channel (Concrete)
- ○ Paved Flume
- ○ Retaining Wall
- ○ Riprap Slope Protection
- ○ Rock Outlet Protection
- ○ Streambank Protection

Other

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Post-construction Stormwater Management Practice (SMP) Requirements

Important: **Completion of Questions 27-39 is not required if response to Question 22 is No.**

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

- ✔ **Preservation of Undisturbed Areas**
- ✔ **Preservation of Buffers**
- ✔ **Reduction of Clearing and Grading**
- ✔ **Locating Development in Less Sensitive Areas**
- ✔ **Roadway Reduction**
- ○ **Sidewalk Reduction**
- ✔ **Driveway Reduction**
- ○ **Cul-de-sac Reduction**
- ✔ **Building Footprint Reduction**
- ✔ **Parking Reduction**

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6("Soil Restoration") of the Design Manual (2010 version).

● All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).

○ Compacted areas were considered as impervious cover when calculating the **WQv Required**, and the compacted areas were assigned a post-construction Hydrologic Soil Group (HSG) designation that is one level less permeable than existing conditions for the hydrology analysis.

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout).

Total WQv Required

0 . 20 1 . 27 1 7 **acre-feet**

29. Identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity in Table 1 (See Page 9) that were used to reduce the Total WQv Required(#28).

Also, provide in Table 1 the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

Note: Redevelopment projects shall use Tables 1 and 2 to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

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Table 1 - Runoff Reduction (RR) Techniques and Standard Stormwater Management Practices (SMPs)

	Total Contributing Area (acres)		Total Contributing Impervious Area(acres)
RR Techniques (Area Reduction)			
○ Conservation of Natural Areas (RR-1) ...	.	and/or	.
○ Sheetflow to Riparian Buffers/Filters Strips (RR-2)	.	and/or	.
○ Tree Planting/Tree Pit (RR-3)	.	and/or	.
○ Disconnection of Rooftop Runoff (RR-4)..	.	and/or	.
RR Techniques (Volume Reduction)			
○ Vegetated Swale (RR-5)			.
○ Rain Garden (RR-6)			.
○ Stormwater Planter (RR-7)			.
○ Rain Barrel/Cistern (RR-8)			.
○ Porous Pavement (RR-9)			.
○ Green Roof (RR-10)			.
Standard SMPs with RRv Capacity			
○ Infiltration Trench (I-1)			.
○ Infiltration Basin (I-2)			.
○ Dry Well (I-3)			.
○ Underground Infiltration System (I-4)			.
✔ Bioretention (F-5)			1.6106606
✔ Dry Swale (O-1)			1.2162666
Standard SMPs			
○ Micropool Extended Detention (P-1)			.
○ Wet Pond (P-2)			.
○ Wet Extended Detention (P-3)			.
○ Multiple Pond System (P-4)			.
○ Pocket Pond (P-5)			.
○ Surface Sand Filter (F-1)			.
○ Underground Sand Filter (F-2)			.
○ Perimeter Sand Filter (F-3)			.
○ Organic Filter (F-4)			.
○ Shallow Wetland (W-1)			.
○ Extended Detention Wetland (W-2)			.
○ Pond/Wetland System (W-3)			.
○ Pocket Wetland (W-4)			.
○ Wet Swale (O-2)			.

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Table 2 - Alternative SMPs (DO NOT INCLUDE PRACTICES BEING USED FOR PRETREATMENT ONLY)

Alternative SMP	Total Contributing Impervious Area(acres)
○ Hydrodynamic	.
○ Wet Vault	.
○ Media Filter	.
○ Other	.

Provide the name and manufacturer of the Alternative SMPs (i.e. proprietary practice(s)) being used for WQv treatment.

Name

Manufacturer

Note: Redevelopment projects which do not use RR techniques, shall use questions 28, 29, 33 and 33a to provide SMPs used, total WQv required and total WQv provided for the project.

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29.

Total RRv provided

0 . 20 1 . 27 1 7 **acre-feet**

31. Is the Total RRv provided (#30) greater than or equal to the total WQv required (#28).

● **Yes** ○ **No**

If Yes, go to question 36.
If No, go to question 32.

32. Provide the Minimum RRv required based on HSG.
[Minimum RRv Required = (P)(0.95)(Ai)/12, Ai=(S)(Aic)]

Minimum RRv Required

. **acre-feet**

32a. Is the Total RRv provided (#30) greater than or equal to the Minimum RRv Required (#32)?

○ **Yes** ○ **No**

If Yes, go to question 33.
Note: Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQv required (#28) must also be included in the SWPPP.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. Identify the Standard SMPs in Table 1 and, if applicable, the Alternative SMPs in Table 2 that were used to treat the remaining total WQv(=Total WQv Required in 28 - Total RRv Provided in 30).

Also, provide in Table 1 and 2 the total impervious area that contributes runoff to each practice selected.

Note: Use Tables 1 and 2 to identify the SMPs used on Redevelopment projects.

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question 29.

WQv Provided

☐☐☐.☐☐☐ **acre-feet**

Note: For the standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - RRv provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a). ☐☐☐.☐☐☐

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)? ○ **Yes** ○ **No**

If Yes, go to question 36.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPv) required and provided or select waiver (36a), if applicable.

CPv Required ☐☐☐.☐☐☐ **acre-feet**

CPv Provided ☐☐☐.☐☐☐ **acre-feet**

36a. The need to provide channel protection has been waived because:

○ Site discharges directly to tidal waters or a fifth order or larger stream.

● Reduction of the total CPv is achieved on site through runoff reduction techniques or infiltration systems.

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (37a), if applicable.

Total Overbank Flood Control Criteria (Qp)

Pre-Development

1,105.95 ~~☐☐☐.☐☐☐~~ **CFS**

Post-development

1,105.95 ~~☐☐☐.☐☐☐~~ **CFS**

Total Extreme Flood Control Criteria (Qf)

Pre-Development

2,098.35 ~~☐☐☐.☐☐☐~~ **CFS**

Post-development

2,098.35 ~~☐☐☐.☐☐☐~~ **CFS**

37a. The need to meet the Qp and Qf criteria has been waived because:

- ○ Site discharges directly to tidal waters or a fifth order or larger stream.
- ○ Downstream analysis reveals that the Qp and Qf controls are not required

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed?

● Yes ○ No

If Yes, Identify the entity responsible for the long term Operation and Maintenance

Individual Lot Owners

39. Use this space to summarize the specific site limitations and justification for not reducing 100% of WQv required(#28). (See question 32a) This space can also be used for other pertinent project information.

40. Identify other DEC permits, existing and new, that are required for this project/facility.

- ○ Air Pollution Control
- ○ Coastal Erosion
- ○ Hazardous Waste
- ○ Long Island Wells
- ○ Mined Land Reclamation
- ○ Solid Waste
- ○ Navigable Waters Protection / Article 15
- ○ Water Quality Certificate
- ○ Dam Safety
- ○ Water Supply
- ○ Freshwater Wetlands/Article 24
- ○ Tidal Wetlands
- ○ Wild, Scenic and Recreational Rivers
- ○ Stream Bed or Bank Protection / Article 15
- ○ Endangered or Threatened Species(Incidental Take Permit)
- ○ Individual SPDES
- ○ SPDES Multi-Sector GP NYR
- ○ Other
- ✔ None

41. Does this project require a US Army Corps of Engineers Wetland Permit? ○ Yes ● No
If Yes, Indicate Size of Impact. .

42. Is this project subject to the requirements of a regulated, traditional land use control MS4? ○ Yes ● No
(If No, skip question 43)

43. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI? ○ Yes ○ No

44. If this NOI is being submitted for the purpose of continuing or transferring coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. NYR

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Owner/Operator Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Print First Name

Alan

MI

M

Print Last Name

Lord

Owner/Operator Signature

Date

/ /

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NOTICE OF INTENT

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

NYR ______ (for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-15-002

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

-IMPORTANT-

RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)

Owner/Operator Contact Person Last Name (NOT CONSULTANT)

Owner/Operator Contact Person First Name

Owner/Operator Mailing Address

City

State

Zip -

Phone (Owner/Operator) - -

Fax (Owner/Operator) - -

Email (Owner/Operator)

FED TAX ID

\- (not required for individuals)

Project Site Information

Project/Site Name

Street Address (NOT P.O. BOX)

Side of Street
○ **North** ○ **South** ○ **East** ○ **West**

City/Town/Village (THAT ISSUES BUILDING PERMIT)

State: N Y | Zip: - | County | DEC Region

Name of Nearest Cross Street

Distance to Nearest Cross Street (Feet)

Project In Relation to Cross Street
○ **North** ○ **South** ○ **East** ○ **West**

Tax Map Numbers
Section-Block-Parcel

Tax Map Numbers

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you **must** go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i"(identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)

Y Coordinates (Northing) 4

2. What is the nature of this construction project?

○ **New Construction**

○ **Redevelopment with increase in impervious area**

○ **Redevelopment with no increase in impervious area**

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use

- ○ FOREST
- ○ PASTURE/OPEN LAND
- ○ CULTIVATED LAND
- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY
- ○ PARKING LOT
- ○ OTHER

Post-Development Future Land Use

- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ MUNICIPAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY (water, sewer, gas, etc.)
- ○ PARKING LOT
- ○ CLEARING/GRADING ONLY
- ○ DEMOLITION, NO REDEVELOPMENT
- ○ WELL DRILLING ACTIVITY *(Oil, Gas, etc.)
- ○ OTHER

Number of Lots

***Note**: for gas well drilling, non-high volume hydraulic fractured wells only

4. In accordance with the larger common plan of development or sale, enter the total project site area; the total area to be disturbed; existing impervious area to be disturbed (for redevelopment activities); and the future impervious area constructed within the disturbed area. (Round to the nearest tenth of an acre.)

Total Site Area	**Total Area To Be Disturbed**	**Existing Impervious Area To Be Disturbed**	**Future Impervious Area Within Disturbed Area**
.	.	.	.

5. Do you plan to disturb more than 5 acres of soil at any one time? ○ **Yes** ○ **No**

6. Indicate the percentage of each Hydrologic Soil Group(HSG) at the site.

A	**B**	**C**	**D**
%	%	%	%

7. Is this a phased project? ○ **Yes** ○ **No**

8. Enter the planned start and end dates of the disturbance activities.

Start Date / / - **End Date** / /

9. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.

Name

9a. Type of waterbody identified in Question 9?

- ○ Wetland / State Jurisdiction On Site (Answer 9b)
- ○ Wetland / State Jurisdiction Off Site
- ○ Wetland / Federal Jurisdiction On Site (Answer 9b)
- ○ Wetland / Federal Jurisdiction Off Site
- ○ Stream / Creek On Site
- ○ Stream / Creek Off Site
- ○ River On Site
- ○ River Off Site
- ○ Lake On Site
- ○ Lake Off Site
- ○ Other Type On Site
- ○ Other Type Off Site

9b. How was the wetland identified?

- ○ Regulatory Map
- ○ Delineated by Consultant
- ○ Delineated by Army Corps of Engineers
- ○ Other (identify)

10. Has the surface waterbody(ies) in question 9 been identified as a 303(d) segment in Appendix E of GP-0-15-002? ○ **Yes** ○ **No**

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-15-002? ○ **Yes** ○ **No**

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? ○ **Yes** ○ **No**
If no, skip question 13.

13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? ○ **Yes** ○ **No**
If Yes, what is the acreage to be disturbed?

14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area? ○ **Yes** ○ **No**

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? ○ **Yes** ○ **No** ○ **Unknown**

16. What is the name of the municipality/entity that owns the separate storm sewer system?

17. Does any runoff from the site enter a sewer classified as a Combined Sewer? ○ **Yes** ○ **No** ○ **Unknown**

18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law? ○ **Yes** ○ **No**

19. Is this property owned by a state authority, state agency, federal government or local government? ○ **Yes** ○ **No**

20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.) ○ **Yes** ○ **No**

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)? ○ **Yes** ○ **No**

22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)? ○ **Yes** ○ **No**
If No, skip questions 23 and 27-39.

23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual? ○ **Yes** ○ **No**

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

○ **Professional Engineer (P.E.)**

○ **Soil and Water Conservation District (SWCD)**

○ **Registered Landscape Architect (R.L.A)**

○ **Certified Professional in Erosion and Sediment Control (CPESC)**

○ **Owner/Operator**

○ **Other**

SWPPP Preparer

Contact Name (Last, Space, First)

Mailing Address

City

State Zip

-

Phone

- -

Fax

- -

Email

SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-15-002. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name

MI

Last Name

Signature

Date

/ /

25. Has a construction sequence schedule for the planned management practices been prepared? ○ Yes ○ No

26. Select **all** of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural

- ○ Check Dams
- ○ Construction Road Stabilization
- ○ Dust Control
- ○ Earth Dike
- ○ Level Spreader
- ○ Perimeter Dike/Swale
- ○ Pipe Slope Drain
- ○ Portable Sediment Tank
- ○ Rock Dam
- ○ Sediment Basin
- ○ Sediment Traps
- ○ Silt Fence
- ○ Stabilized Construction Entrance
- ○ Storm Drain Inlet Protection
- ○ Straw/Hay Bale Dike
- ○ Temporary Access Waterway Crossing
- ○ Temporary Stormdrain Diversion
- ○ Temporary Swale
- ○ Turbidity Curtain
- ○ Water bars

Biotechnical

- ○ Brush Matting
- ○ Wattling

Vegetative Measures

- ○ Brush Matting
- ○ Dune Stabilization
- ○ Grassed Waterway
- ○ Mulching
- ○ Protecting Vegetation
- ○ Recreation Area Improvement
- ○ Seeding
- ○ Sodding
- ○ Straw/Hay Bale Dike
- ○ Streambank Protection
- ○ Temporary Swale
- ○ Topsoiling
- ○ Vegetating Waterways

Permanent Structural

- ○ Debris Basin
- ○ Diversion
- ○ Grade Stabilization Structure
- ○ Land Grading
- ○ Lined Waterway (Rock)
- ○ Paved Channel (Concrete)
- ○ Paved Flume
- ○ Retaining Wall
- ○ Riprap Slope Protection
- ○ Rock Outlet Protection
- ○ Streambank Protection

Other

Post-construction Stormwater Management Practice (SMP) Requirements

Important: Completion of Questions 27-39 is not required if response to Question 22 is No.

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

○ **Preservation of Undisturbed Areas**

○ **Preservation of Buffers**

○ **Reduction of Clearing and Grading**

○ **Locating Development in Less Sensitive Areas**

○ **Roadway Reduction**

○ **Sidewalk Reduction**

○ **Driveway Reduction**

○ **Cul-de-sac Reduction**

○ **Building Footprint Reduction**

○ **Parking Reduction**

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6("Soil Restoration") of the Design Manual (2010 version).

○ All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).

○ Compacted areas were considered as impervious cover when calculating the **WQv Required**, and the compacted areas were assigned a post-construction Hydrologic Soil Group (HSG) designation that is one level less permeable than existing conditions for the hydrology analysis.

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout).

Total WQv Required

[ ][ ][ ] . [ ][ ][ ] **acre-feet**

29. Identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity in Table 1 (See Page 9) that were used to reduce the Total WQv Required(#28).

Also, provide in Table 1 the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

Note: Redevelopment projects shall use Tables 1 and 2 to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

Table 1 - Runoff Reduction (RR) Techniques and Standard Stormwater Management Practices (SMPs)

	Total Contributing Area (acres)		Total Contributing Impervious Area(acres)
RR Techniques (Area Reduction)			
○ Conservation of Natural Areas (RR-1) ...	.	and/or	.
○ Sheetflow to Riparian Buffers/Filters Strips (RR-2)	.	and/or	.
○ Tree Planting/Tree Pit (RR-3)	.	and/or	.
○ Disconnection of Rooftop Runoff (RR-4)..	.	and/or	.
RR Techniques (Volume Reduction)			
○ Vegetated Swale (RR-5)			.
○ Rain Garden (RR-6)			.
○ Stormwater Planter (RR-7)			.
○ Rain Barrel/Cistern (RR-8)			.
○ Porous Pavement (RR-9)			.
○ Green Roof (RR-10)			.
Standard SMPs with RRv Capacity			
○ Infiltration Trench (I-1)			.
○ Infiltration Basin (I-2)			.
○ Dry Well (I-3)			.
○ Underground Infiltration System (I-4)			.
○ Bioretention (F-5)			.
○ Dry Swale (O-1)			.
Standard SMPs			
○ Micropool Extended Detention (P-1)			.
○ Wet Pond (P-2)			.
○ Wet Extended Detention (P-3)			.
○ Multiple Pond System (P-4)			.
○ Pocket Pond (P-5)			.
○ Surface Sand Filter (F-1)			.
○ Underground Sand Filter (F-2)			.
○ Perimeter Sand Filter (F-3)			.
○ Organic Filter (F-4)			.
○ Shallow Wetland (W-1)			.
○ Extended Detention Wetland (W-2)			.
○ Pond/Wetland System (W-3)			.
○ Pocket Wetland (W-4)			.
○ Wet Swale (O-2)			.

Table 2 - Alternative SMPs (DO NOT INCLUDE PRACTICES BEING USED FOR PRETREATMENT ONLY)

Alternative SMP	Total Contributing Impervious Area(acres)
○ Hydrodynamic	.
○ Wet Vault	.
○ Media Filter	.
○ Other	.

Provide the name and manufacturer of the Alternative SMPs (i.e. proprietary practice(s)) being used for WQv treatment.

Name

Manufacturer

Note: Redevelopment projects which do not use RR techniques, shall use questions 28, 29, 33 and 33a to provide SMPs used, total WQv required and total WQv provided for the project.

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29.

Total RRv provided

. **acre-feet**

31. Is the Total RRv provided (#30) greater than or equal to the total WQv required (#28).

○ **Yes** ○ **No**

If Yes, go to question 36.
If No, go to question 32.

32. Provide the Minimum RRv required based on HSG.
[Minimum RRv Required = (P)(0.95)(Ai)/12, Ai=(S)(Aic)]

Minimum RRv Required

. **acre-feet**

32a. Is the Total RRv provided (#30) greater than or equal to the Minimum RRv Required (#32)?

○ **Yes** ○ **No**

If Yes, go to question 33.
Note: Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQv required (#28) must also be included in the SWPPP.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. Identify the Standard SMPs in Table 1 and, if applicable, the Alternative SMPs in Table 2 that were used to treat the remaining total WQv(=Total WQv Required in 28 - Total RRv Provided in 30).

Also, provide in Table 1 and 2 the total impervious area that contributes runoff to each practice selected.

Note: Use Tables 1 and 2 to identify the SMPs used on Redevelopment projects.

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question 29.

WQv Provided

___.___ **acre-feet**

Note: For the standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - RRv provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a). ___.___

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)? ○ **Yes** ○ **No**

If Yes, go to question 36.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPv) required and provided or select waiver (36a), if applicable.

CPv Required ___.___ **acre-feet**

CPv Provided ___.___ **acre-feet**

36a. The need to provide channel protection has been waived because:

○ Site discharges directly to tidal waters or a fifth order or larger stream.

○ Reduction of the total CPv is achieved on site through runoff reduction techniques or infiltration systems.

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (37a), if applicable.

Total Overbank Flood Control Criteria (Qp)

Pre-Development ___.___ **CFS**

Post-development ___.___ **CFS**

Total Extreme Flood Control Criteria (Qf)

Pre-Development ___.___ **CFS**

Post-development ___.___ **CFS**

37a. The need to meet the Qp and Qf criteria has been waived because:

- ○ Site discharges directly to tidal waters or a fifth order or larger stream.
- ○ Downstream analysis reveals that the Qp and Qf controls are not required

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ○ **Yes** ○ **No**

If Yes, Identify the entity responsible for the long term Operation and Maintenance

39. Use this space to summarize the specific site limitations and justification for not reducing 100% of WQv required(#28). (See question 32a) This space can also be used for other pertinent project information.

40. Identify other DEC permits, existing and new, that are required for this project/facility.

- ○ Air Pollution Control
- ○ Coastal Erosion
- ○ Hazardous Waste
- ○ Long Island Wells
- ○ Mined Land Reclamation
- ○ Solid Waste
- ○ Navigable Waters Protection / Article 15
- ○ Water Quality Certificate
- ○ Dam Safety
- ○ Water Supply
- ○ Freshwater Wetlands/Article 24
- ○ Tidal Wetlands
- ○ Wild, Scenic and Recreational Rivers
- ○ Stream Bed or Bank Protection / Article 15
- ○ Endangered or Threatened Species(Incidental Take Permit)
- ○ Individual SPDES
- ○ SPDES Multi-Sector GP N Y R
- ○ Other
- ○ None

41. Does this project require a US Army Corps of Engineers Wetland Permit? ○ Yes ○ No
If Yes, Indicate Size of Impact. .

42. Is this project subject to the requirements of a regulated, traditional land use control MS4? ○ Yes ○ No
(If No, skip question 43)

43. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI? ○ Yes ○ No

44. If this NOI is being submitted for the purpose of continuing or transferring coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. N Y R

3547089826

Owner/Operator Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Print First Name

MI

Print Last Name

Owner/Operator Signature

Date

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CONTRACTOR'S CERTIFICATION STATEMENT
FOR
COMPLIANCE WITH STORMWATER MANAGEMENT AND POLLUTION PREVENTION PLAN

The Contractor and Subcontractors engaged in work affecting storm water drainage at the subject site shall sign a copy of the following certification statement and return a signed copy of this statement to the Operator before undertaking any construction activity at the subject site, and keep a copy of the signed statement at the site during construction.

- Subject Site:
  Lot No.:_________
  Forestburgh Pond Residential Subdivision
  Route 48 and 42
  Town of Forestburgh, County of Sullivan, NY

- Operator:
  Name:____
  Address:____

- Site Plan:
  Forestburgh Pond Residential Subdivision
  Route 48 and 42
  Prepared by: New York Land and Lakes Development LLC
  155 Main Street, Suite D, Oneonta, NY 13820

- Storm Water Management and Pollution Prevention Plan:
  Forestburgh Pond Residential Subdivisionj
  Route 48 and 42
  Prepared by: Keystone Associates Architects, Engineers, and Surveyors, LLC., 58 Exchange Street, Binghamton, New York 13901. 2019.

Under the provision of the New York State Department of Environmental Conservation, State Pollutant Discharge Elimination System, (SPDES) General Permit for Storm Water Discharges from Construction Activities, Permit No. GP-0-15-002 issued pursuant to Article 17, Titles 7, 8, and 70 of the Environmental Conservation Law,

"I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations."

Contract Description: ____

Company: __________________________________
____
____
Phone: __________________________
Fax: __________________________

____ ___________________
Authorized Signature Date

____ ___________________
Printed Name Title

____ ___________________
Printed Name(s) of "Trained Individual(s)" Title

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New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505
(NOTE: Submit completed form to address above)

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity

Please indicate your permit identification number: NYR ___ ___ ___ ___ ___ ___

I. Owner or Operator Information

1. Owner/Operator Name:

2. Street Address:

3. City/State/Zip:

4. Contact Person: | 4a.Telephone:

4b. Contact Person E-Mail:

II. Project Site Information

5. Project/Site Name:

6. Street Address:

7. City/Zip:

8. County:

III. Reason for Termination

9a. □ All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP. ***Date final stabilization completed** (month/year): ____________________

9b. □ Permit coverage has been transferred to new owner/operator. Indicate new owner/operator's permit identification number: NYR ____ ____ ____ ____ ____ ____
(Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

9c. □ Other (Explain on Page 2)

IV. Final Site Information:

10a. Did this construction activity require the development of a SWPPP that includes post-construction stormwater management practices? □ yes □ no (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed? □ yes □ no (If no, explain on Page 2)

10c. Identify the entity responsible for long-term operation and maintenance of practice(s)?

____

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

10d. Has the entity responsible for long-term operation and maintenance been given a copy of the operation and maintenance plan required by the general permit? □ yes □ no

10e. Indicate the method used to ensure long-term operation and maintenance of the post-construction stormwater management practice(s):

□ Post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.

□ Executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s).

□ For post-construction stormwater management practices that are privately owned, a mechanism is in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the owner or operator's deed of record.

□ For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university or hospital), government agency or authority, or public utility; policy and procedures are in place that ensures operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

10f. Provide the total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? ________________________________ (acres)

11. Is this project subject to the requirements of a regulated, traditional land use control MS4? □ yes □ no

(If Yes, complete section VI - "MS4 Acceptance" statement

V. Additional Information/Explanation:

(Use this section to answer questions 9c. and 10b., if applicable)

VI. MS4 Acceptance - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative (Note: Not required when 9b. is checked -transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 5 to submit the Notice of Termination at this time.

Printed Name:	
Title/Position:	
Signature:	Date:

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

VII. Qualified Inspector Certification - Final Stabilization:	
I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the general permit, and that all temporary, structural erosion and sediment control measures have been removed. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.	
Printed Name:	
Title/Position:	
Signature:	Date:
VIII. Qualified Inspector Certification - Post-construction Stormwater Management Practice(s):	
I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.	
Printed Name:	
Title/Position:	
Signature:	Date:
IX. Owner or Operator Certification	
I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.	
Printed Name:	
Title/Position:	
Signature:	Date:

(NYS DEC Notice of Termination - January 2015)

Tim O'Connor

From: New York State Parks CRIS Application <cris.web@parks.ny.gov>
Sent: Monday, December 23, 2019 11:32 AM
To: Tim O'Connor
Subject: SHPO Initial Submission Accepted for Consultation Project: 19PR08655

This message is a notification from the New York State Historic Preservation Office (SHPO) through its Cultural Resource Information System (CRIS). Initial submission NFL2AN8Q2IG9 (Forestburgh Pond Residential Development / NA) has been accepted as new project submission 19PR08655.001. Please refer to project number 19PR08655 in future correspondence with SHPO.

No action on your part is required at this time. SHPO review of the submission is currently in progress, and you will receive updates by email.

If you have any questions about CRIS, please contact CRIS Help at CRISHelp@parks.ny.gov. For any other questions, please call 518-237-8643.

Sincerely,

New York State Historic Preservation Office
Peebles Island State Park, P.O. Box 189, Waterford, NY 12188-0189
518-237-8643 | https://parks.ny.gov/shpo
CRIS: https://cris.parks.ny.gov

You are receiving this email as part of an online service administered by New York State Parks, Recreation and Historic Preservation's Division for Historic Preservation, also known as the New York State Historic Preservation Office (SHPO). The Cultural Resource Information System (CRIS) is an advanced Geographic Information System application that provides access to New York State's vast historic and cultural resource databases and digitized paper records. In addition, CRIS serves as an interactive portal for agencies, municipalities and the public who use or require consultation with our agency on historic preservation programs or issues.

Our email to you is in direct response to material that was submitted to our office regarding a project for which you were identified as a contact. Such projects include actions that are reviewable by our agency under the National Historic Preservation Act of 1966 (Section 106), the New York State Historic Preservation Act (Section 14.09 NYSPRHPL), or the State Environmental Quality Review Act (SEQRA).

If you did not enter this project directly into CRIS, you are receiving this notification as SHPO or another project contact has entered it in our system. You will receive future correspondence for this project via email.

You may access the project in CRIS at https://cris.parks.ny.gov/. If you are a registered CRIS user, the project will appear in the **My Projects** tab on your Home dashboard. If you are a guest user, you may view the project details using the **Find My Project** form on the CRIS Home page after you click **Proceed as Guest**, or by entering the submission token (NFL2AN8Q2IG9) in the Lookup tab on the Search page.

December 31, 2019

Timothy O'Connor
58 Exchange Street
Binghamton, NY 13901

Re: DEC
Forestburgh Pond Residential Development
Town of Forestburgh, Sullivan County, NY
19PR08655

Dear Timothy O'Connor:

Thank you for requesting the comments of the Office of Parks, Recreation and Historic Preservation (OPRHP). We have reviewed the project in accordance with the New York State Historic Preservation Act of 1980 (Section 14.09 of the New York Parks, Recreation and Historic Preservation Law). These comments are those of the OPRHP and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8) and its implementing regulations (6 NYCRR Part 617).

Based upon this review, it is the opinion of OPRHP that no properties, including archaeological and/or historic resources, listed in or eligible for the New York State and National Registers of Historic Places will be impacted by this project.

If further correspondence is required regarding this project, please be sure to refer to the OPRHP Project Review (PR) number noted above.

Sincerely,

Roger Daniel Mackay

R. Daniel Mackay

Deputy Commissioner for Historic Preservation
Division for Historic Preservation

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NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

From

CONSTRUCTION ACTIVITY

Permit No. GP-0-15-002

Issued Pursuant to Article 17, Titles 7, 8 and Article 70
of the Environmental Conservation Law

Effective Date: January 29, 2015 Expiration Date: January 28, 2020

John J. Ferguson
Chief Permit Administrator

1 / 12 / 15

Authorized Signature Date

Address: NYS DEC
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, N.Y. 12233-1750

PREFACE

Pursuant to Section 402 of the Clean Water Act ("CWA"), stormwater *discharges* from certain *construction activities* are unlawful unless they are authorized by a *National Pollutant Discharge Elimination System ("NPDES")* permit or by a state permit program. New York's *State Pollutant Discharge Elimination System ("SPDES")* is a NPDES-approved program with permits issued in accordance with the *Environmental Conservation Law ("ECL").*

This general permit ("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 permit by submitting a Notice of Intent ("NOI") to the Department. Copies of this permit and the NOI for New York are available by calling (518) 402-8109 or at any New York State Department of Environmental Conservation ("the Department") regional office (see Appendix G).They are also available on the Department's website at:
http://www.dec.ny.gov/

An *owner or operator* of a *construction activity* that is eligible for coverage under this permit must obtain coverage prior to the *commencement of construction activity*. Activities that fit the definition of "*construction activity*", as defined under 40 CFR 122.26(b)(14)(x), (15)(i), and (15)(ii), constitute construction of a point source and therefore, pursuant to Article 17-0505 of the ECL, the *owner or operator* must have coverage under a SPDES permit prior to *commencing construction activity*. They cannot wait until there is an actual *discharge* from the construction site to obtain permit coverage.

***Note: The italicized words/phrases within this permit are defined in Appendix A.**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES
FROM CONSTRUCTION ACTIVITIES

Part I. PERMIT COVERAGE AND LIMITATIONS

A. Permit Application

This permit authorizes stormwater *discharges* to *surface waters of the State* from the following *construction activities* identified within 40 CFR Parts 122.26(b)(14)(x), 122.26(b)(15)(i) and 122.26(b)(15)(ii), provided all of the eligibility provisions of this permit are met:

1. *Construction activities* involving soil disturbances of one (1) or more acres; including disturbances of less than one acre that are part of a *larger common plan of development or sale* that will ultimately disturb one or more acres of land; excluding *routine maintenance activity* that is performed to maintain the original line and grade, hydraulic capacity or original purpose of a facility;

2. *Construction activities* involving soil disturbances of less than one (1) acre where the Department has determined that a *SPDES* permit is required for stormwater *discharges* based on the potential for contribution to a violation of a *water quality standard* or for significant contribution of *pollutants* to *surface waters of the State.*

3. *Construction activities* located in the watershed(s) identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

B. Effluent Limitations Applicable to Discharges from Construction Activities

*Discharge*s authorized by this permit must achieve, at a minimum, the effluent limitations in Part I.B.1. (a) – (f) of this permit. These limitations represent the degree of effluent reduction attainable by the application of best practicable technology currently available.

1. Erosion and Sediment Control Requirements - The *owner or operator* must select, design, install, implement and maintain control measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. The selection, design, installation, implementation, and maintenance of these control measures must meet the non-numeric effluent limitations in Part I.B.1.(a) – (f) of this permit and be in accordance with the New York State Standards and Specifications for Erosion and Sediment Control, dated August 2005, using sound engineering judgment. Where control measures are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must include in the Stormwater Pollution Prevention Plan ("SWPPP") the reason(s) for the deviation or alternative design and provide information

which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

a. **Erosion and Sediment Controls.** Design, install and maintain effective erosion and sediment controls to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such controls must be designed, installed and maintained to:

(i) *Minimize* soil erosion through application of runoff control and soil stabilization control measure to *minimize pollutant discharge*s;

(ii) Control stormwater *discharge*s to *minimize* channel and streambank erosion and scour in the immediate vicinity of the *discharge* points;

(iii) *Minimize* the amount of soil exposed during *construction activity*;

(iv) *Minimize* the disturbance of *steep slopes*;

(v) *Minimize* sediment *discharge*s from the site;

(vi) Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas and maximize stormwater infiltration to reduce *pollutant discharge*s, unless *infeasible*;

(vii) *Minimize* soil compaction. Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted; and

(viii) Unless *infeasible*, preserve a sufficient amount of topsoil to complete soil restoration and establish a uniform, dense vegetative cover.

b. **Soil Stabilization**. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within fourteen (14) days from the date the current soil disturbance activity ceased. For construction sites that *directly discharge* to one of the 303(d) segments listed in Appendix E or is located in one of the watersheds listed in Appendix C, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. See Appendix A for definition of *Temporarily Ceased*.

c. **Dewatering**. *Discharge*s from dewatering activities, including *discharge*s from dewatering of trenches and excavations, must be managed by appropriate control measures.

d. **Pollution Prevention Measures**. Design, install, implement, and maintain effective pollution prevention measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such measures must be designed, installed, implemented and maintained to:

(i) *Minimize* the *discharge* of *pollutants* from equipment and vehicle washing, wheel wash water, and other wash waters. This applies to washing operations that use clean water only. Soaps, detergents and solvents cannot be used;

(ii) *Minimize* the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a *discharge* of *pollutants*, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use) ; and

(iii) Prevent the *discharge* of *pollutants* from spills and leaks and implement chemical spill and leak prevention and response procedures.

e. **Prohibited *Discharges*.** The following *discharge*s are prohibited:

(i) Wastewater from washout of concrete;

(ii) Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

(iii) Fuels, oils, or other *pollutants* used in vehicle and equipment operation and maintenance;

(iv) Soaps or solvents used in vehicle and equipment washing; and

(v) Toxic or hazardous substances from a spill or other release.

f. Surface Outlets. When discharging from basins and impoundments, the outlets shall be designed, constructed and maintained in such a manner that sediment does not leave the basin or impoundment and that erosion at or below the outlet does not occur.

C. Post-construction Stormwater Management Practice Requirements

1. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must select, design, install, and maintain the practices to meet the *performance criteria* in the New York State Stormwater Management Design Manual ("Design Manual"), dated January 2015, using sound engineering judgment. Where post-construction stormwater management practices ("SMPs") are not designed in conformance with the *performance criteria* in the Design Manual, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must design the practices to meet the applicable *sizing criteria* in Part I.C.2.a., b., c. or d. of this permit.

   a. ***Sizing Criteria* for *New Development***

      (i) Runoff Reduction Volume ("RRv"): Reduce the total Water Quality Volume ("WQv") by application of RR techniques and standard SMPs with RRv capacity. The total WQv shall be calculated in accordance with the criteria in Section 4.2 of the Design Manual.

      (ii) Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the criteria in Part I.C.2.a.(i) of this permit due to *site limitations* shall direct runoff from all newly constructed *impervious areas* to a RR technique or standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv shall be documented in the SWPPP. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible.*

      In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 4.3 of the Design Manual. The remaining portion of the total WQv that cannot be reduced shall be treated by application of standard SMPs.

(iii) Channel Protection Volume (“Cpv”): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:

(1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or

(2) The site *discharge*s directly to tidal waters, or fifth order or larger streams.

(iv) Overbank Flood Control Criteria (“Qp”): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:

(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that overbank control is not required.

(v) Extreme Flood Control Criteria (“Qf”): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:

(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that overbank control is not required.

b. ***Sizing Criteria* for *New Development* in Enhanced Phosphorus Removal Watershed**

(i) Runoff Reduction Volume (RRv): Reduce the total Water Quality Volume (WQv) by application of RR techniques and standard SMPs with RRv capacity. The total WQv is the runoff volume from the 1-year, 24 hour design storm over the post-developed watershed and shall be calculated in accordance with the criteria in Section 10.3 of the Design Manual.

(ii) Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the criteria in Part I.C.2.b.(i) of this permit due to *site limitations* shall direct runoff from all newly constructed *impervious areas* to a RR technique or standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv shall be documented in the SWPPP. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible.*

In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 10.3 of the Design Manual. The remaining portion of the total WQv that cannot be reduced shall be treated by application of standard SMPs.

(iii) Channel Protection Volume (Cpv): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:

(1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or

(2) The site *discharge*s directly to tidal waters, or fifth order or larger streams.

(iv) Overbank Flood Control Criteria (Qp): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:

(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that overbank control is not required.

(v) Extreme Flood Control Criteria (Qf): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:

(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that overbank control is not required.

c. ***Sizing Criteria* for *Redevelopment Activity***

(i) Water Quality Volume (WQv): The WQv treatment objective for *redevelopment activity* shall be addressed by one of the following options. *Redevelopment activities* located in an Enhanced Phosphorus Removal Watershed (see Part III.B.3. and Appendix C of this permit) shall calculate the WQv in accordance with Section 10.3 of the Design Manual. All other *redevelopment activities* shall calculate the WQv in accordance with Section 4.2 of the Design Manual.

(1) Reduce the existing *impervious cover* by a minimum of 25% of the total disturbed, *impervious area*. The Soil Restoration criteria in Section 5.1.6 of the Design Manual must be applied to all newly created pervious areas, or
(2) Capture and treat a minimum of 25% of the WQv from the disturbed, *impervious area* by the application of standard SMPs; or reduce 25% of the WQv from the disturbed, *impervious area* by the application of RR techniques or standard SMPs with RRv capacity., or
(3) Capture and treat a minimum of 75% of the WQv from the disturbed, *impervious area* as well as any additional runoff from tributary areas by application of the alternative practices discussed in Sections 9.3 and 9.4 of the Design Manual., or
(4) Application of a combination of 1, 2 and 3 above that provide a weighted average of at least two of the above methods. Application of this method shall be in accordance with the criteria in Section 9.2.1(B) (IV) of the Design Manual.

If there is an existing post-construction stormwater management practice located on the site that captures and treats runoff from the *impervious area* that is being disturbed, the WQv treatment option selected must, at a minimum, provide treatment equal to the treatment that was being provided by the existing practice(s) if that treatment is greater than the treatment required by options 1 – 4 above.

(ii) Channel Protection Volume (Cpv): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

(iii) Overbank Flood Control Criteria (Qp): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

(iv) Extreme Flood Control Criteria (Qf): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

d. ***Sizing Criteria* for Combination of *Redevelopment Activity* and *New Development***

Construction projects that include both *New Development* and *Redevelopment Activity* shall provide post-construction stormwater management controls that meet the *sizing criteria* calculated as an aggregate of the *Sizing Criteria* in Part I.C.2.a. or b. of this permit for the *New Development* portion of the project and Part I.C.2.c of this permit for *Redevelopment Activity* portion of the project.

D. Maintaining Water Quality

The Department expects that compliance with the conditions of this permit will control *discharge*s necessary to meet applicable *water quality standards*. It shall be a violation of the *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 or settleable 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, nor visible oil film, nor globules of grease.

If there is evidence indicating that the stormwater *discharge*s authorized by this permit are causing, have the reasonable potential to cause, or are contributing to a violation of the *water quality standards*; the *owner or operator* must take appropriate corrective action in accordance with Part IV.C.5. of this general permit and document in accordance with Part IV.C.4. of this general permit. To address the *water quality standard* violation the *owner or operator* may need to provide additional information, include and implement appropriate controls in the SWPPP to correct the problem, or obtain an individual SPDES permit.

If there is evidence indicating that despite compliance with the terms and conditions of this general permit it is demonstrated that the stormwater *discharge*s authorized by this permit are causing or contributing to a violation of *water quality standards*, or if the Department determines that a modification of the permit is necessary to prevent a violation of *water quality standards*, the authorized *discharge*s will no longer be eligible for coverage under this permit. The Department may require the *owner or operator* to obtain an individual SPDES permit to continue discharging.

E. Eligibility Under This General Permit

1. This permit may authorize all *discharges* of stormwater from *construction activity* to *surface waters of the State* and *groundwaters* except for ineligible *discharges* identified under subparagraph F. of this Part.

2. Except for non-stormwater *discharges* explicitly listed in the next paragraph, this permit only authorizes stormwater *discharge*s from *construction activities*.

3. Notwithstanding paragraphs E.1 and E.2 above, the following non-stormwater *discharges* may be authorized by this permit: *discharge*s from firefighting activities; fire hydrant flushings; waters to which cleansers or other components have not been added that are used to wash vehicles or control dust in accordance with the SWPPP, routine external building washdown which does not use detergents; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; uncontaminated *groundwater* or spring water; uncontaminated *discharge*s from construction site de-watering operations; and foundation or footing drains where flows are not contaminated with process materials such as solvents. For those entities required to obtain coverage under this permit, and who *discharge* as noted in this paragraph, and with the exception of flows from firefighting activities, these *discharge*s must be identified in the SWPPP. Under all circumstances, the *owner or operator* must still comply with *water quality standards* in Part I.D of this permit.

4. The *owner or operator* must maintain permit eligibility to *discharge* under this permit. Any *discharges* that are not compliant with the eligibility conditions of this permit are not authorized by the permit and the *owner or operator* must either apply for a separate permit to cover those ineligible *discharges* or take steps necessary to make the *discharge* eligible for coverage.

F. Activities Which Are Ineligible for Coverage Under This General Permit

All of the following are **<u>not</u>** authorized by this permit:

1. *Discharge*s after *construction activities* have been completed and the site has undergone *final stabilization*;

2. *Discharge*s that are mixed with sources of non-stormwater other than those expressly authorized under subsection E.3. of this Part and identified in the SWPPP required by this permit;

3. *Discharges* that are required to obtain an individual SPDES permit or another SPDES general permit pursuant to Part VII.K. of this permit;

4. *Construction activities* or *discharges* from *construction activities* that may adversely affect an endangered or threatened species unless the *owner or operator* has obtained a permit issued pursuant to 6 NYCRR Part 182 for the project or the Department has issued a letter of non-jurisdiction for the project. All documentation necessary to demonstrate eligibility shall be maintained on site in accordance with Part II.C.2 of this permit.

5. *Discharges* which either cause or contribute to a violation of *water quality standards* adopted pursuant to the *ECL* and its accompanying regulations;

6. *Construction activities* for residential, commercial and institutional projects:

   a. Where the *discharge*s from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and

   b. Which disturb one or more acres of land with no existing *impervious cover*; and

   c. Which are undertaken on land with a Soil Slope Phase that is identified as an E or F, or the map unit name is inclusive of 25% or greater slope, on the United States Department of Agriculture (“USDA”) Soil Survey for the County where the disturbance will occur.

7. *Construction activities* for linear transportation projects and linear utility projects:

   a. Where the *discharge*s from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and

   b. Which disturb two or more acres of land with no existing *impervious cover*; and

   c. Which are undertaken on land with a Soil Slope Phase that is identified as an E or F, or the map unit name is inclusive of 25% or greater slope, on the USDA Soil Survey for the County where the disturbance will occur.

8. *Construction activities* that have the potential to affect an *historic property*, unless there is documentation that such impacts have been resolved. The following documentation necessary to demonstrate eligibility with this requirement shall be maintained on site in accordance with Part II.C.2 of this permit and made available to the Department in accordance with Part VII.F of this permit:

   a. Documentation that the *construction activity* is not within an archeologically sensitive area indicated on the sensitivity map, and that the *construction activity* is not located on or immediately adjacent to a property listed or determined to be eligible for listing on the National or State Registers of Historic Places, and that there is no new permanent building on the construction site within the following distances from a building, structure, or object that is more than 50 years old, or if there is such a new permanent building on the construction site within those parameters that NYS Office of Parks, Recreation and Historic Preservation (OPRHP), a Historic Preservation Commission of a Certified Local Government, or a qualified preservation professional has determined that the building, structure, or object more than 50 years old is not historically/archeologically significant.

      - 1-5 acres of disturbance - 20 feet
      - 5-20 acres of disturbance - 50 feet
      - 20+ acres of disturbance - 100 feet, or

   b. DEC consultation form sent to OPRHP, and copied to the NYS DEC Agency Historic Preservation Officer (APO), and
      (i) the State Environmental Quality Review (SEQR) Environmental Assessment Form (EAF) with a negative declaration or the Findings Statement, with documentation of OPRHP's agreement with the resolution; or
      (ii) documentation from OPRHP that the *construction activity* will result in No Impact; or
      (iii) documentation from OPRHP providing a determination of No Adverse Impact; or
      (iv) a Letter of Resolution signed by the owner/operator, OPRHP and the DEC APO which allows for this *construction activity* to be eligible for coverage under the general permit in terms of the State Historic Preservation Act (SHPA); or

   c. Documentation of satisfactory compliance with Section 106 of the National Historic Preservation Act for a coterminous project area:
      (i) No Affect
      (ii) No Adverse Affect

(Part I.F.8.c.iii)

(iii) Executed Memorandum of Agreement, or

d. Documentation that:

(i) SHPA Section 14.09 has been completed by NYS DEC or another state agency.

9. *Discharges* from *construction activities* that are subject to an existing SPDES individual or general permit where a SPDES permit for *construction activity* has been terminated or denied; or where the *owner or operator* has failed to renew an expired individual permit.

II. Part II. OBTAINING PERMIT COVERAGE

A. Notice of Intent (NOI) Submittal

1. An *owner or operator* of a *construction activity* that is not subject to the requirements of a *regulated, traditional land use control MS4* must first prepare a SWPPP in accordance with all applicable requirements of this permit and then submit a completed NOI form to the Department in order to be authorized to *discharge* under this permit. An *owner or operator* shall use either the electronic (eNOI) or paper version of the NOI that the Department prepared. Both versions of the NOI are located on the Department's website (http://www.dec.ny.gov/). The paper version of the NOI shall be signed in accordance with Part VII.H. of this permit and submitted to the following address.

NOTICE OF INTENT
NYS DEC, Bureau of Water Permits
625 Broadway, 4th Floor
Albany, New York 12233-3505

2. An *owner or operator* of a *construction activity* that is subject to the requirements of a *regulated, traditional land use control MS4* must first prepare a SWPPP in accordance with all applicable requirements of this permit and then have its SWPPP reviewed and accepted by the *regulated, traditional land use control MS4* prior to submitting the NOI to the Department. The *owner or operator* shall have the "MS4 SWPPP Acceptance" form signed in accordance with Part VII.H., and then submit that form along with a completed NOI to the Department. An *owner or operator* shall use either the electronic (eNOI) or paper version of the NOI.

   The paper version of the NOI shall be signed in accordance with Part VII.H. of this permit and submitted to the address in Part II.A.1.

The requirement for an *owner or operator* to have its SWPPP reviewed and accepted by the *MS4* prior to submitting the NOI to the Department does not apply to an *owner or operator* that is obtaining permit coverage in accordance with the requirements in Part II.E. (Change of *Owner or Operator*) or where the *owner or operator* of the *construction activity* is the *regulated, traditional land use control MS4*.

3. The *owner or operator* shall have the SWPPP preparer sign the "SWPPP Preparer Certification" statement on the NOI prior to submitting the form to the Department.

4. As of the date the NOI is submitted to the Department, the *owner or operator* shall make the NOI and SWPPP available for review and copying in accordance with the requirements in Part VII.F. of this permit.

B. Permit Authorization

1. An *owner or operator* shall not *commence construction activity* until their authorization to *discharge* under this permit goes into effect.

2. Authorization to *discharge* under this permit will be effective when the *owner or operator* has satisfied all of the following criteria:

   a. project review pursuant to the State Environmental Quality Review Act ("SEQRA") have been satisfied, when SEQRA is applicable. See the Department's website (http://www.dec.ny.gov/) for more information,

   b. where required, all necessary Department permits subject to the *Uniform Procedures Act ("UPA")* (see 6 NYCRR Part 621) have been obtained, unless otherwise notified by the Department pursuant to 6 NYCRR 621.3(a)(4). *Owners or operators* of *construction activities* that are required to obtain *UPA* permits must submit a preliminary SWPPP to the appropriate DEC Permit Administrator at the Regional Office listed in Appendix F at the time all other necessary *UPA* permit applications are submitted. The preliminary SWPPP must include sufficient information to demonstrate that the *construction activity* qualifies for authorization under this permit,

   c. the final SWPPP has been prepared, and

   d. a complete NOI has been submitted to the Department in accordance with the requirements of this permit.

3. An *owner or operator* that has satisfied the requirements of Part II.B.2 above

will be authorized to *discharge* stormwater from their *construction activity* in accordance with the following schedule:

a. For *construction activities* that are not subject to the requirements of a *regulated, traditional land use control MS4*:

(i) Five (5) business days from the date the Department receives a complete electronic version of the NOI (eNOI) for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.; or

(ii) Sixty (60) business days from the date the Department receives a complete NOI (electronic or paper version) for *construction activities* with a SWPPP that has not been prepared in conformance with the design criteria in technical standard referenced in Part III.B.1. or, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C., the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, or;

(iii) Ten (10) business days from the date the Department receives a complete paper version of the NOI for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.

b. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*:

(i) Five (5) business days from the date the Department receives both a complete electronic version of the NOI (eNOI) and signed "*MS4* SWPPP Acceptance" form, or

(ii) Ten (10) business days from the date the Department receives both a complete paper version of the NOI and signed "MS4 SWPPP Acceptance" form.

4. The Department may suspend or deny an *owner's or operator's* coverage

under this permit if the Department determines that the SWPPP does not meet the permit requirements. In accordance with statute, regulation, and the terms and conditions of this permit, the Department may deny coverage under this permit and require submittal of an application for an individual SPDES permit based on a review of the NOI or other information pursuant to Part II.

5. Coverage under this permit authorizes stormwater *discharges* from only those areas of disturbance that are identified in the NOI. If an *owner or operator* wishes to have stormwater *discharges* from future or additional areas of disturbance authorized, they must submit a new NOI that addresses that phase of the development, unless otherwise notified by the Department. The *owner or operator* shall not *commence construction activity* on the future or additional areas until their authorization to *discharge* under this permit goes into effect in accordance with Part II.B. of this permit.

C. General Requirements For Owners or Operators With Permit Coverage

1. The *owner or operator* shall ensure that the provisions of the SWPPP are implemented from the *commencement of construction activity* until all areas of disturbance have achieved *final stabilization* and the Notice of Termination ("NOT") has been submitted to the Department in accordance with Part V. of this permit. This includes any changes made to the SWPPP pursuant to Part III.A.4. of this permit.

2. The *owner or operator* shall maintain a copy of the General Permit (GP-0-15-002), NOI, *NOI Acknowledgment Letter*, SWPPP, MS4 SWPPP Acceptance form, inspection reports, and all documentation necessary to demonstrate eligibility with this permit at the construction site until all disturbed areas have achieved *final stabilization* and the NOT has been submitted to the Department. The documents must be maintained in a secure location, such as a job trailer, on-site construction office, or mailbox with lock. The secure location must be accessible during normal business hours to an individual performing a compliance inspection.

3. The *owner or operator* of a *construction activity* shall not disturb greater than five (5) acres of soil at any one time without prior written authorization from the Department or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*). At a minimum, the *owner or operator* must comply with the following requirements in order to be authorized to disturb greater than five (5) acres of soil at any one time:

a. The *owner or operator* shall

have a *qualified inspector* conduct **at least** two (2) site inspections in accordance with Part IV.C. of this permit every seven (7) calendar days, for as long as greater than five (5) acres of soil remain disturbed. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

b. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated August 2005.

c. The *owner or operator* shall prepare a phasing plan that defines maximum disturbed area per phase and shows required cuts and fills.

d. The *owner or operator* shall install any additional site specific practices needed to protect water quality.

e. The *owner or operator* shall include the requirements above in their SWPPP.

4. In accordance with statute, regulations, and the terms and conditions of this permit, the Department may suspend or revoke an *owner's or operator's* coverage under this permit at any time if the Department determines that the SWPPP does not meet the permit requirements. Upon a finding of significant non-compliance with the practices described in the SWPPP or violation of this permit, the Department may order an immediate stop to all activity at the site until the non-compliance is remedied. The stop work order shall be in writing, describe the non-compliance in detail, and be sent to the *owner or operator*.

5. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*, the *owner or operator* shall notify the *regulated, traditional land use control MS4* in writing of any planned amendments or modifications to the post-construction stormwater management practice component of the SWPPP required by Part III.A. 4. and 5. of this permit. Unless otherwise notified by the *regulated, traditional land use control MS4*, the *owner or operator* shall have the SWPPP amendments or modifications reviewed and accepted by the *regulated, traditional land use control MS4* prior to commencing construction of the post-construction stormwater management practice

D. Permit Coverage for Discharges Authorized Under GP-0-10-001

1. Upon renewal of SPDES General Permit for Stormwater Discharges from *Construction Activity* (Permit No. GP-0-10-001), an *owner or operator* of *a construction activity* with coverage under GP-0-10-001, as of the effective date of GP-0-15-002, shall be authorized to *discharge* in accordance with GP-0-15-002, unless otherwise notified by the Department.

   An *owner or operator* may continue to implement the technical/design components of the post-construction stormwater management controls provided that such design was done in conformance with the technical standards in place at the time of initial project authorization. However, they must comply with the other, non-design provisions of GP-0-15-002.

E. Change of *Owner or Operator*

2. When property ownership changes or when there is a change in operational control over the construction plans and specifications, the original *owner or operator* must notify the new *owner or operator*, <u>in writing,</u> of the requirement to obtain permit coverage by submitting a NOI with the Department. Once the new *owner or operator* obtains permit coverage, the original *owner or operator* shall then submit a completed NOT with the name and permit identification number of the new *owner or operator* to the Department at the address in Part II.A.1. of this permit. If the original *owner or operator* maintains ownership of a portion of the *construction activity* and will disturb soil, they must maintain their coverage under the permit.

Permit coverage for the new *owner or operator* will be effective as of the date the Department receives a complete NOI, provided the original *owner or operator* was not subject to a sixty (60) business day authorization period that has not expired as of the date the Department receives the NOI from the new *owner or operator*.

III. Part III. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A. General SWPPP Requirements

1. A SWPPP shall be prepared and implemented by the *owner or operator* of each *construction activity* covered by this permit. The SWPPP must document the selection, design, installation, implementation and maintenance of the control measures and practices that will be used to meet the effluent limitations in Part I.B. of this permit and where applicable, the post-construction stormwater management practice requirements in Part I.C. of this permit. The SWPPP shall be prepared prior to the submittal of the NOI. The NOI shall be submitted to the Department prior to the *commencement of construction activity*. A copy of the completed, final NOI shall be included in the SWPPP.

2. The SWPPP shall describe the erosion and sediment control practices and where required, post-construction stormwater management practices that will be used and/or constructed to reduce the *pollutants* in stormwater *discharges* and to assure compliance with the terms and conditions of this permit. In addition, the SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater *discharges*.

3. All SWPPPs that require the post-construction stormwater management practice component shall be prepared by a *qualified professional* that is knowledgeable in the principles and practices of stormwater management and treatment.

4. The *owner or operator* must keep the SWPPP current so that it at all times accurately documents the erosion and sediment controls practices that are being used or will be used during construction, and all post-construction stormwater management practices that will be constructed on the site. At a minimum, the *owner or operator* shall amend the SWPPP:

   a. whenever the current provisions prove to be ineffective in minimizing *pollutants* in stormwater *discharges* from the site;

   b. whenever there is a change in design, construction, or operation at the construction site that has or could have an effect on the *discharge* of *pollutants*; and

   c. to address issues or deficiencies identified during an inspection by the *qualified inspector,* the Department or other regulatory authority.

5. The Department may notify the *owner or operator* at any time that the

SWPPP does not meet one or more of the minimum requirements of this permit. The notification shall be in writing and identify the provisions of the SWPPP that require modification. Within fourteen (14) calendar days of such notification, or as otherwise indicated by the Department, the *owner or operator* shall make the required changes to the SWPPP and submit written notification to the Department that the changes have been made. If the *owner or operator* does not respond to the Department's comments in the specified time frame, the Department may suspend the *owner's or operator's* coverage under this permit or require the *owner or operator* to obtain coverage under an individual SPDES permit in accordance with Part II.C.4. of this permit.

6. Prior to the *commencement of construction activity*, the *owner or operator* must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, replacing, inspecting and maintaining the erosion and sediment control practices included in the SWPPP; and the contractor(s) and subcontractor(s) that will be responsible for constructing the post-construction stormwater management practices included in the SWPPP. The *owner or operator* shall have each of the contractors and subcontractors identify at least one person from their company that will be responsible for implementation of the SWPPP. This person shall be known as the *trained contractor.* The *owner or operator* shall ensure that at least one *trained contractor* is on site on a daily basis when soil disturbance activities are being performed.

   The *owner or operator* shall have each of the contractors and subcontractors identified above sign a copy of the following certification statement below before they commence any *construction activity*:

   > "I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that the *owner or operator* must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater *discharge*s from *construction activities* and that it is unlawful for any person to cause or contribute to a violation of *water quality standards*. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations"

   In addition to providing the certification statement above, the certification page must also identify the specific elements of the SWPPP that each contractor and subcontractor will be responsible for and include the name and title of the person providing the signature; the name and title of the *trained contractor* responsible for SWPPP implementation; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification statement is signed. The *owner or operator* shall attach the certification statement(s) to the copy of the SWPPP that is maintained at the construction site. If new or additional contractors are hired to implement measures identified in the SWPPP after construction has commenced, they must also sign the certification statement and provide the information listed above.

7. For projects where the Department requests a copy of the SWPPP or inspection reports, the *owner or operator* shall submit the documents in both electronic (PDF only) and paper format within five (5) business days, unless otherwise notified by the Department.

B. Required SWPPP Contents

1. Erosion and sediment control component - All SWPPPs prepared pursuant to this permit shall include erosion and sediment control practices designed in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated August 2005. Where erosion and sediment control practices are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must demonstrate *equivalence* to the technical standard. At a minimum, the erosion and sediment control component of the SWPPP shall include the following:

   a. Background information about the scope of the project, including the location, type and size of project;

   b. A site map/construction drawing(s) for the project, including a general location map. At a minimum, the site map shall show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s); floodplain/floodway boundaries; wetlands and drainage patterns that could be affected by the *construction activity*; existing and final contours ; locations of different soil types with boundaries; material, waste, borrow or equipment storage areas located on adjacent properties; and location(s) of the stormwater *discharge*(s);

   c. A description of the soil(s) present at the site, including an identification of the Hydrologic Soil Group (HSG);

   d. A construction phasing plan and sequence of operations describing the intended order of *construction activities*, including clearing and grubbing, excavation and grading, utility and infrastructure installation and any other activity at the site that results in soil disturbance;

e. A description of the minimum erosion and sediment control practices to be installed or implemented for each *construction activity* that will result in soil disturbance. Include a schedule that identifies the timing of initial placement or implementation of each erosion and sediment control practice and the minimum time frames that each practice should remain in place or be implemented;

f. A temporary and permanent soil stabilization plan that meets the requirements of this general permit and the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated August 2005, for each stage of the project, including initial land clearing and grubbing to project completion and achievement of *final stabilization*;

g. A site map/construction drawing(s) showing the specific location(s), size(s), and length(s) of each erosion and sediment control practice;

h. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices. Include the location and sizing of any temporary sediment basins and structural practices that will be used to divert flows from exposed soils;

i. A maintenance inspection schedule for the contractor(s) identified in Part III.A.6. of this permit, to ensure continuous and effective operation of the erosion and sediment control practices. The maintenance inspection schedule shall be in accordance with the requirements in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated August 2005;

j. A description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a *pollutant* source in the stormwater *discharges*;

k. A description and location of any stormwater *discharges* associated with industrial activity other than construction at the site, including, but not limited to, stormwater *discharges* from asphalt plants and concrete plants located on the construction site; and

l. Identification of any elements of the design that are not in conformance with the design criteria in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated August 2005. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. Post-construction stormwater management practice component – The *owner or operator* of any construction project identified in Table 2 of Appendix B as needing post-construction stormwater management practices shall prepare a SWPPP that includes practices designed in conformance with the applicable *sizing criteria* in Part I.C.2.a., c. or d. of this permit and the *performance criteria* in the technical standard, New York State Stormwater Management Design Manual dated January 2015

   Where post-construction stormwater management practices are not designed in conformance with the *performance criteria* in the technical standard, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

   The post-construction stormwater management practice component of the SWPPP shall include the following:

   a. Identification of all post-construction stormwater management practices to be constructed as part of the project. Include the dimensions, material specifications and installation details for each post-construction stormwater management practice;

   b. A site map/construction drawing(s) showing the specific location and size of each post-construction stormwater management practice;

   c. A Stormwater Modeling and Analysis Report that includes:

      (i) Map(s) showing pre-development conditions, including watershed/subcatchments boundaries, flow paths/routing, and design points;

      (ii) Map(s) showing post-development conditions, including watershed/subcatchments boundaries, flow paths/routing, design points and post-construction stormwater management practices;

      (iii) Results of stormwater modeling (i.e. hydrology and hydraulic analysis) for the required storm events. Include supporting calculations (model runs), methodology, and a summary table that compares pre and post-development runoff rates and volumes for the different storm events;

      (iv) Summary table, with supporting calculations, which demonstrates that each post-construction stormwater management practice has been designed in conformance with the *sizing criteria* included in the Design Manual;

(v) Identification of any *sizing criteria* that is not required based on the requirements included in Part I.C. of this permit; and

(vi) Identification of any elements of the design that are not in conformance with the *performance criteria* in the Design Manual. Include the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the Design Manual;

d. Soil testing results and locations (test pits, borings);

e. Infiltration test results, when required; and

f. An operations and maintenance plan that includes inspection and maintenance schedules and actions to ensure continuous and effective operation of each post-construction stormwater management practice. The plan shall identify the entity that will be responsible for the long term operation and maintenance of each practice.

3. Enhanced Phosphorus Removal Standards - All construction projects identified in Table 2 of Appendix B that are located in the watersheds identified in Appendix C shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the applicable *sizing criteria* in Part I.C.2. b., c. or d. of this permit and the *performance criteria,* Enhanced Phosphorus Removal Standards included in the Design Manual. At a minimum, the post-construction stormwater management practice component of the SWPPP shall include items 2.a - 2.f. above.

C. Required SWPPP Components by Project Type

Unless otherwise notified by the Department, *owners or operators* of *construction activities* identified in Table 1 of Appendix B are required to prepare a SWPPP that only includes erosion and sediment control practices designed in conformance with Part III.B.1 of this permit. *Owners or operators* of the *construction activities* identified in Table 2 of Appendix B shall prepare a SWPPP that also includes post-construction stormwater management practices designed in conformance with Part III.B.2 or 3 of this permit.

IV. Part IV. INSPECTION AND MAINTENANCE REQUIREMENTS

A. General Construction Site Inspection and Maintenance Requirements

1. The *owner or operator* must ensure that all erosion and sediment control practices (including pollution prevention measures) and all post-construction stormwater management practices identified in the SWPPP are inspected and maintained in accordance with Part IV.B. and C. of this permit.

2. The terms of this permit shall not be construed to prohibit the State of New York from exercising any authority pursuant to the ECL, common law or federal law, or prohibit New York State from taking any measures, whether civil or criminal, to prevent violations of the laws of the State of New York, or protect the public health and safety and/or the environment.

B. Contractor Maintenance Inspection Requirements

1. The *owner or operator* of each *construction activity* identified in Tables 1 and 2 of Appendix B shall have a *trained contractor* inspect the erosion and sediment control practices and pollution prevention measures being implemented within the active work area daily to ensure that they are being maintained in effective operating condition at all times. If deficiencies are identified, the contractor shall begin implementing corrective actions within one business day and shall complete the corrective actions in a reasonable time frame.

2. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *trained contractor* can stop conducting the maintenance inspections. The *trained contractor* shall begin conducting the maintenance inspections in accordance with Part IV.B.1. of this permit as soon as soil disturbance activities resume.

3. For construction sites where soil disturbance activities have been shut down with partial project completion, the *trained contractor* can stop conducting the maintenance inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* <u>and</u> all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational.

C. Qualified Inspector Inspection Requirements

The *owner or operator* shall have a *qualified inspector* conduct site inspections in conformance with the following requirements:

[Note: The *trained contractor* identified in Part III.A.6. and IV.B. of this permit **cannot** conduct the *qualified inspector* site inspections unless they meet the *qualified inspector* qualifications included in Appendix A. In order to perform these inspections, the *trained contractor* would have to be a:

- licensed Professional Engineer,
- Certified Professional in Erosion and Sediment Control (CPESC),
- Registered Landscape Architect, or
- someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity].

1. A *qualified inspector* shall conduct site inspections for all *construction activities* identified in Tables 1 and 2 of Appendix B, <u>with the exception of</u>:

   a. the construction of a single family residential subdivision with 25% or less *impervious cover* at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> directly discharging to one of the 303(d) segments listed in Appendix E;

   b. the construction of a single family home that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> directly discharging to one of the 303(d) segments listed in Appendix E;

   c. construction on agricultural property that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres; and

   d. *construction activities* located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

2. Unless otherwise notified by the Department, the *qualified inspector* shall conduct site inspections in accordance with the following timetable:

   a. For construction sites where soil disturbance activities are on-going, the *qualified inspector* shall conduct a site inspection at least once every seven (7) calendar days.

   b. For construction sites where soil disturbance activities are on-going and the *owner or operator* has received authorization in accordance with Part II.C.3 to disturb greater than five (5) acres of soil at any one time, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

c. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *qualified inspector* shall conduct a site inspection at least once every thirty (30) calendar days. The *owner or operator* shall notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*) in writing prior to reducing the frequency of inspections.

d. For construction sites where soil disturbance activities have been shut down with partial project completion, the *qualified inspector* can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The *owner or operator* shall notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*) in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the *owner or operator* shall have the *qualified inspector* perform a final inspection and certify that all disturbed areas have achieved *final stabilization,* and all temporary, structural erosion and sediment control measures have been removed; and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the "*Final Stabilization*" and "Post-Construction Stormwater Management Practice" certification statements on the NOT. The *owner or operator* shall then submit the completed NOT form to the address in Part II.A.1 of this permit.

e. For construction sites that directly *discharge* to one of the 303(d) segments listed in Appendix E or is located in one of the watersheds listed in Appendix C, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

3. At a minimum, the *qualified inspector* shall inspect all erosion and sediment control practices and pollution prevention measures to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved *final stabilization,* all points of *discharge* to natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site, and all points of *discharge* from the construction site.

4. The *qualified inspector* shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:

   a. Date and time of inspection;

   b. Name and title of person(s) performing inspection;

   c. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;

   d. A description of the condition of the runoff at all points of *discharge* from the construction site. This shall include identification of any *discharges* of sediment from the construction site. Include *discharges* from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;

   e. A description of the condition of all natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site which receive runoff from disturbed areas. This shall include identification of any *discharges* of sediment to the surface waterbody;

   f. Identification of all erosion and sediment control practices and pollution prevention measures that need repair or maintenance;

   g. Identification of all erosion and sediment control practices and pollution prevention measures that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;

   h. Description and sketch of areas with active soil disturbance activity, areas that have been disturbed but are inactive at the time of the inspection, and areas that have been stabilized (temporary and/or final) since the last inspection;

i. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;

j. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices and pollution prevention measures; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s);

k. Identification and status of all corrective actions that were required by previous inspection; and

l. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The *qualified inspector* shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

5. Within one business day of the completion of an inspection, the *qualified inspector* shall notify the *owner or operator* and appropriate contractor or subcontractor identified in Part III.A.6. of this permit of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

6. All inspection reports shall be signed by the *qualified inspector.* Pursuant to Part II.C.2. of this permit, the inspection reports shall be maintained on site with the SWPPP.

V. Part V. TERMINATION OF PERMIT COVERAGE

A. Termination of Permit Coverage

1. An *owner or operator* that is eligible to terminate coverage under this permit must submit a completed NOT form to the address in Part II.A.1 of this permit. The NOT form shall be one which is associated with this permit, signed in accordance with Part VII.H of this permit.

2. An *owner or operator* may terminate coverage when one or more the following conditions have been met:

   a. Total project completion - All *construction activity* identified in the SWPPP has been completed; <u>and</u> all areas of disturbance have achieved *final stabilization*; <u>and</u> all temporary, structural erosion and sediment control measures have been removed; <u>and</u> all post-construction stormwater management practices have been constructed in conformance with the SWPPP and are operational;

   b. Planned shutdown with partial project completion - All soil disturbance activities have ceased; <u>and</u> all areas disturbed as of the project shutdown date have achieved *final stabilization*; <u>and</u> all temporary, structural erosion and sediment control measures have been removed; <u>and</u> all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational;

   c. A new *owner or operator* has obtained coverage under this permit in accordance with Part II.E. of this permit.

   d. The *owner or operator* obtains coverage under an alternative SPDES general permit or an individual SPDES permit.

3. For *construction activities* meeting subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *qualified inspector* perform a final site inspection prior to submitting the NOT. The *qualified inspector* shall, by signing the "*Final Stabilization*" and "Post-Construction Stormwater Management Practice certification statements on the NOT, certify that all the requirements in Part V.A.2.a. or b. of this permit have been achieved.

4. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4* and meet subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *regulated, traditional land use control MS4* sign the "MS4 Acceptance" statement on the NOT in accordance with the requirements in Part VII.H. of this permit. The *regulated, traditional land use control MS4* official, by signing this statement, has determined that it is acceptable for the *owner or operator* to submit the NOT in accordance with the requirements of this Part. The *regulated, traditional land use control MS4* can make this determination by performing a final site inspection themselves or by accepting the *qualified inspector*'s final site inspection certification(s) required in Part V.A.3. of this permit.

5. For *construction activities* that require post-construction stormwater management practices and meet subdivision 2a. of this Part, the *owner or operator* must, prior to submitting the NOT, ensure one of the following:

   a. the post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain such practice(s) have been deeded to the municipality in which the practice(s) is located,

   b. an executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s),

   c. for post-construction stormwater management practices that are privately owned, the *owner or operator* has a mechanism in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the *owner or operator's* deed of record,

   d. for post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university, hospital), government agency or authority, or public utility; the *owner or operator* has policy and procedures in place that ensures operation and maintenance of the practices in accordance with the operation and maintenance plan.

VI. Part VI. REPORTING AND RETENTION OF RECORDS

A. Record Retention

The *owner or operator* shall retain a copy of the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form and any inspection reports that were prepared in conjunction with this permit for a period of at least five (5) years from the date that the Department receives a complete NOT submitted in accordance with Part V. of this general permit.

B. Addresses

With the exception of the NOI, NOT, and MS4 SWPPP Acceptance form (which must be submitted to the address referenced in Part II.A.1 of this permit), all written correspondence requested by the Department, including individual permit applications, shall be sent to the address of the appropriate DOW Water (SPDES) Program contact at the Regional Office listed in Appendix F.

VII. **Part VII. STANDARD PERMIT CONDITIONS**

A. Duty to Comply

The *owner or operator* must comply with all conditions of this permit. All contractors and subcontractors associated with the project must comply with the terms of the SWPPP. Any non-compliance with this permit constitutes a violation of the Clean Water Act (CWA) and the ECL and is grounds for an enforcement action against the *owner or operator* and/or the contractor/subcontractor; permit revocation, suspension or modification; or denial of a permit renewal application. Upon a finding of significant non-compliance with this permit or the applicable SWPPP, the Department may order an immediate stop to all *construction activity* at the site until the non-compliance is remedied. The stop work order shall be in writing, shall describe the non-compliance in detail, and shall be sent to the *owner or operator*.

If any human remains or archaeological remains are encountered during excavation, the *owner or operator* must immediately cease, or cause to cease, all *construction activity* in the area of the remains and notify the appropriate Regional Water Engineer (RWE). *Construction activity* shall not resume until written permission to do so has been received from the RWE.

B. Continuation of the Expired General Permit

This permit expires five (5) years from the effective date. If a new general permit is not issued prior to the expiration of this general permit, an *owner or operator* with coverage under this permit may continue to operate and *discharge* in accordance with the terms and conditions of this general permit, if it is extended pursuant to the State Administrative Procedure Act and 6 NYCRR Part 621, until a new general permit is issued.

C. Enforcement

Failure of the *owner or operator,* its contractors, subcontractors, agents and/or assigns to strictly adhere to any of the permit requirements contained herein shall constitute a violation of this permit. There are substantial criminal, civil, and administrative penalties associated with violating the provisions of this permit. Fines of up to $37,500 per day for each violation and imprisonment for up to fifteen (15) years may be assessed depending upon the nature and degree of the offense.

D. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for an *owner or operator* in an enforcement action that it would have been necessary to halt or reduce the *construction activity* in order to maintain compliance with the conditions of this permit.

E. Duty to Mitigate

The *owner or operator* and its contractors and subcontractors shall take all reasonable steps to *minimize* or prevent any *discharge* in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

F. Duty to Provide Information

The *owner or operator* shall furnish to the Department, within a reasonable specified time period of a written request, all documentation necessary to demonstrate eligibility and any information to determine compliance with this permit or to determine whether cause exists for modifying or revoking this permit, or suspending or denying coverage under this permit, in accordance with the terms and conditions of this permit. The NOI, SWPPP and inspection reports required by this permit are public documents that the *owner or operator* must make available for review and copying by any person within five (5) business days of the *owner or operator* receiving a written request by any such person to review these documents. Copying of documents will be done at the requester's expense.

G. Other Information

When the *owner or operator* becomes aware that they failed to submit any relevant facts, or submitted incorrect information in the NOI or in any of the documents required by this permit , or have made substantive revisions to the SWPPP (e.g. the scope of the project changes significantly, the type of post-construction stormwater management practice(s) changes, there is a reduction in the sizing of the post-construction stormwater management practice, or there is an increase in the disturbance area or *impervious area*), which were not reflected in the original NOI submitted to the Department, they shall promptly submit such facts or information to the Department using the contact information in Part II.A. of this permit. Failure of the *owner or operator* to correct or supplement any relevant facts within five (5) business days of becoming aware of the deficiency shall constitute a violation of this permit.

H. Signatory Requirements

1. All NOIs and NOTs shall be signed as follows:

   a. For a corporation these forms shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

      (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or

(ii) the manager of one or more manufacturing, production or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

b. For a partnership or sole proprietorship these forms shall be signed by a general partner or the proprietor, respectively; or

c. For a municipality, State, Federal, or other public agency these forms shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

(i) the chief executive officer of the agency, or

(ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. The SWPPP and other information requested by the Department shall be signed by a person described in Part VII.H.1. of this permit or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described in Part VII.H.1. of this permit;

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of *equivalent* responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position) and,

c. The written authorization shall include the name, title and signature of the authorized representative and be attached to the SWPPP.

3. All inspection reports shall be signed by the *qualified inspector* that performs the inspection.

4. The MS4 SWPPP Acceptance form shall be signed by the principal executive officer or ranking elected official from the *regulated, traditional land use control MS4,* or by a duly authorized representative of that person.

   It shall constitute a permit violation if an incorrect and/or improper signatory authorizes any required forms, SWPPP and/or inspection reports.

I. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations. *Owners or operators* must obtain any applicable conveyances, easements, licenses and/or access to real property prior to *commencing construction activity*.

J. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

K. Requirement to Obtain Coverage Under an Alternative Permit

1. The Department may require any *owner or operator* authorized by this permit to apply for and/or obtain either an individual SPDES permit or another SPDES general permit. When the Department requires any *discharge*r authorized by a general permit to apply for an individual SPDES permit, it shall notify the *discharge*r in writing that a permit application is required. This notice shall include a brief statement of the reasons for this decision, an application form, a statement setting a time frame for the *owner or operator* to file the application for an individual SPDES permit, and a deadline, not sooner than 180 days from *owner or operator* receipt of the notification letter, whereby the authorization to

discharge under this general permit shall be terminated. Applications must be submitted to the appropriate Permit Administrator at the Regional Office. The Department may grant additional time upon demonstration, to the satisfaction of the Department, that additional time to apply for an alternative authorization is necessary or where the Department has not provided a permit determination in accordance with Part 621 of this Title.

2. When an individual SPDES permit is issued to a discharger authorized to *discharge* under a general SPDES permit for the same *discharge*(s), the general permit authorization for outfalls authorized under the individual SPDES permit is automatically terminated on the effective date of the individual permit unless termination is earlier in accordance with 6 NYCRR Part 750.

L. Proper Operation and Maintenance

The *owner or operator* shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the *owner or operator* to achieve compliance with the conditions of this permit and with the requirements of the SWPPP.

M. Inspection and Entry

The *owner or operator* shall allow an authorized representative of the Department, EPA, applicable county health department, or, in the case of a construction site which *discharges* through an *MS4*, an authorized representative of the *MS4* receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the *owner's or operator's* premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment), practices or operations regulated or required by this permit.

4. Sample or monitor at reasonable times, for purposes of assuring permit compliance or as otherwise authorized by the Act or ECL, any substances or parameters at any location.

N. Permit Actions

This permit may, at any time, be modified, suspended, revoked, or renewed by the Department in accordance with 6 NYCRR Part 621. The filing of a request by the *owner or operator* for a permit modification, revocation and reissuance, termination, a notification of planned changes or anticipated noncompliance does not limit, diminish and/or stay compliance with any terms of this permit.

O. Definitions

Definitions of key terms are included in Appendix A of this permit.

P. Re-Opener Clause

1. If there is evidence indicating potential or realized impacts on water quality due to any stormwater discharge associated with *construction activity* covered by this permit, the *owner or operator* of such discharge may be required to obtain an individual permit or alternative general permit in accordance with Part VII.K. of this permit or the permit may be modified to include different limitations and/or requirements.

2. Any Department initiated permit modification, suspension or revocation will be conducted in accordance with 6 NYCRR Part 621, 6 NYCRR 750-1.18, and 6 NYCRR 750-1.20.

Q. Penalties for Falsification of Forms and Reports

In accordance with 6NYCRR Part 750-2.4 and 750-2.5, any person who knowingly makes any false material statement, representation, or certification in any application, record, report or other document filed or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished in accordance with ECL §71-1933 and or Articles 175 and 210 of the New York State Penal Law.

R. Other Permits

Nothing in this permit relieves the *owner or operator* from a requirement to obtain any other permits required by law.

VIII. **APPENDIX A**

Definitions

Alter Hydrology from Pre to Post-Development Conditions - means the post-development peak flow rate(s) has increased by more than 5% of the pre-developed condition for the design storm of interest (e.g. 10 yr and 100 yr).

Combined Sewer - means a sewer that is designed to collect and convey both “sewage” and “stormwater”.

Commence (Commencement of) Construction Activities - means the initial disturbance of soils associated with clearing, grading or excavation activities; or other construction related activities that disturb or expose soils such as demolition, stockpiling of fill material, and the initial installation of erosion and sediment control practices required in the SWPPP. See definition for “*Construction Activity(ies)*” also.

***Construction Activity*(ies) -** means any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, logging equipment operation, the cutting and skidding of trees, stump removal and/or brush root removal. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Direct Discharge (to a specific surface waterbody) - means that runoff flows from a construction site by overland flow and the first point of discharge is the specific surface waterbody, or runoff flows from a construction site to a separate storm sewer system and the first point of discharge from the separate storm sewer system is the specific surface waterbody.

Discharge(s) - means any addition of any pollutant to waters of the State through an outlet or point source.

Environmental Conservation Law (ECL) - means chapter 43-B of the Consolidated Laws of the State of New York, entitled the Environmental Conservation Law.

Equivalent (Equivalence) – means that the practice or measure meets all the performance, longevity, maintenance, and safety objectives of the technical standard and will provide an equal or greater degree of water quality protection.

Final Stabilization - means that all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other equivalent stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.

General SPDES permit - means a SPDES permit issued pursuant to 6 NYCRR Part 750-1.21 and Section 70-0117 of the ECL authorizing a category of discharges.

Groundwater(s) - means waters in the saturated zone. The saturated zone is a subsurface zone in which all the interstices are filled with water under pressure greater than that of the atmosphere. Although the zone may contain gas-filled interstices or interstices filled with fluids other than water, it is still considered saturated.

Historic Property – means any building, structure, site, object or district that is listed on the State or National Registers of Historic Places or is determined to be eligible for listing on the State
or National Registers of Historic Places.

Impervious Area (Cover) - means all impermeable surfaces that cannot effectively infiltrate rainfall. This includes paved, concrete and gravel surfaces (i.e. parking lots, driveways, roads, runways and sidewalks); building rooftops and miscellaneous impermeable structures such as patios, pools, and sheds.

Infeasible – means not technologically possible, or not economically practicable and achievable in light of best industry practices.

Larger Common Plan of Development or Sale - means a contiguous area where multiple separate and distinct *construction activities* are occurring, or will occur, under one plan. The term "plan" in "larger common plan of development or sale" is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, marketing plan, advertisement, drawing, permit application, State Environmental Quality Review Act (SEQRA) environmental assessment form or other documents, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating that *construction activities* may occur on a specific plot.

For discrete construction projects that are located within a larger common plan of development or sale that are at least 1/4 mile apart, each project can be treated as a separate plan of development or sale provided any interconnecting road, pipeline or utility project that is part of the same "common plan" is not concurrently being disturbed.

Minimize – means reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practices.

Municipal Separate Storm Sewer (MS4) - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters,

ditches, man-made
channels, or storm drains):

(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to surface waters of the State*;*
(ii) Designed or used for collecting or conveying stormwater;
(iii) Which is not a *combined sewer*; and
(iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

National Pollutant Discharge Elimination System (NPDES) - means the national system for the issuance of wastewater and stormwater permits under the Federal Water Pollution Control Act (Clean Water Act).

New Development – means any land disturbance that does meet the definition of Redevelopment Activity included in this appendix.

NOI Acknowledgment Letter - means the letter that the Department sends to an owner or operator to acknowledge the Department's receipt and acceptance of a complete Notice of Intent. This letter documents the owner's or operator's authorization to discharge in accordance with the general permit for stormwater discharges from *construction activity*.

Owner or Operator - means the person, persons or legal entity which owns or leases the property on which the *construction activity* is occurring; and/or an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications.

Performance Criteria – means the design criteria listed under the "Required Elements" sections in Chapters 5, 6 and 10 of the technical standard, New York State Stormwater Management Design Manual, dated January 2015. It does not include the Sizing Criteria (i.e. WQv, RRv, Cpv, Qp and Qf) in Part I.C.2. of the permit.

Pollutant - means dredged spoil, filter backwash, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, agricultural waste and ballast discharged into water; which may cause or might reasonably be expected to cause pollution of the waters of the state in contravention of the standards or guidance values adopted as provided in 6 NYCRR Parts 700 et seq .

Qualified Inspector - means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or other Department endorsed individual(s).

It can also mean someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years.

It can also mean a person that meets the *Qualified Professional* qualifications in addition to the *Qualified Inspector* qualifications.

Note: Inspections of any post-construction stormwater management practices that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

Qualified Professional - means a person that is knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, Registered Landscape Architect or other Department endorsed individual(s). Individuals preparing SWPPPs that require the post-construction stormwater management practice component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics. All components of the SWPPP that involve the practice of engineering, as defined by the NYS Education Law (see Article 145), shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York..

Redevelopment Activity(ies) – means the disturbance and reconstruction of existing impervious area, including impervious areas that were removed from a project site within five (5) years of preliminary project plan submission to the local government (i.e. site plan, subdivision, etc.).

Regulated, Traditional Land Use Control MS4 - means a city, town or village with land use control authority that is required to gain coverage under New York State DEC's SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s).

Routine Maintenance Activity - means *construction activity* that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility, including, but not limited to:

- Re-grading of gravel roads or parking lots,
- Stream bank restoration projects (does not include the placement of spoil material),
- Cleaning and shaping of existing roadside ditches and culverts that maintains the approximate original line and grade, and hydraulic capacity of the ditch,
- Cleaning and shaping of existing roadside ditches that does not maintain the approximate original grade, hydraulic capacity and purpose of the ditch if the changes to the line and grade, hydraulic capacity or purpose of the ditch are installed to improve water quality and quantity controls (e.g. installing grass lined ditch),
- Placement of aggregate shoulder backing that makes the transition between the road shoulder and the ditch or embankment,
- Full depth milling and filling of existing asphalt pavements, replacement of concrete pavement slabs, and similar work that does not expose soil or disturb the bottom six (6) inches of subbase material,
- Long-term use of equipment storage areas at or near highway maintenance facilities,
- Removal of sediment from the edge of the highway to restore a previously existing sheet-flow drainage connection from the highway surface to the highway ditch or embankment,
- Existing use of Canal Corp owned upland disposal sites for the canal, and
- Replacement of curbs, gutters, sidewalks and guide rail posts.

Site limitations – means site conditions that prevent the use of an infiltration technique and or infiltration of the total WQv. Typical site limitations include: seasonal high groundwater, shallow depth to bedrock, and soils with an infiltration rate less than 0.5 inches/hour. The existence of site limitations shall be confirmed and documented using actual field testing (i.e. test pits, soil borings, and infiltration test) or using information from the most current United States Department of Agriculture (USDA) Soil Survey for the County where the project is located.

Sizing Criteria – means the criteria included in Part I.C.2 of the permit that are used to size post-construction stormwater management control practices. The criteria include; Water Quality Volume (WQv), Runoff Reduction Volume (RRv), Channel Protection Volume (Cpv), Overbank Flood (Qp), and Extreme Flood (Qf).

State Pollutant Discharge Elimination System (SPDES) - means the system established pursuant to Article 17 of the ECL and 6 NYCRR Part 750 for issuance of permits authorizing discharges to the waters of the state.

Steep Slope – means land area with a Soil Slope Phase that is identified as an E or F, or the map unit name is inclusive of 25% or greater slope, on the United States Department of Agriculture ("USDA") Soil Survey for the County where the disturbance will occur.

Surface Waters of the State - shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic ocean within the territorial seas of the state of New York and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters that do not combine or effect a junction with natural surface waters), which are wholly or partially within or bordering the state or within its jurisdiction. Waters of the state are further defined in 6 NYCRR Parts 800 to 941.

Temporarily Ceased – means that an existing disturbed area will not be disturbed again within 14 calendar days of the previous soil disturbance.

Temporary Stabilization - means that exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).

Total Maximum Daily Loads (TMDLs) - A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. It is a calculation of the maximum amount of a pollutant that a waterbody can receive on a daily basis and still meet *water quality standards*, and an allocation of that amount to the pollutant's sources. A TMDL stipulates wasteload allocations (WLAs) for point source discharges, load allocations (LAs) for nonpoint sources, and a margin of safety (MOS).

Trained Contractor - means an employee from the contracting (construction) company, identified in Part III.A.6., that has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the *trained contractor* shall receive four (4) hours of training every three (3) years.

It can also mean an employee from the contracting (construction) company, identified in Part III.A.6., that meets the *qualified inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity).

The *trained contractor* is responsible for the day to day implementation of the SWPPP.

Uniform Procedures Act (UPA) Permit - means a permit required under 6 NYCRR Part

621 of the Environmental Conservation Law (ECL), Article 70.

Water Quality Standard - means such measures of purity or quality for any waters in relation to their reasonable and necessary use as promulgated in 6 NYCRR Part 700 et seq.

IX. APPENDIX B

Required SWPPP Components by Project Type

Table 1
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS

The following construction activities that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres: • Single family home not located in one of the watersheds listed in Appendix C or not *directly discharging* to one of the 303(d) segments listed in Appendix E • Single family residential subdivisions with 25% or less impervious cover at total site build-out and not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E • Construction of a barn or other agricultural building, silo, stock yard or pen.
The following construction activities that involve soil disturbances of one (1) or more acres of land: • Installation of underground, linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains • Environmental enhancement projects, such as wetland mitigation projects, stormwater retrofits and stream restoration projects • Bike paths and trails • Sidewalk construction projects that are not part of a road/ highway construction or reconstruction project • Slope stabilization projects • Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics • Spoil areas that will be covered with vegetation • Land clearing and grading for the purposes of creating vegetated open space (i.e. recreational parks, lawns, meadows, fields), excluding projects that *alter hydrology from pre to post development* conditions • Athletic fields (natural grass) that do not include the construction or reconstruction of *impervious area* and do not *alter hydrology from pre to post development* conditions • Demolition project where vegetation will be established and no redevelopment is planned • Overhead electric transmission line project that does not include the construction of permanent access roads or parking areas surfaced with *impervious cover* • Structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State", excluding projects that involve soil disturbances of less than five acres and construction activities that include the construction or reconstruction of impervious area
The following construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land: • All construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

Table 2

CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Single family home located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions that involve soil disturbances of between one (1) and five (5) acres of land with greater than 25% impervious cover at total site build-out
- Single family residential subdivisions that involve soil disturbances of five (5) or more acres of land, and single family residential subdivisions that involve soil disturbances of less than five (5) acres that are part of a larger common plan of development or sale that will ultimately disturb five or more acres of land
- Multi-family residential developments; includes townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Airports
- Amusement parks
- Campgrounds
- Cemeteries that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Commercial developments
- Churches and other places of worship
- Construction of a barn or other agricultural building(e.g. silo) and structural practices as identified in Table II in the “Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State” that include the construction or reconstruction of *impervious area*, excluding projects that involve soil disturbances of less than five acres.
- Golf courses
- Institutional, includes hospitals, prisons, schools and colleges
- Industrial facilities, includes industrial parks
- Landfills
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTW’s and water treatment plants
- Office complexes
- Sports complexes
- Racetracks, includes racetracks with earthen (dirt) surface
- Road construction or reconstruction
- Parking lot construction or reconstruction
- Athletic fields (natural grass) that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Athletic fields with artificial turf
- Permanent access roads, parking areas, substations, compressor stations and well drilling pads, surfaced with *impervious cover,* and constructed as part of an over-head electric transmission line project , wind-power project, cell tower project, oil or gas well drilling project, sewer or water main project or other linear utility project
- All other construction activities that include the construction or reconstruction of *impervious area* <u>or</u> *alter the hydrology from pre to post development* conditions, <u>and</u> are not listed in Table 1

X. APPENDIX C

Watersheds Where Enhanced Phosphorus Removal Standards Are Required

Watersheds where *owners or operators* of construction activities identified in Table 2 of Appendix B must prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the technical standard, New York State Stormwater Management Design Manual ("Design Manual").

- Entire New York City Watershed located east of the Hudson River **-** Figure 1
- Onondaga Lake Watershed **-** Figure 2
- Greenwood Lake Watershed **-**Figure 3
- Oscawana Lake Watershed – Figure 4
- Kinderhook Lake Watershed – Figure 5

Figure 1 - New York City Watershed East of the Hudson

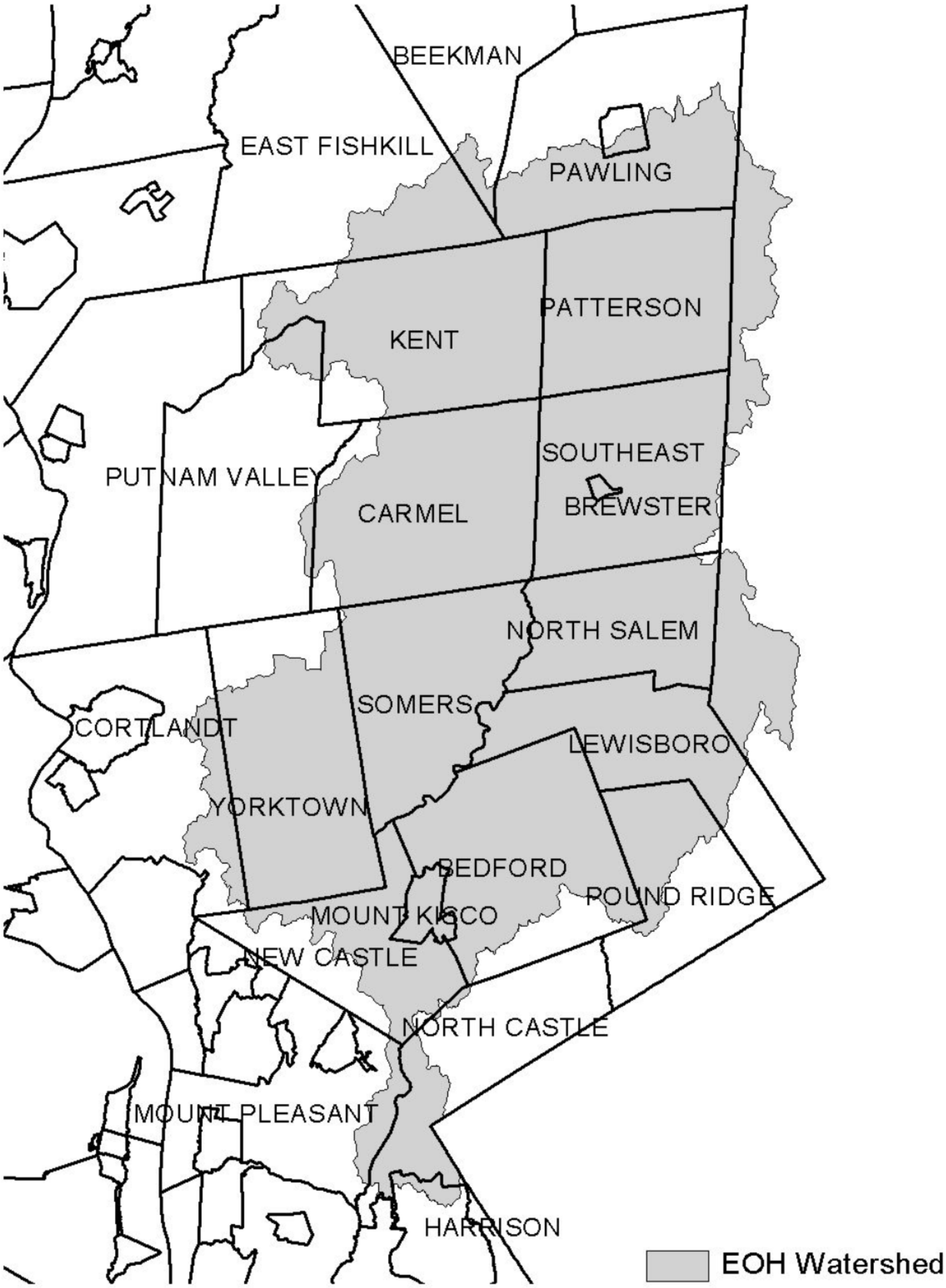


Figure 2 - Onondaga Lake Watershed

Figure 3 - Greenwood Lake Watershed

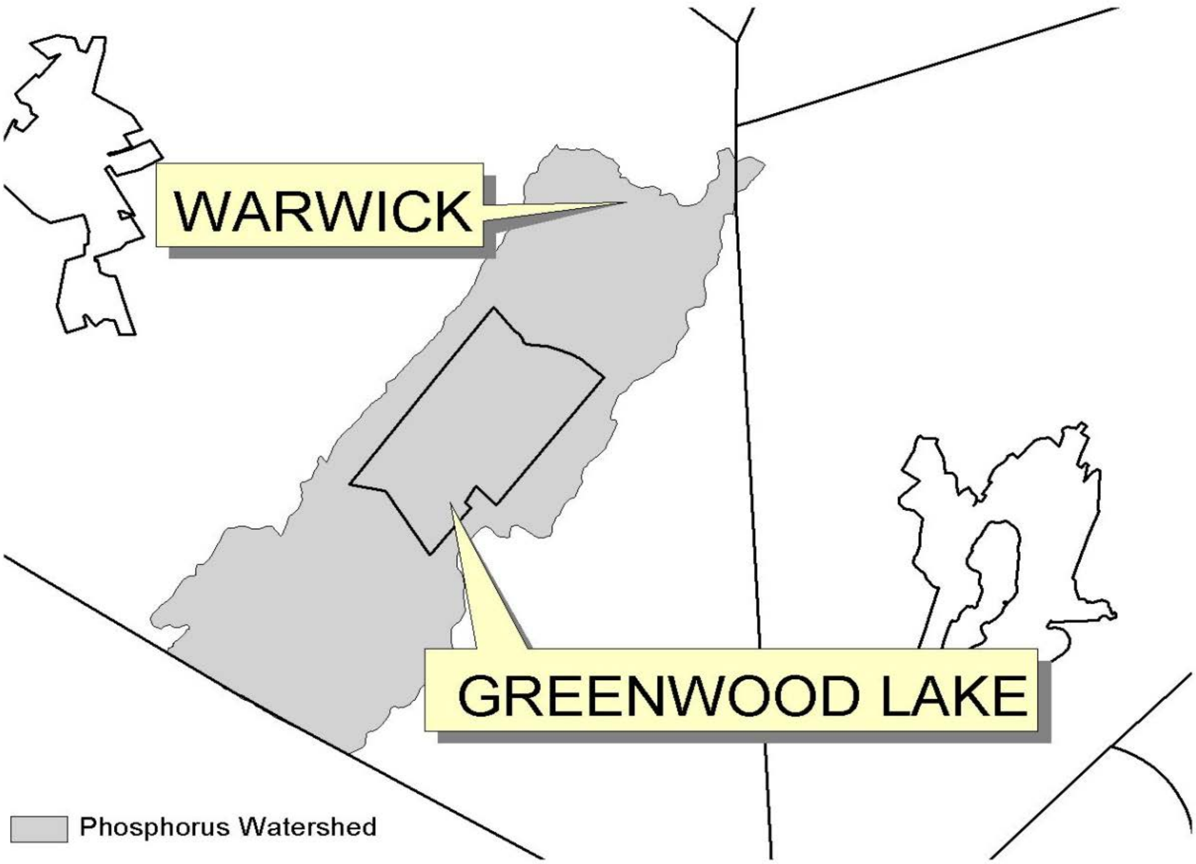


Figure 4 - Oscawana Lake Watershed

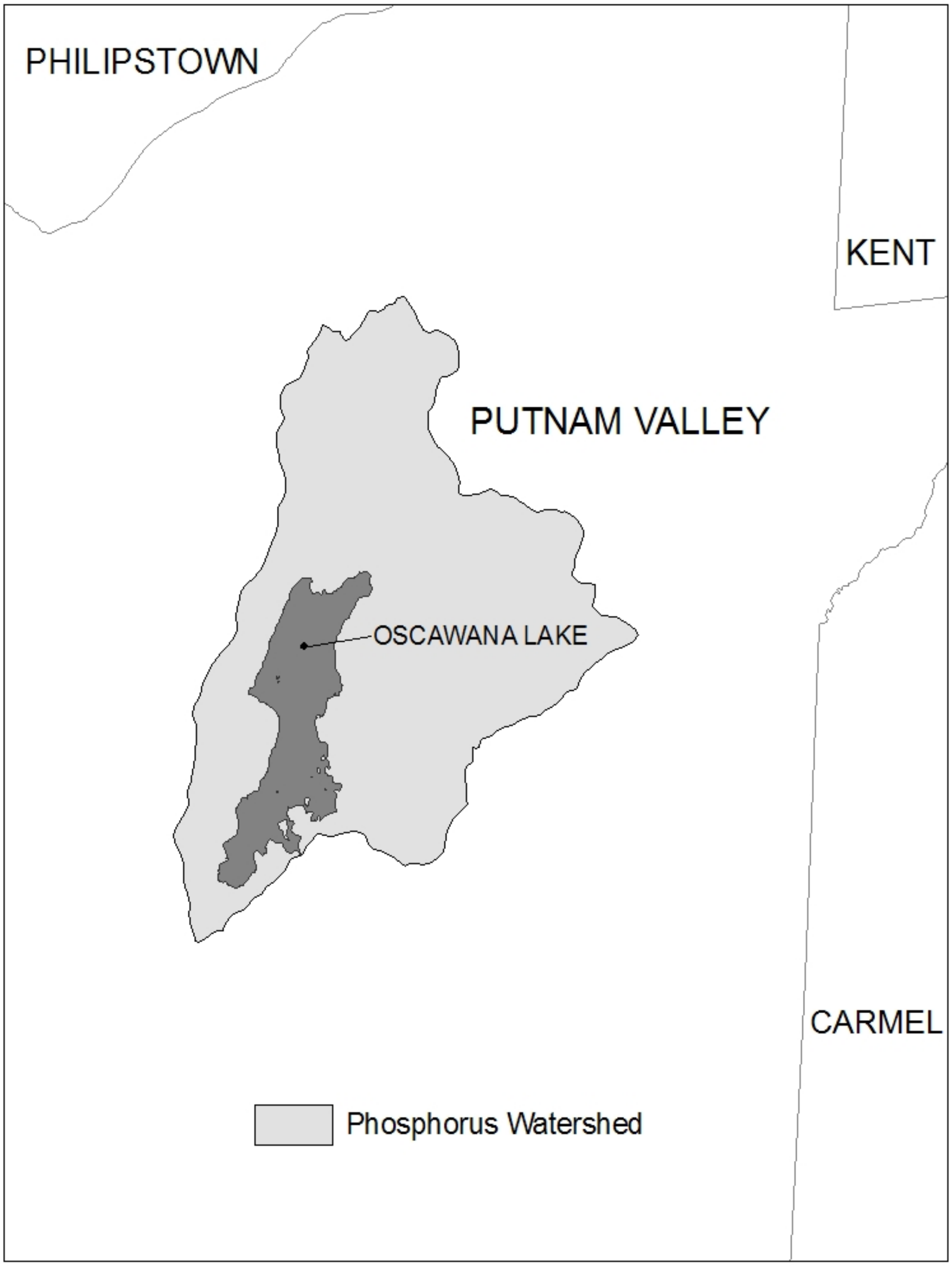
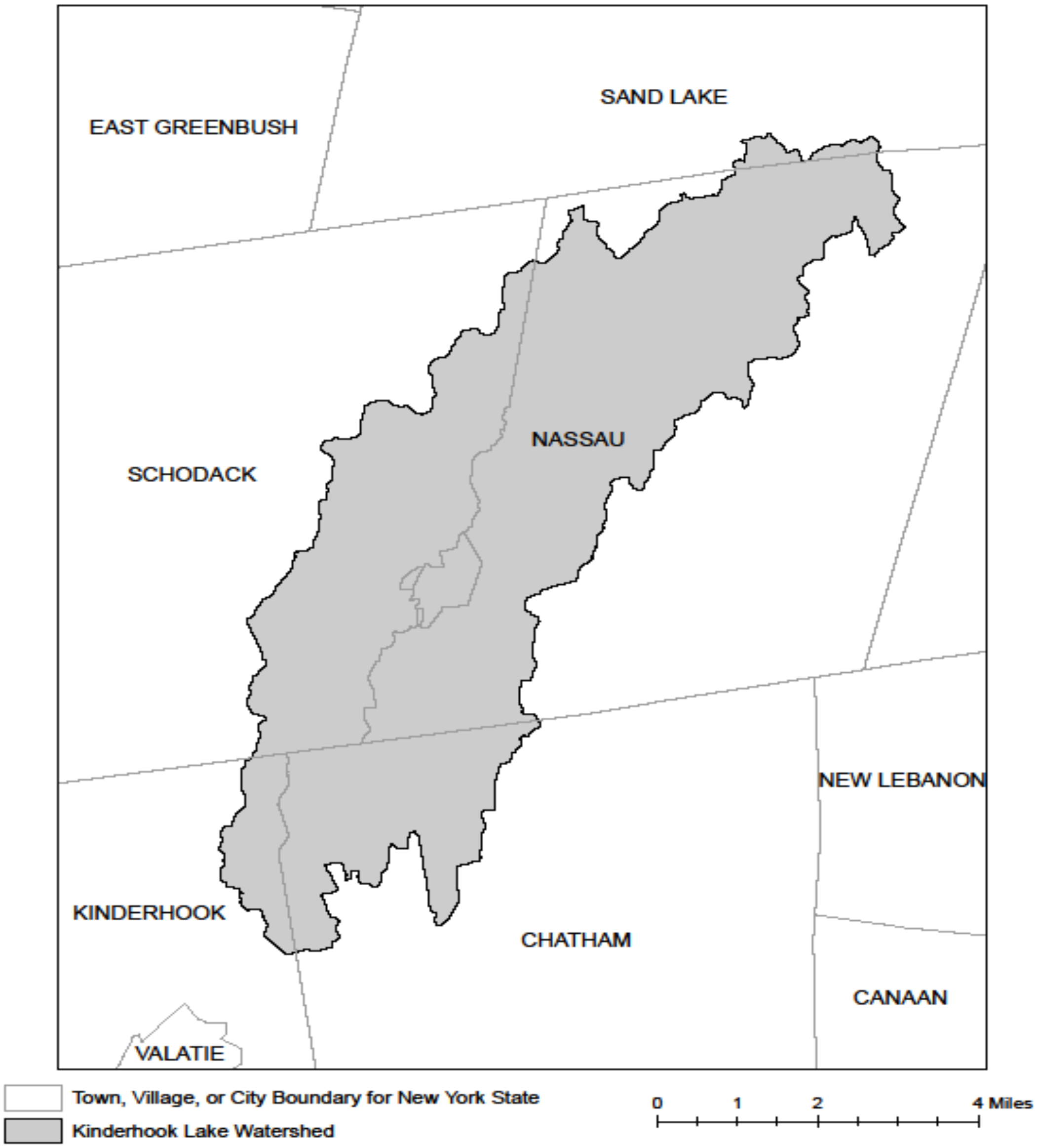


Figure 5: Kinderhook Lake Watershed



XI. APPENDIX D

Watersheds where *owners or operators* of construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land must obtain coverage under this permit.

Entire New York City Watershed that is located east of the Hudson River **-** See Figure 1 in Appendix C

XII. APPENDIX E

List of 303(d) segments impaired by pollutants related to *construction activity* (e.g. silt, sediment or nutrients). *Owners or operators* of single family home and single family residential subdivisions with 25% or less total impervious cover at total site build-out that involve soil disturbances of one or more acres of land, but less than 5 acres, and *directly discharge* to one of the listed segments below shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the New York State Stormwater Management Design Manual ("Design Manual"), dated January 2015.

COUNTY	WATERBODY
Albany	Ann Lee (Shakers) Pond, Stump Pond
Albany	Basic Creek Reservoir
Allegheny	Amity Lake, Saunders Pond
Bronx	Van Cortlandt Lake
Broome	Whitney Point Lake/Reservoir
Broome	Fly Pond, Deer Lake
Broome	Minor Tribs to Lower Susquehanna (north)
Cattaraugus	Allegheny River/Reservoir
Cattaraugus	Case Lake
Cattaraugus	Linlyco/Club Pond
Cayuga	Duck Lake
Chautauqua	Chautauqua Lake, North
Chautauqua	Chautauqua Lake, South
Chautauqua	Bear Lake
Chautauqua	Chadakoin River and tribs
Chautauqua	Lower Cassadaga Lake
Chautauqua	Middle Cassadaga Lake
Chautauqua	Findley Lake
Clinton	Great Chazy River, Lower, Main Stem
Columbia	Kinderhook Lake
Columbia	Robinson Pond
Dutchess	Hillside Lake
Dutchess	Wappinger Lakes
Dutchess	Fall Kill and tribs
Erie	Green Lake
Erie	Scajaquada Creek, Lower, and tribs
Erie	Scajaquada Creek, Middle, and tribs
Erie	Scajaquada Creek, Upper, and tribs
Erie	Rush Creek and tribs
Erie	Ellicott Creek, Lower, and tribs
Erie	Beeman Creek and tribs
Erie	Murder Creek, Lower, and tribs
Erie	South Branch Smoke Cr, Lower, and tribs
Erie	Little Sister Creek, Lower, and tribs
Essex	Lake George (primary county: Warren)
Genesee	Black Creek, Upper, and minor tribs
Genesee	Tonawanda Creek, Middle, Main Stem
Genesee	Oak Orchard Creek, Upper, and tribs
Genesee	Bowen Brook and tribs
Genesee	Bigelow Creek and tribs
Genesee	Black Creek, Middle, and minor tribs
Genesee	LeRoy Reservoir
Greene	Schoharie Reservoir
Greene	Sleepy Hollow Lake
Herkimer	Steele Creek tribs
Kings	Hendrix Creek
Lewis	Mill Creek/South Branch and tribs
Livingston	Conesus Lake
Livingston	Jaycox Creek and tribs
Livingston	Mill Creek and minor tribs
Livingston	Bradner Creek and tribs
Livingston	Christie Creek and tribs
Monroe	Lake Ontario Shoreline, Western
Monroe	Mill Creek/Blue Pond Outlet and tribs
Monroe	Rochester Embayment - East
Monroe	Rochester Embayment - West
Monroe	Unnamed Trib to Honeoye Creek
Monroe	Genesee River, Lower, Main Stem
Monroe	Genesee River, Middle, Main Stem
Monroe	Black Creek, Lower, and minor tribs
Monroe	Buck Pond
Monroe	Long Pond
Monroe	Cranberry Pond
Monroe	Mill Creek and tribs
Monroe	Shipbuilders Creek and tribs
Monroe	Minor tribs to Irondequoit Bay
Monroe	Thomas Creek/White Brook and tribs
Nassau	Glen Cove Creek, Lower, and tribs
Nassau	LI Tribs (fresh) to East Bay
Nassau	East Meadow Brook, Upper, and tribs
Nassau	Hempstead Bay
Nassau	Hempstead Lake
Nassau	Grant Park Pond
Nassau	Beaver Lake
Nassau	Camaans Pond
Nassau	Halls Pond
Nassau	LI Tidal Tribs to Hempstead Bay
Nassau	Massapequa Creek and tribs
Nassau	Reynolds Channel, east
Nassau	Reynolds Channel, west
Nassau	Silver Lake, Lofts Pond
Nassau	Woodmere Channel
Niagara	Hyde Park Lake
Niagara	Lake Ontario Shoreline, Western
Niagara	Bergholtz Creek and tribs
Oneida	Ballou, Nail Creeks
Onondaga	Ley Creek and tribs
Onondaga	Onondaga Creek, Lower and tribs

APPENDIX E

List of 303(d) segments impaired by pollutants related to construction activity, cont'd.

COUNTY	WATERBODY
Onondaga	Onondaga Creek, Middle and tribs
Onondaga	Onondaga Creek, Upp, and minor tribs
Onondaga	Harbor Brook, Lower, and tribs
Onondaga	Ninemile Creek, Lower, and tribs
Onondaga	Minor tribs to Onondaga Lake
Onondaga	Onondaga Creek, Lower, and tribs
Ontario	Honeoye Lake
Ontario	Hemlock Lake Outlet and minor tribs
Ontario	Great Brook and minor tribs
Orange	Monhagen Brook and tribs
Orange	Orange Lake
Orleans	Lake Ontario Shoreline, Western
Oswego	Pleasant Lake
Oswego	Lake Neatahwanta
Putnam	Oscawana Lake
Putnam	Palmer Lake
Putnam	Lake Carmel
Queens	Jamaica Bay, Eastern, and tribs (Queens)
Queens	Bergen Basin
Queens	Shellbank Basin
Rensselaer	Nassau Lake
Rensselaer	Snyders Lake
Richmond	Grasmere, Arbutus and Wolfes Lakes
Rockland	Congers Lake, Swartout Lake
Rockland	Rockland Lake
Saratoga	Ballston Lake
Saratoga	Round Lake
Saratoga	Dwaas Kill and tribs
Saratoga	Tribs to Lake Lonely
Saratoga	Lake Lonely
Schenectady	Collins Lake
Schenectady	Duane Lake
Schenectady	Mariaville Lake
Schoharie	Engleville Pond
Schoharie	Summit Lake
Schuyler	Cayuta Lake
St. Lawrence	Fish Creek and minor tribs
St. Lawrence	Black Lake Outlet/Black Lake
Steuben	Lake Salubria
Steuben	Smith Pond
Suffolk	Millers Pond
Suffolk	Mattituck (Marratooka) Pond
Suffolk	Tidal tribs to West Moriches Bay
Suffolk	Canaan Lake
Suffolk	Lake Ronkonkoma
Suffolk	Beaverdam Creek and tribs
Suffolk	Big/Little Fresh Ponds
Suffolk	Fresh Pond
Suffolk	Great South Bay, East
Suffolk	Great South Bay, Middle

COUNTY	WATERBODY
Suffolk	Great South Bay, West
Suffolk	Mill and Seven Ponds
Suffolk	Moriches Bay, East
Suffolk	Moriches Bay, West
Suffolk	Quantuck Bay
Suffolk	Shinnecock Bay (and Inlet)
Sullivan	Bodine, Montgomery Lakes
Sullivan	Davies Lake
Sullivan	Pleasure Lake
Sullivan	Swan Lake
Tompkins	Cayuga Lake, Southern End
Tompkins	Owasco Inlet, Upper, and tribs
Ulster	Ashokan Reservoir
Ulster	Esopus Creek, Upper, and minor tribs
Ulster	Esopus Creek, Lower, Main Stem
Ulster	Esopus Creek, Middle, and minor tribs
Warren	Lake George
Warren	Tribs to L.George, Village of L George
Warren	Huddle/Finkle Brooks and tribs
Warren	Indian Brook and tribs
Warren	Hague Brook and tribs
Washington	Tribs to L.George, East Shr Lk George
Washington	Cossayuna Lake
Washington	Wood Cr/Champlain Canal, minor tribs
Wayne	Port Bay
Wayne	Marbletown Creek and tribs
Westchester	Lake Katonah
Westchester	Lake Mohegan
Westchester	Lake Shenorock
Westchester	Reservoir No.1 (Lake Isle)
Westchester	Saw Mill River, Middle, and tribs
Westchester	Silver Lake
Westchester	Teatown Lake
Westchester	Truesdale Lake
Westchester	Wallace Pond
Westchester	Peach Lake
Westchester	Mamaroneck River, Lower
Westchester	Mamaroneck River, Upp, and tribs
Westchester	Sheldrake River and tribs
Westchester	Blind Brook, Lower
Westchester	Blind Brook, Upper, and tribs
Westchester	Lake Lincolndale
Westchester	Lake Meahaugh
Wyoming	Java Lake
Wyoming	Silver Lake

Note: The list above identifies those waters from the final New York State "2014 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy", dated January 2015, that are impaired by silt, sediment or nutrients.

XIII. APPENDIX F

LIST OF NYS DEC REGIONAL OFFICES

Region	COVERING THE FOLLOWING COUNTIES:	DIVISION OF ENVIRONMENTAL PERMITS (DEP) PERMIT ADMINISTRATORS	DIVISION OF WATER (DOW) WATER (SPDES) PROGRAM
1	NASSAU AND SUFFOLK	50 CIRCLE ROAD STONY BROOK, NY 11790 TEL. (631) 444-0365	50 CIRCLE ROAD STONY BROOK, NY 11790-3409 TEL. (631) 444-0405
2	BRONX, KINGS, NEW YORK, QUEENS AND RICHMOND	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4997	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4933
3	DUTCHESS, ORANGE, PUTNAM, ROCKLAND, SULLIVAN, ULSTER AND WESTCHESTER	21 SOUTH PUTT CORNERS ROAD NEW PALTZ, NY 12561-1696 TEL. (845) 256-3059	100 HILLSIDE AVENUE, SUITE 1W WHITE PLAINS, NY 10603 TEL. (914) 428 - 2505
4	ALBANY, COLUMBIA, DELAWARE, GREENE, MONTGOMERY, OTSEGO, RENSSELAER, SCHENECTADY AND SCHOHARIE	1150 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2069	1130 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2045
5	CLINTON, ESSEX, FRANKLIN, FULTON, HAMILTON, SARATOGA, WARREN AND WASHINGTON	1115 STATE ROUTE 86, PO BOX 296 RAY BROOK, NY 12977-0296 TEL. (518) 897-1234	232 GOLF COURSE ROAD WARRENSBURG, NY 12885-1172 TEL. (518) 623-1200
6	HERKIMER, JEFFERSON, LEWIS, ONEIDA AND ST. LAWRENCE	STATE OFFICE BUILDING 317 WASHINGTON STREET WATERTOWN, NY 13601-3787 TEL. (315) 785-2245	STATE OFFICE BUILDING 207 GENESEE STREET UTICA, NY 13501-2885 TEL. (315) 793-2554
7	BROOME, CAYUGA, CHENANGO, CORTLAND, MADISON, ONONDAGA, OSWEGO, TIOGA AND TOMPKINS	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7438	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7500
8	CHEMUNG, GENESEE, LIVINGSTON, MONROE, ONTARIO, ORLEANS, SCHUYLER, SENECA, STEUBEN, WAYNE AND YATES	6274 EAST AVON-LIMA ROAD AVON, NY 14414-9519 TEL. (585) 226-2466	6274 EAST AVON-LIMA RD. AVON, NY 14414-9519 TEL. (585) 226-2466
9	ALLEGANY, CATTARAUGUS, CHAUTAUQUA, ERIE, NIAGARA AND WYOMING	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7165	270 MICHIGAN AVE. BUFFALO, NY 14203-2999 TEL. (716) 851-7070

APPENDIX B
SOILS INFORMATION

United States Department of Agriculture

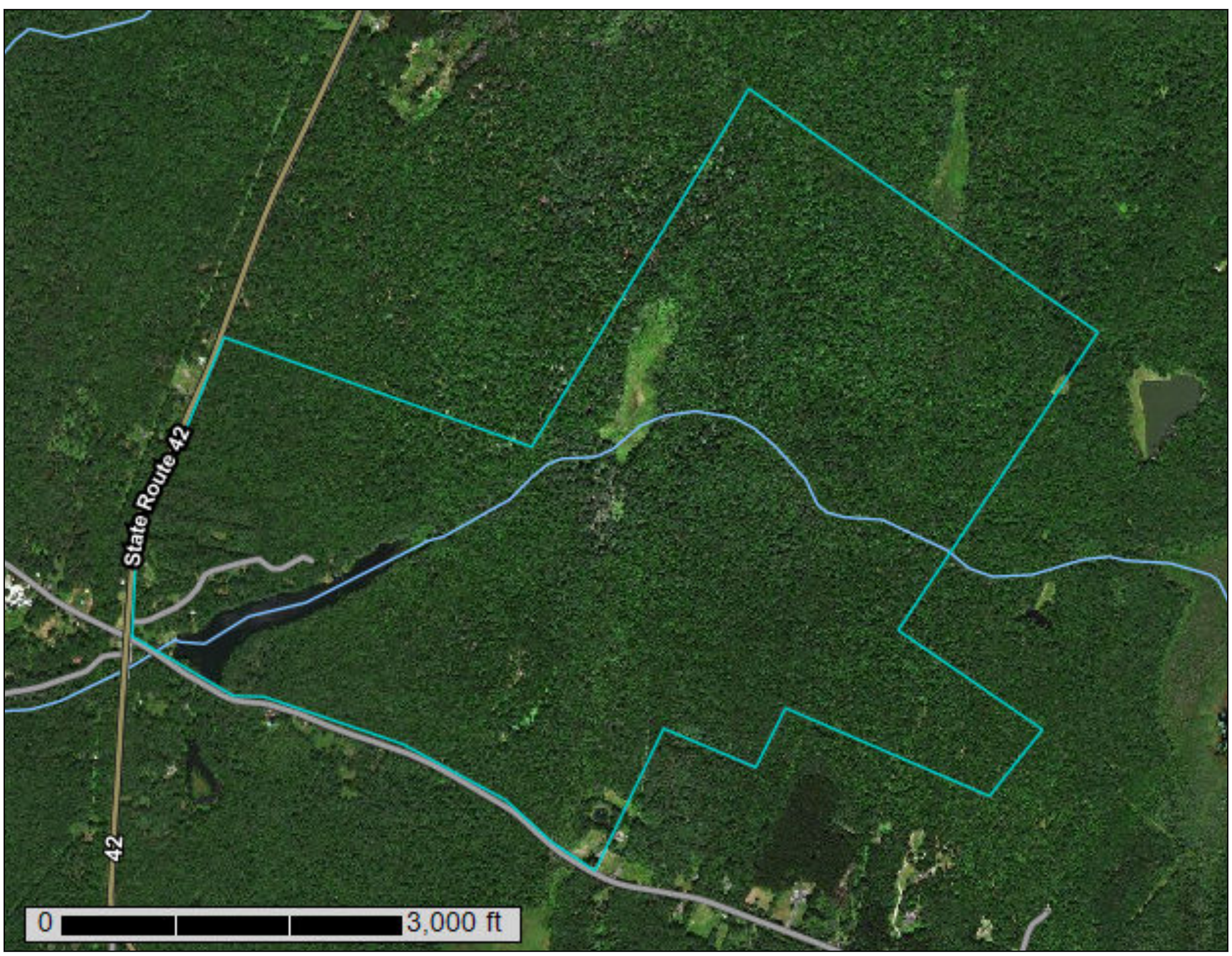
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Sullivan County, New York



October 10, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:17,700 if printed on A landscape (11" x 8.5") sheet.

Meters: 0, 250, 500, 1000, 1500

Feet: 0, 500, 1000, 2000, 3000

N

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 Map Unit Polygons
Soil Map Unit Lines
Soil Map Unit Points

Special Point Features
Blowout
Borrow Pit
Clay Spot
Closed Depression
Gravel Pit
Gravelly Spot
Landfill
Lava Flow
Marsh or swamp
Mine or Quarry
Miscellaneous Water
Perennial Water
Rock Outcrop
Saline Spot
Sandy Spot
Severely Eroded Spot
Sinkhole
Slide or Slip
Sodic Spot
Spoil Area
Stony Spot
Very Stony Spot
Wet Spot
Other
Special Line Features

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 1:15,800.

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: Sullivan County, New York
Survey Area Data: Version 18, Sep 16, 2019

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

Date(s) aerial images were photographed: Feb 5, 2014—Sep 15, 2016

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ad	Alden silt loam	0.1	0.0%
AlC	Arnot-Lordstown complex, 0 to 15 percent slopes, very rocky	46.6	6.8%
AlE	Arnot-Lordstown complex, 15 to 35 percent slopes, very rocky	43.6	6.3%
AoC	Arnot-Oquaga complex, 0 to 15 percent slopes, very rocky	10.2	1.5%
Ca	Carlisle muck	6.5	0.9%
Fu	Fluvaquents-Udifluvents complex, frequently flooded	0.7	0.1%
LoB	Lordstown channery silt loam, 3 to 8 percent slopes, very stony	3.8	0.6%
MrB	Morris loam, 3 to 8 percent slopes	0.0	0.0%
Ne	Neversink loam	5.7	0.8%
Nf	Neversink and Alden soils, very stony	7.9	1.2%
Pa	Palms muck	3.1	0.4%
ScA	Scriba loam, 0 to 3 percent slopes, stony	2.4	0.3%
ScB	Scriba loam, 3 to 8 percent slopes, stony	4.8	0.7%
SeB	Scriba and Morris loams, gently sloping, rubbly	122.3	17.7%
SrB	Swartswood gravelly loam, 3 to 8 percent slopes, stony	95.9	13.9%
SrC	Swartswood gravelly loam, 8 to 15 percent slopes, stony	81.6	11.8%
SrD	Swartswood gravelly loam, 15 to 25 percent slopes, stony	22.3	3.2%
SwE	Swartswood and Lackawanna soils, steep, extremely stony	13.1	1.9%
W	Water	12.8	1.9%
Wd	Wayland soils complex, non-calcareous substratum, 0 to 3 percent slopes, frequently flooded	8.2	1.2%
WeB	Wellsboro gravelly loam, 3 to 8 percent slopes	3.1	0.5%
WeC	Wellsboro gravelly loam, 8 to 15 percent slopes	0.2	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
WlC	Wellsboro and Wurtsboro soils, strongly sloping, extremely stony	118.6	17.2%
WuB	Wurtsboro loam, 3 to 8 percent slopes, stony	76.5	11.1%
Totals for Area of Interest		**690.1**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Sullivan County, New York

Ad—Alden silt loam

Map Unit Setting

National map unit symbol: 9x0j
Elevation: 300 to 1,500 feet
Mean annual precipitation: 41 to 51 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Alden and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alden

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: A silty mantle of local deposition overlying loamy till

Typical profile

H1 - 0 to 12 inches: silt loam
H2 - 12 to 33 inches: silt loam
H3 - 33 to 60 inches: gravelly silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Palms

Percent of map unit: 5 percent
Landform: Marshes, swamps
Hydric soil rating: Yes

Scriba

Percent of map unit: 5 percent
Hydric soil rating: No

Morris

Percent of map unit: 5 percent
Hydric soil rating: No

Neversink

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

AlC—Arnot-Lordstown complex, 0 to 15 percent slopes, very rocky

Map Unit Setting

National map unit symbol: 9x0k
Elevation: 750 to 1,800 feet
Mean annual precipitation: 41 to 51 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Arnot and similar soils: 40 percent
Lordstown and similar soils: 40 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arnot

Setting

Landform: Hills, ridges, benches
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from acid sandstone, siltstone, and shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
H1 - 1 to 3 inches: channery loam
H2 - 3 to 17 inches: very channery loam
H3 - 17 to 21 inches: unweathered bedrock

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Lordstown

Setting

Landform: Ridges, benches, hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived from sandstone and siltstone

Typical profile

Oe - 0 to 3 inches: moderately decomposed plant material
H1 - 3 to 6 inches: silt loam
H2 - 6 to 20 inches: channery loam
H3 - 20 to 28 inches: channery loam
H4 - 28 to 32 inches: unweathered bedrock

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: Unranked

Wurtsboro

Percent of map unit: 4 percent
Hydric soil rating: No

Swartswood

Percent of map unit: 4 percent
Hydric soil rating: No

Tuller

Percent of map unit: 4 percent
Hydric soil rating: No

Valois

Percent of map unit: 3 percent
Hydric soil rating: No

AlE—Arnot-Lordstown complex, 15 to 35 percent slopes, very rocky

Map Unit Setting

National map unit symbol: 9x0l
Elevation: 750 to 1,800 feet
Mean annual precipitation: 41 to 51 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Arnot and similar soils: 40 percent
Lordstown and similar soils: 40 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arnot

Setting

Landform: Hills, ridges, benches
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from acid sandstone, siltstone, and shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
H1 - 1 to 3 inches: channery loam
H2 - 3 to 17 inches: very channery loam
H3 - 17 to 21 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Lordstown

Setting

Landform: Benches, hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived from sandstone and siltstone

Typical profile

Oe - 0 to 3 inches: moderately decomposed plant material
H1 - 3 to 6 inches: silt loam
H2 - 6 to 20 inches: channery loam
H3 - 20 to 28 inches: channery loam
H4 - 28 to 32 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: Unranked

Wurtsboro

Percent of map unit: 4 percent
Hydric soil rating: No

Swartswood

Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 4 percent
Hydric soil rating: No

Valois

Percent of map unit: 3 percent
Hydric soil rating: No

AoC—Arnot-Oquaga complex, 0 to 15 percent slopes, very rocky

Map Unit Setting

National map unit symbol: 2xp98
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Arnot, very stony, and similar soils: 45 percent
Oquaga and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arnot, Very Stony

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainflank, mountaintop, interfluve, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loamy till derived mainly from acid sandstone, siltstone, and shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: channery loam
Bw1 - 3 to 12 inches: very channery loam
Bw2 - 12 to 17 inches: very channery loam
2R - 17 to 27 inches: bedrock

Properties and qualities

Slope: 0 to 15 percent
Percent of area covered with surface fragments: 1.0 percent

Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Oquaga

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Upper third of mountainflank, mountaintop, crest, nose slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Reddish loamy till derived from sandstone, siltstone, and shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: very channery highly organic silt loam
Bw1 - 5 to 15 inches: very channery silt loam
Bw2 - 15 to 24 inches: very channery silt loam
C - 24 to 30 inches: extremely channery loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 0 to 15 percent
Percent of area covered with surface fragments: 0.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Wellsboro, very stony

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainflank, mountaintop, crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Unranked

Tuller, somewhat poorly drained

Percent of map unit: 3 percent
Landform: Hills, ridges, benches
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Cadosia, very stony

Percent of map unit: 2 percent
Landform: Ridges
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ca—Carlisle muck

Map Unit Setting

National map unit symbol: 9x0v
Elevation: 250 to 1,000 feet
Mean annual precipitation: 41 to 51 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Carlisle and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carlisle

Setting

Landform: Marshes, swamps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Deep organic material

Typical profile

H1 - 0 to 60 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water storage in profile: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Minor Components

Wayland

Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: Yes

Palms

Percent of map unit: 5 percent
Landform: Marshes, swamps
Hydric soil rating: Yes

Neversink

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

Alden

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

Red hook

Percent of map unit: 1 percent
Hydric soil rating: No

Fu—Fluvaquents-Udifluvents complex, frequently flooded

Map Unit Setting

National map unit symbol: 9x1c
Elevation: 100 to 3,000 feet
Mean annual precipitation: 41 to 51 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Fluvaquents and similar soils: 45 percent
Udifluvents, frequently flooded, and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fluvaquents

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Alluvium with highly variable texture

Typical profile

H1 - 0 to 5 inches: gravelly silt loam
H2 - 5 to 70 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Occasional
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D

Hydric soil rating: Yes

Description of Udifluvents, Frequently Flooded

Setting

Landform: Flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Alluvium with a wide range of texture

Typical profile

H1 - 0 to 4 inches: gravelly silt loam
H2 - 4 to 70 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 19.98 in/hr)
Depth to water table: About 24 to 72 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Suncook

Percent of map unit: 4 percent
Hydric soil rating: No

Pope

Percent of map unit: 3 percent
Hydric soil rating: No

Barbour

Percent of map unit: 2 percent
Hydric soil rating: No

Wayland

Percent of map unit: 2 percent
Landform: Flood plains
Hydric soil rating: Yes

Philo

Percent of map unit: 2 percent
Hydric soil rating: No

Bash

Percent of map unit: 2 percent

Hydric soil rating: No

LoB—Lordstown channery silt loam, 3 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2xp92
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Lordstown, very stony, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lordstown, Very Stony

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Mountainflank, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till derived from sandstone and siltstone

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: channery highly organic silt loam
Bw1 - 5 to 17 inches: channery silt loam
Bw2 - 17 to 24 inches: very channery silt loam
C - 24 to 30 inches: extremely channery silt loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent
Percent of area covered with surface fragments: 2.5 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Mardin, very stony

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Arnot, very stony

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Mountaintop, mountainflank, crest, nose slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

MrB—Morris loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2vxdj
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Morris and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morris

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till from reddish sandstone, siltstone, and shale

Typical profile

Ap - 0 to 8 inches: loam
Bw - 8 to 12 inches: gravelly loam
Eg - 12 to 16 inches: gravelly loam
Bx - 16 to 60 inches: gravelly loam
C - 60 to 72 inches: gravelly loam

Properties and qualities

Slope: 3 to 8 percent
Percent of area covered with surface fragments: 0.0 percent
Depth to restrictive feature: 10 to 22 inches to fragipan
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Wellsboro

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Norwich

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Ne—Neversink loam

Map Unit Setting

National map unit symbol: 9x26
Mean annual precipitation: 41 to 51 inches

Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Neversink and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Neversink

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Acid loamy till derived from sandstone, siltstone, and shale

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
H1 - 2 to 7 inches: loam
H2 - 7 to 23 inches: gravelly loam
H3 - 23 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Alden

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Scriba

Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Wallington

Percent of map unit: 3 percent
Hydric soil rating: No

Wurtsboro

Percent of map unit: 1 percent
Hydric soil rating: No

Wellsboro

Percent of map unit: 1 percent
Hydric soil rating: No

Morris

Percent of map unit: 1 percent
Hydric soil rating: No

Nf—Neversink and Alden soils, very stony

Map Unit Setting

National map unit symbol: 9x27
Mean annual precipitation: 41 to 51 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Neversink, very stony, and similar soils: 45 percent
Alden, very stony, and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Neversink, Very Stony

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Acid loamy till derived from sandstone, siltstone, and shale

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
H1 - 2 to 7 inches: loam
H2 - 7 to 23 inches: gravelly loam
H3 - 23 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Description of Alden, Very Stony

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: A silty mantle of local deposition overlying loamy till

Typical profile

H1 - 0 to 12 inches: silt loam
H2 - 12 to 33 inches: silt loam
H3 - 33 to 60 inches: gravelly silt loam

Properties and qualities

Slope: 0 to 3 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Morris

Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 5 percent
Landform: Bogs
Hydric soil rating: Yes

Scriba

Percent of map unit: 5 percent
Hydric soil rating: No

Pa—Palms muck

Map Unit Setting

National map unit symbol: 9x2n
Elevation: 250 to 1,500 feet
Mean annual precipitation: 41 to 51 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Palms and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Palms

Setting

Landform: Swamps, marshes
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Organic material over loamy glacial drift

Typical profile

H1 - 0 to 12 inches: muck
H2 - 12 to 22 inches: muck
H3 - 22 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 20 percent
Available water storage in profile: Very high (about 15.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Carlisle

Percent of map unit: 5 percent
Landform: Swamps, marshes
Hydric soil rating: Yes

Alden

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Wayland

Percent of map unit: 3 percent
Landform: Flood plains
Hydric soil rating: Yes

Neversink

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

ScA—Scriba loam, 0 to 3 percent slopes, stony

Map Unit Setting

National map unit symbol: 9x33
Mean annual precipitation: 41 to 51 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Scriba, stony, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scriba, Stony

Setting

Landform: Drumlins, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till dominated by sandstone, with lesser amounts of limestone and shale

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

H1 - 2 to 8 inches: loam
H2 - 8 to 20 inches: channery loam
H3 - 20 to 60 inches: channery loam

Properties and qualities

Slope: 0 to 3 percent
Percent of area covered with surface fragments: 0.1 percent
Depth to restrictive feature: 12 to 20 inches to fragipan
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Wurtsboro

Percent of map unit: 5 percent
Hydric soil rating: No

Morris

Percent of map unit: 5 percent
Hydric soil rating: No

Neversink

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Wallington

Percent of map unit: 5 percent
Hydric soil rating: No

ScB—Scriba loam, 3 to 8 percent slopes, stony

Map Unit Setting

National map unit symbol: 9x34
Mean annual precipitation: 41 to 51 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Scriba, stony, and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scriba, Stony

Setting

Landform: Drumlins, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till dominated by sandstone, with lesser amounts of limestone and shale

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
H1 - 2 to 8 inches: loam
H2 - 8 to 20 inches: channery loam
H3 - 20 to 60 inches: channery loam

Properties and qualities

Slope: 3 to 8 percent
Percent of area covered with surface fragments: 0.1 percent
Depth to restrictive feature: 12 to 20 inches to fragipan
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Morris

Percent of map unit: 5 percent
Hydric soil rating: No

Wellsboro

Percent of map unit: 5 percent
Hydric soil rating: No

Neversink

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Wurtsboro

Percent of map unit: 5 percent
Hydric soil rating: No

Wallington

Percent of map unit: 5 percent
Hydric soil rating: No

SeB—Scriba and Morris loams, gently sloping, rubbly

Map Unit Setting

National map unit symbol: 2vxdt
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Morris, rubbly, and similar soils: 40 percent
Scriba, rubbly, and similar soils: 40 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morris, Rubbly

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till from reddish sandstone, siltstone, and shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: loam
Bw - 5 to 12 inches: gravelly loam
Eg - 12 to 16 inches: gravelly loam
Bx - 16 to 60 inches: gravelly loam
C - 60 to 72 inches: gravelly loam

Properties and qualities

Slope: 2 to 8 percent
Percent of area covered with surface fragments: 20.0 percent
Depth to restrictive feature: 10 to 22 inches to fragipan
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 6 to 18 inches

Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Scriba, Rubbly

Setting
Landform: Drumlins, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till dominated by sandstone, with lesser amounts of limestone and shale

Typical profile
Oi - 0 to 2 inches: slightly decomposed plant material
H1 - 2 to 8 inches: loam
H2 - 8 to 20 inches: channery loam
H3 - 20 to 60 inches: channery loam

Properties and qualities
Slope: 2 to 8 percent
Percent of area covered with surface fragments: 20.0 percent
Depth to restrictive feature: 12 to 20 inches to fragipan
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Alden, very stony
Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Wurtsboro, extremely stony

Percent of map unit: 5 percent
Landform: Till plains, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Wellsboro, rubbly

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, side slope, head slope
Down-slope shape: Linear, concave
Across-slope shape: Linear
Hydric soil rating: No

Neversink, very stony

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

SrB—Swartswood gravelly loam, 3 to 8 percent slopes, stony

Map Unit Setting

National map unit symbol: 9x39
Elevation: 1,000 to 1,800 feet
Mean annual precipitation: 41 to 51 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Swartswood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swartswood

Setting

Landform: Till plains, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex

Across-slope shape: Convex
Parent material: Loamy till derived mainly from quartzite, conglomerate, and sandstone

Typical profile

H1 - 0 to 1 inches: gravelly loam
H2 - 1 to 26 inches: gravelly loam
H3 - 26 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 22 to 30 inches to fragipan
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 18 to 26 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Cheshire

Percent of map unit: 5 percent
Hydric soil rating: No

Wurtsboro

Percent of map unit: 5 percent
Hydric soil rating: No

Scriba

Percent of map unit: 2 percent
Hydric soil rating: No

Valois

Percent of map unit: 1 percent
Hydric soil rating: No

Wellsboro

Percent of map unit: 1 percent
Hydric soil rating: No

Lackawanna

Percent of map unit: 1 percent
Hydric soil rating: No

SrC—Swartswood gravelly loam, 8 to 15 percent slopes, stony

Map Unit Setting

National map unit symbol: 9x3b
Elevation: 1,000 to 1,800 feet
Mean annual precipitation: 41 to 51 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Swartswood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swartswood

Setting

Landform: Till plains, hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from quartzite, conglomerate, and sandstone

Typical profile

H1 - 0 to 1 inches: gravelly loam
H2 - 1 to 26 inches: gravelly loam
H3 - 26 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 22 to 30 inches to fragipan
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 18 to 26 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Cheshire

Percent of map unit: 5 percent
Hydric soil rating: No

Wurtsboro

Percent of map unit: 5 percent
Hydric soil rating: No

Scriba

Percent of map unit: 2 percent
Hydric soil rating: No

Lackawanna

Percent of map unit: 1 percent
Hydric soil rating: No

Wellsboro

Percent of map unit: 1 percent
Hydric soil rating: No

Valois

Percent of map unit: 1 percent
Hydric soil rating: No

SrD—Swartswood gravelly loam, 15 to 25 percent slopes, stony

Map Unit Setting

National map unit symbol: 9x3c
Elevation: 1,000 to 1,800 feet
Mean annual precipitation: 41 to 51 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Swartswood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swartswood

Setting

Landform: Hills, till plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from quartzite, conglomerate, and sandstone

Typical profile

H1 - 0 to 1 inches: gravelly loam
H2 - 1 to 26 inches: gravelly loam
H3 - 26 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 22 to 30 inches to fragipan
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 18 to 26 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Cheshire

Percent of map unit: 5 percent
Hydric soil rating: No

Wurtsboro

Percent of map unit: 5 percent
Hydric soil rating: No

Valois

Percent of map unit: 2 percent
Hydric soil rating: No

Lackawanna

Percent of map unit: 1 percent
Hydric soil rating: No

Lordstown

Percent of map unit: 1 percent
Hydric soil rating: No

Wellsboro

Percent of map unit: 1 percent
Hydric soil rating: No

SwE—Swartswood and Lackawanna soils, steep, extremely stony

Map Unit Setting

National map unit symbol: 2w0bw

Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Lackawanna, extremely stony, and similar soils: 40 percent
Swartswood, extremely stony, and similar soils: 40 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lackawanna, Extremely Stony

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex, concave
Across-slope shape: Convex, linear
Parent material: Loamy till derived mainly from reddish sandstone, siltstone, and shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: channery loam
Bw1 - 3 to 17 inches: channery loam
Bw2 - 17 to 26 inches: channery loam
Bx - 26 to 60 inches: channery loam
C - 60 to 72 inches: very channery loam

Properties and qualities

Slope: 15 to 35 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 17 to 36 inches to fragipan
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 16 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Swartswood, Extremely Stony

Setting

Landform: Till plains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Parent material: Loamy till derived mainly from quartzite, conglomerate, and sandstone

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
H1 - 2 to 3 inches: gravelly loam
H2 - 3 to 28 inches: gravelly loam
H3 - 28 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 15 to 35 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 22 to 30 inches to fragipan
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 18 to 26 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Wellsboro, extremely stony

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Oquaga, extremely stony

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, side slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Wurtsboro, extremely stony

Percent of map unit: 5 percent
Landform: Hills, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Cadosia, extremely stony

Percent of map unit: 5 percent

Landform: Ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

W—Water

Map Unit Setting

National map unit symbol: 9x40
Mean annual precipitation: 41 to 51 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Wd—Wayland soils complex, non-calcareous substratum, 0 to 3 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2srgt
Elevation: 160 to 1,970 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Wayland and similar soils: 60 percent
Wayland, very poorly drained, and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wayland

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Silty and clayey alluvium derived from interbedded sedimentary rock

Typical profile

Ap - 0 to 9 inches: silt loam
Bg - 9 to 21 inches: silt loam
Cg1 - 21 to 28 inches: silt loam
Cg2 - 28 to 47 inches: silt loam
Cg3 - 47 to 54 inches: silt loam
Cg4 - 54 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Very high (about 13.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Description of Wayland, Very Poorly Drained

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Silty and clayey alluvium derived from interbedded sedimentary rock

Typical profile

A - 0 to 9 inches: mucky silt loam
Bg - 9 to 21 inches: silt loam
Cg1 - 21 to 28 inches: silt loam
Cg2 - 28 to 47 inches: silt loam
Cg3 - 47 to 54 inches: silt loam
Cg4 - 54 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent

Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Very high (about 13.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Holderton

Percent of map unit: 10 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

WeB—Wellsboro gravelly loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9x44
Elevation: 1,100 to 1,800 feet
Mean annual precipitation: 41 to 51 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Wellsboro and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wellsboro

Setting

Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till derived mainly from reddish sandstone, siltstone, and shale

Typical profile

H1 - 0 to 7 inches: gravelly loam
H2 - 7 to 23 inches: gravelly loam
H3 - 23 to 60 inches: gravelly loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 12 to 30 inches to fragipan
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 10 to 28 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Morris

Percent of map unit: 4 percent
Hydric soil rating: No

Lackawanna

Percent of map unit: 3 percent
Hydric soil rating: No

Scriba

Percent of map unit: 2 percent
Hydric soil rating: No

Swartswood

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 2 percent

Wurtsboro

Percent of map unit: 2 percent
Hydric soil rating: No

WeC—Wellsboro gravelly loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9x45
Elevation: 1,100 to 1,800 feet
Mean annual precipitation: 41 to 51 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Wellsboro and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wellsboro

Setting

Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till derived mainly from reddish sandstone, siltstone, and shale

Typical profile

H1 - 0 to 7 inches: gravelly loam
H2 - 7 to 23 inches: gravelly loam
H3 - 23 to 60 inches: gravelly loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 12 to 30 inches to fragipan
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 10 to 28 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Lackawanna

Percent of map unit: 4 percent
Hydric soil rating: No

Morris

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 2 percent

Swartswood

Percent of map unit: 2 percent
Hydric soil rating: No

Oquaga

Percent of map unit: 2 percent
Hydric soil rating: No

Wurtsboro

Percent of map unit: 2 percent
Hydric soil rating: No

Scriba

Percent of map unit: 1 percent
Hydric soil rating: No

WlC—Wellsboro and Wurtsboro soils, strongly sloping, extremely stony

Map Unit Setting

National map unit symbol: 9x46
Elevation: 1,100 to 1,800 feet
Mean annual precipitation: 41 to 51 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Wellsboro, extremely stony, and similar soils: 40 percent
Wurtsboro, extremely stony, and similar soils: 40 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wellsboro, Extremely Stony

Setting

Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till derived mainly from reddish sandstone, siltstone, and shale

Typical profile

H1 - 0 to 7 inches: gravelly loam
H2 - 7 to 23 inches: gravelly loam
H3 - 23 to 60 inches: gravelly loam

Properties and qualities

Slope: 0 to 15 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 12 to 30 inches to fragipan
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 10 to 28 inches
Frequency of flooding: None
Frequency of ponding: None

Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Wurtsboro, Extremely Stony

Setting

Landform: Hills, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till derived mainly from acid quartzite, conglomerate, and sandstone

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
H1 - 2 to 4 inches: loam
H2 - 4 to 28 inches: loam
H3 - 28 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 15 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 20 to 28 inches to fragipan
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 22 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Scriba

Percent of map unit: 5 percent
Hydric soil rating: No

Swartswood

Percent of map unit: 5 percent
Hydric soil rating: No

Lackawanna

Percent of map unit: 3 percent
Hydric soil rating: No

Morris

Percent of map unit: 3 percent

Hydric soil rating: No

Lordstown

Percent of map unit: 2 percent
Hydric soil rating: No

Oquaga

Percent of map unit: 2 percent
Hydric soil rating: No

WuB—Wurtsboro loam, 3 to 8 pecent slopes, stony

Map Unit Setting

National map unit symbol: 9x4d
Elevation: 1,000 to 1,800 feet
Mean annual precipitation: 41 to 51 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Wurtsboro, stony, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wurtsboro, Stony

Setting

Landform: Hills, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till derived mainly from acid quartzite, conglomerate, and sandstone

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
H1 - 2 to 4 inches: loam
H2 - 4 to 28 inches: loam
H3 - 28 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Percent of area covered with surface fragments: 0.1 percent
Depth to restrictive feature: 20 to 28 inches to fragipan
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 22 inches

Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Swartswood

Percent of map unit: 5 percent
Hydric soil rating: No

Scriba

Percent of map unit: 5 percent
Hydric soil rating: No

Lackawanna

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 1 percent
Hydric soil rating: No

Valois

Percent of map unit: 1 percent
Hydric soil rating: No

Morris

Percent of map unit: 1 percent
Hydric soil rating: No

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APPENDIX C
RUNOFF REDUCTION AND WATER QUALITY COMPUTATIONS

Version 1.8
Last Updated: 11/09/2015

Total Water Quality Volume Calculation
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)?...		
Design Point:	1	Calculations shown for single 800sf residence. Apply design to each home.
P=	1.30	*inch*

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Description
Breakdown of Subcatchments						
1	0.04	0.02	50%	0.50	85	Bioretention
2						
3						
4						
5						
6						
7						
8						
9						
10						
Subtotal (1-30)	0.04	0.02	50%	0.50	**85**	**Subtotal 1**
Total	0.04	0.02	50%	0.50	**85**	**Initial WQv**

Technique	Total Contributing Area *(Acre)*	Contributing Impervious Area *(Acre)*	Notes
Identify Runoff Reduction Techniques By Area			
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**	

	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Runoff Coefficient Rv	WQv *(ft^3)*
Recalculate WQv after application of Area Reduction Techniques					
"<<Initial WQv"	0.04	0.02	50%	0.50	85
Subtract Area	0.00	0.00			
WQv adjusted after Area Reductions	**0.04**	**0.02**	50%	0.50	85
Disconnection of Rooftops		0.00			
Adjusted WQv after Area Reduction and Rooftop Disconnect	0.04	0.02	50%	0.50	**85**
WQv reduced by Area Reduction techniques					0

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		0.00		
	Vegetated Swale	RR-5	0.00	0.00	0	
	Rain Garden	RR-6	0.00	0.00	0	
	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	0.04	0.02	85	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	0.00	0	
Totals by Volume Reduction		→	0.00	0.00	0	
Totals by Standard SMP w/RRV		→	0.04	0.02	85	0
Totals by Standard SMP		→	0.00	0.00		0
Totals (Area + Volume + all SMPs)		→	0.04	0.02	85	0
	Impervious Cover √	okay				

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A		55%
B		40%
C	3.42	30%
D	**567.15**	20%
Total Area	570.57	
Calculate the Minimum RRv		
S =	**0.20**	
Impervious =	0.02	*acre*
Precipitation	1.3	*in*
Rv	0.95	
Minimum RRv	**16**	***ft3***
	0.00	af

NOI QUESTIONS

#	NOI Question	Reported Value	
		cf	af
28	Total Water Quality Volume (WQv) Required	85	*0.002*
30	Total RRV Provided	85	*0.002*
31	Is RRv Provided ≥WQv Required?	Yes	
32	Minimum RRv	16	*0.000*
32a	Is RRv Provided ≥ Minimum RRv Required?	Yes	
33a	Total WQv Treated	0	*0.000*
34	Sum of Volume Reduced & Treated	85	*0.002*
34	Sum of Volume Reduced and Treated	85	*0.002*
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?		

Bioretention Worksheet

(For use on HSG C or D Soils with underdrains)

Af=WQv*(df)/[k*(hf+df)(tf)]

Af	Required Surface Area (ft2)
WQv	Water Quality Volume (ft3)
df	Depth of the Soil Medium (feet)
hf	Average height of water above the planter bed
tf	Volume Through the Filter Media (days)
k	The hydraulic conductivity [ft/day], can be varied depending on the properties of the soil media. Some reported conductivity values are: ***Sand*** - 3.5 ft/day (City of Austin 1988); ***Peat*** - 2.0 ft/day (Galli 1990); ***Leaf Compost*** - 8.7 ft/day (Claytor and Schueler, 1996); ***Bioretention Soil*** (0.5 ft/day (Claytor &

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	0.04	800 sf home 0.02	0.50	0.50	84.94	1.30	Bioretention
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	50%	0.50	85	<<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*	
Soil Information							
Soil Group		D					
Soil Infiltration Rate		0.00	*in/hour*	*Okay*			
Using Underdrains?		Yes	*Okay*				
Calculate the Minimum Filter Area							
				Value		Units	Notes
WQv				85		*ft^3*	
Enter Depth of Soil Media			*df*	2.5		*ft*	*2.5-4 ft*
Enter Hydraulic Conductivity			*k*	0.5		*ft/day*	
Enter Average Height of Ponding			*hf*	0.5		*ft*	*6 inches max.*
Enter Filter Time			*tf*	2		*days*	
Required Filter Area			***Af***	**71**		***ft^2***	
Determine Actual Bio-Retention Area							
Filter Width		14	*ft*	49sf Bio at each of four roof leader discharges			
Filter Length		13	*ft*	Provide at each home site			
Filter Area		182	*ft^2*				
Actual Volume Provided		218	*ft^3*				
Determine Runoff Reduction							
Is the Bioretention contributing flow to another practice?			No	Select Practice			
RRv		87	100% RRv Provided at each rooftop				
RRv applied		**85**	***ft^3***	***This is 40% of the storage 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.*			
Volume Directed		0	*ft^3*	This volume is directed another practice			
Sizing √		OK		*Check to be sure Area provided ≥ Af*			

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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=	1.30	*inch*

Manually enter P, Total Area and Impervious Cover.

Forest Stag

Breakdown of Subcatchments						
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Description**
1	0.33	0.11	32%	0.34	524	Dry Swale
2						
3						
4						
5						
6						
7						
8						
9						
10						
Subtotal (1-30)	0.33	0.11	32%	0.34	**524**	**Subtotal 1**
Total	0.33	0.11	32%	0.34	**524**	**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"	0.33	0.11	32%	0.34	524
Subtract Area	0.00	0.00			
WQv adjusted after Area Reductions	**0.33**	**0.11**	32%	0.34	524
Disconnection of Rooftops		0.00			
Adjusted WQv after Area Reduction and Rooftop Disconnect	0.33	0.11	32%	0.34	**524**
WQv reduced by Area Reduction techniques					0

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		0.00		
	Vegetated Swale	RR-5	0.00	0.00	0	
	Rain Garden	RR-6	0.00	0.00	0	
	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	0.00	0.00	0	0
	Dry swale	O-1	0.33	0.11	524	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	0.00	0	
Totals by Volume Reduction		→	0.00	0.00	0	
Totals by Standard SMP w/RRV		→	0.33	0.11	524	0
Totals by Standard SMP		→	0.00	0.00		0
Totals (Area + Volume + all SMPs)		→	0.33	0.11	524	0
	Impervious Cover √	okay				

Minimum RRv

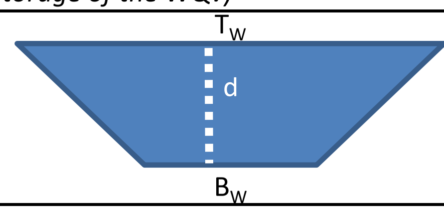
Enter the Soils Data for the site		
Soil Group	Acres	S
A		55%
B		40%
C	3.42	30%
D	**567.15**	20%
Total Area	570.57	
Calculate the Minimum RRv		
S =	**0.20**	
Impervious =	0.11	*acre*
Precipitation	1.3	*in*
Rv	0.95	
Minimum RRv	**94**	***ft3***
	0.00	af

NOI QUESTIONS

#	NOI Question	Reported Value	
		cf	af
28	Total Water Quality Volume (WQv) Required	524	*0.012*
30	Total RRV Provided	524	*0.012*
31	Is RRv Provided ≥WQv Required?	Yes	
32	Minimum RRv	94	*0.002*
32a	Is RRv Provided ≥ Minimum RRv Required?	Yes	
33a	Total WQv Treated	0	*0.000*
34	Sum of Volume Reduced & Treated	524	*0.012*
34	Sum of Volume Reduced and Treated	524	*0.012*
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?		

Dry Swale Worksheet

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**
Forest Stag 1	0.33	0.11	0.32	0.34	523.81	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops			32%	0.34	524	<<WQv after adjusting for Disconnected Rooftops	
Pretreatment Provided					**Pretreatment Technique**		
Pretreatment (10% of WQv)			52	*ft^3*			
Calculate Available Storage Capacity							
Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet				
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope				
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*				
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*				
Top Width	17	*ft*					
Area	18.75	*sf*					
Minimum Length	25	*ft*					
Actual Length	137	*ft*					
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*				
Storage Capacity	2,621	*ft^3*					
Soil Group (HSG)			D				
Runoff Reduction							
Is the Dry Swale contributing flow to another practice?			No	Select Practice			
RRv	**524**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**				
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale				
Volume Directed	0	*ft^3*	This volume is directed another practice				
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv				

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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=	1.30	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**
East Access 1	0.64	0.21	33%	0.35	1,050	Dry Swale
2						
3						
4						
5						
6						
7						
8						
9						
10						
Subtotal (1-30)	0.64	0.21	33%	0.35	**1,050**	**Subtotal 1**
Total	0.64	0.21	33%	0.35	**1,050**	**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"	0.64	0.21	33%	0.35	1,050
Subtract Area	0.00	0.00			
WQv adjusted after Area Reductions	**0.64**	**0.21**	33%	0.35	1,050
Disconnection of Rooftops		0.00			
Adjusted WQv after Area Reduction and Rooftop Disconnect	0.64	0.21	33%	0.35	**1,050**
WQv reduced by Area Reduction techniques					0

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		0.00		
	Vegetated Swale	RR-5	0.00	0.00	0	
	Rain Garden	RR-6	0.00	0.00	0	
	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	0.00	0.00	0	0
	Dry swale	O-1	0.64	0.21	1050	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	0.00	0	
Totals by Volume Reduction		→	0.00	0.00	0	
Totals by Standard SMP w/RRV		→	0.64	0.21	1050	0
Totals by Standard SMP		→	0.00	0.00		0
Totals (Area + Volume + all SMPs)		→	0.64	0.21	1,050	0
	Impervious Cover √	okay				

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A		55%
B		40%
C	3.42	30%
D	**567.15**	20%
Total Area	570.57	
Calculate the Minimum RRv		
S =	**0.20**	
Impervious =	0.21	*acre*
Precipitation	1.3	*in*
Rv	0.95	
Minimum RRv	**191**	***ft3***
	0.00	af

NOI QUESTIONS

#	NOI Question	Reported Value	
		cf	af
28	Total Water Quality Volume (WQv) Required	1050	*0.024*
30	Total RRV Provided	1050	*0.024*
31	Is RRv Provided ≥WQv Required?	Yes	
32	Minimum RRv	191	*0.004*
32a	Is RRv Provided ≥ Minimum RRv Required?	Yes	
33a	Total WQv Treated	0	*0.000*
34	Sum of Volume Reduced & Treated	1050	*0.024*
34	Sum of Volume Reduced and Treated	1050	*0.024*
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?		

Dry Swale Worksheet

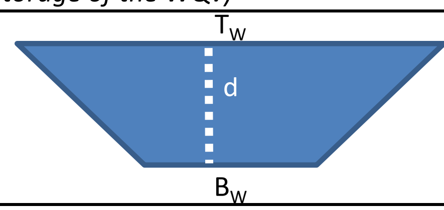
Design Point:	**1**

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**
East Access 1	0.64	0.21	0.33	0.35	1050.45	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	33%	0.35	1,050	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			**Pretreatment Technique**
Pretreatment (10% of WQv)	105	*ft^3*	

Calculate Available Storage Capacity

Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	50	*ft*	
Actual Length	275	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	5,261	*ft^3*	
Soil Group (HSG)			D

Runoff Reduction

Is the Dry Swale contributing flow to another practice?	No	Select Practice	
RRv	**1,050**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale
Volume Directed	0	*ft^3*	This volume is directed another practice
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv

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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	Max 0.05/ 2,000 sf				Disconnection of Rooftops/Driveways
Design Elements					
Is another area based practice applied to this area?	*No*				
Soil Type	D				
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* Applicable only to Bio areas		
Contributing Area of Rooftop to Downspout	500	*sf*	*Okay*		
Contributing Area of Rooftop	500	*sf*	*500 sf maximum. Up to 2000 sf with suitable flow dispersion technique*		
Method of flow dispersion	NA		*required If area to downspout >500 sf*		
Flow length thru vegetated channel, swale or filter	Min 25	*ft*	*vegetated area must be equal to or greater than the length of contributing impervious*		
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	**0.05**	***Acres from the Total Impervious Area of Sub-catchment Number***			**1**

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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=	1.30	*inch*

Manually enter P, Total Area and Impervious Cover.

Breakdown of Subcatchments						
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft³)*	**Description**
Lot 1	0.18	0.06	33%	0.35	297	Dry Swale
Lot 2	0.14	0.05	33%	0.35	238	Dry Swale
Lot 3	0.30	0.10	33%	0.35	500	Dry Swale
Lot 4	0.15	0.05	33%	0.35	248	Dry Swale
5						
6						
7						
8						
9						
10						
Subtotal (1-30)	0.78	0.26	33%	0.35	**1,283**	**Subtotal 1**
Total	0.78	0.26	33%	0.35	**1,283**	**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** *(ft³)*
"<<Initial WQv"	0.78	0.26	33%	0.35	1,283
Subtract Area	0.00	0.00			
WQv adjusted after Area Reductions	**0.78**	**0.26**	33%	0.35	1,283
Disconnection of Rooftops		0.19			
Adjusted WQv after Area Reduction and Rooftop Disconnect	0.78	0.07	9%	0.13	**481**
WQv reduced by Area Reduction techniques					803

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		0.19		
	Vegetated Swale	RR-5	0.00	0.00	0	
	Rain Garden	RR-6	0.00	0.00	0	
	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	0.00	0.00	0	0
	Dry swale	O-1	0.78	0.07	481	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	0.19	803	
Totals by Volume Reduction		→	0.00	0.00	0	
Totals by Standard SMP w/RRV		→	0.78	0.07	481	0
Totals by Standard SMP		→	0.00	0.00		0
Totals (Area + Volume + all SMPs)		→	0.78	0.26	1,283	0
	Impervious Cover √	okay				

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A		55%
B		40%
C	3.42	30%
D	**567.15**	20%
Total Area	570.57	
Calculate the Minimum RRv		
S =	**0.20**	
Impervious =	0.26	*acre*
Precipitation	1.3	*in*
Rv	0.95	
Minimum RRv	**233**	***ft3***
	0.01	af

NOI QUESTIONS

#	NOI Question	Reported Value	
		cf	af
28	Total Water Quality Volume (WQv) Required	1283	*0.029*
30	Total RRV Provided	1283	*0.029*
31	Is RRv Provided ≥WQv Required?	Yes	
32	Minimum RRv	233	*0.005*
32a	Is RRv Provided ≥ Minimum RRv Required?	Yes	
33a	Total WQv Treated	0	*0.000*
34	Sum of Volume Reduced & Treated	1283	*0.029*
34	Sum of Volume Reduced and Treated	1283	*0.029*
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?		

Dry Swale Worksheet

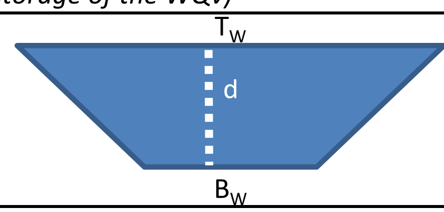
Design Point:	1

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**
Lot 1	0.18	0.06	0.33	0.35	297.30	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.02	21%	0.24	200	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			**Pretreatment Technique**
Pretreatment (10% of WQv)	20	ft^3	Plunge Pool

Calculate Available Storage Capacity

Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	10	*ft*	
Actual Length	53	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	1,014	*ft^3*	
Soil Group (HSG)			D

Runoff Reduction

Is the Dry Swale contributing flow to another practice? 100% RRv Provided		No	Select Practice	
RRv	**200**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**	
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale	
Volume Directed	0	*ft^3*	This volume is directed another practice	
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv	

Dry Swale Worksheet

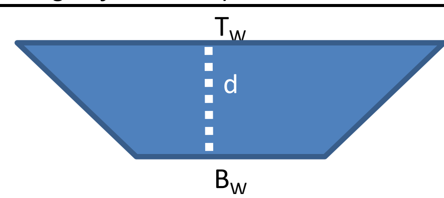
Design Point:	1

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
Lot 2	0.14	0.05	0.33	0.35	237.84	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.05	-1%	0.04	30	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			Pretreatment Technique
Pretreatment (10% of WQv)	3	*ft^3*	Plunge Pool

Calculate Available Storage Capacity

Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	1	*ft*	
Actual Length	8	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	153	*ft^3*	
Soil Group (HSG)			D

Runoff Reduction

Is the Dry Swale contributing flow to another practice? 100% RRv Provided	No	Select Practice	
RRv	**30**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale
Volume Directed	0	*ft^3*	This volume is directed another practice
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv

Dry Swale Worksheet

Design Point:	1

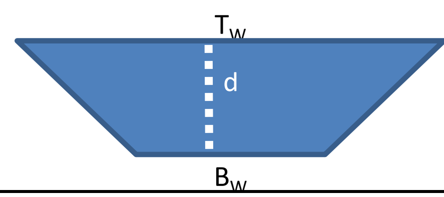
Enter Site Data For Drainage Area to be Treated by Practice

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Precipitation *(in)*	Description
Lot 3	0.30	0.10	0.33	0.35	500.45	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.07	11%	0.15	212	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			Pretreatment Technique
Pretreatment (10% of WQv)	21	*ft^3*	Plunge Pool

Calculate Available Storage Capacity

Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	10	*ft*	
Actual Length	56	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	1,071	*ft^3*	
Soil Group (HSG)		D	



Runoff Reduction

Is the Dry Swale contributing flow to another practice? 100% RRv Provided	No	Select Practice	
RRv	**212**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale
Volume Directed	0	*ft^3*	This volume is directed another practice
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv

Dry Swale Worksheet

Design Point:	1

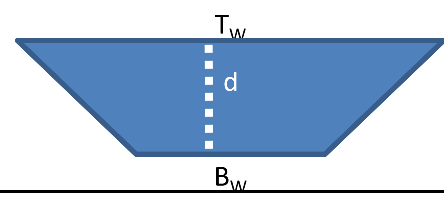
Enter Site Data For Drainage Area to be Treated by Practice

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious %	Rv	WQv *(ft^3)*	Precipitation *(in)*	Description
Lot 4	0.15	0.05	0.33	0.35	247.75	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.05	1%	0.06	40	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			**Pretreatment Technique**
Pretreatment (10% of WQv)	4	*ft^3*	Plunge Pool

Calculate Available Storage Capacity

Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	2	*ft*	
Actual Length	11	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	210	*ft^3*	
Soil Group (HSG)			D



Runoff Reduction

Is the Dry Swale contributing flow to another practice? 100% RRv Provided	No	Select Practice	
RRv	**40**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale
Volume Directed	0	*ft^3*	This volume is directed another practice
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv

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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		*Manually enter P, Total Area and Impervious Cover.*			
P=	1.30	*inch*				

Breakdown of Subcatchments						
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Description**
Lot 5 1	0.21	0.07	34%	0.35	351	Dry Swale
Lot 6 2	0.20	0.07	33%	0.35	337	Dry Swale
Lot 7 3	0.25	0.08	33%	0.35	406	Dry Swale
Lot 8 4	0.05	0.02	33%	0.35	84	Dry Swale
5						
6						
7						
8						
9						
10						
Subtotal (1-30)	0.71	0.24	33%	0.35	**1,179**	**Subtotal 1**
Total	0.71	0.24	33%	0.35	**1,179**	**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"	0.71	0.24	33%	0.35	1,179
Subtract Area	0.00	0.00			
WQv adjusted after Area Reductions	**0.71**	**0.24**	33%	0.35	1,179
Disconnection of Rooftops		0.20			
Adjusted WQv after Area Reduction and Rooftop Disconnect	0.71	0.04	6%	0.10	**338**
WQv reduced by Area Reduction techniques					841

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		0.20		
	Vegetated Swale	RR-5	0.00	0.00	0	
	Rain Garden	RR-6	0.00	0.00	0	
	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	0.00	0.00	0	0
	Dry swale	O-1	0.71	0.04	338	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	0.20	841	
	Totals by Volume Reduction	→	0.00	0.00	0	
	Totals by Standard SMP w/RRV	→	0.71	0.04	338	0
	Totals by Standard SMP	→	0.00	0.00		0
	Totals (Area + Volume + all SMPs)	→	0.71	0.24	1,179	0
	Impervious Cover √	okay				

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A		55%
B		40%
C	3.42	30%
D	**567.15**	20%
Total Area	570.57	
Calculate the Minimum RRv		
S =	**0.20**	
Impervious =	0.24	*acre*
Precipitation	1.3	*in*
Rv	0.95	
Minimum RRv	**214**	***ft3***
	0.00	af

NOI QUESTIONS

#	NOI Question	Reported Value	
		cf	af
28	Total Water Quality Volume (WQv) Required	1179	*0.027*
30	Total RRV Provided	1179	*0.027*
31	Is RRv Provided ≥WQv Required?	Yes	
32	Minimum RRv	214	*0.005*
32a	Is RRv Provided ≥ Minimum RRv Required?	Yes	
33a	Total WQv Treated	0	*0.000*
34	Sum of Volume Reduced & Treated	1179	*0.027*
34	Sum of Volume Reduced and Treated	1179	*0.027*
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?		

Dry Swale Worksheet

Design Point:	1

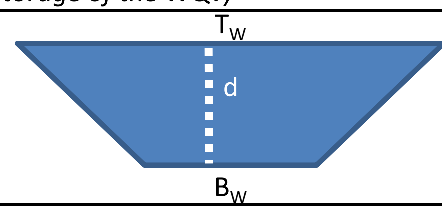
Enter Site Data For Drainage Area to be Treated by Practice

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious %	Rv	WQv *(ft^3)*	Precipitation *(in)*	Description
Lot 5 1	0.21	0.07	0.34	0.35	351.09	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.07	0%	0.05	50	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			Pretreatment Technique
Pretreatment (10% of WQv)	5	*ft^3*	Plunge Pool

Calculate Available Storage Capacity

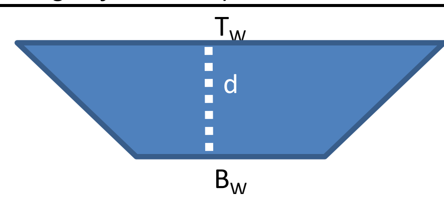
Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	2	*ft*	
Actual Length	13	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	249	*ft^3*	
Soil Group (HSG)			D



Runoff Reduction

Is the Dry Swale contributing flow to another practice?	No	Select Practice	
RRv	**50**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale
Volume Directed	0	*ft^3*	This volume is directed another practice
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv

Dry Swale Worksheet

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**
Lot 6 2	0.20	0.07	0.33	0.35	336.94	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.03	20%	0.23	218	<<WQv after adjusting for Disconnected Rooftops	
Pretreatment Provided					**Pretreatment Technique**		
Pretreatment (10% of WQv)			22	ft^3	Plunge Pool		
Calculate Available Storage Capacity							
Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet				
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope				
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*				
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*				
Top Width	17	*ft*					
Area	18.75	*sf*					
Minimum Length	10	*ft*					
Actual Length	57	*ft*					
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*				
Storage Capacity	1,091	ft^3					
Soil Group (HSG)			D				
Runoff Reduction							
Is the Dry Swale contributing flow to another practice?			No	Select Practice			
RRv	**218**	ft^3	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**				
Volume Treated	0	ft^3	This is the difference between the WQv calculated and the runoff reduction achieved in the swale				
Volume Directed	0	ft^3	This volume is directed another practice				
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv				

Dry Swale Worksheet

Design Point:	1

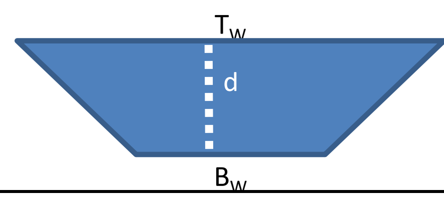
Enter Site Data For Drainage Area to be Treated by Practice

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Precipitation *(in)*	Description
Lot 7 3	0.25	0.08	0.33	0.35	406.31	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.08	0%	0.05	58	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			Pretreatment Technique
Pretreatment (10% of WQv)	6	*ft^3*	Plunge Pool

Calculate Available Storage Capacity

Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	3	*ft*	
Actual Length	16	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	306	*ft^3*	
Soil Group (HSG)			D



Runoff Reduction

Is the Dry Swale contributing flow to another practice?	No	Select Practice	
RRv	**58**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale
Volume Directed	0	*ft^3*	This volume is directed another practice
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv

Dry Swale Worksheet

Design Point:	1

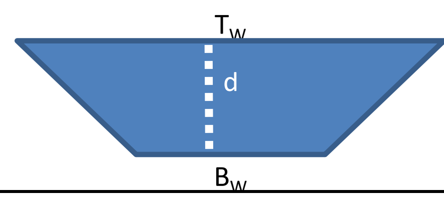
Enter Site Data For Drainage Area to be Treated by Practice

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Precipitation *(in)*	Description
Lot 8 4	0.05	0.02	0.33	0.35	84.23	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.02	0%	0.05	12	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			Pretreatment Technique
Pretreatment (10% of WQv)	1	*ft^3*	Plunge Pool

Calculate Available Storage Capacity

Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	1	*ft*	
Actual Length	4	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	76	*ft^3*	
Soil Group (HSG)		D	



Runoff Reduction

Is the Dry Swale contributing flow to another practice?	No	Select Practice	
RRv	**12**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale
Volume Directed	0	*ft^3*	This volume is directed another practice
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv

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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=	1.30	*inch*

Manually enter P, Total Area and Impervious Cover.

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft³)*	Description
Breakdown of Subcatchments						
Lot 9 1	0.17	0.06	33%	0.35	282	Dry Swale
Lot 10 2	0.24	0.08	33%	0.35	401	Dry Swale
Lot 11 3	0.21	0.07	33%	0.35	347	Dry Swale
Lot 12 4	0.26	0.09	33%	0.35	426	Dry Swale
5						
6						
7						
8						
9						
10						
Subtotal (1-30)	0.88	0.29	33%	0.35	**1,457**	**Subtotal 1**
Total	0.88	0.29	33%	0.35	**1,457**	**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 *(ft³)*
"<<Initial WQv"	0.88	0.29	33%	0.35	1,457
Subtract Area	0.00	0.00			
WQv adjusted after Area Reductions	**0.88**	**0.29**	33%	0.35	1,457
Disconnection of Rooftops		0.14			
Adjusted WQv after Area Reduction and Rooftop Disconnect	0.88	0.16	18%	0.21	**871**
WQv reduced by Area Reduction techniques					586

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		0.14		
	Vegetated Swale	RR-5	0.00	0.00	0	
	Rain Garden	RR-6	0.00	0.00	0	
	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	0.00	0.00	0	0
	Dry swale	O-1	0.88	0.16	871	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	0.14	586	
Totals by Volume Reduction		→	0.00	0.00	0	
Totals by Standard SMP w/RRV		→	0.88	0.16	871	0
Totals by Standard SMP		→	0.00	0.00		0
Totals (Area + Volume + all SMPs)		→	0.88	0.29	1,457	0
	Impervious Cover √	okay				

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A		55%
B		40%
C	3.42	30%
D	**567.15**	20%
Total Area	570.57	
Calculate the Minimum RRv		
S =	**0.20**	
Impervious =	0.29	*acre*
Precipitation	1.3	*in*
Rv	0.95	
Minimum RRv	**264**	***ft3***
	0.01	af

NOI QUESTIONS

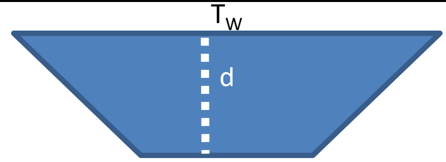
#	NOI Question	Reported Value	
		cf	af
28	Total Water Quality Volume (WQv) Required	1457	*0.033*
30	Total RRV Provided	1457	*0.033*
31	Is RRv Provided ≥WQv Required?	Yes	
32	Minimum RRv	264	*0.006*
32a	Is RRv Provided ≥ Minimum RRv Required?	Yes	
33a	Total WQv Treated	0	*0.000*
34	Sum of Volume Reduced & Treated	1457	*0.033*
34	Sum of Volume Reduced and Treated	1457	*0.033*
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?		

Dry Swale Worksheet

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**
Lot 9 1	0.17	0.06	0.33	0.35	282.43	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.06	0%	0.05	40	<<WQv after adjusting for Disconnected Rooftops	
Pretreatment Provided					**Pretreatment Technique**		
Pretreatment (10% of WQv)		4	ft^3		Plunge Pool		

Calculate Available Storage Capacity			
Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	2	*ft*	
Actual Length	11	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	210	ft^3	
Soil Group (HSG)			D

Runoff Reduction			
Is the Dry Swale contributing flow to another practice?		No	Select Practice
RRv	**40**	ft^3	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	0	ft^3	This is the difference between the WQv calculated and the runoff reduction achieved in the swale
Volume Directed	0	ft^3	This volume is directed another practice
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv

Dry Swale Worksheet

Design Point:	**1**

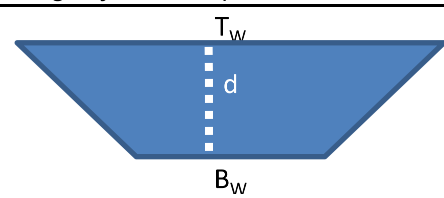
Enter Site Data For Drainage Area to be Treated by Practice

Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
Lot 10[2]	0.24	0.08	0.33	0.35	401.35	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.08	0%	0.05	57	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			**Pretreatment Technique**
Pretreatment (10% of WQv)	6	*ft^3*	Plunge Pool

Calculate Available Storage Capacity

Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	3	*ft*	
Actual Length	15	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	287	*ft^3*	
Soil Group (HSG)			D



Runoff Reduction

Is the Dry Swale contributing flow to another practice?		No	Select Practice	
RRv	**57**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**	
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale	
Volume Directed	0	*ft^3*	This volume is directed another practice	
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv	

Dry Swale Worksheet

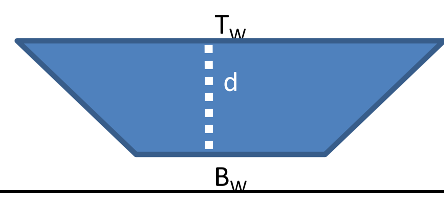
Design Point:	1

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
Lot 11[3]	0.21	0.07	0.33	0.35	346.85	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	33%	0.35	347	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			Pretreatment Technique
Pretreatment (10% of WQv)	35	*ft^3*	Plunge Pool

Calculate Available Storage Capacity

Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	17	*ft*	
Actual Length	91	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	1,741	*ft^3*	
Soil Group (HSG)			D

Runoff Reduction

Is the Dry Swale contributing flow to another practice?		No	Select Practice
RRv	**347**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale
Volume Directed	0	*ft^3*	This volume is directed another practice
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv

Dry Swale Worksheet

Design Point:	1

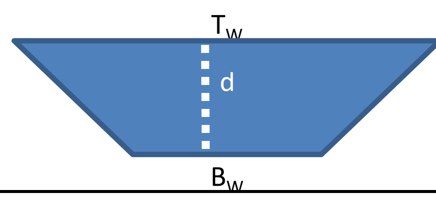
Enter Site Data For Drainage Area to be Treated by Practice

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Precipitation *(in)*	Description
Lot 12[4]	0.26	0.09	0.33	0.35	426.13	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	33%	0.35	426	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			Pretreatment Technique
Pretreatment (10% of WQv)	43	ft^3	Plunge Pool

Calculate Available Storage Capacity

Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	20	*ft*	
Actual Length	112	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	2,143	ft^3	
Soil Group (HSG)			D



Runoff Reduction

Is the Dry Swale contributing flow to another practice?		No	Select Practice
RRv	**426**	ft^3	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	0	ft^3	This is the difference between the WQv calculated and the runoff reduction achieved in the swale
Volume Directed	0	ft^3	This volume is directed another practice
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv

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Version 1.8
Last Updated: 11/09/2015

Total Water Quality Volume Calculation
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=	1.30	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**
Lot 13 1	0.18	0.06	33%	0.35	297	Dry Swale
Lot 14 2	0.24	0.08	33%	0.35	391	Dry Swale
Lot 15 3	0.22	0.07	33%	0.35	362	Dry Swale
Lot 16 4	0.18	0.06	33%	0.35	292	Dry Swale
5						
6						
7						
8						
9						
10						
Subtotal (1-30)	0.81	0.27	33%	0.35	**1,343**	**Subtotal 1**
Total	0.81	0.27	33%	0.35	**1,343**	**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"	0.81	0.27	33%	0.35	1,343
Subtract Area	0.00	0.00			
WQv adjusted after Area Reductions	**0.81**	**0.27**	33%	0.35	1,343
Disconnection of Rooftops		0.11			
Adjusted WQv after Area Reduction and Rooftop Disconnect	0.81	0.17	20%	0.23	**893**
WQv reduced by Area Reduction techniques					450

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		0.11		
	Vegetated Swale	RR-5	0.00	0.00	0	
	Rain Garden	RR-6	0.00	0.00	0	
	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	0.00	0.00	0	0
	Dry swale	O-1	0.81	0.17	893	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	0.11	450	
	Totals by Volume Reduction	→	0.00	0.00	0	
	Totals by Standard SMP w/RRV	→	0.81	0.17	893	0
	Totals by Standard SMP	→	0.00	0.00		0
	Totals (Area + Volume + all SMPs)	→	0.81	0.27	1,343	0
	Impervious Cover √	okay				

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A		55%
B		40%
C	3.42	30%
D	**567.15**	20%
Total Area	570.57	
Calculate the Minimum RRv		
S =	**0.20**	
Impervious =	0.27	*acre*
Precipitation	1.3	*in*
Rv	0.95	
Minimum RRv	**244**	***ft3***
	0.01	af

NOI QUESTIONS

#	NOI Question	Reported Value	
		cf	af
28	Total Water Quality Volume (WQv) Required	1343	*0.031*
30	Total RRV Provided	1343	*0.031*
31	Is RRv Provided ≥WQv Required?	Yes	
32	Minimum RRv	244	*0.006*
32a	Is RRv Provided ≥ Minimum RRv Required?	Yes	
33a	Total WQv Treated	0	*0.000*
34	Sum of Volume Reduced & Treated	1343	*0.031*
34	Sum of Volume Reduced and Treated	1343	*0.031*
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?		

Dry Swale Worksheet

Design Point:	1

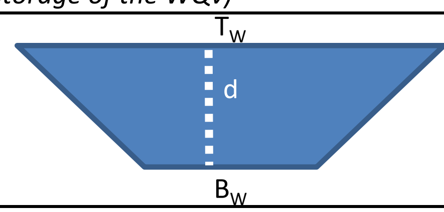
Enter Site Data For Drainage Area to be Treated by Practice

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Precipitation *(in)*	Description
Lot 13[1]	0.18	0.06	0.33	0.35	297.30	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	33%	0.35	297	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			Pretreatment Technique
Pretreatment (10% of WQv)	30	*ft^3*	Plunge Pool

Calculate Available Storage Capacity

Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	14	*ft*	
Actual Length	78	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	1,492	*ft^3*	
Soil Group (HSG)			D



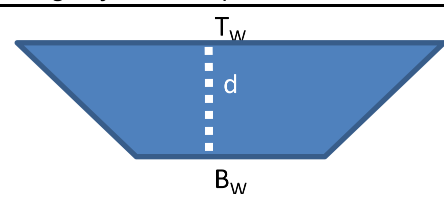
Runoff Reduction

Is the Dry Swale contributing flow to another practice?	No	Select Practice	
RRv	**297**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale
Volume Directed	0	*ft^3*	This volume is directed another practice
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv

Dry Swale Worksheet

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 Lot 14	0.24	0.08	0.33	0.35	391.44	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.08	0%	0.05	56	<<WQv after adjusting for Disconnected Rooftops	
Pretreatment Provided					**Pretreatment Technique**		
Pretreatment (10% of WQv)			6	ft^3	Plunge Pool		
Calculate Available Storage Capacity							
Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet				
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope				
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*				
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*				
Top Width	17	*ft*					
Area	18.75	*sf*					
Minimum Length	3	*ft*					
Actual Length	15	*ft*					
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*				
Storage Capacity	287	ft^3					
Soil Group (HSG)			D				
Runoff Reduction							
Is the Dry Swale contributing flow to another practice?			No	Select Practice			
RRv	**56**	ft^3	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**				
Volume Treated	0	ft^3	This is the difference between the WQv calculated and the runoff reduction achieved in the swale				
Volume Directed	0	ft^3	This volume is directed another practice				
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv				



Dry Swale Worksheet

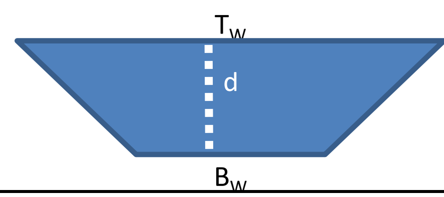
Design Point:	1

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 Lot 15	0.22	0.07	0.33	0.35	361.71	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	33%	0.35	362	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			Pretreatment Technique
Pretreatment (10% of WQv)	36	*ft^3*	Plunge Pool

Calculate Available Storage Capacity

Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	17	*ft*	
Actual Length	95	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	1,817	*ft^3*	
Soil Group (HSG)			D

Runoff Reduction

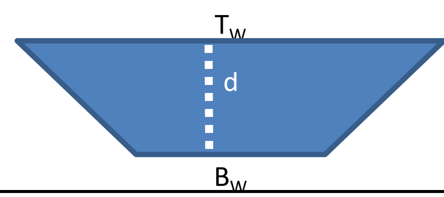
Is the Dry Swale contributing flow to another practice?	No	Select Practice	
RRv	**362**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale
Volume Directed	0	*ft^3*	This volume is directed another practice
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv

Dry Swale Worksheet

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**
4 Lot 16	0.18	0.06	0.33	0.35	292.34	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.03	18%	0.21	178	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			**Pretreatment Technique**
Pretreatment (10% of WQv)	18	*ft^3*	Plunge Pool

Calculate Available Storage Capacity			
Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	9	*ft*	
Actual Length	47	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	899	*ft^3*	
Soil Group (HSG)			D

Runoff Reduction			
Is the Dry Swale contributing flow to another practice?	No	Select Practice	
RRv	**178**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale
Volume Directed	0	*ft^3*	This volume is directed another practice
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv

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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=	1.30	inch

Manually enter P, Total Area and Impervious Cover.

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Description
Breakdown of Subcatchments						
Lot 17 1	0.07	0.02	33%	0.35	119	Dry Swale
Lot 18 2	0.04	0.01	33%	0.35	64	Dry Swale
Lot 19 3	0.04	0.01	31%	0.33	60	Dry Swale
Lot 20 4	0.20	0.07	33%	0.35	322	Dry Swale
5						
6						
7						
8						
9						
10						
Subtotal (1-30)	0.35	0.11	33%	0.35	**566**	**Subtotal 1**
Total	0.35	0.11	33%	0.35	**566**	**Initial WQv**

Technique	Total Contributing Area *(Acre)*	Contributing Impervious Area *(Acre)*	Notes
Identify Runoff Reduction Techniques By Area			
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**	

	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Runoff Coefficient Rv	WQv *(ft^3)*
Recalculate WQv after application of Area Reduction Techniques					
"<<Initial WQv"	0.35	0.11	33%	0.35	566
Subtract Area	0.00	0.00			
WQv adjusted after Area Reductions	**0.35**	**0.11**	33%	0.35	566
Disconnection of Rooftops		0.08			
Adjusted WQv after Area Reduction and Rooftop Disconnect	0.35	0.04	10%	0.14	**234**
WQv reduced by Area Reduction techniques					331

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		0.08		
	Vegetated Swale	RR-5	0.00	0.00	0	
	Rain Garden	RR-6	0.00	0.00	0	
	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	0.00	0.00	0	0
	Dry swale	O-1	0.35	0.04	234	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	0.08	331	
	Totals by Volume Reduction	→	0.00	0.00	0	
	Totals by Standard SMP w/RRV	→	0.35	0.04	234	0
	Totals by Standard SMP	→	0.00	0.00		0
	Totals (Area + Volume + all SMPs)	→	0.35	0.11	566	0
	Impervious Cover √	okay				

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A		55%
B		40%
C	3.42	30%
D	**567.15**	20%
Total Area	570.57	
Calculate the Minimum RRv		
S =	**0.20**	
Impervious =	0.11	*acre*
Precipitation	1.3	*in*
Rv	0.95	
Minimum RRv	**103**	***ft3***
	0.00	af

NOI QUESTIONS

#	NOI Question	Reported Value	
		cf	af
28	Total Water Quality Volume (WQv) Required	566	*0.013*
30	Total RRV Provided	566	*0.013*
31	Is RRv Provided ≥WQv Required?	Yes	
32	Minimum RRv	103	*0.002*
32a	Is RRv Provided ≥ Minimum RRv Required?	Yes	
33a	Total WQv Treated	0	*0.000*
34	Sum of Volume Reduced & Treated	566	*0.013*
34	Sum of Volume Reduced and Treated	566	*0.013*
35	Is Sum RRv Provided and WQv Provided ≥WQv Required?	Yes	

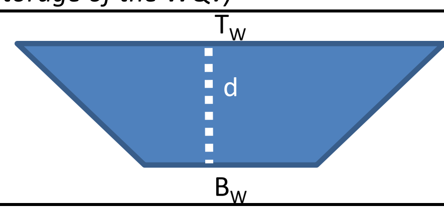
Apply Peak Flow Attenuation			
36	Channel Protection	*Cpv*	
37	Overbank	*Qp*	
37	Extreme Flood Control	*Qf*	
	Are Quantity Control requirements met?		

Dry Swale Worksheet

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 Lot 17	0.07	0.02	0.33	0.35	118.92	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.02	0%	0.05	17	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			**Pretreatment Technique**
Pretreatment (10% of WQv)	2	*ft^3*	Plunge Pool

Calculate Available Storage Capacity			
Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	1	*ft*	
Actual Length	5	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	95	*ft^3*	
Soil Group (HSG)		D	

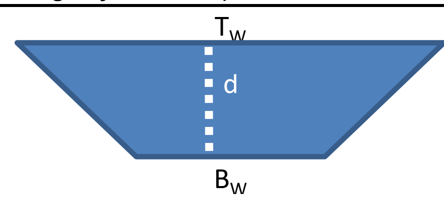
Runoff Reduction			
Is the Dry Swale contributing flow to another practice?	No	Select Practice	
RRv	**17**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale
Volume Directed	0	*ft^3*	This volume is directed another practice
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv

Dry Swale Worksheet

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**
Lot 18 2	0.04	0.01	0.33	0.35	64.41	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.01	15%	0.19	35	<<WQv after adjusting for Disconnected Rooftops	
Pretreatment Provided					**Pretreatment Technique**		
Pretreatment (10% of WQv)			3	*ft^3*	Plunge Pool		

Calculate Available Storage Capacity			
Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	2	*ft*	
Actual Length	10	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	191	*ft^3*	
Soil Group (HSG)			D



Runoff Reduction			
Is the Dry Swale contributing flow to another practice?	No	Select Practice	
RRv	**35**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale
Volume Directed	0	*ft^3*	This volume is directed another practice
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv

Dry Swale Worksheet

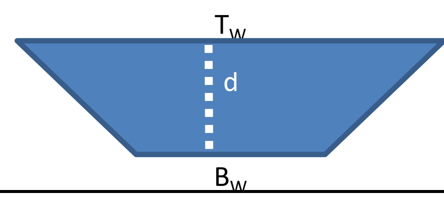
Design Point:	1

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
Lot 19[3]	0.04	0.01	0.31	0.33	60.17	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.01	0%	0.05	9	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			Pretreatment Technique
Pretreatment (10% of WQv)	1	*ft^3*	Plunge Pool

Calculate Available Storage Capacity

Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	0	*ft*	
Actual Length	3	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	57	*ft^3*	
Soil Group (HSG)			D

Runoff Reduction

Is the Dry Swale contributing flow to another practice?		No	Select Practice
RRv	**9**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale
Volume Directed	0	*ft^3*	This volume is directed another practice
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv

Dry Swale Worksheet

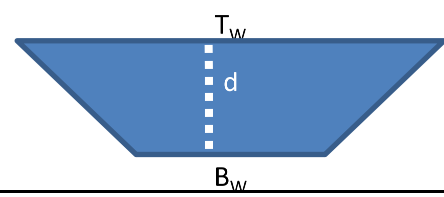
Design Point:	**1**

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**
4 Lot 20	0.20	0.07	0.33	0.35	322.07	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.04	15%	0.19	173	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			**Pretreatment Technique**
Pretreatment (10% of WQv)	17	ft^3	Plunge Pool

Calculate Available Storage Capacity

Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	8	*ft*	
Actual Length	46	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	880	*ft^3*	
Soil Group (HSG)			D

Runoff Reduction

Is the Dry Swale contributing flow to another practice?		No	Select Practice	
RRv	**173**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**	
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale	
Volume Directed	0	*ft^3*	This volume is directed another practice	
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv	

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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		*Manually enter P, Total Area and Impervious Cover.*			
P=	1.30	*inch*				

Breakdown of Subcatchments						
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Description**
Lot 21 1	0.15	0.05	33%	0.35	248	Dry Swale
2						
3						
4						
5						
6						
7						
8						
9						
10						
Subtotal (1-30)	0.15	0.05	33%	0.35	**248**	**Subtotal 1**
Total	0.15	0.05	33%	0.35	**248**	**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"	0.15	0.05	33%	0.35	248
Subtract Area	0.00	0.00			
WQv adjusted after Area Reductions	**0.15**	**0.05**	33%	0.35	248
Disconnection of Rooftops		0.05			
Adjusted WQv after Area Reduction and Rooftop Disconnect	0.15	0.00	0%	0.05	**35**
WQv reduced by Area Reduction techniques					212

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		0.05		
	Vegetated Swale	RR-5	0.00	0.00	0	
	Rain Garden	RR-6	0.00	0.00	0	
	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	0.00	0.00	0	0
	Dry swale	O-1	0.15	0.00	35	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	0.05	212	
	Totals by Volume Reduction	→	0.00	0.00	0	
	Totals by Standard SMP w/RRV	→	0.15	0.00	35	0
	Totals by Standard SMP	→	0.00	0.00		0
	Totals (Area + Volume + all SMPs)	→	0.15	0.05	248	0
	Impervious Cover √	okay				

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A		55%
B		40%
C	3.42	30%
D	**567.15**	20%
Total Area	570.57	
Calculate the Minimum RRv		
S =	**0.20**	
Impervious =	0.05	*acre*
Precipitation	1.3	*in*
Rv	0.95	
Minimum RRv	**45**	***ft3***
	0.00	af

NOI QUESTIONS

#	NOI Question	Reported Value	
		cf	af
28	Total Water Quality Volume (WQv) Required	248	*0.006*
30	Total RRV Provided	248	*0.006*
31	Is RRv Provided ≥WQv Required?	Yes	
32	Minimum RRv	45	*0.001*
32a	Is RRv Provided ≥ Minimum RRv Required?	Yes	
33a	Total WQv Treated	0	*0.000*
34	Sum of Volume Reduced & Treated	248	*0.006*
34	Sum of Volume Reduced and Treated	248	*0.006*
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?		

Dry Swale Worksheet

Design Point:	1

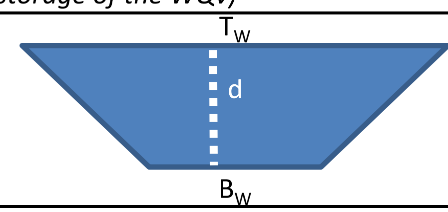
Enter Site Data For Drainage Area to be Treated by Practice

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Precipitation *(in)*	Description
Lot 21[1]	0.15	0.05	0.33	0.35	247.75	1.30	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.05	0%	0.05	35	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			Pretreatment Technique
Pretreatment (10% of WQv)	4	*ft^3*	Plunge Pool

Calculate Available Storage Capacity

Bottom Width	8	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	4%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	1.5	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	18.75	*sf*	
Minimum Length	2	*ft*	
Actual Length	10	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	191	*ft^3*	
Soil Group (HSG)			D



Runoff Reduction

Is the Dry Swale contributing flow to another practice?	No	Select Practice	
RRv	**35**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**
Volume Treated	0	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale
Volume Directed	0	*ft^3*	This volume is directed another practice
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv

APPENDIX D
HYDROLOGIC AND HYDRAULIC COMPUTATIONS

NOAA Atlas 14, Volume 10, Version 3
Location name: Forestburgh, New York, USA*
Latitude: 41.5506°, Longitude: -74.748°
Elevation: 1243.28 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.332** (0.252-0.437)	**0.400** (0.303-0.527)	**0.511** (0.386-0.676)	**0.603** (0.453-0.801)	**0.730** (0.533-1.01)	**0.826** (0.592-1.16)	**0.925** (0.646-1.35)	**1.03** (0.690-1.54)	**1.18** (0.764-1.82)	**1.30** (0.824-2.04)
10-min	**0.471** (0.357-0.620)	**0.567** (0.429-0.747)	**0.724** (0.547-0.957)	**0.854** (0.642-1.13)	**1.03** (0.755-1.43)	**1.17** (0.838-1.65)	**1.31** (0.915-1.91)	**1.46** (0.978-2.18)	**1.67** (1.08-2.58)	**1.84** (1.17-2.89)
15-min	**0.554** (0.420-0.729)	**0.667** (0.505-0.879)	**0.852** (0.643-1.13)	**1.01** (0.755-1.34)	**1.22** (0.888-1.68)	**1.38** (0.987-1.94)	**1.54** (1.08-2.24)	**1.72** (1.15-2.56)	**1.97** (1.27-3.03)	**2.17** (1.37-3.40)
30-min	**0.762** (0.577-1.00)	**0.917** (0.694-1.21)	**1.17** (0.883-1.55)	**1.38** (1.04-1.84)	**1.67** (1.22-2.31)	**1.89** (1.35-2.66)	**2.12** (1.48-3.07)	**2.36** (1.58-3.52)	**2.70** (1.75-4.16)	**2.97** (1.88-4.66)
60-min	**0.970** (0.735-1.28)	**1.17** (0.883-1.54)	**1.49** (1.12-1.97)	**1.76** (1.32-2.33)	**2.12** (1.55-2.93)	**2.40** (1.72-3.38)	**2.69** (1.88-3.91)	**3.00** (2.01-4.47)	**3.43** (2.22-5.28)	**3.78** (2.39-5.92)
2-hr	**1.25** (0.956-1.64)	**1.48** (1.13-1.94)	**1.86** (1.41-2.44)	**2.17** (1.64-2.86)	**2.59** (1.90-3.56)	**2.91** (2.10-4.08)	**3.25** (2.29-4.71)	**3.63** (2.43-5.37)	**4.17** (2.70-6.37)	**4.61** (2.93-7.18)
3-hr	**1.44** (1.10-1.88)	**1.70** (1.29-2.21)	**2.12** (1.61-2.77)	**2.47** (1.87-3.24)	**2.95** (2.17-4.04)	**3.31** (2.40-4.62)	**3.69** (2.61-5.34)	**4.12** (2.77-6.08)	**4.75** (3.09-7.24)	**5.28** (3.36-8.19)
6-hr	**1.77** (1.36-2.29)	**2.11** (1.62-2.74)	**2.67** (2.04-3.48)	**3.14** (2.39-4.10)	**3.77** (2.80-5.15)	**4.25** (3.10-5.92)	**4.76** (3.39-6.87)	**5.35** (3.60-7.84)	**6.21** (4.05-9.40)	**6.94** (4.43-10.7)
12-hr	**2.12** (1.64-2.73)	**2.60** (2.00-3.35)	**3.37** (2.59-4.36)	**4.01** (3.07-5.22)	**4.90** (3.65-6.65)	**5.56** (4.07-7.70)	**6.26** (4.48-8.99)	**7.08** (4.79-10.3)	**8.27** (5.41-12.4)	**9.27** (5.93-14.2)
24-hr	**2.53** (1.97-3.24)	**3.12** (2.42-3.99)	**4.07** (3.15-5.24)	**4.87** (3.74-6.29)	**5.96** (4.46-8.04)	**6.78** (4.98-9.33)	**7.64** (5.49-10.9)	**8.65** (5.88-12.5)	**10.1** (6.65-15.2)	**11.4** (7.32-17.3)
2-day	**3.02** (2.36-3.84)	**3.64** (2.84-4.64)	**4.66** (3.62-5.95)	**5.51** (4.26-7.07)	**6.67** (5.02-8.94)	**7.54** (5.57-10.3)	**8.46** (6.12-12.0)	**9.56** (6.52-13.8)	**11.2** (7.37-16.6)	**12.6** (8.11-19.0)
3-day	**3.34** (2.61-4.23)	**3.98** (3.11-5.05)	**5.03** (3.92-6.39)	**5.89** (4.57-7.54)	**7.09** (5.35-9.47)	**7.98** (5.92-10.9)	**8.94** (6.47-12.6)	**10.1** (6.88-14.4)	**11.8** (7.76-17.4)	**13.2** (8.53-19.9)
4-day	**3.59** (2.82-4.54)	**4.25** (3.33-5.38)	**5.33** (4.17-6.77)	**6.23** (4.84-7.94)	**7.46** (5.64-9.93)	**8.38** (6.23-11.4)	**9.37** (6.79-13.2)	**10.5** (7.21-15.0)	**12.3** (8.10-18.1)	**13.7** (8.88-20.6)
7-day	**4.24** (3.34-5.34)	**4.97** (3.91-6.25)	**6.15** (4.83-7.77)	**7.13** (5.57-9.05)	**8.49** (6.43-11.2)	**9.50** (7.07-12.8)	**10.6** (7.66-14.7)	**11.8** (8.11-16.8)	**13.6** (9.01-19.9)	**15.1** (9.77-22.5)
10-day	**4.88** (3.86-6.11)	**5.65** (4.46-7.09)	**6.91** (5.44-8.70)	**7.96** (6.23-10.1)	**9.40** (7.14-12.4)	**10.5** (7.81-14.1)	**11.6** (8.42-16.1)	**12.9** (8.88-18.2)	**14.7** (9.76-21.5)	**16.2** (10.5-24.1)
20-day	**6.85** (5.45-8.54)	**7.73** (6.14-9.64)	**9.16** (7.25-11.5)	**10.4** (8.15-13.0)	**12.0** (9.13-15.6)	**13.2** (9.88-17.5)	**14.5** (10.5-19.8)	**15.8** (11.0-22.2)	**17.6** (11.7-25.5)	**19.0** (12.3-28.0)
30-day	**8.51** (6.79-10.6)	**9.47** (7.54-11.8)	**11.0** (8.76-13.7)	**12.3** (9.73-15.4)	**14.1** (10.8-18.2)	**15.5** (11.6-20.4)	**16.9** (12.2-22.8)	**18.2** (12.6-25.4)	**20.0** (13.3-28.8)	**21.3** (13.9-31.3)
45-day	**10.6** (8.45-13.1)	**11.6** (9.29-14.4)	**13.4** (10.6-16.6)	**14.8** (11.7-18.5)	**16.8** (12.8-21.6)	**18.3** (13.7-24.0)	**19.8** (14.3-26.6)	**21.3** (14.8-29.6)	**23.0** (15.4-33.1)	**24.3** (15.9-35.6)
60-day	**12.3** (9.84-15.1)	**13.4** (10.8-16.6)	**15.3** (12.2-19.0)	**16.9** (13.4-21.0)	**19.1** (14.6-24.4)	**20.8** (15.6-27.0)	**22.4** (16.2-29.9)	**23.9** (16.7-33.1)	**25.7** (17.3-36.8)	**27.0** (17.6-39.4)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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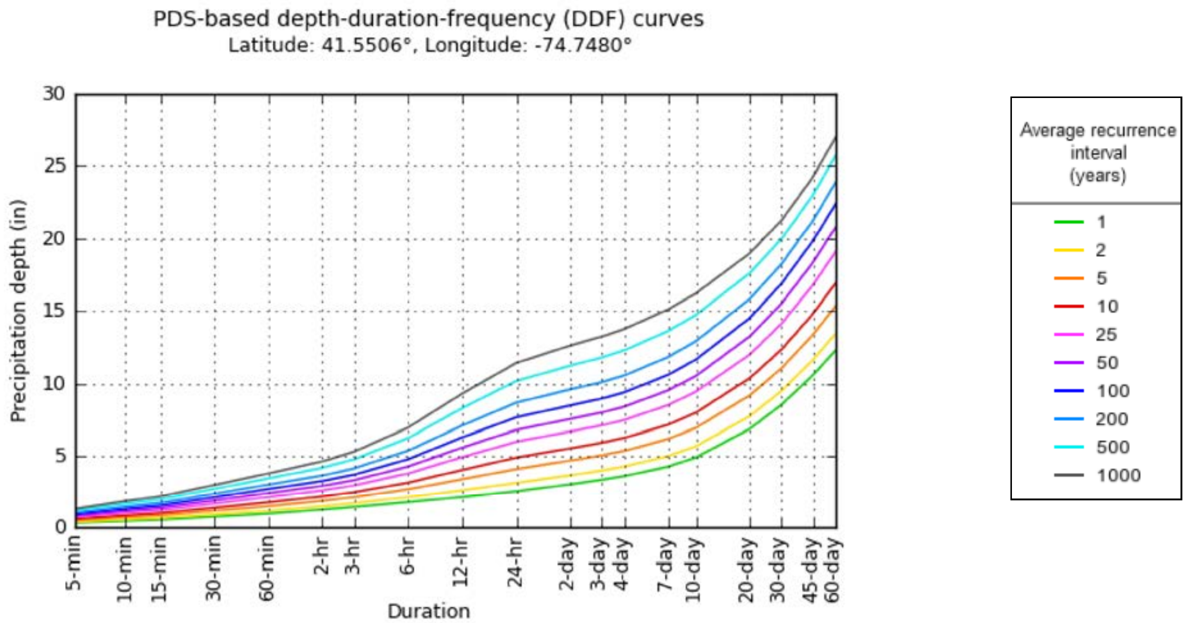
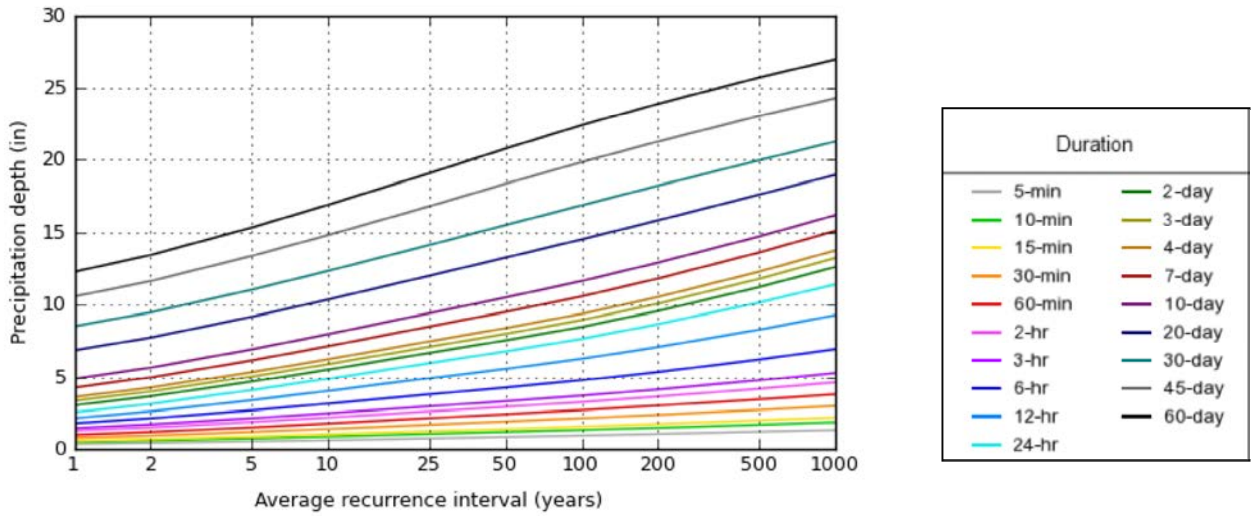
PF graphical





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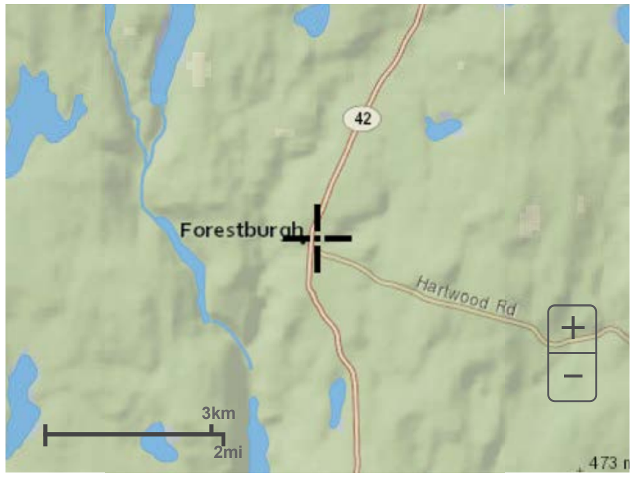
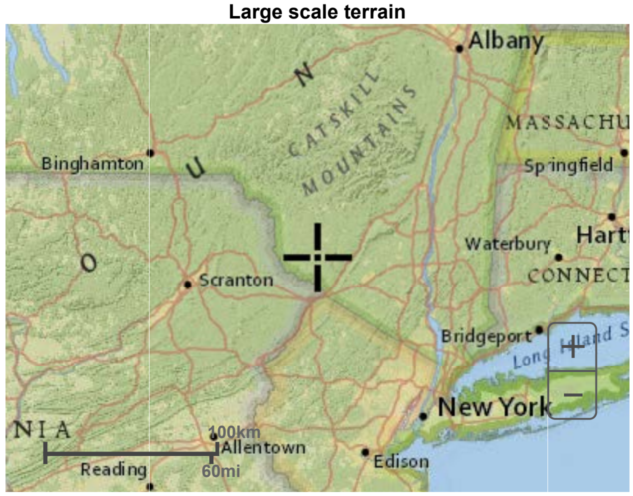
Maps & aerials

Small scale terrain

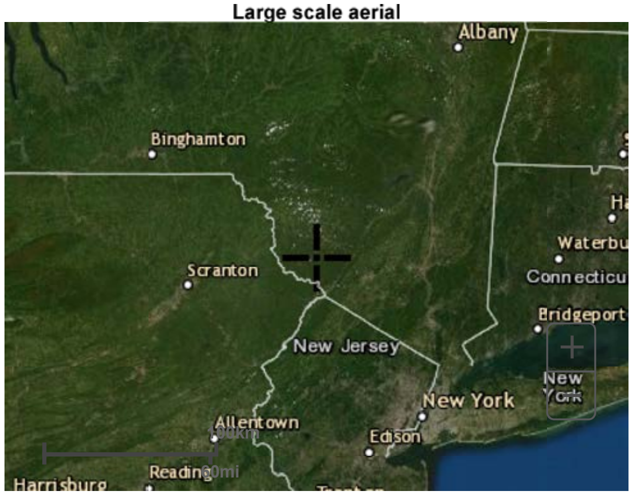


Large scale terrain



Large scale map

Large scale aerial



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National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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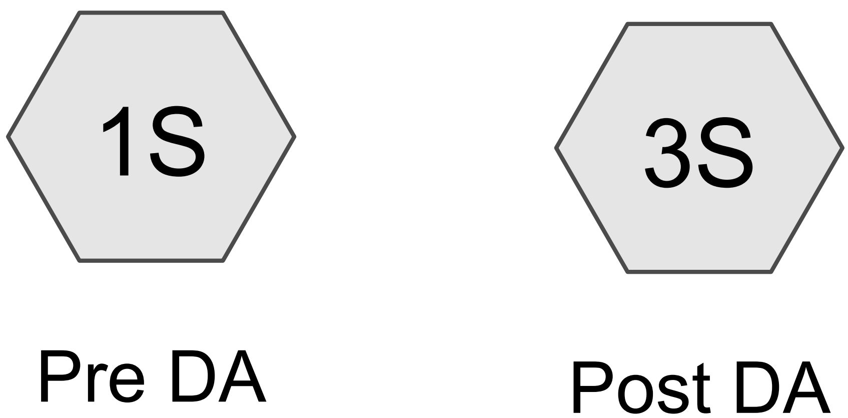
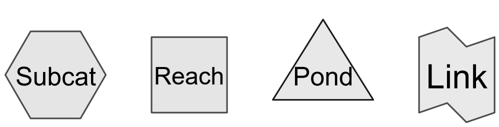




Routing Diagram for 0392.12119-Forestburgh-Hydrology
Prepared by {enter your company name here}, Printed 12/20/2019
HydroCAD® 10.00-14 s/n 07486 © 2015 HydroCAD Software Solutions LLC

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

Subcatchment1S: Pre DA Runoff Area=570.569 ac 5.81% Impervious Runoff Depth=0.91"
Flow Length=8,724' Tc=41.3 min CN=80 Runoff=341.74 cfs 43.253 af

Subcatchment3S: Post DA Runoff Area=570.569 ac 6.09% Impervious Runoff Depth=0.91"
Flow Length=8,724' Tc=41.3 min CN=80 Runoff=341.74 cfs 43.253 af

Total Runoff Area = 1,141.138 ac Runoff Volume = 86.507 af Average Runoff Depth = 0.91"
94.05% Pervious = 1,073.280 ac 5.95% Impervious = 67.858 ac

Summary for Subcatchment 1S: Pre DA

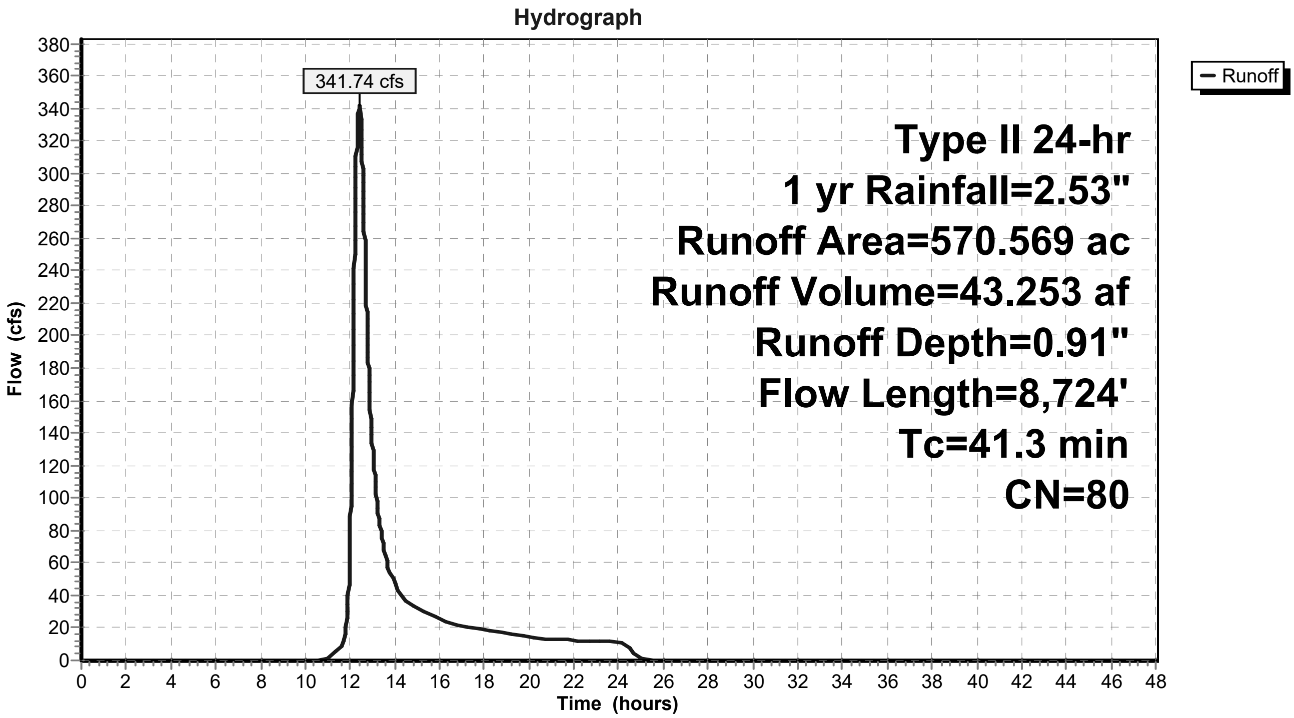
Runoff = 341.74 cfs @ 12.43 hrs, Volume= 43.253 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 yr Rainfall=2.53"

	Area (ac)	CN	Description
	31.480	98	Water Surface, HSG D
	537.443	79	Woods, Fair, HSG D
*	0.420	98	Stag Forest Road
*	0.380	98	Existing Structures
*	0.846	98	East Access Road
	570.569	80	Weighted Average
	537.443		94.19% Pervious Area
	33.126		5.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1100	0.14		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 2.60"
21.1	1,948	0.0950	1.54		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
2.3	1,633	0.0400	11.79	943.55	**Channel Flow, C to D** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.4	1,043	0.0120	7.38	1,771.90	**Channel Flow, D to E** Area= 240.0 sf Perim= 120.0' r= 2.00' n= 0.035 Earth, dense weeds
1.0	1,663	0.2300	28.28	2,262.56	**Channel Flow, E to F** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.5	2,337	0.0010	15.74	10,165.98	**Channel Flow, F to G** Area= 7,000.0 sf Perim= 350.0' r= 20.00' n= 0.022 Earth, clean & straight
41.3	8,724	Total			

Subcatchment 1S: Pre DA



Summary for Subcatchment 3S: Post DA

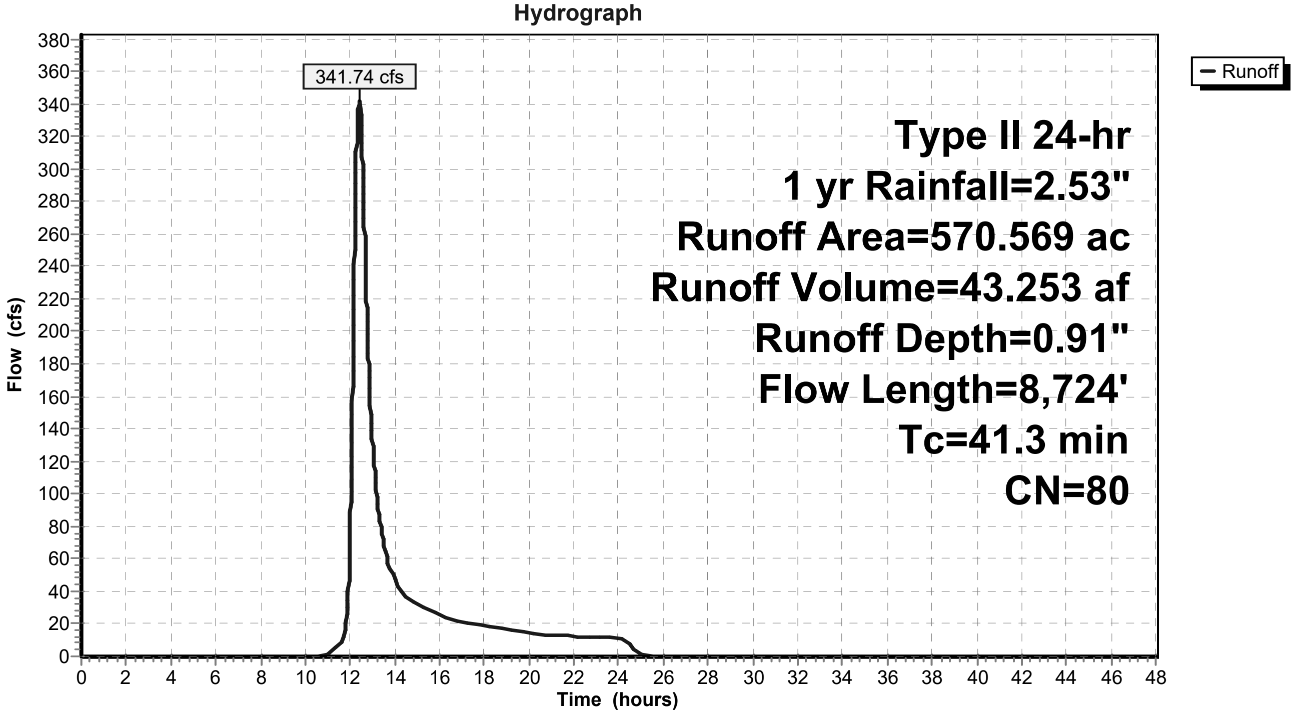
Runoff = 341.74 cfs @ 12.43 hrs, Volume= 43.253 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 yr Rainfall=2.53"

	Area (ac)	CN	Description
	31.480	98	Water Surface, HSG D
	500.396	79	Woods, Fair, HSG D
*	0.420	98	Stag Forest Road
*	0.380	98	Existing Structures
*	0.846	98	East Access Road
*	0.378	98	21 New Homes
*	1.228	98	21 New Driveways
*	31.647	80	21 New Grassed Lawns
*	2.534	80	Grassed roadside along Stag Rd
*	1.260	80	Grassed roadside along East Access
	570.569	80	Weighted Average
	535.837		93.91% Pervious Area
	34.732		6.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1100	0.14		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 2.60"
21.1	1,948	0.0950	1.54		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
2.3	1,633	0.0400	11.79	943.55	**Channel Flow, C to D** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.4	1,043	0.0120	7.38	1,771.90	**Channel Flow, D to E** Area= 240.0 sf Perim= 120.0' r= 2.00' n= 0.035 Earth, dense weeds
1.0	1,663	0.2300	28.28	2,262.56	**Channel Flow, E to F** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.5	2,337	0.0010	15.74	110,165.98	**Channel Flow, F to G** Area= 7,000.0 sf Perim= 350.0' r= 20.00' n= 0.022 Earth, clean & straight
41.3	8,724	Total			

Subcatchment 3S: Post DA



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

Subcatchment1S: Pre DA Runoff Area=570.569 ac 5.81% Impervious Runoff Depth=1.34"
Flow Length=8,724' Tc=41.3 min CN=80 Runoff=519.76 cfs 63.747 af

Subcatchment3S: Post DA Runoff Area=570.569 ac 6.09% Impervious Runoff Depth=1.34"
Flow Length=8,724' Tc=41.3 min CN=80 Runoff=519.76 cfs 63.747 af

Total Runoff Area = 1,141.138 ac Runoff Volume = 127.494 af Average Runoff Depth = 1.34"
94.05% Pervious = 1,073.280 ac 5.95% Impervious = 67.858 ac

Summary for Subcatchment 1S: Pre DA

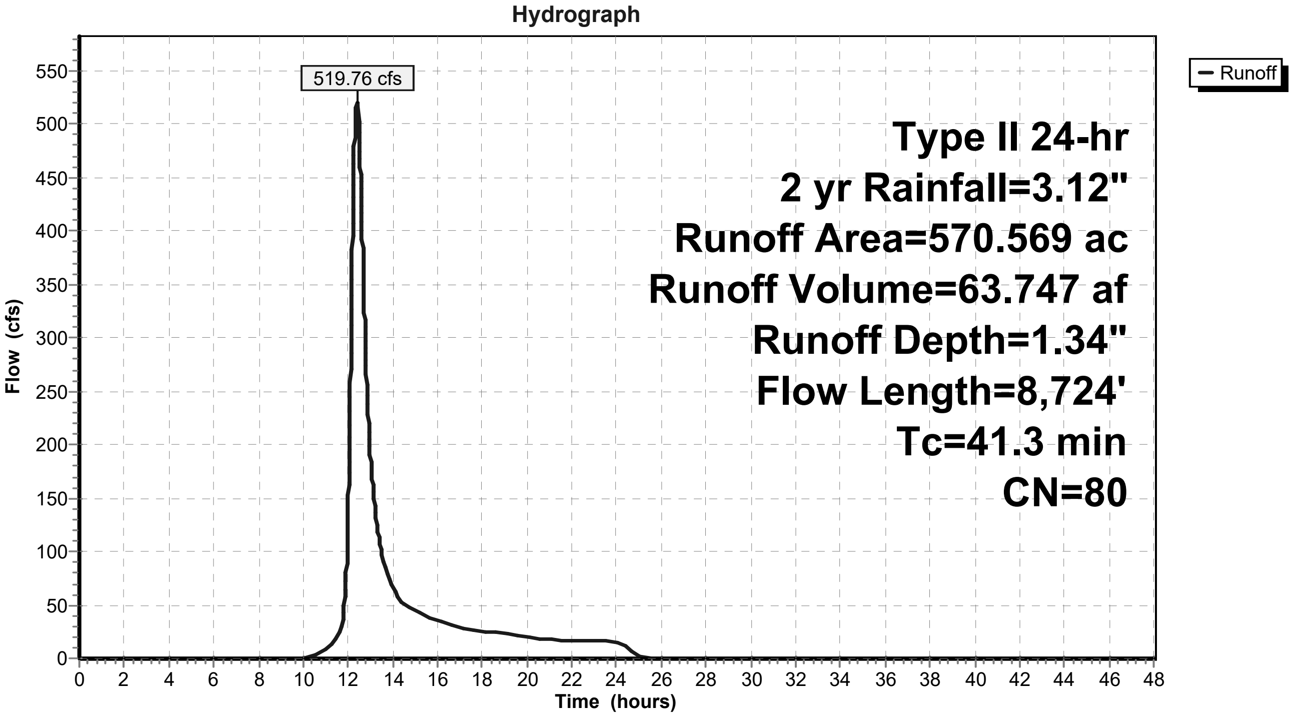
Runoff = 519.76 cfs @ 12.39 hrs, Volume= 63.747 af, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 2 yr Rainfall=3.12"

	Area (ac)	CN	Description
	31.480	98	Water Surface, HSG D
	537.443	79	Woods, Fair, HSG D
*	0.420	98	Stag Forest Road
*	0.380	98	Existing Structures
*	0.846	98	East Access Road
	570.569	80	Weighted Average
	537.443		94.19% Pervious Area
	33.126		5.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1100	0.14		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 2.60"
21.1	1,948	0.0950	1.54		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
2.3	1,633	0.0400	11.79	943.55	**Channel Flow, C to D** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.4	1,043	0.0120	7.38	1,771.90	**Channel Flow, D to E** Area= 240.0 sf Perim= 120.0' r= 2.00' n= 0.035 Earth, dense weeds
1.0	1,663	0.2300	28.28	2,262.56	**Channel Flow, E to F** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.5	2,337	0.0010	15.74	10,165.98	**Channel Flow, F to G** Area= 7,000.0 sf Perim= 350.0' r= 20.00' n= 0.022 Earth, clean & straight
41.3	8,724	Total			

Subcatchment 1S: Pre DA



Summary for Subcatchment 3S: Post DA

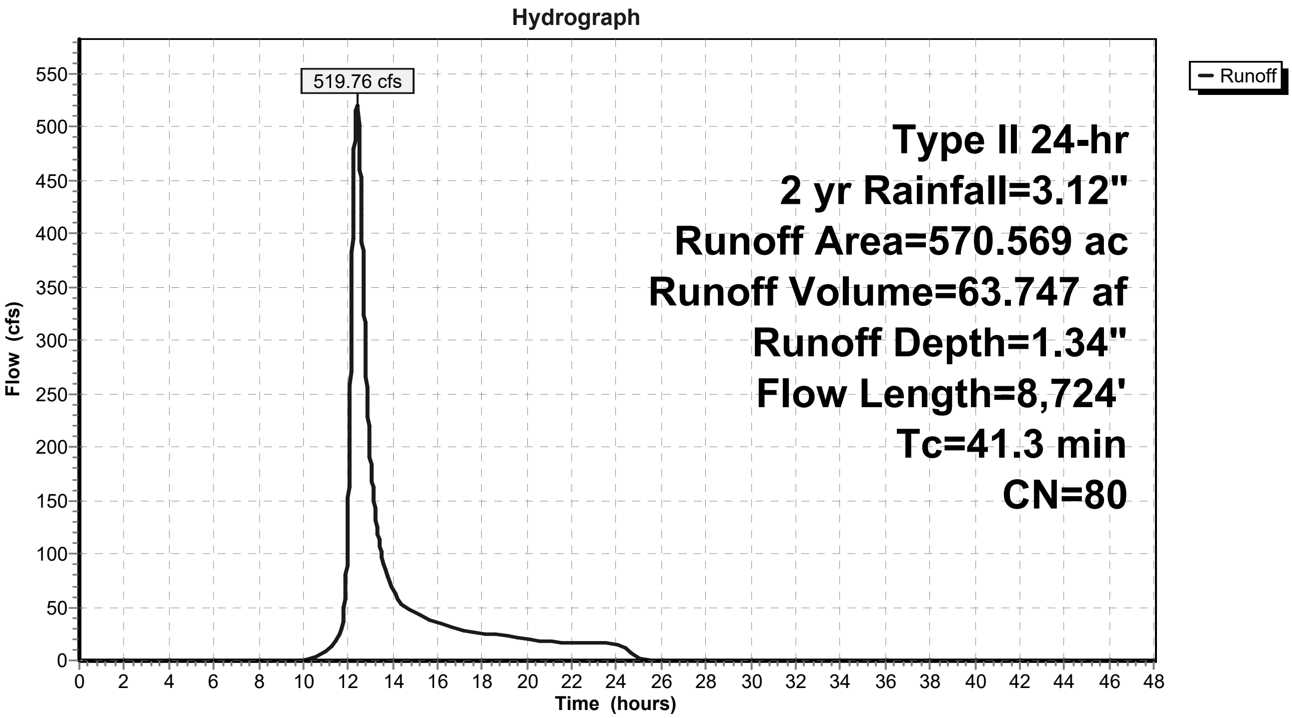
Runoff = 519.76 cfs @ 12.39 hrs, Volume= 63.747 af, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 2 yr Rainfall=3.12"

	Area (ac)	CN	Description
	31.480	98	Water Surface, HSG D
	500.396	79	Woods, Fair, HSG D
*	0.420	98	Stag Forest Road
*	0.380	98	Existing Structures
*	0.846	98	East Access Road
*	0.378	98	21 New Homes
*	1.228	98	21 New Driveways
*	31.647	80	21 New Grassed Lawns
*	2.534	80	Grassed roadside along Stag Rd
*	1.260	80	Grassed roadside along East Access
	570.569	80	Weighted Average
	535.837		93.91% Pervious Area
	34.732		6.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1100	0.14		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 2.60"
21.1	1,948	0.0950	1.54		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
2.3	1,633	0.0400	11.79	943.55	**Channel Flow, C to D** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.4	1,043	0.0120	7.38	1,771.90	**Channel Flow, D to E** Area= 240.0 sf Perim= 120.0' r= 2.00' n= 0.035 Earth, dense weeds
1.0	1,663	0.2300	28.28	2,262.56	**Channel Flow, E to F** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.5	2,337	0.0010	15.74	110,165.98	**Channel Flow, F to G** Area= 7,000.0 sf Perim= 350.0' r= 20.00' n= 0.022 Earth, clean & straight
41.3	8,724	Total			

Subcatchment 3S: Post DA



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

Subcatchment1S: Pre DA Runoff Area=570.569 ac 5.81% Impervious Runoff Depth=2.78"
Flow Length=8,724' Tc=41.3 min CN=80 Runoff=1,105.95 cfs 132.170 af

Subcatchment3S: Post DA Runoff Area=570.569 ac 6.09% Impervious Runoff Depth=2.78"
Flow Length=8,724' Tc=41.3 min CN=80 Runoff=1,105.95 cfs 132.170 af

Total Runoff Area = 1,141.138 ac Runoff Volume = 264.340 af Average Runoff Depth = 2.78"
94.05% Pervious = 1,073.280 ac 5.95% Impervious = 67.858 ac

Summary for Subcatchment 1S: Pre DA

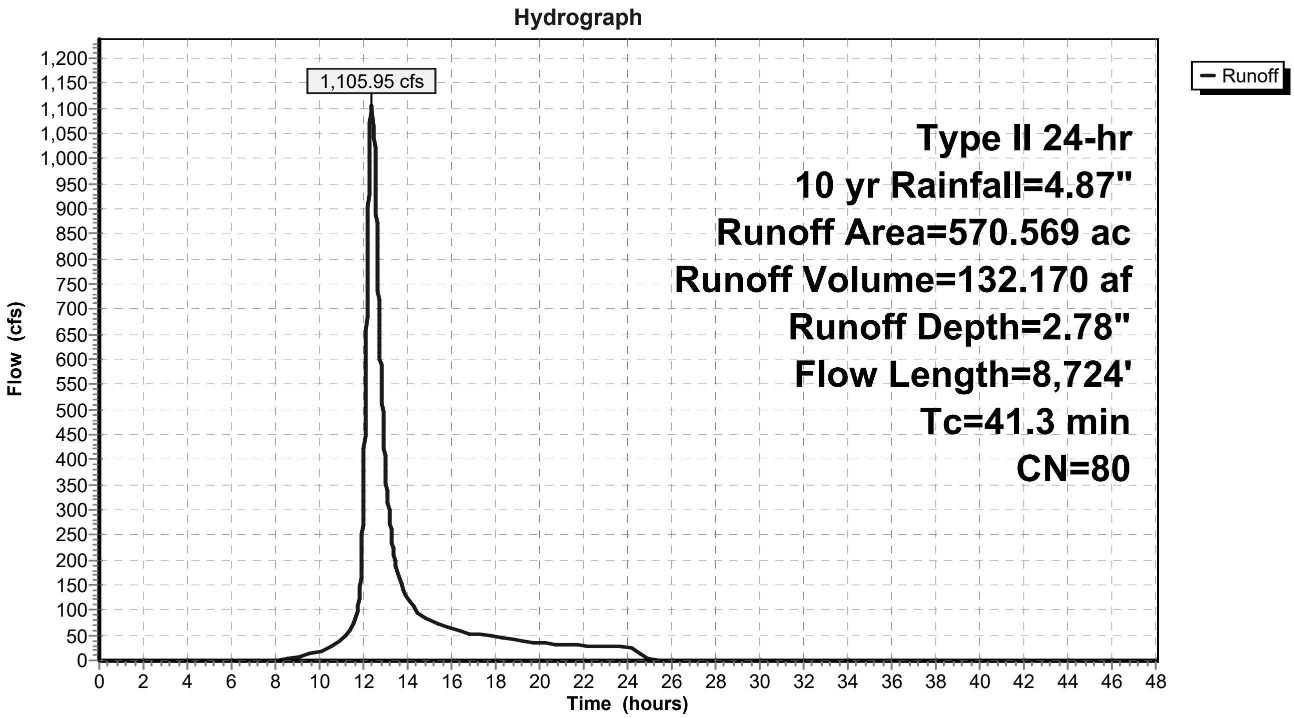
Runoff = 1,105.95 cfs @ 12.39 hrs, Volume= 132.170 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 yr Rainfall=4.87"

	Area (ac)	CN	Description
	31.480	98	Water Surface, HSG D
	537.443	79	Woods, Fair, HSG D
*	0.420	98	Stag Forest Road
*	0.380	98	Existing Structures
*	0.846	98	East Access Road
	570.569	80	Weighted Average
	537.443		94.19% Pervious Area
	33.126		5.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1100	0.14		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 2.60"
21.1	1,948	0.0950	1.54		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
2.3	1,633	0.0400	11.79	943.55	**Channel Flow, C to D** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.4	1,043	0.0120	7.38	1,771.90	**Channel Flow, D to E** Area= 240.0 sf Perim= 120.0' r= 2.00' n= 0.035 Earth, dense weeds
1.0	1,663	0.2300	28.28	2,262.56	**Channel Flow, E to F** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.5	2,337	0.0010	15.74	110,165.98	**Channel Flow, F to G** Area= 7,000.0 sf Perim= 350.0' r= 20.00' n= 0.022 Earth, clean & straight
41.3	8,724	Total			

Subcatchment 1S: Pre DA



Summary for Subcatchment 3S: Post DA

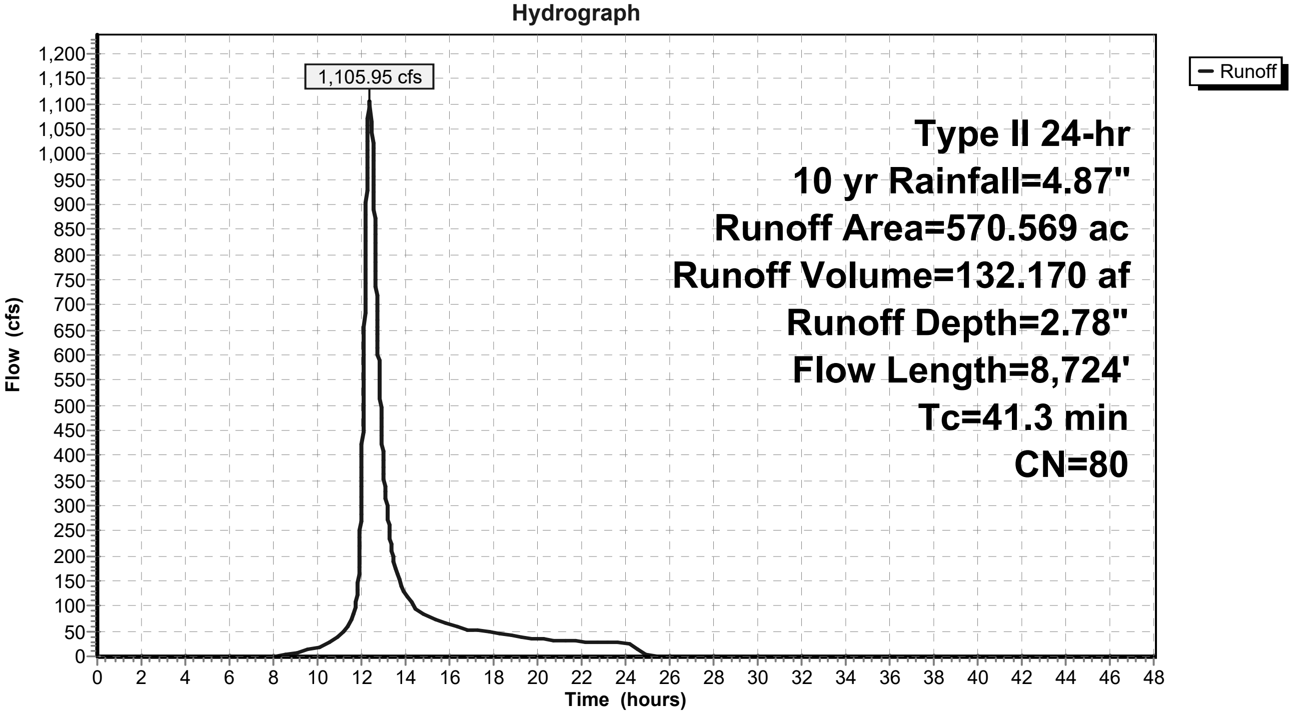
Runoff = 1,105.95 cfs @ 12.39 hrs, Volume= 132.170 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 yr Rainfall=4.87"

	Area (ac)	CN	Description
	31.480	98	Water Surface, HSG D
	500.396	79	Woods, Fair, HSG D
*	0.420	98	Stag Forest Road
*	0.380	98	Existing Structures
*	0.846	98	East Access Road
*	0.378	98	21 New Homes
*	1.228	98	21 New Driveways
*	31.647	80	21 New Grassed Lawns
*	2.534	80	Grassed roadside along Stag Rd
*	1.260	80	Grassed roadside along East Access
	570.569	80	Weighted Average
	535.837		93.91% Pervious Area
	34.732		6.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1100	0.14		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 2.60"
21.1	1,948	0.0950	1.54		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
2.3	1,633	0.0400	11.79	943.55	**Channel Flow, C to D** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.4	1,043	0.0120	7.38	1,771.90	**Channel Flow, D to E** Area= 240.0 sf Perim= 120.0' r= 2.00' n= 0.035 Earth, dense weeds
1.0	1,663	0.2300	28.28	2,262.56	**Channel Flow, E to F** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.5	2,337	0.0010	15.74	110,165.98	**Channel Flow, F to G** Area= 7,000.0 sf Perim= 350.0' r= 20.00' n= 0.022 Earth, clean & straight
41.3	8,724	Total			

Subcatchment 3S: Post DA



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

Subcatchment1S: Pre DA Runoff Area=570.569 ac 5.81% Impervious Runoff Depth=3.75"
Flow Length=8,724' Tc=41.3 min CN=80 Runoff=1,491.16 cfs 178.073 af

Subcatchment3S: Post DA Runoff Area=570.569 ac 6.09% Impervious Runoff Depth=3.75"
Flow Length=8,724' Tc=41.3 min CN=80 Runoff=1,491.16 cfs 178.073 af

Total Runoff Area = 1,141.138 ac Runoff Volume = 356.147 af Average Runoff Depth = 3.75"
94.05% Pervious = 1,073.280 ac 5.95% Impervious = 67.858 ac

Summary for Subcatchment 1S: Pre DA

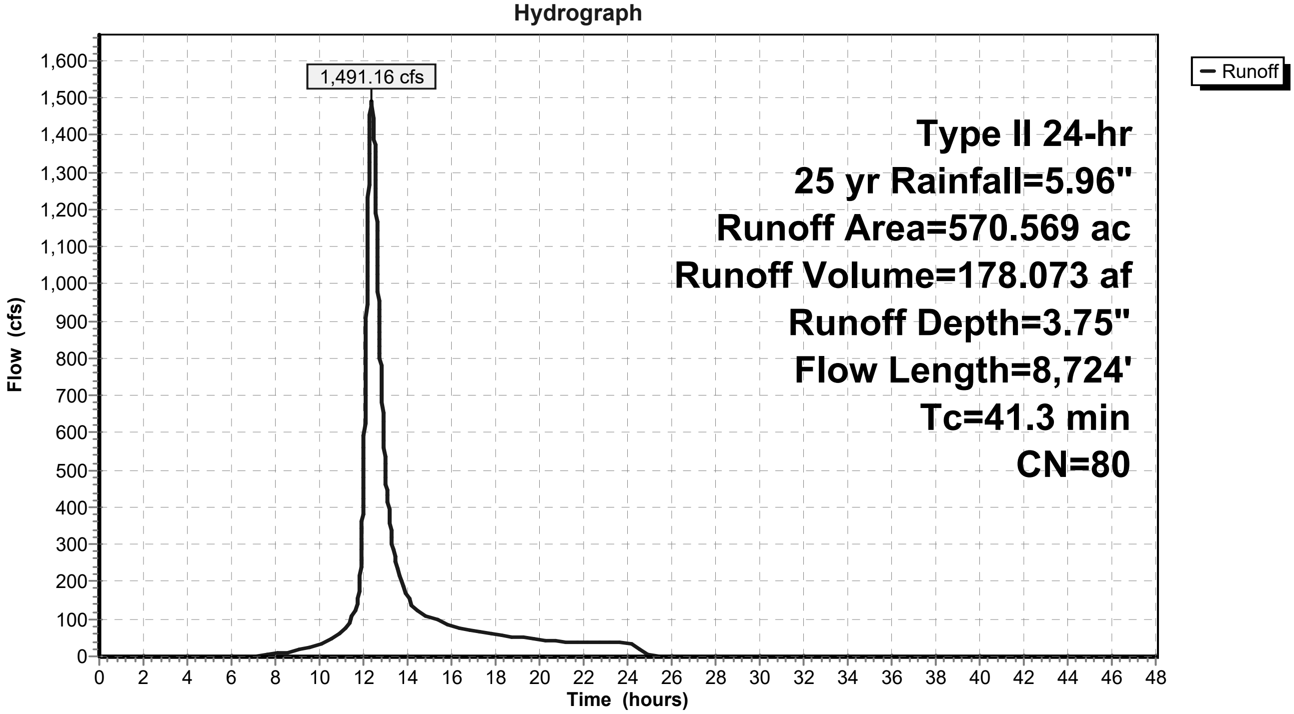
Runoff = 1,491.16 cfs @ 12.38 hrs, Volume= 178.073 af, Depth= 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 yr Rainfall=5.96"

	Area (ac)	CN	Description
	31.480	98	Water Surface, HSG D
	537.443	79	Woods, Fair, HSG D
*	0.420	98	Stag Forest Road
*	0.380	98	Existing Structures
*	0.846	98	East Access Road
	570.569	80	Weighted Average
	537.443		94.19% Pervious Area
	33.126		5.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1100	0.14		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 2.60"
21.1	1,948	0.0950	1.54		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
2.3	1,633	0.0400	11.79	943.55	**Channel Flow, C to D** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.4	1,043	0.0120	7.38	1,771.90	**Channel Flow, D to E** Area= 240.0 sf Perim= 120.0' r= 2.00' n= 0.035 Earth, dense weeds
1.0	1,663	0.2300	28.28	2,262.56	**Channel Flow, E to F** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.5	2,337	0.0010	15.74	10,165.98	**Channel Flow, F to G** Area= 7,000.0 sf Perim= 350.0' r= 20.00' n= 0.022 Earth, clean & straight
41.3	8,724	Total			

Subcatchment 1S: Pre DA



Summary for Subcatchment 3S: Post DA

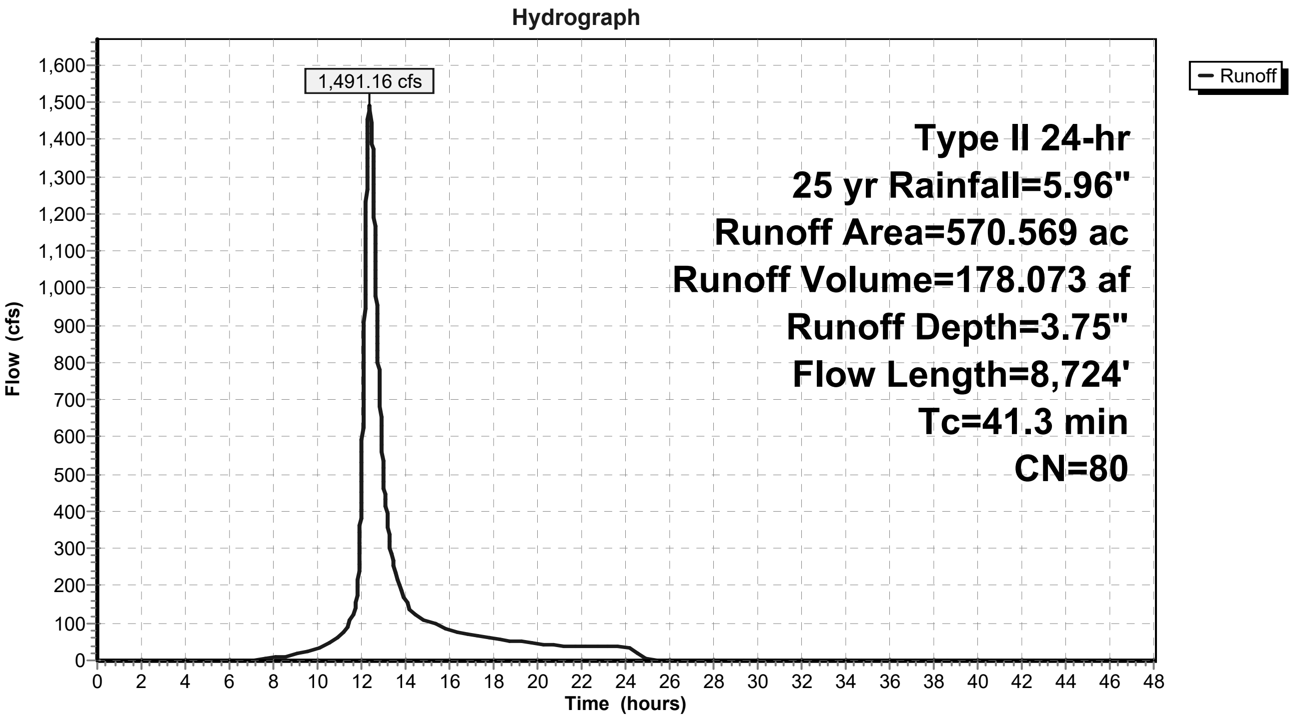
Runoff = 1,491.16 cfs @ 12.38 hrs, Volume= 178.073 af, Depth= 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 yr Rainfall=5.96"

	Area (ac)	CN	Description
	31.480	98	Water Surface, HSG D
	500.396	79	Woods, Fair, HSG D
*	0.420	98	Stag Forest Road
*	0.380	98	Existing Structures
*	0.846	98	East Access Road
*	0.378	98	21 New Homes
*	1.228	98	21 New Driveways
*	31.647	80	21 New Grassed Lawns
*	2.534	80	Grassed roadside along Stag Rd
*	1.260	80	Grassed roadside along East Access
	570.569	80	Weighted Average
	535.837		93.91% Pervious Area
	34.732		6.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1100	0.14		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 2.60"
21.1	1,948	0.0950	1.54		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
2.3	1,633	0.0400	11.79	943.55	**Channel Flow, C to D** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.4	1,043	0.0120	7.38	1,771.90	**Channel Flow, D to E** Area= 240.0 sf Perim= 120.0' r= 2.00' n= 0.035 Earth, dense weeds
1.0	1,663	0.2300	28.28	2,262.56	**Channel Flow, E to F** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.5	2,337	0.0010	15.74	110,165.98	**Channel Flow, F to G** Area= 7,000.0 sf Perim= 350.0' r= 20.00' n= 0.022 Earth, clean & straight
41.3	8,724	Total			

Subcatchment 3S: Post DA



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

Subcatchment1S: Pre DA Runoff Area=570.569 ac 5.81% Impervious Runoff Depth=4.49"
Flow Length=8,724' Tc=41.3 min CN=80 Runoff=1,785.74 cfs 213.576 af

Subcatchment3S: Post DA Runoff Area=570.569 ac 6.09% Impervious Runoff Depth=4.49"
Flow Length=8,724' Tc=41.3 min CN=80 Runoff=1,785.74 cfs 213.576 af

Total Runoff Area = 1,141.138 ac Runoff Volume = 427.151 af Average Runoff Depth = 4.49"
94.05% Pervious = 1,073.280 ac 5.95% Impervious = 67.858 ac

Summary for Subcatchment 1S: Pre DA

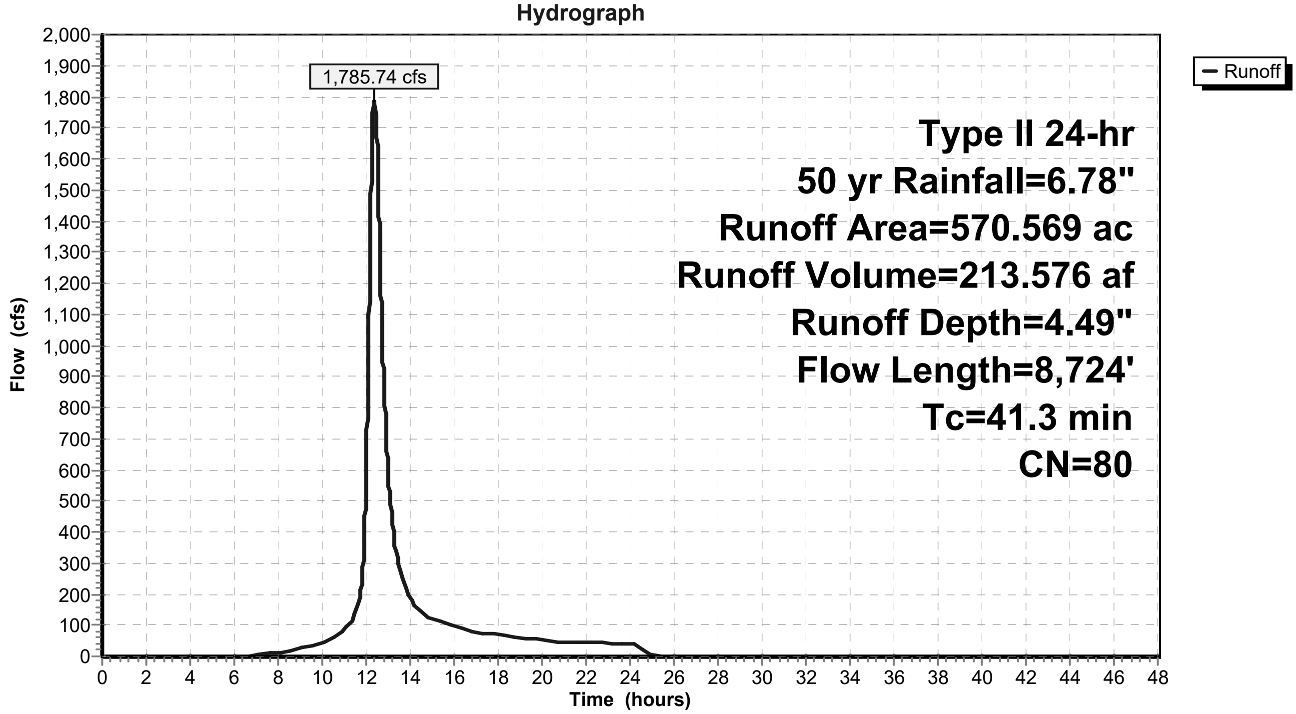
Runoff = 1,785.74 cfs @ 12.38 hrs, Volume= 213.576 af, Depth= 4.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 50 yr Rainfall=6.78"

	Area (ac)	CN	Description
	31.480	98	Water Surface, HSG D
	537.443	79	Woods, Fair, HSG D
*	0.420	98	Stag Forest Road
*	0.380	98	Existing Structures
*	0.846	98	East Access Road
	570.569	80	Weighted Average
	537.443		94.19% Pervious Area
	33.126		5.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1100	0.14		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 2.60"
21.1	1,948	0.0950	1.54		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
2.3	1,633	0.0400	11.79	943.55	**Channel Flow, C to D** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.4	1,043	0.0120	7.38	1,771.90	**Channel Flow, D to E** Area= 240.0 sf Perim= 120.0' r= 2.00' n= 0.035 Earth, dense weeds
1.0	1,663	0.2300	28.28	2,262.56	**Channel Flow, E to F** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.5	2,337	0.0010	15.74	110,165.98	**Channel Flow, F to G** Area= 7,000.0 sf Perim= 350.0' r= 20.00' n= 0.022 Earth, clean & straight
41.3	8,724	Total			

Subcatchment 1S: Pre DA



Summary for Subcatchment 3S: Post DA

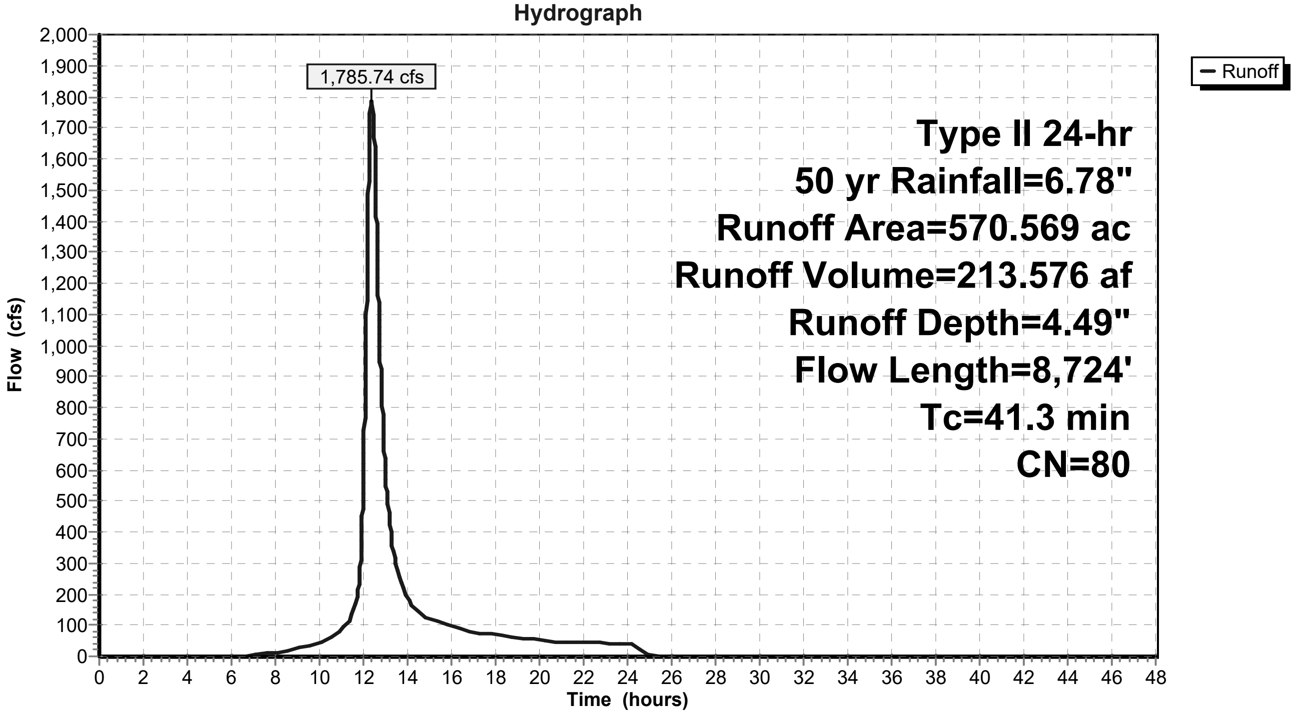
Runoff = 1,785.74 cfs @ 12.38 hrs, Volume= 213.576 af, Depth= 4.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 50 yr Rainfall=6.78"

	Area (ac)	CN	Description
	31.480	98	Water Surface, HSG D
	500.396	79	Woods, Fair, HSG D
*	0.420	98	Stag Forest Road
*	0.380	98	Existing Structures
*	0.846	98	East Access Road
*	0.378	98	21 New Homes
*	1.228	98	21 New Driveways
*	31.647	80	21 New Grassed Lawns
*	2.534	80	Grassed roadside along Stag Rd
*	1.260	80	Grassed roadside along East Access
	570.569	80	Weighted Average
	535.837		93.91% Pervious Area
	34.732		6.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1100	0.14		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 2.60"
21.1	1,948	0.0950	1.54		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
2.3	1,633	0.0400	11.79	943.55	**Channel Flow, C to D** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.4	1,043	0.0120	7.38	1,771.90	**Channel Flow, D to E** Area= 240.0 sf Perim= 120.0' r= 2.00' n= 0.035 Earth, dense weeds
1.0	1,663	0.2300	28.28	2,262.56	**Channel Flow, E to F** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.5	2,337	0.0010	15.74	110,165.98	**Channel Flow, F to G** Area= 7,000.0 sf Perim= 350.0' r= 20.00' n= 0.022 Earth, clean & straight
41.3	8,724	Total			

Subcatchment 3S: Post DA



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

Subcatchment1S: Pre DA Runoff Area=570.569 ac 5.81% Impervious Runoff Depth=5.29"
Flow Length=8,724' Tc=41.3 min CN=80 Runoff=2,098.35 cfs 251.447 af

Subcatchment3S: Post DA Runoff Area=570.569 ac 6.09% Impervious Runoff Depth=5.29"
Flow Length=8,724' Tc=41.3 min CN=80 Runoff=2,098.35 cfs 251.447 af

Total Runoff Area = 1,141.138 ac Runoff Volume = 502.894 af Average Runoff Depth = 5.29"
94.05% Pervious = 1,073.280 ac 5.95% Impervious = 67.858 ac

Summary for Subcatchment 1S: Pre DA

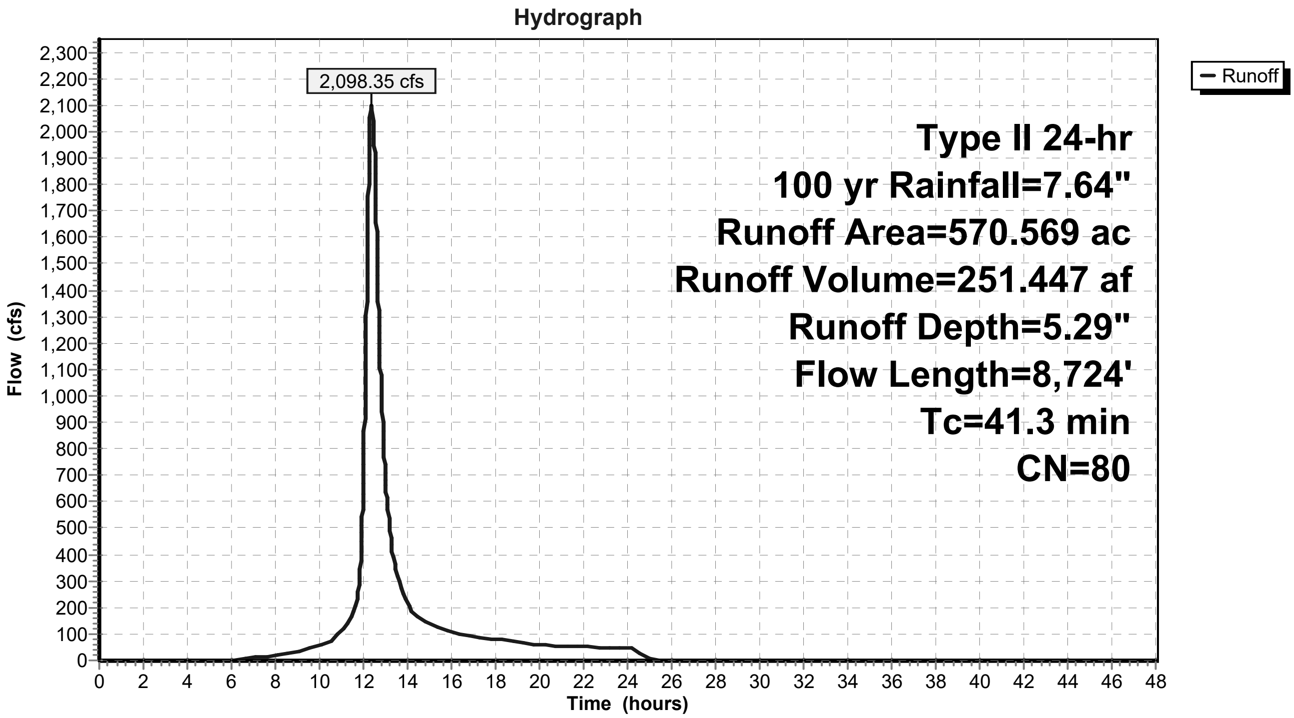
Runoff = 2,098.35 cfs @ 12.35 hrs, Volume= 251.447 af, Depth= 5.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 yr Rainfall=7.64"

	Area (ac)	CN	Description
	31.480	98	Water Surface, HSG D
	537.443	79	Woods, Fair, HSG D
*	0.420	98	Stag Forest Road
*	0.380	98	Existing Structures
*	0.846	98	East Access Road
	570.569	80	Weighted Average
	537.443		94.19% Pervious Area
	33.126		5.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1100	0.14		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 2.60"
21.1	1,948	0.0950	1.54		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
2.3	1,633	0.0400	11.79	943.55	**Channel Flow, C to D** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.4	1,043	0.0120	7.38	1,771.90	**Channel Flow, D to E** Area= 240.0 sf Perim= 120.0' r= 2.00' n= 0.035 Earth, dense weeds
1.0	1,663	0.2300	28.28	2,262.56	**Channel Flow, E to F** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.5	2,337	0.0010	15.74	110,165.98	**Channel Flow, F to G** Area= 7,000.0 sf Perim= 350.0' r= 20.00' n= 0.022 Earth, clean & straight
41.3	8,724	Total			

Subcatchment 1S: Pre DA



Summary for Subcatchment 3S: Post DA

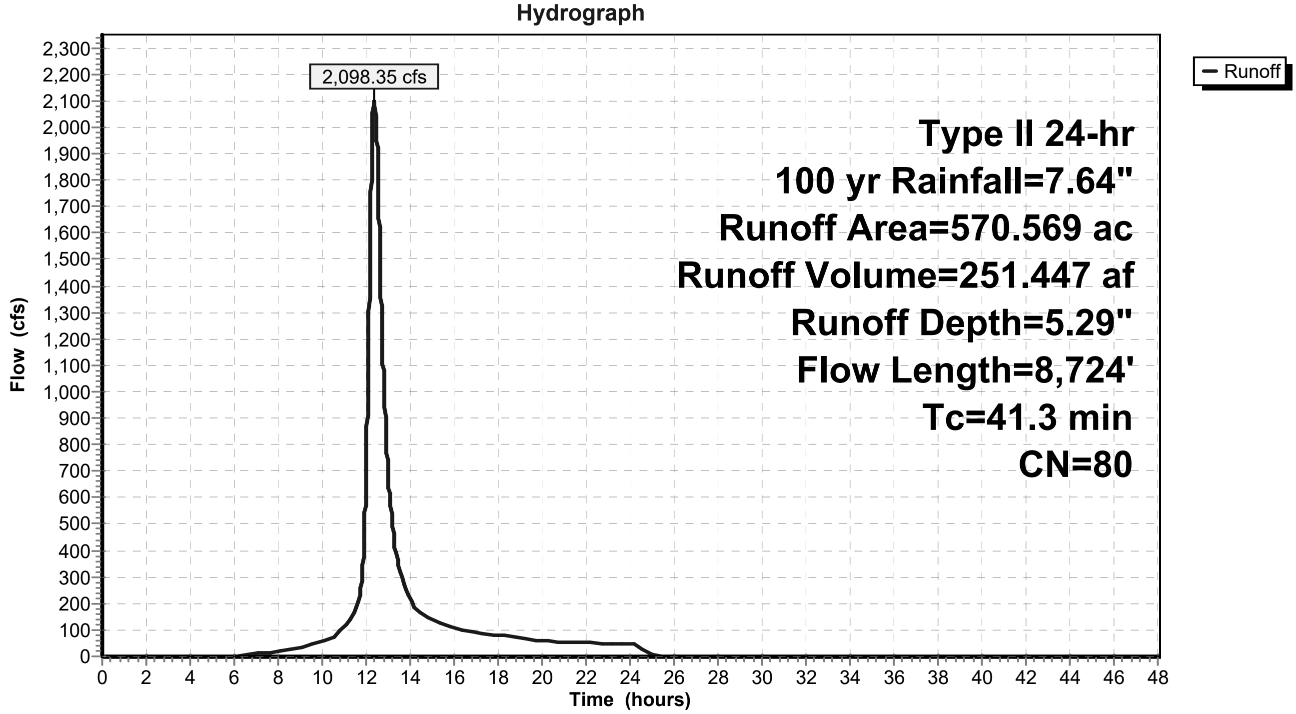
Runoff = 2,098.35 cfs @ 12.35 hrs, Volume= 251.447 af, Depth= 5.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 yr Rainfall=7.64"

	Area (ac)	CN	Description
	31.480	98	Water Surface, HSG D
	500.396	79	Woods, Fair, HSG D
*	0.420	98	Stag Forest Road
*	0.380	98	Existing Structures
*	0.846	98	East Access Road
*	0.378	98	21 New Homes
*	1.228	98	21 New Driveways
*	31.647	80	21 New Grassed Lawns
*	2.534	80	Grassed roadside along Stag Rd
*	1.260	80	Grassed roadside along East Access
	570.569	80	Weighted Average
	535.837		93.91% Pervious Area
	34.732		6.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.1100	0.14		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 2.60"
21.1	1,948	0.0950	1.54		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
2.3	1,633	0.0400	11.79	943.55	**Channel Flow, C to D** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.4	1,043	0.0120	7.38	1,771.90	**Channel Flow, D to E** Area= 240.0 sf Perim= 120.0' r= 2.00' n= 0.035 Earth, dense weeds
1.0	1,663	0.2300	28.28	2,262.56	**Channel Flow, E to F** Area= 80.0 sf Perim= 40.0' r= 2.00' n= 0.040 Mountain streams
2.5	2,337	0.0010	15.74	110,165.98	**Channel Flow, F to G** Area= 7,000.0 sf Perim= 350.0' r= 20.00' n= 0.022 Earth, clean & straight
41.3	8,724	Total			

Subcatchment 3S: Post DA



APPENDIX E
STORMWATER MANAGEMENT PLANS, DETAILS AND SPECIFICATIONS

STANDARD AND SPECIFICATIONS FOR DUST CONTROL

Definition & Scope

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

Conditions Where Practice Applies

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

Design Criteria

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

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

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

Construction Specifications

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

Vegetative Cover – For disturbed areas not subject to traffic, vegetation provides the most practical method of dust control (see Section 3).

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

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

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

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

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

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

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

Maintenance

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

STANDARD AND SPECIFICATIONS FOR STABILIZED CONSTRUCTION ACCESS

Definition & Scope

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

Conditions Where Practice Applies

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

Design Criteria

See Figure 2.1 on page 2.31 for details.

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

Thickness: Not less than six (6) inches.

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

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

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

Criteria for Geotextile: The geotextile shall be woven or nonwoven fabric consisting only of continuous chain polymeric filaments or yarns of polyester. The fabric shall be inert to commonly encountered chemicals, hydro-carbons, mildew, rot resistant, and conform to the fabric properties as shown:

Fabric Properties[3]	Light Duty[1] Roads Grade Subgrade	Heavy Duty[2] Haul Roads Rough Graded	Test Method
Grab Tensile Strength (lbs)	200	220	ASTM D1682
Elongation at Failure (%)	50	60	ASTM D1682
Mullen Burst Strength (lbs)	190	430	ASTM D3786
Puncture Strength (lbs)	40	125	ASTM D751 Modified
Equivalent	40-80	40-80	US Std Sieve
Opening Size			CW-02215
Aggregate Depth	6	10	-

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

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

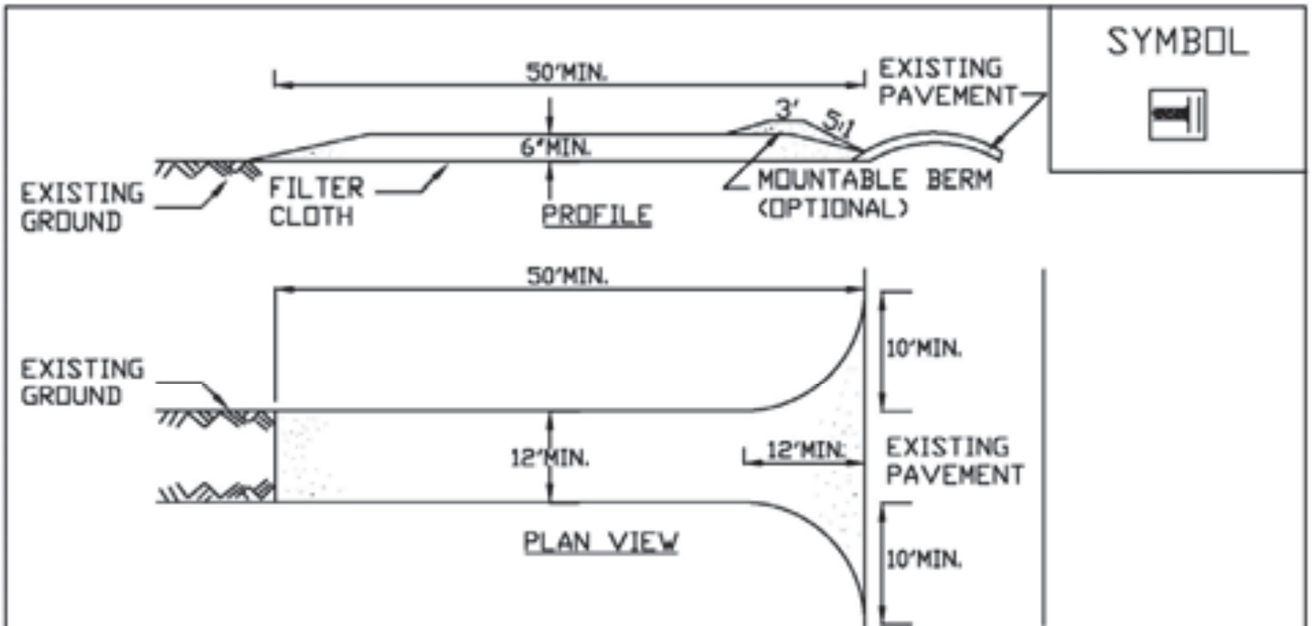
[3]Fabrics not meeting these specifications may be used only when design procedure and supporting documentation are supplied to determine aggregate depth and fabric strength.

Maintenance

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

When necessary, wheels must be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device. All sediment shall be prevented from entering storm drains, ditches, or watercourses.

Figure 2.1
Stabilized Construction Access



CONSTRUCTION SPECIFICATIONS

1. STONE SIZE - USE 1-4 INCH STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ACCESS SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 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.

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

STANDARD AND SPECIFICATIONS FOR CHECK DAM

Definition & Scope

Small barriers or dams constructed of stone, bagged sand or gravel, or other durable materials across a drainageway to reduce erosion in a drainage channel by reducing the velocity of flow in the channel.

Conditions Where Practice Applies

This practice is used as a **temporary** and, in some cases, a **permanent** measure to limit erosion by reducing velocities in open channels that are degrading or subject to erosion or where permanent stabilization is impractical due to short period of usefulness and time constraints of construction.

Design Criteria

Drainage Area: Maximum drainage area above the check dam shall not exceed two (2) acres.

Height: Not greater than 2 feet. Center shall be maintained 9 inches lower than abutments at natural ground elevation.

Side Slopes: Shall be 2:1 or flatter.

Spacing: The check dams shall be spaced as necessary in the channel so that the crest of the downstream dam is at the elevation of the toe of the upstream dam. This spacing is equal to the height of the check dam divided by the channel slope.

Therefore:

$$S = \frac{h}{s}$$

Where: S = spacing interval (ft.)
h = height of check dam (ft.)
s = channel slope (ft./ft.)

Example:

For a channel with a 4% slope and 2 ft. high stone check dams, they are spaced as follows:

$$S = \frac{2\ \text{ft}}{0.04\ \frac{\text{ft}}{\text{ft}}} = 50\ \text{ft}$$

For stone check dams: Use a well graded stone matrix 2 to 9 inches in size (NYS – DOT Light Stone Fill meets these requirements).

The overflow of the check dams will be stabilized to resist erosion that might be caused by the check dam. See Figure 3.1 on page 3.3 for details.

Check dams should be anchored in the channel by a cutoff trench 1.5 ft. wide and 0.5 ft. deep and lined with filter fabric to prevent soil migration.

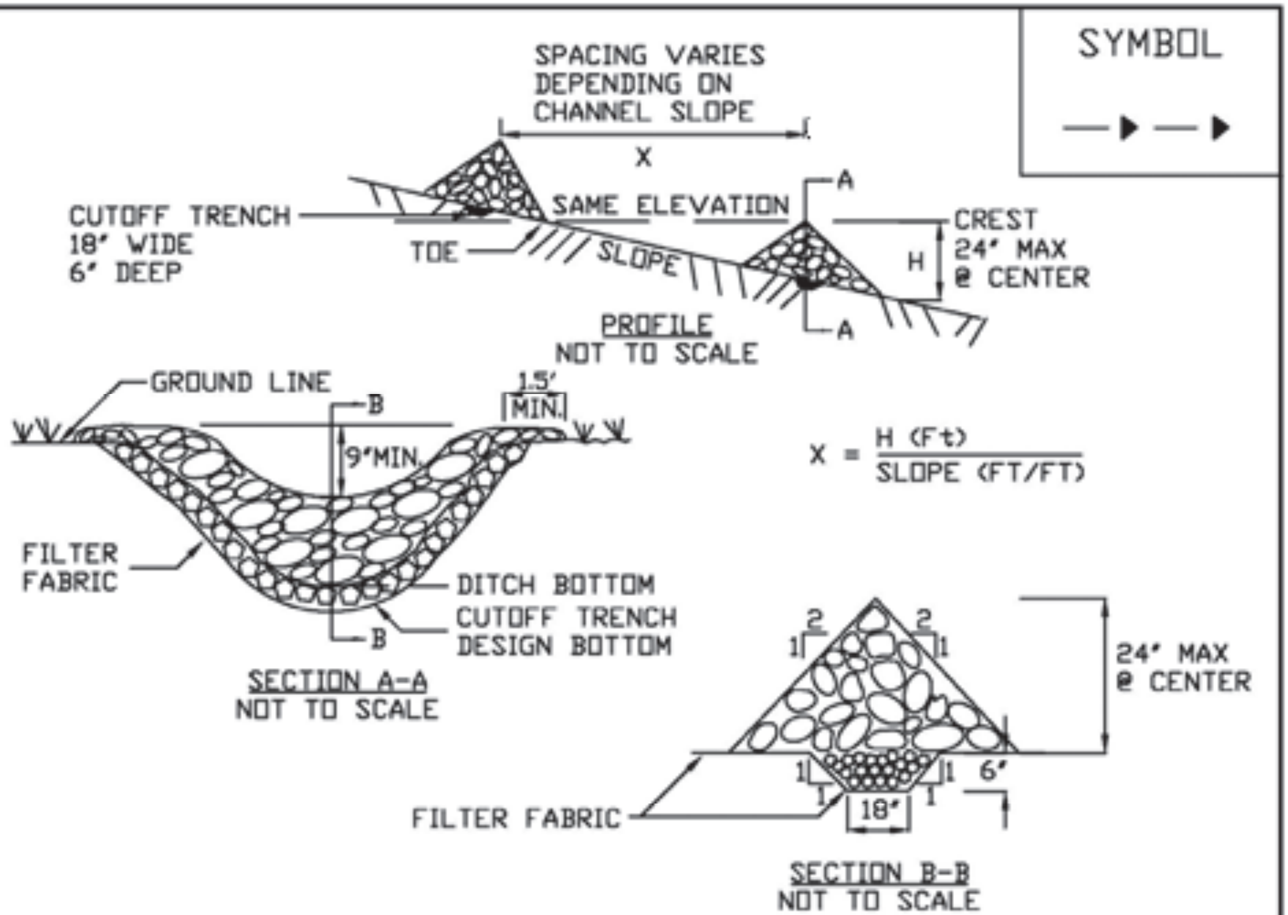
For filter sock or fiber roll check dams: The check dams will be anchored by staking the dam to the earth contact surface. The dam will extend to the top of the bank. The check dam will have a splash apron of NYS DOT #2 crushed stone extending a minimum 3 feet downstream from the dam and 1 foot up the sides of the channel. The compost and materials for a filter sock check dam shall meet the requirements shown in the standard for Compost Filter Sock on page 5.7.

Maintenance

The check dams should be inspected after each runoff event. Correct all damage immediately. If significant erosion has occurred between structures, a liner of stone or other suitable material should be installed in that portion of the channel or additional check dams added.

Remove sediment accumulated behind the dam as needed to allow channel to drain through the stone check dam and prevent large flows from carrying sediment over the dam.

Figure 3.1
Stone Check Dam Detail



CONSTRUCTION SPECIFICATIONS

1. STONE WILL BE PLACED ON A FILTER FABRIC FOUNDATION TO THE LINES, GRADES AND LOCATIONS SHOWN IN THE PLAN.
2. SET SPACING OF CHECK DAMS TO ASSUME THAT THE ELEVATIONS OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION OF THE TOE OF THE UPSTREAM DAM.
3. EXTEND THE STONE A MINIMUM OF 1.5 FEET BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
4. PROTECT THE CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.
5. ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.

MAXIMUM DRAINAGE AREA 2 ACRES.

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

STANDARD AND SPECIFICATIONS FOR LANDGRADING

Definition & Scope

Permanent reshaping of the existing land surface by grading in accordance with an engineering topographic plan and specification to provide for erosion control and vegetative establishment on disturbed, reshaped areas.

Design Criteria

The grading plan should be based upon the incorporation of building designs and street layouts that fit and utilize existing topography and desirable natural surrounding to avoid extreme grade modifications. Information submitted must provide sufficient topographic surveys and soil investigations to determine limitations that must be imposed on the grading operation related to slope stability, effect on adjacent properties and drainage patterns, measures for drainage and water removal, and vegetative treatment, etc.

Many municipalities and counties have regulations and design procedures already established for land grading and cut and fill slopes. Where these requirements exist, they shall be followed.

The plan must show existing and proposed contours of the area(s) to be graded. The plan shall also include practices for erosion control, slope stabilization, safe disposal of runoff water and drainage, such as waterways, lined ditches, reverse slope benches (include grade and cross section), grade stabilization structures, retaining walls, and surface and subsurface drains. The plan shall also include phasing of these practices. The following shall be incorporated into the plan:

1. Provisions shall be made to safely convey surface runoff to storm drains, protected outlets, or to stable water courses to ensure that surface runoff will not damage slopes or other graded areas; see standards and specifications for Grassed Waterway, Diversion, or Grade Stabilization Structure.

2. Cut and fill slopes that are to be stabilized with grasses shall not be steeper than 2:1. When slopes exceed 2:1, special design and stabilization consideration are required and shall be adequately shown on the plans. (Note: Where the slope is to be mowed, the slope should be no steeper than 3:1, although 4:1 is preferred because of safety factors related to mowing steep slopes.)

3. Reverse slope benches or diversion shall be provided whenever the vertical interval (height) of any 2:1 slope exceeds 20 feet; for 3:1 slope it shall be increased to 30 feet and for 4:1 to 40 feet. Benches shall be located to divide the slope face as equally as possible and shall convey the water to a stable outlet. Soils, seeps, rock outcrops, etc., shall also be taken into consideration when designing benches.

   A. Benches shall be a minimum of six feet wide to provide for ease of maintenance.

   B. Benches shall be designed with a reverse slope of 6:1 or flatter to the toe of the upper slope and with a minimum of one foot in depth. Bench gradient to the outlet shall be between 2 percent and 3 percent, unless accompanied by appropriate design and computations.

   C. The flow length within a bench shall not exceed 800 feet unless accompanied by appropriate design and computations; see Standard and Specifications for Diversion on page 3.9

4. Surface water shall be diverted from the face of all cut and/or fill slopes by the use of diversions, ditches and swales or conveyed downslope by the use of a designed structure, except where:

   A. The face of the slope is or shall be stabilized and the face of all graded slopes shall be protected from surface runoff until they are stabilized.

   B. The face of the slope shall not be subject to any concentrated flows of surface water such as from natural drainage ways, graded ditches, downspouts, etc.

   C. The face of the slope will be protected by anchored stabilization matting, sod, gravel, riprap, or other stabilization method.

5. Cut slopes occurring in ripable rock shall be serrated as shown in Figure 4.9 on page 4.26. The serrations shall be made with conventional equipment as the excavation is made. Each step or serration shall be constructed on the contour and will have steps cut at nominal two-foot intervals with nominal three-foot horizontal shelves. These steps will vary depending on the slope ratio or the cut slope. The nominal slope line is 1 ½: 1. These steps will weather and act to hold moisture, lime, fertilizer, and seed thus producing a much quicker and longer-lived vegetative cover and better slope stabilization. Overland flow shall be diverted from the top of all serrated cut slopes and carried to a suitable outlet.

6. Subsurface drainage shall be provided where necessary to intercept seepage that would otherwise adversely affect slope stability or create excessively wet site conditions.

7. Slopes shall not be created so close to property lines as to endanger adjoining properties without adequately protecting such properties against sedimentation, erosion, slippage, settlement, subsidence, or other related damages.

8. Fill material shall be free of brush, rubbish, rocks, logs, stumps, building debris, and other objectionable material. It should be free of stones over two (2) inches in diameter where compacted by hand or mechanical tampers or over eight (8) inches in diameter where compacted by rollers or other equipment. Frozen material shall not be placed in the fill nor shall the fill material be placed on a frozen foundation.

9. Stockpiles, borrow areas, and spoil shall be shown on the plans and shall be subject to the provisions of this Standard and Specifications.

10. All disturbed areas shall be stabilized structurally or vegetatively in compliance with the Permanent Construction Area Planting Standard on page 4.42.

Construction Specifications

See Figures 4.9 and 4.10 for details.

1. All graded or disturbed areas, including slopes, shall be protected during clearing and construction in accordance with the erosion and sediment control plan until they are adequately stabilized.

2. All erosion and sediment control practices and measures shall be constructed, applied and maintained in accordance with the erosion and sediment control plan and these standards.

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 that 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 shall be placed and compacted in layers not to exceed 9 inches in thickness.

8. Except for approved landfills or nonstructural fills, fill material shall be free of frozen particles, brush, roots, sod, or other foreign objectionable materials that would interfere with, or prevent, construction of satisfactory fills.

9. Frozen material or soft, mucky or highly compressible materials shall not be incorporated into fill slopes or structural 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 on page 3.48 or other approved methods.

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 Specifications.

Figure 4.9
Typical Section of Serrated Cut Slope

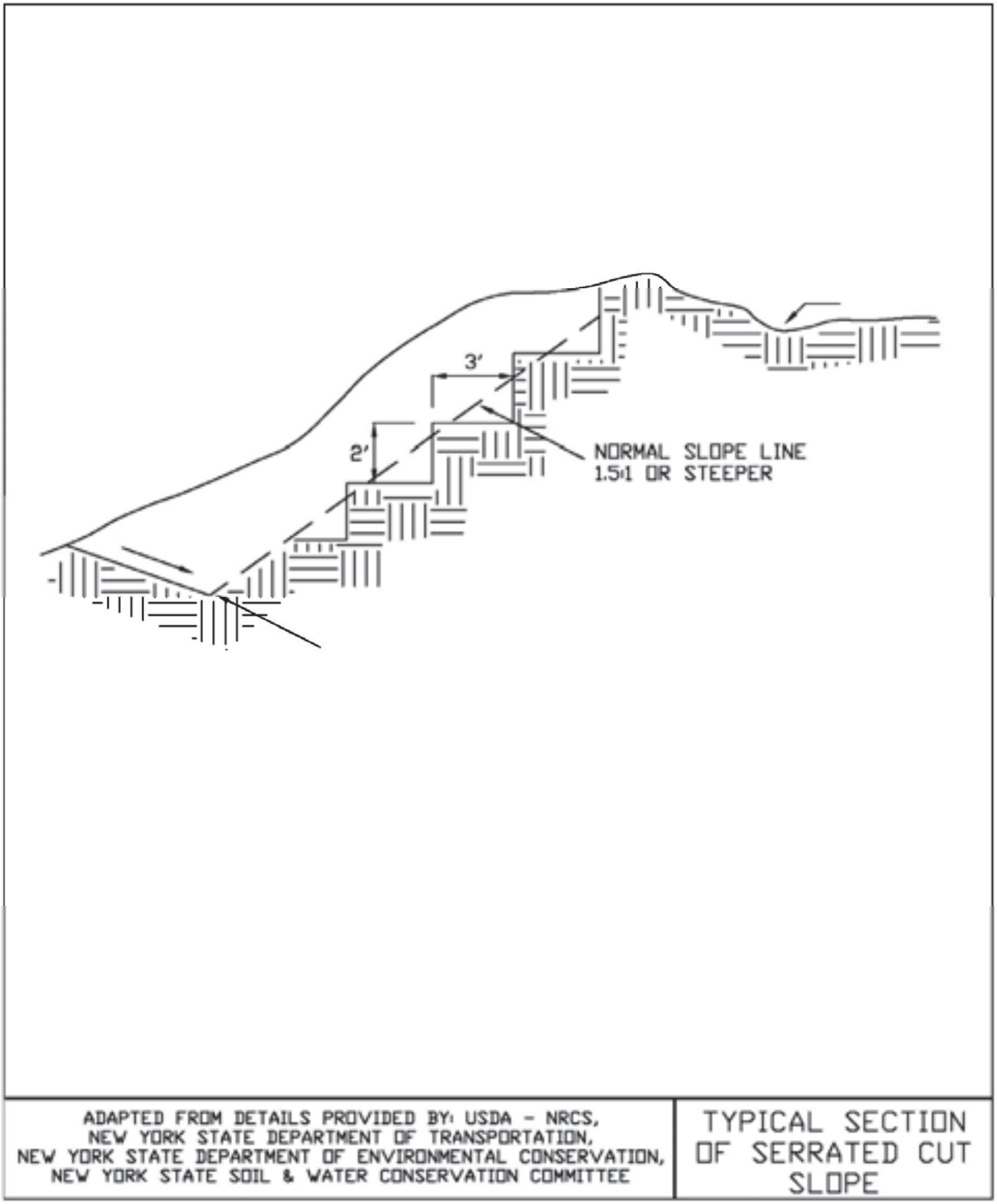
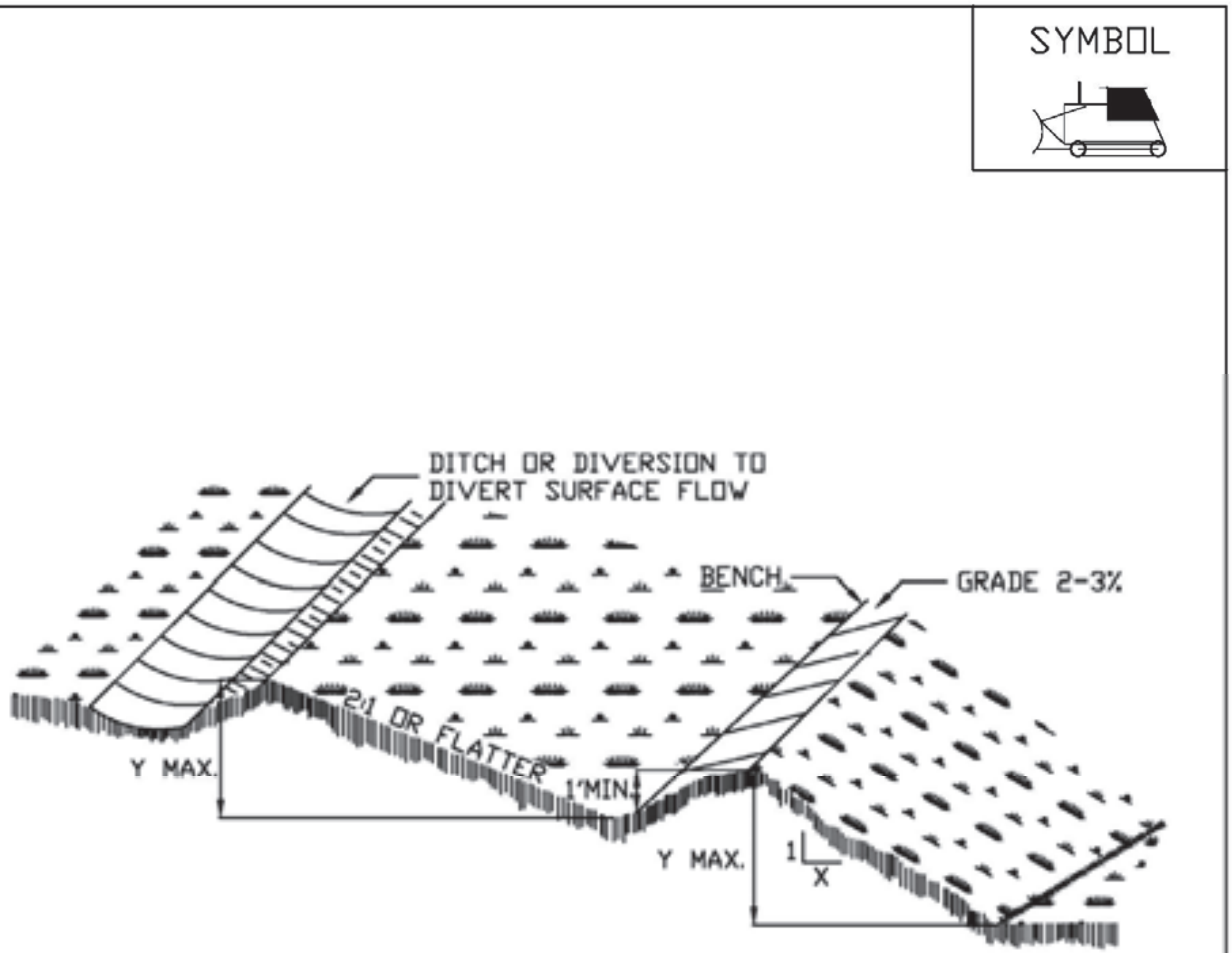


Figure 4.10
Landgrading



X	Y(MAX)
2	20'
3	30'
4	40'

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

LANDGRADING DETAIL

Figure 4.11
Landgrading - Construction Specifications

CONSTRUCTION SPECIFICATIONS

1. ALL GRADED OR DISTURBED AREAS INCLUDING SLOPES SHALL BE PROTECTED DURING CLEARING AND CONSTRUCTION IN ACCORDANCE WITH THE APPROVED EROSION AND 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 EROSION AND SEDIMENT CONTROL PLAN.
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 SHALL 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.

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

STANDARD AND SPECIFICATIONS FOR MULCHING

Definition and Scope

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

Conditions Where Practice Applies

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

Criteria

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

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

Remove all undesirable stones and other debris to meet the needs of the anticipated land use and maintenance required.

Apply mulch after soil amendments and planting is accomplished or simultaneously if hydroseeding is used.

Select appropriate mulch material and application rate or material needs. Hay mulch shall not be used in wetlands or in areas of permanent seeding. Clean straw mulch is preferred alternative in wetland application. Determine local availability.

Select appropriate mulch anchoring material.

NOTE: The best combination for grass/legume establishment is straw (cereal grain) mulch applied at 2 ton/acre (90 lbs./1000sq.ft.) and anchored with wood fiber mulch (hydromulch) at 500 – 750 lbs./acre (11 – 17 lbs./1000 sq. ft.). The wood fiber mulch must be applied through a hydroseeder immediately after mulching.

Table 4.2
Guide to Mulch Materials, Rates, and Uses

Mulch Material	Quality Standards	per 1000 Sq. Ft.	per Acre	Depth of Application	Remarks
Wood chips or shavings	Air-dried. Free of objectionable coarse material	500-900 lbs.	10-20 tons	2-7"	Used primarily around shrub and tree plantings and recreation trails to inhibit weed competition. Resistant to wind blowing. Decomposes slowly.
Wood fiber cellulose (partly digested wood fibers)	Made from natural wood usually with green dye and dispersing agent	50 lbs.	2,000 lbs.	—	Apply with hydromulcher. No tie down required. Less erosion control provided than 2 tons of hay or straw.
Gravel, Crushed Stone or Slag	Washed; Size 2B or 3A—1 1/2"	9 cu. yds.	405 cu. yds.	3"	Excellent mulch for short slopes and around plants and ornamentals. Use 2B where subject to traffic. (Approximately 2,000 lbs./cu. yd.). Frequently used over filter fabric for better weed control.
Hay or Straw	Air-dried; free of undesirable seeds & coarse materials	90-100 lbs. 2-3 bales	2 tons (100-120 bales)	cover about 90% surface	Use small grain straw where mulch is maintained for more than three months. Subject to wind blowing unless anchored. Most commonly used mulching material. Provides the best micro-environment for germinating seeds.
Jute twisted yarn	Undyed, unbleached plain weave. Warp 78 ends/yd., Weft 41 ends/yd. 60-90 lbs./roll	48" x 50 yds. or 48" x 75 yds.	—	—	Use without additional mulch. Tie down as per manufacturers specifications. Good for center line of concentrated water flow.
Excelsior wood fiber mats	Interlocking web of excelsior fibers with photodegradable plastic netting	4' x 112.5' or 8' x 112.5'.	—	—	Use without additional mulch. Excellent for seeding establishment. Anchor as per manufacturers specifications. Approximately 72 lbs./roll for excelsior with plastic on both sides. Use two sided plastic for centerline of waterways.
Straw or coconut fiber, or combination	Photodegradable plastic net on one or two sides	Most are 6.5 ft. x 3.5 ft.	81 rolls	—	Designed to tolerate higher velocity water flow, centerlines of waterways, 60 sq. yds. per roll.

Table 4.3
Mulch Anchoring Guide

Anchoring Method or Material	Kind of Mulch to be Anchored	How to Apply
1. Peg and Twine	Hay or straw	After mulching, divide areas into blocks approximately 1 sq. yd. in size. Drive 4-6 pegs per block to within 2" to 3" of soil surface. Secure mulch to surface by stretching twine between pegs in criss-cross pattern on each block. Secure twine around each peg with 2 or more tight turns. Drive pegs flush with soil. Driving stakes into ground tightens the twine.
2. Mulch netting	Hay or straw	Staple the light-weight paper, jute, wood fiber, or plastic nettings to soil surface according to manufacturer's recommendations. Should be biodegradable. Most products are not suitable for foot traffic.
3. Wood cellulose fiber	Hay or straw	Apply with hydroseeder immediately after mulching. Use 500 lbs. wood fiber per acre. Some products contain an adhesive material ("tackifier"), possibly advantageous.
4. Mulch anchoring tool	Hay or straw	Apply mulch and pull a mulch anchoring tool (blunt, straight discs) over mulch as near to the contour as possible. Mulch material should be "tucked" into soil surface about 3".
5. Tackifier	Hay or straw	Mix and apply polymeric and gum tackifiers according to manufacturer's instructions. Avoid application during rain. A 24-hour curing period and a soil temperature higher than 45^0 Fahrenheit are required.

STANDARD AND SPECIFICATIONS FOR TOPSOILING

Definition & Scope

Spreading a specified quality and quantity of topsoil materials on graded or constructed subsoil areas to provide acceptable plant cover growing conditions, thereby reducing erosion; to reduce irrigation water needs; and to reduce the need for nitrogen fertilizer application.

Conditions Where Practice Applies

Topsoil is applied to subsoils that are droughty (low available moisture for plants), stony, slowly permeable, salty or extremely acid. It is also used to backfill around shrub and tree transplants. This standard does not apply to wetland soils.

Design Criteria

1. Preserve existing topsoil in place where possible, thereby reducing the need for added topsoil.
2. Conserve by stockpiling topsoil and friable fine textured subsoils that must be stripped from the excavated site and applied after final grading where vegetation will be established. Topsoil stockpiles must be stabilized. Stockpile surfaces can be stabilized by vegetation, geotextile or plastic covers. This can be aided by orientating the stockpile lengthwise into prevailing winds.
3. Refer to USDA Natural Resource Conservation Service soil surveys or soil interpretation record sheets for further soil texture information for selecting appropriate design topsoil depths.

Site Preparation

1. As needed, install erosion and sediment control practices such as diversions, channels, sediment traps, and stabilizing measures, or maintain if already installed.
2. Complete rough grading and final grade, allowing for depth of topsoil to be added.
3. Scarify all compact, slowly permeable, medium and fine textured subsoil areas. Scarify at approximately right angles to the slope direction in soil areas that are steeper than 5 percent. Areas that have been overly compacted shall be decompacted in accordance with the Soil Restoration Standard.
4. Remove refuse, woody plant parts, stones over 3 inches in diameter, and other litter.

Topsoil Materials

1. Topsoil shall have at least 6 percent by weight of fine textured stable organic material, and no greater than 20 percent. Muck soil shall not be considered topsoil.
2. Topsoil shall have not less than 20 percent fine textured material (passing the NO. 200 sieve) and not more than 15 percent clay.
3. Topsoil treated with soil sterilants or herbicides shall be so identified to the purchaser.
4. Topsoil shall be relatively free of stones over 1 1/2 inches in diameter, trash, noxious weeds such as nut sedge and quackgrass, and will have less than 10 percent gravel.
5. Topsoil containing soluble salts greater than 500 parts per million shall not be used.
6. Topsoil may be manufactured as a mixture of a mineral component and organic material such as compost.

Application and Grading

1. Topsoil shall be distributed to a uniform depth over the area. It shall not be placed when it is partly frozen, muddy, or on frozen slopes or over ice, snow, or standing water puddles.
2. Topsoil placed and graded on slopes steeper than 5 percent shall be promptly fertilized, seeded, mulched, and stabilized by “tracking” with suitable equipment.
3. Apply topsoil in the amounts shown in Table 4.7 below:

STANDARD AND SPECIFICATIONS FOR SILT FENCE

Definition & Scope

A **temporary** barrier of geotextile fabric installed on the contours across a slope used to intercept sediment laden runoff from small drainage areas of disturbed soil by temporarily ponding the sediment laden runoff allowing settling to occur. The maximum period of use is limited by the ultraviolet stability of the fabric (approximately one year).

Conditions Where Practice Applies

A silt fence may be used subject to the following conditions:

1. Maximum allowable slope length and fence length will not exceed the limits shown in the Design Criteria for the specific type of silt fence used ; and
2. Maximum ponding depth of 1.5 feet behind the fence; and
3. Erosion would occur in the form of sheet erosion; and
4. There is no concentration of water flowing to the barrier; and
5. Soil conditions allow for proper keying of fabric, or other anchorage, to prevent blowouts.

Design Criteria

1. Design computations are not required for installations of 1 month or less. Longer installation periods should be designed for expected runoff.
2. All silt fences shall be placed as close to the disturbed area as possible, but at least 10 feet from the toe of a slope steeper than 3H:1V, to allow for maintenance and roll down. The area beyond the fence must be undisturbed or stabilized.
3. The type of silt fence specified for each location on the plan shall not exceed the maximum slope length and maximum fence length requirements shown in the following table:

		Slope Length/Fence Length (ft.)		
Slope	Steepness	Standard	Reinforced	Super
<2%	< 50:1	300/1500	N/A	N/A
2-10%	50:1 to 10:1	125/1000	250/2000	300/2500
10-20%	10:1 to 5:1	100/750	150/1000	200/1000
20-33%	5:1 to 3:1	60/500	80/750	100/1000
33-50%	3:1 to 2:1	40/250	70/350	100/500
>50%	> 2:1	20/125	30/175	50/250

Standard Silt Fence (SF) is fabric rolls stapled to wooden stakes driven 16 inches in the ground.
Reinforced Silt Fence (RSF) is fabric placed against welded wire fabric with anchored steel posts driven 16 inches in the ground.
Super Silt Fence (SSF) is fabric placed against chain link fence as support backing with posts driven 3 feet in the ground.

4. Silt fence shall be removed as soon as the disturbed area has achieved final stabilization.

The silt fence shall be installed in accordance with the appropriate details. Where ends of filter cloth come together, they shall be overlapped, folded and stapled to prevent sediment bypass. Butt joints are not acceptable. A detail of the silt fence shall be shown on the plan. See Figure 5.30 on page 5.56 for Reinforced Silt Fence as an example of details to be provided.

Criteria for Silt Fence Materials

1. Silt Fence Fabric: The fabric shall meet the following specifications unless otherwise approved by the appropriate erosion and sediment control plan approval authority. Such approval shall not constitute statewide acceptance.

Fabric Properties	Minimum Acceptable Value	Test Method
Grab Tensile Strength (lbs)	110	ASTM D 4632
Elongation at Failure (%)	20	ASTM D 4632
Mullen Burst Strength (PSI)	300	ASTM D 3786
Puncture Strength (lbs)	60	ASTM D 4833
Minimum Trapezoidal Tear Strength (lbs)	50	ASTM D 4533
Flow Through Rate (gal/ min/sf)	25	ASTM D 4491
Equivalent Opening Size	40-80	US Std Sieve ASTM D 4751
Minimum UV Residual (%)	70	ASTM D 4355

2. Fence Posts (for fabricated units): The length shall be a minimum of 36 inches long. Wood posts will be of sound quality hardwood with a minimum cross sectional area of 3.5 square inches. Steel posts will be standard T and U section weighing not less than 1.00 pound per linear foot. Posts for super silt fence shall be standard chain link fence posts.

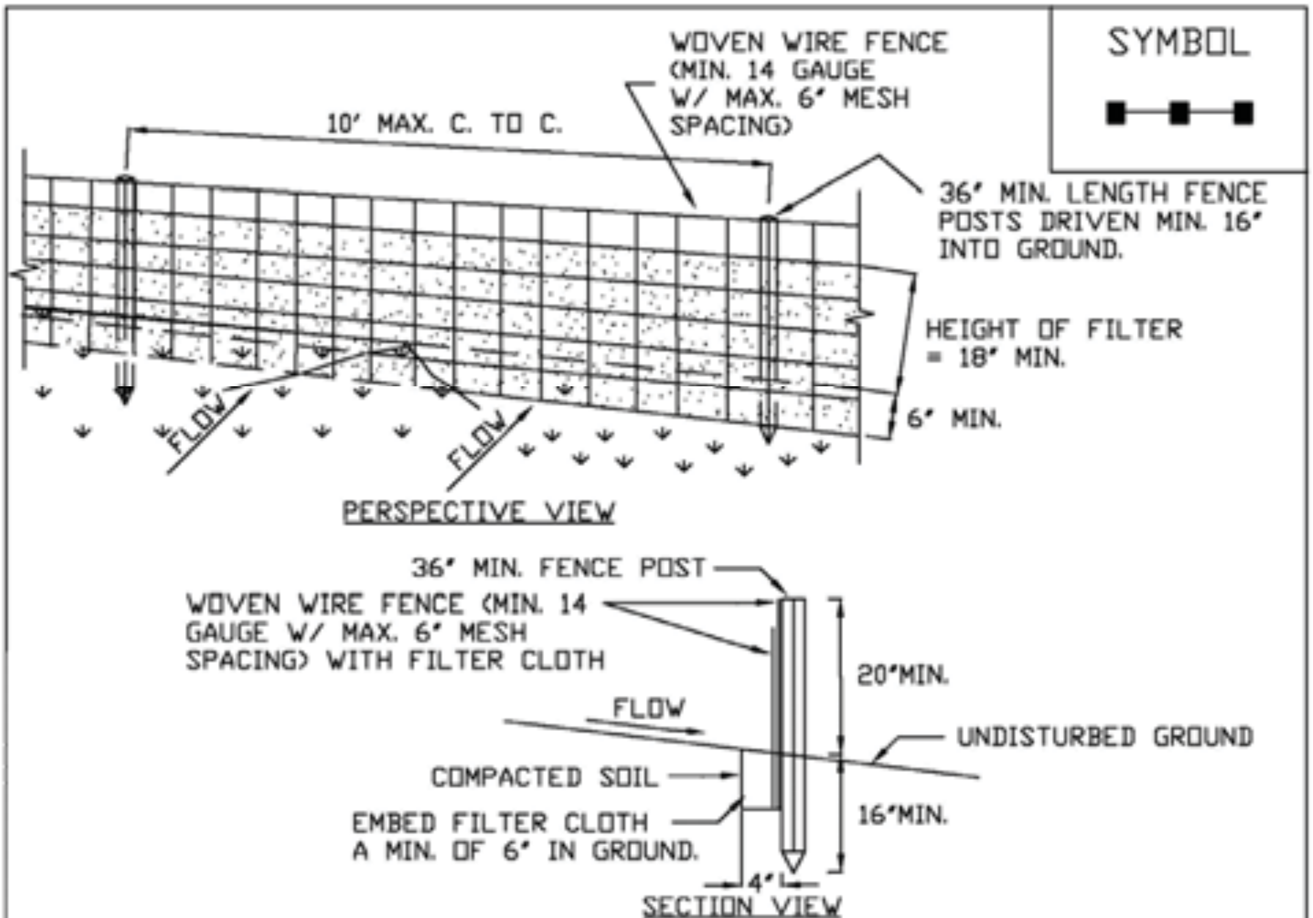
3. Wire Fence for reinforced silt fence: Wire fencing shall be a minimum 14 gage with a maximum 6 in. mesh opening, or as approved.

4. Prefabricated silt fence is acceptable as long as all material specifications are met.

Reinforced Silt Fence

Super Silt Fence

Figure 5.30
Reinforced Silt Fence



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 FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24' AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6' MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL MEET THE MINIMUM REQUIREMENTS SHOWN.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN 'BULGES' DEVELOP IN THE SILT FENCE.

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

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APPENDIX F
STORMWATER CONSTRUCTION SITE LOGBOOK

Stormwater Construction Site Logbook

Forestburgh Pond Residential Subdivision Project
Route 48 and 42
Town of Forestburgh
Sullivan County, New York

Prepared For:
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Project No. 0392.12119 January 2019

APPENDIX F
CONSTRUCTION SITE INSPECTION AND MAINTENANCE LOG BOOK

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM FOR CONSTRUCTION ACTIVITIES

SAMPLE CONSTRUCTION SITE LOG BOOK

Table of Contents

I. PRE-CONSTRUCTION MEETING DOCUMENTS

Project Name ____
Permit No. __________________________________ **Date of Authorization** ______________
Name of Operator ____
Prime Contractor ____

a. Preamble to Site Assessment and Inspections

The Following Information To Be Read By All Person's Involved in The Construction of Stormwater Related Activities:

The Operator agrees to have a qualified inspector[1] conduct an assessment of the site prior to the commencement of construction[2] and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.

Prior to the commencement of construction, the Operator shall certify in this site logbook that the SWPPP has been prepared in accordance with the State's standards and meets all Federal, State and local erosion and sediment control requirements. A preconstruction meeting should be held to review all of the SWPPP requirements with construction personnel.

When construction starts, site inspections shall be conducted by the qualified inspector at least every 7 calendar days. The Operator shall maintain a record of all inspection reports in this site logbook. The site logbook shall be maintained on site and be made available to the permitting authorities upon request.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified inspector perform a final site inspection. The qualified inspector shall certify that the site has undergone final stabilization[3] using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed. In addition, the Operator must identify and certify that all permanent structures described in the SWPPP have been constructed and provide the owner(s) with an operation and maintenance plan that ensures the structure(s) continuously functions as designed.

1 Refer to "Qualified Inspector" inspection requirements in the current SPDES General Permit for Stormwater Discharges from Construction Activity for complete list of inspection requirements.
2 "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.
3 "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

b. Pre-construction Site Assessment Checklist
(NOTE: Provide comments below as necessary)

1. Notice of Intent, SWPPP, and Contractors Certification:

Yes No NA

[ ] [ ] [ ] Has a Notice of Intent been filed with the NYS Department of Conservation?
[ ] [ ] [ ] Is the SWPPP on-site? Where?_______________________________
[ ] [ ] [ ] Is the Plan current? What is the latest revision date?______________
[ ] [ ] [ ] Is a copy of the NOI (with brief description) onsite? Where?______________
[ ] [ ] [ ] Have all contractors involved with stormwater related activities signed a contractor's certification?

2. Resource Protection

Yes No NA

[ ] [ ] [ ] Are construction limits clearly flagged or fenced?
[ ] [ ] [ ] Important trees and associated rooting zones, on-site septic system absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, have been flagged for protection.
[ ] [ ] [ ] Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

3. Surface Water Protection

Yes No NA

[ ] [ ] [ ] Clean stormwater runoff has been diverted from areas to be disturbed.
[ ] [ ] [ ] Bodies of water located either on site or in the vicinity of the site have been identified and protected.
[ ] [ ] [ ] Appropriate practices to protect on-site or downstream surface water are installed.
[ ] [ ] [ ] Are clearing and grading operations divided into areas <5 acres?

4. Stabilized Construction Access

Yes No NA

[ ] [ ] [ ] A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.
[ ] [ ] [ ] Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.
[ ] [ ] [ ] Sediment tracked onto public streets is removed or cleaned on a regular basis.

5. Sediment Controls

Yes No NA

[ ] [ ] [ ] Silt fence material and installation comply with the standard drawing and specifications.
[ ] [ ] [ ] Silt fences are installed at appropriate spacing intervals
[ ] [ ] [ ] Sediment/detention basin was installed as first land disturbing activity.
[ ] [ ] [ ] Sediment traps and barriers are installed.

6. Pollution Prevention for Waste and Hazardous Materials

Yes No NA

[ ] [ ] [ ] The Operator or designated representative has been assigned to implement the spill prevention avoidance and response plan.
[ ] [ ] [ ] The plan is contained in the SWPPP on page ______
[ ] [ ] [ ] Appropriate materials to control spills are onsite. Where? __________________

II. CONSTRUCTION DURATION INSPECTIONS

a. Directions:

Inspection Forms will be filled out during the entire construction phase of the project.

Required Elements:

1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;

2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;

3) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;

4) Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of sediment storage volume (for example, 10 percent, 20 percent, 50 percent);

5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water; and

6) Immediately report to the Operator any deficiencies that are identified with the implementation of the SWPPP.

SITE PLAN/SKETCH

______________________________ ______________________________
Inspector (print name) **Date of Inspection**

______________________________ ______________________________
Qualified Inspector (print name) **Qualified Inspector Signature**

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

Maintaining Water Quality

Yes No NA
[ ] [ ] [ ] Is there an increase in turbidity causing a substantial visible contrast to natural conditions at the outfalls?
[ ] [ ] [ ] Is there residue from oil and floating substances, visible oil film, or globules or grease at the outfalls?
[ ] [ ] [ ] All disturbance is within the limits of the approved plans.
[ ] [ ] [ ] Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?

Housekeeping

1. General Site Conditions

Yes No NA
[ ] [ ] [ ] Is construction site litter, debris and spoils appropriately managed?
[ ] [ ] [ ] Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
[ ] [ ] [ ] Is construction impacting the adjacent property?
[ ] [ ] [ ] Is dust adequately controlled?

2. Temporary Stream Crossing

Yes No NA
[ ] [ ] [ ] Maximum diameter pipes necessary to span creek without dredging are installed.
[ ] [ ] [ ] Installed non-woven geotextile fabric beneath approaches.
[ ] [ ] [ ] Is fill composed of aggregate (no earth or soil)?
[ ] [ ] [ ] Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.

3. Stabilized Construction Access

Yes No NA
[ ] [ ] [ ] Stone is clean enough to effectively remove mud from vehicles.
[ ] [ ] [ ] Installed per standards and specifications?
[ ] [ ] [ ] Does all traffic use the stabilized entrance to enter and leave site?
[ ] [ ] [ ] Is adequate drainage provided to prevent ponding at entrance?

Runoff Control Practices

1. Excavation Dewatering

Yes No NA
[ ] [ ] [ ] Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
[ ] [ ] [ ] Clean water from upstream pool is being pumped to the downstream pool.
[ ] [ ] [ ] Sediment laden water from work area is being discharged to a silt-trapping device.
[ ] [ ] [ ] Constructed upstream berm with one-foot minimum freeboard.

Runoff Control Practices (continued)

2. Flow Spreader

Yes No NA

[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
[ ] [ ] [ ] Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales

Yes No NA

[ ] [ ] [ ] Installed per plan with minimum side slopes 2H:1V or flatter.
[ ] [ ] [ ] Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
[ ] [ ] [ ] Sediment-laden runoff directed to sediment trapping structure

4. Stone Check Dam

Yes No NA

[ ] [ ] [ ] Is channel stable? (flow is not eroding soil underneath or around the structure).
[ ] [ ] [ ] Check is in good condition (rocks in place and no permanent pools behind the structure).
[ ] [ ] [ ] Has accumulated sediment been removed?.

5. Rock Outlet Protection

Yes No NA

[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Installed concurrently with pipe installation.

Soil Stabilization

1. Topsoil and Spoil Stockpiles

Yes No NA

[ ] [ ] [ ] Stockpiles are stabilized with vegetation and/or mulch.
[ ] [ ] [ ] Sediment control is installed at the toe of the slope.

2. Revegetation

Yes No NA

[ ] [ ] [ ] Temporary seedings and mulch have been applied to idle areas.
[ ] [ ] [ ] 4 inches minimum of topsoil has been applied under permanent seedings

Sediment Control Practices

1. Silt Fence and Linear Barriers

Yes No NA

[ ] [ ] [ ] Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
[ ] [ ] [ ] Joints constructed by wrapping the two ends together for continuous support.
[ ] [ ] [ ] Fabric buried 6 inches minimum.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.
Sediment accumulation is ___% of design capacity.

Sediment Control Practices (continued)

2. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated; Filter Sock or Manufactured practices)

Yes No NA
[ ] [ ] [ ] Installed concrete blocks lengthwise so open ends face outward, not upward.
[ ] [ ] [ ] Placed wire screen between No. 3 crushed stone and concrete blocks.
[ ] [ ] [ ] Drainage area is 1acre or less.
[ ] [ ] [ ] Excavated area is 900 cubic feet.
[ ] [ ] [ ] Excavated side slopes should be 2:1.
[ ] [ ] [ ] 2” x 4” frame is constructed and structurally sound.
[ ] [ ] [ ] Posts 3-foot maximum spacing between posts.
[ ] [ ] [ ] Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.
[ ] [ ] [ ] Manufactured insert fabric is free of tears and punctures.
[ ] [ ] [ ] Filter Sock is not torn or flattened and fill material is contained within the mesh sock.
Sediment accumulation ___% of design capacity.

3. Temporary Sediment Trap

Yes No NA
[ ] [ ] [ ] Outlet structure is constructed per the approved plan or drawing.
[ ] [ ] [ ] Geotextile fabric has been placed beneath rock fill.
[ ] [ ] [ ] Sediment trap slopes and disturbed areas are stabilized.
Sediment accumulation is ___% of design capacity.

4. Temporary Sediment Basin

Yes No NA
[ ] [ ] [ ] Basin and outlet structure constructed per the approved plan.
[ ] [ ] [ ] Basin side slopes are stabilized with seed/mulch.
[ ] [ ] [ ] Drainage structure flushed and basin surface restored upon removal of sediment basin facility.
[ ] [ ] [ ] Sediment basin dewatering pool is dewatering at appropriate rate.
Sediment accumulation is ___% of design capacity.

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design. All practices shall be maintained in accordance with their respective standards.

Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.

CONSTRUCTION DURATION INSPECTIONS

b. Modifications to the SWPPP (To be completed as described below)

The Operator shall amend the SWPPP whenever:

1. There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or
2. The SWPPP proves to be ineffective in:
   a. Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or
   b. Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and
3. Additionally, the SWPPP shall be amended to identify any new contractor or subcontractor that will implement any measure of the SWPPP.

Modification & Reason:

APPENDIX G
EROSION AND SEDIMENT CONTROL FOR SMALL HOMESITE CONSTRUCTION

APPENDIX E
EROSION & SEDIMENT CONTROL PLAN
FOR SMALL HOMESITE CONSTRUCTION

CONTENTS

Appendix prepared by:

Paula Smith, CPESC, CPSWQ
Executive Director
Monroe County Soil & Water Conservation District

List of Figures

EROSION AND SEDIMENT CONTROL PLAN FOR SMALL HOMESITE CONSTRUCTION

Definition

Small homesite erosion and sediment control plans are a group of minimum erosion and sediment control practices and management techniques that apply to small homesite construction activity on a single residential lot, in order to prevent polluted discharge.

Purpose

This appendix lays out a series of minimum requirements for erosion and sediment control, and management practices that may be used to meet these requirements. Use of these templates will help show compliance with the general requirements for construction activities that require basic stormwater pollution prevention plans (SWPPP). This applies to the construction of small homesites. The owner/developer must complete the relevant conditions (1-4), or small parcel erosion and sediment control plan included in this section, and submit the NOI in order to meet compliance with the SPDES General Permit for Stormwater Discharges From Construction Activities.

Criteria

Generally, several types of practices are required on any one site for effective erosion and sediment control. There are three broad categories of construction-related practices for controlling erosion and sediment on small homesite developments:

1. **Cover practices** prevent erosion by protecting the soil surface from rainfall and runoff. Prevention of erosion is the most preferable and cost-effective approach. These practices include: protection of existing vegetation; temporary covering of exposed soil by mulching, matting, or covering; and permanent site stabilization by topsoiling, seeding, and/or sodding.

2. **Structural Practices** are structural controls that either reduce erosion, control runoff, or keep sediment on the construction site. Examples of these practices include stabilized construction entrances, filter fences, sediment traps, berms, and check dams.

3. **Management Measures** are construction management methods that prevent or reduce erosion potential and ensure the proper functioning of erosion and sediment control practices. Careful construction management can dramatically reduce the costs associated with erosion and sediment problems. Examples of these management measures include:

- Preserving existing trees and grass where possible to prevent erosion;
- Re-vegetating the site as soon as possible;
- Locating soil piles away from roads or waterways;
- Limiting tracking of mud onto streets by requiring all vehicles to use designated access drives;
- Removing sediment carried off-site by vehicles or storms;
- Installing downspout extenders to prevent erosion from roof runoff; and
- Maintaining erosion and sediment practices through sediment removal, structure replacement, etc.

Specifications

Each construction site is different. The owner/developer of a small construction site may choose and follow one of the four variations of ESC plans included in this section to develop a SWPPP in compliance with the SPDES Construction Permit For Stormwater Discharges From Construction Activities. However, because of the general nature of the following conditions, **the plans included in this section may not cover all of the resource protection needs on a particular site, and this form does not exempt an owner from the responsibility of filing an NOI.**

Small Homesite Minimum Requirements:

1. Stabilized Construction Entrance:
To prevent vehicles and equipment from tracking sediment and mud off-site, apply gravel or crushed rock to the driveway area and restrict traffic to this one route. This practice will help keep soil from sticking to tires and stop soil from washing off into the street. Carry out periodic inspections and maintenance including washing, top-dressing with additional stone, reworking, and compaction. Plan for periodic street cleaning to remove any sediment that may have been tracked off-site. Remove sediment by shoveling or sweeping and transport to a suitable disposal area where it can be stabilized.

2. Stabilization of Denuded Areas:
Stabilization measures must be initiated as soon as practicable, but in no case more than 14 days after the construction activity has ceased. In frozen ground conditions, stabilization measures must be initiated as soon as practicable. Where construction activity on a portion of the site is temporarily ceased, and earth-disturbing activities will be resumed within twenty-one (21) days, temporary stabilization measures need not be initiated on that portion of the site.

Stabilize denuded areas by implementing soil covering practices (e.g. mulching, matting, sodding). Exposed soils are the most prone to erosion from rainfall and runoff. Vegetation helps protect the soil from these forces and provides natural erosion control. Plan construction to limit the amount of exposed area, and avoid grading activities during the rainy season (November through March) as much as possible. Clearing limits should be clearly marked and kept as small as possible. Once construction is completed, the site must be permanently stabilized with topsoiling, seeding and plantings, or sodding if needed.

3. Protection of Adjacent Properties:
Keep sediment on-site by using structural and source control practices (e.g. vegetative buffer strips, sediment barriers, soil berms or dikes, etc). See Sections 3, 4, or 5 as appropriate. Wherever possible, preserve a buffer of existing vegetation around the site boundary. This will help to decrease runoff velocities and trap sediment suspended in the runoff. Other structural controls such as filter fence or straw bale barriers should also be used to filter runoff and trap sediment on-site.

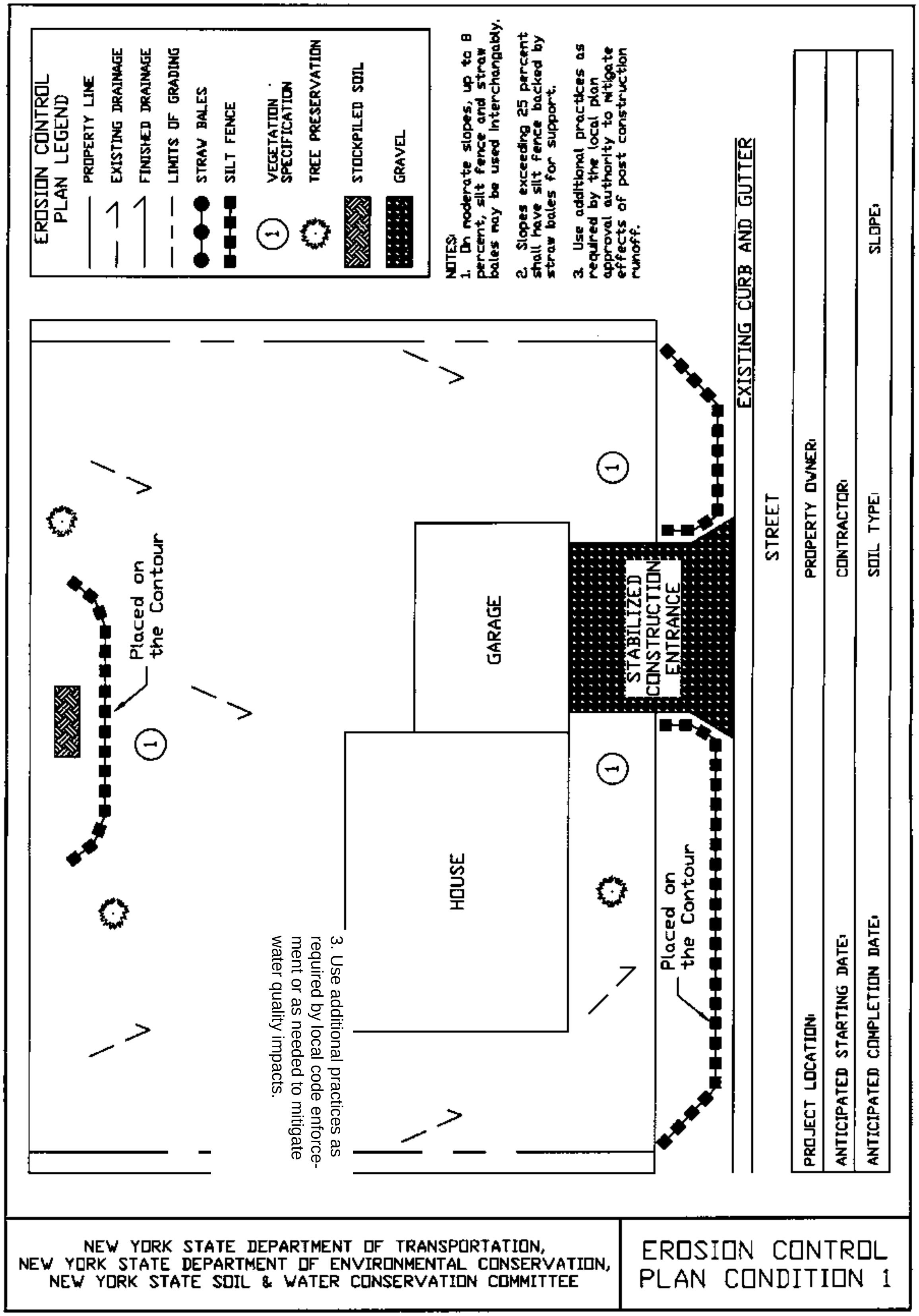
When excavating basement soils, move the soil to a location that is, or will be, vegetated, such as in the backyard or side yard area. This will increase the distance eroded soil must travel, through vegetation, to reach the storm sewer system. Piles should be situated so that sediment does not run into the street or adjoining yards. Soil piles should be temporarily seeded and circled with silt fence until the soil is either replaced or removed. Backfill basement walls as soon as possible and rough grade the lot. This will eliminate the large soil mounds, which are highly erodible, and prepare the lot for temporary cover. After backfilling, grade or remove excess soil from the site quickly, to eliminate any sediment loss from surplus fill.

4. Concentrated Flow:
For constructed drainage ways, or other areas of concentrated flow, install check dams according to the specifications on page E.12 to reduce erosion in the channel. As with other erosion controls, check dams must be inspected regularly. Remove sediment accumulated behind the dam as needed to allow channel to drain through the stone check dam and prevent large flows from carrying sediment over the dam Replace stones as needed to maintain the design cross section of the structures. Sediment removal is crucial to the effectiveness of the dam—if not maintained, high flows could cause erosion around the sides of the structures, adding significant sediment loads downstream.

5. Maintenance:
Maintain erosion and sediment control practices through regular inspection. Regular maintenance is extremely important for the proper operation of structural practices. After initial groundbreaking, the builder shall conduct site inspections at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.

6. Other Practices:
Use additional practices as required by the local plan approval authority to mitigate effects of increased runoff. This may include providing additional controls to a locally protected stream or resource area, protecting riparian corridors (vegetative stream buffers), etc. Individual homeowners and/or developers are responsible for researching additional requirements related to erosion and sediment runoff control established by their local jurisdictions.

Figure E.1
Erosion Control Plan Condition 1



Condition 1—Vegetative Requirements & Compliance Form

Vegetation Requirements:

1.) Site Preparation

A. Install needed water and erosion control measures and bring area to be seeded to desired grades using a minimum of 4 in. topsoil.
B. Prepare seedbed by loosening soil to a depth of 4-6 inches.
C. Lime to a pH of 6.5
E. Fertilize as per soil test or, if fertilizer must be applied before soil test results are received, apply 850 pounds of 5-10-10 or equivalent per acre (20 lbs/1,000 sq. ft.)
F. Incorporate lime and fertilizer in top 2-4 inches of topsoil.
G. Smooth. Remove all stones over 1 inch in diameter, sticks, and foreign matter from the surface. Firm the seedbed.

2.) Planting—Sunny Location.

Use a cultipacker type seeder if possible. Seed to a depth of 1/8 to 1/4 inch. If seed is to be broadcast, cultipack or roll after seeding. If hydroseeded, lime and fertilizer may be applied through the seeder and rolling is not practical. Seed using the following mix and rates:

Species (% by weight)	lbs/1,000sq. ft	lbs./acre
65% Kentucky bluegrass blend	2.0-2.6	85-114
20% perennial ryegrass	0.6-0.8	26-35
15% fine fescue	0.4-0.6	19-26
Total	3.0-4.0	130-175
or,		
100% Tall fescue, Turf-type, fine leaf	3.4-4.6	150-200

3.) When using the cultipacker or broadcast seed method, mulch using small grain straw, applied at a rate of 2 tons per acre; and anchor with a netting or tackifier. Hydroseed applications should include mulch, fertilizer and seed.

Common white clover can be added to mixtures at the rate of 1-2 lbs/acre to help maintain green color during the dry summer period, however, they will not withstand heavy traffic. Fertilizing—First year, (spring seedlings) three to four weeks after germination apply 1 pound nitrogen/1,000 square feet using a complete fertilizer with a 2-1-1 or 4-1-3 ratio or as recommended by soil test results. For summer and early fall seedings, apply as above unless air temperatures are above 85ºF for extended period. Wait until heat wave is over to fertilize. For late fall/ winter seedings, fertilize in spring. Restrict use—new seedlings should be protected from use for one full year to allow development of a dense sod with good root structure.

Certification Statement

Please complete and sign this 2-sided document (with Typical Erosion Control Plan) and attach to BLUEPRINTS and SITE PLAN prior to any earth disturbance. These documents must be kept on site and be available for review as requested by any agent of the NYSDEC. **This 2-sided form can be used as a basic stormwater pollution prevention plan, but will not exempt a landowner from filing a Notice of Intent.**

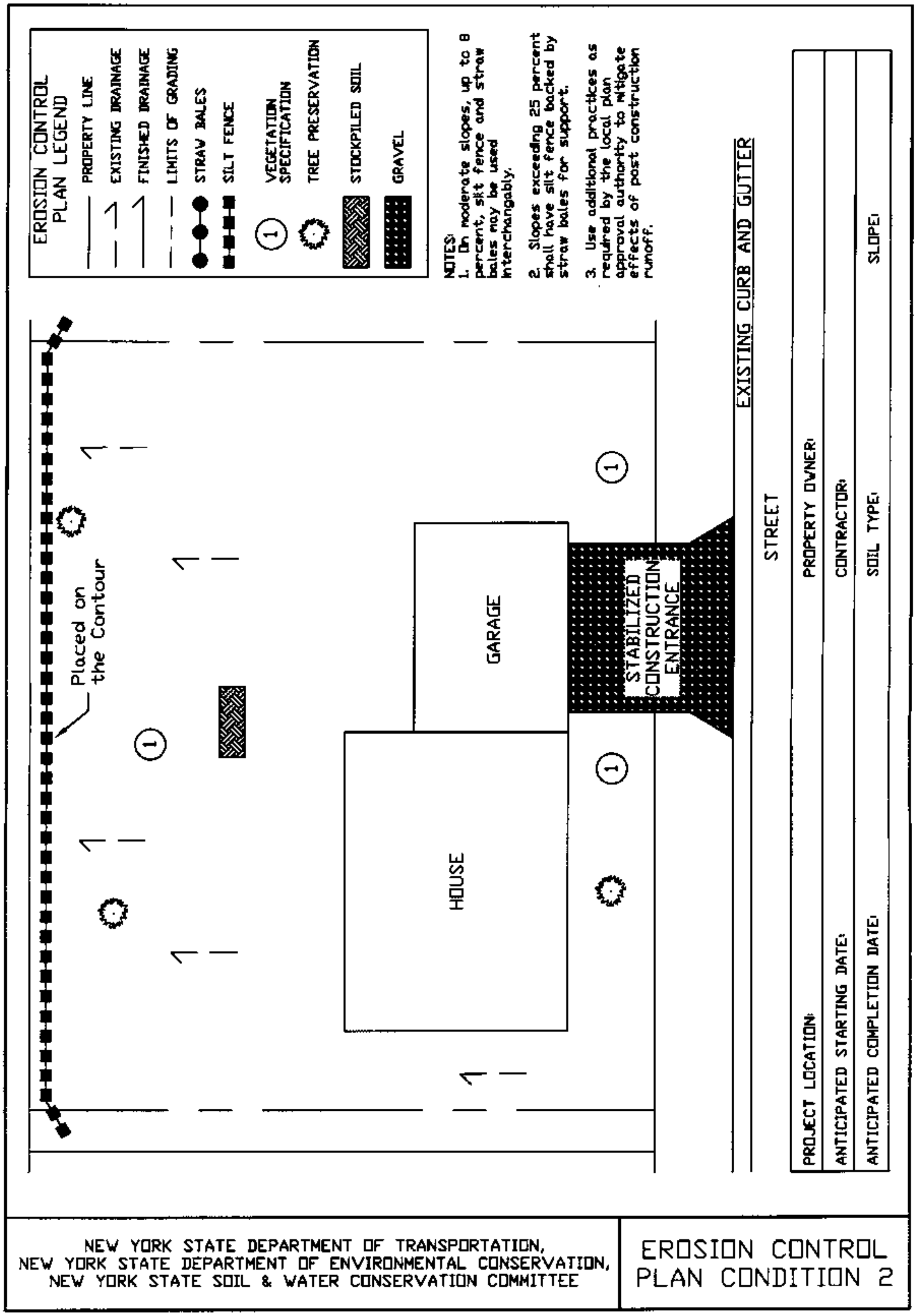
"I certify under penalty of law that I understand and agree to comply with the terms and conditions of the ESC plan for the construction site identified in such ESC plan as a condition of authorization to discharge stormwater. I also understand that the operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards."

Builder/Contractor (print) Signature

Address

Telephone Fax E-mail

Figure E.2
Erosion Control Plan Condition 2



Condition 2—Vegetative Requirements & Compliance Form

Vegetation Requirements:

1.) Site Preparation

A. Install needed water and erosion control measures and bring area to be seeded to desired grades using a minimum of 4 in. topsoil.
B. Prepare seedbed by loosening soil to a depth of 4-6 inches.
C. Lime to a pH of 6.5
E. Fertilize as per soil test or, if fertilizer must be applied before soil test results are received, apply 850 pounds of 5-10-10 or equivalent per acre (20 lbs/1,000 sq. ft.)
F. Incorporate lime and fertilizer in top 2-4 inches of topsoil.
G. Smooth. Remove all stones over 1 inch in diameter, sticks, and foreign matter from the surface. Firm the seedbed.

2.) Planting—Sunny Location.

Use a cultipacker type seeder if possible. Seed to a depth of 1/8 to 1/4 inch. If seed is to be broadcast, cultipack or roll after seeding. If hydroseeded, lime and fertilizer may be applied through the seeder and rolling is not practical. Seed using the following mix and rates:

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20% perennial ryegrass	0.6-0.8	26-35
15% fine fescue	0.4-0.6	19-26
Total	3.0-4.0	130-175
or,		
100% Tall fescue, Turf-type, fine leaf	3.4-4.6	150-200

3.) When using the cultipacker or broadcast seed method, mulch using small grain straw, applied at a rate of 2 tons per acre; and anchor with a netting or tackifier. Hydroseed applications should include mulch, fertilizer and seed.

Common white clover can be added to mixtures at the rate of 1-2 lbs/acre to help maintain green color during the dry summer period, however, they will not withstand heavy traffic. Fertilizing—First year, (spring seedlings) three to four weeks after germination apply 1 pound nitrogen/1,000 square feet using a complete fertilizer with a 2-1-1 or 4-1-3 ratio or as recommended by soil test results. For summer and early fall seedings, apply as above unless air temperatures are above 85ºF for extended period. Wait until heat wave is over to fertilize. For late fall/ winter seedings, fertilize in spring. Restrict use—new seedlings should be protected from use for one full year to allow development of a dense sod with good root structure.

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Builder/Contractor (print) Signature

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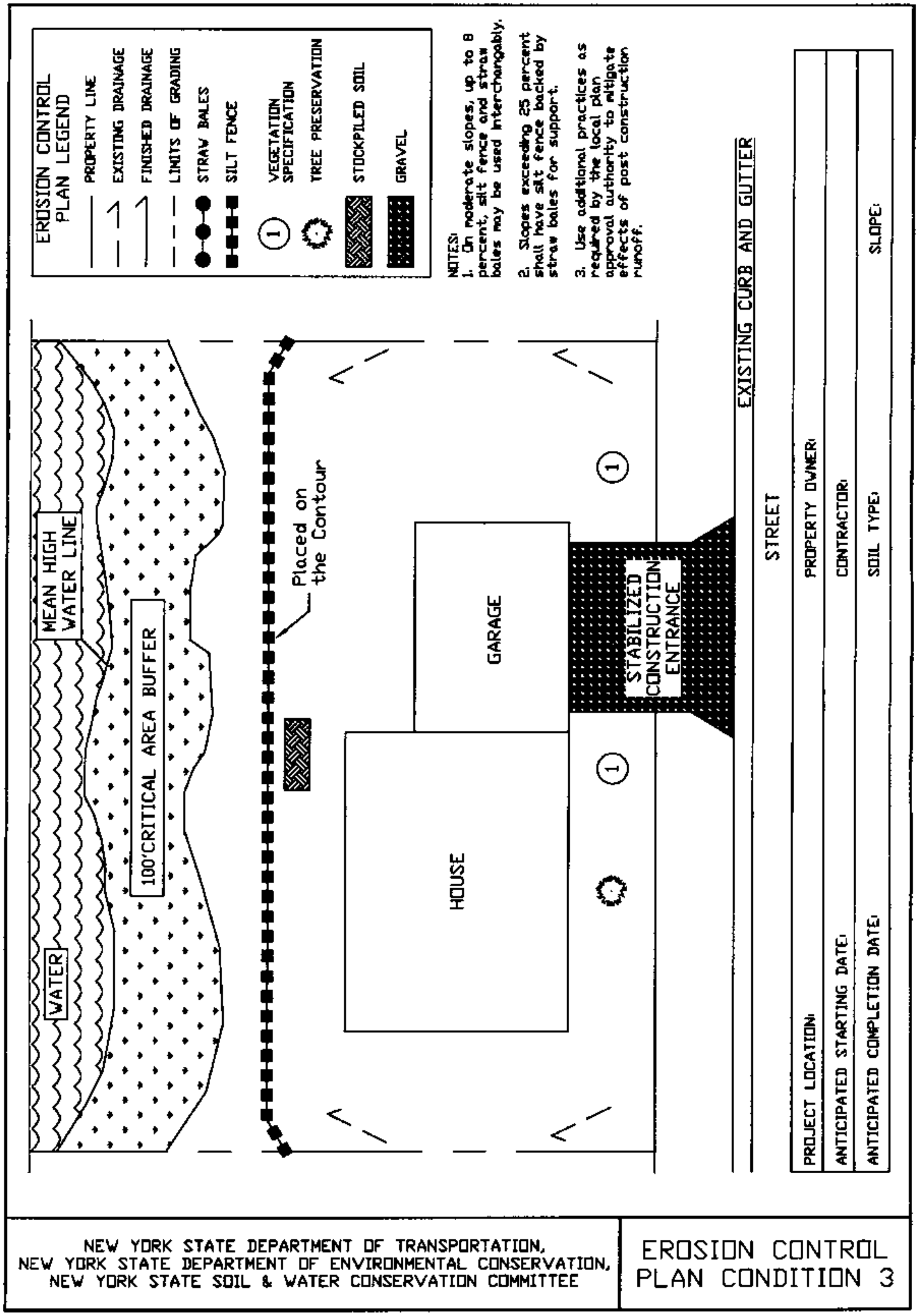
Figure E.3
Erosion Control Plan Condition 3



Condition 3—Vegetative Requirements & Compliance Form

Vegetation Requirements:

1.) Site Preparation

A. Install needed water and erosion control measures and bring area to be seeded to desired grades using a minimum of 4 in. topsoil.
B. Prepare seedbed by loosening soil to a depth of 4-6 inches.
C. Lime to a pH of 6.5
E. Fertilize as per soil test or, if fertilizer must be applied before soil test results are received, apply 850 pounds of 5-10-10 or equivalent per acre (20 lbs/1,000 sq. ft.)
F. Incorporate lime and fertilizer in top 2-4 inches of topsoil.
G. Smooth. Remove all stones over 1 inch in diameter, sticks, and foreign matter from the surface. Firm the seedbed.

2.) Planting—Sunny Location.

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Total	3.0-4.0	130-175
or,		
100% Tall fescue, Turf-type, fine leaf	3.4-4.6	150-200

3.) When using the cultipacker or broadcast seed method, mulch using small grain straw, applied at a rate of 2 tons per acre; and anchor with a netting or tackifier. Hydroseed applications should include mulch, fertilizer and seed.

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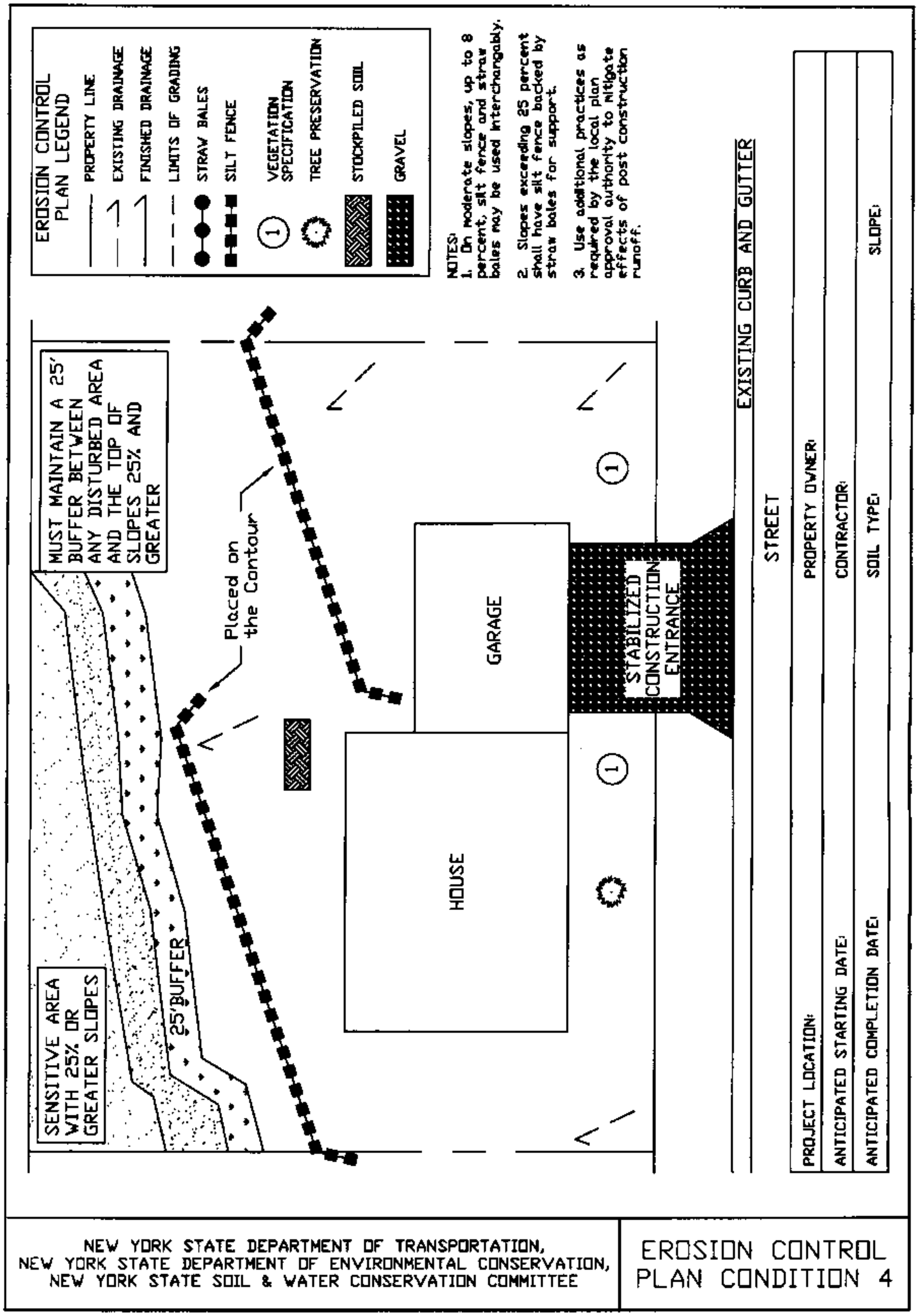
Figure E.4
Erosion Control Plan Condition 4



Condition 4—Vegetative Requirements & Compliance Form

Vegetation Requirements:

1.) Site Preparation

A. Install needed water and erosion control measures and bring area to be seeded to desired grades using a minimum of 4 in. topsoil.
B. Prepare seedbed by loosening soil to a depth of 4-6 inches.
C. Lime to a pH of 6.5
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F. Incorporate lime and fertilizer in top 2-4 inches of topsoil.
G. Smooth. Remove all stones over 1 inch in diameter, sticks, and foreign matter from the surface. Firm the seedbed.

2.) Planting—Sunny Location.

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Total	3.0-4.0	130-175
or,		
100% Tall fescue, Turf-type, fine leaf	3.4-4.6	150-200

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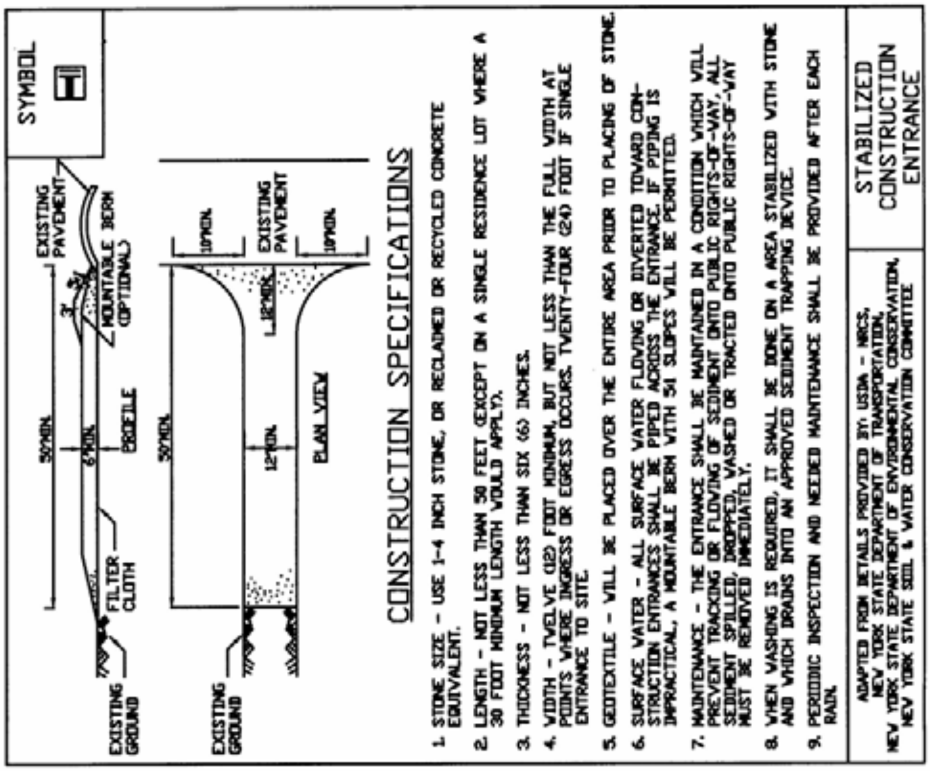
Builder/Contractor (print) Signature

Address

Telephone Fax E-mail

Figure E.5
Construction Details for Stabilized Construction Entrance and Silt Fence



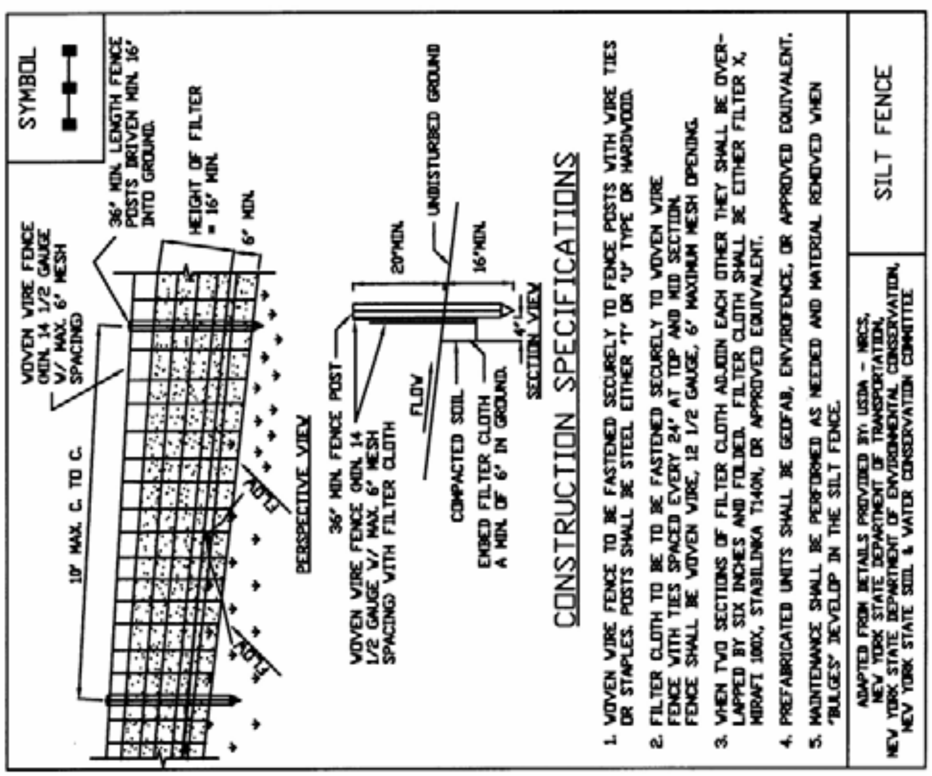


Figure E.6
Construction Details for Straw Bale Dike and Check Dam