Engineering Report

STORMWATER MANAGEMENT AND POLLUTION PREVENTION PLAN

MILL CREEK PRESERVE PROJECT
CASWELL ROAD
TOWN OF DRYDEN
COUNTY OF TOMPKINS
STATE OF NEW YORK

PREPARED FOR:

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TABLE OF CONTENTS

Section **Page**

List of Tables

List of Figures

List of Appendices

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, 297 River Street, Suite 3, Oneonta, New York 13820 to complete a Stormwater Management and Pollution Prevention Plan (SWPPP) associated with land subdivision of an 893-acre property. The property is to be divided into 40 lots planned for single family home development. These lots are located in the Town of Dryden, Tompkins County, New York, bordered by Wood Road on the west, West Dryden Road on the north, and Main Street (Route 366) on the south and east, with Caswell Road going north and south through the middle of the proposed residential development (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 a Generic Notice of Intent (NOI) Form filled out for informational purposes only (which is not to be submitted), a blank NOI, a sample Contractor Certification Statement Form, and 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 an 893-acre parcel into 40 individual lots where single family homes are planned for construction. This area of development is referred to as Mill Creek Preserve. The 40 lots range from 5 acres to 80 acres. For purposes of this report, each lot has been proposed with a 1,094 square foot home footprint with driveway off of existing road access as well as proposed lawns measuring roughly 1.5 to 2.5 acres in size. The site layout was provided by the Client as shown on sheet C100 – Overall Stormwater Plan provided in Appendix E. There is a 22.81-acre area of wetland on the eastern side of the site along Fall Creek that will be conveyed to the Town of Dryden for conservation of land, as well as a 3.5 acres parcel off Wood Road on the west side of the property. 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 four (4) separate drainage areas within it. Note that slight variations in the final plat (893 acres) and the modeled hydrology (912 acres) exists however remained consistent within the report and is not considered to have impeded accuracy of the calculations. A description for each of the pre-development drainage areas is provided below.

Drainage Area #1 (702.20 acres) includes 458.51 acres of woods, 226.08 acres of row crops, 9.94 acres of water surface (ponds and creeks), 3.95 acres of residential and 3.72 acres of road (Caswell Road). The site generally drains South and East into Mill Creek that eventually conveys the water into Fall Creek along the Eastern property line of the property boundary.

Drainage Area #2 (59.44 acres) consists entirely of woods prior to development. This drainage area generally drains south and east to the Southeastern property line where it eventually discharges into Fall Creek.

Drainage Area #3 (113.36 acres) includes 103.75 acres of woods, 8.58 acres of row crops, and 1.03 acres of road (Caswell Road). This drainage area generally drains south and east into a ditch/small creek which flows into a small pond east of the site that then flows into Fall Creek.

Drainage Area #4 (37.01 acres) consists entirely of woods prior to development. This area generally flows east into the same pond that drainage area #3 flows into which then flows into Fall Creek.

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. Fall Creek is classified as a "Class A" stream. Classification A indicates a best usage for a source of drinking water, swimming and other recreation and fishing. Mill Creek is classified as a "Class C" stream. Classification C indicates waters supporting fisheries and non-contact activities. Refer to Figure No. 4 – NYSDEC Environmental Resource Map. As further described in the report, detention is not required or proposed on-site, therefore applicable Protection of Waters regulations have been incorporated throughout preparation of the SWPPP.

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 in the vicinity of the project's drainage area. The owner of the property will convey 26.3-acres to the Town of Dryden for land conservation of New York State regulated freshwater wetlands. Also all house locations should be selected to avoid any disturbance to any wetlands and existing water bodies. Based on this information, written permission to proceed from the NYSDEC Natural Heritage Program was not deemed warranted by Keystone Associates 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 I(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). The site is not located within a mapped archaeologically sensitive area and 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. Also, in accordance with Part I(F)(8) of the General Permit, and there are no new permanent building(s) to be constructed within 20 feet or less of a building/object that is more than 50 years old. Therefore, in accordance with the NYSDEC's Cultural Resource Screening Process Flow Chart, written authorization to proceed is not required and was not conducted.

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 was one (1) federally regulated wetland area and multiple state wetlands identified during the course of a field investigation. Refer to Figure No. 7 – National Wetland Inventory Map. As previously stated in Section 1.4, as a measure to prevent significant wetland disturbances on-site, 22.81 acres of wetlands on the eastern side of the site along

Fall Creek that will be conveyed to the Town of Dryden for conservation of land. Note that 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 Panel Number 360846 B, dated May 15, 1985, Town of Dryden, Tompkins County, New York, there is a 100-yr. flood zone inside the project limits on the eastern edge of the property boundary along Fall Creek, however the proposed building locations were selected well outside of the flood zone (refer to Figure No. 8 – Flood Zone Map East and Figure No. 9 – Flood Zone Map West).

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 on site. Those soil classifications as well as other characteristics are listed in table 1-1. 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 site consists of 3.9% Hydrologic Soil Group A, 1.2% Hydrologic Soil Group B, 3.3% Hydrologic Soil Group C and 91.6% Hydrologic Soil Group D. Since there is a large variety of soil groups and 91.6% 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

				Depth To:		
Symbol	Name	% Slopes	SG	GW	BR	Perm. In/hr
Ab	Alluvial Land	0-5	A/D	24-72"	>80"	0.06-19.98
Arb	Arkport fine sandy loam	2-6	A	>80"	>80"	1.98-5.95
BgC	Bath and Valois soils	5-15	C	24-36"	24-38"	0.00-0.20
BgD	Bath and Valois soils	15-25	C	24-36"	24-38"	0.00-2.20
CdA	Chenango gravelly loam	0-5	A	>80"	>80"	0.57-5.95
CdC	Chenango gravelly loam	5-15	C	>80"	>80"	0.57-5.95
EbB	Erie channery silt loam	3-8	D	7-14"	10-21"	0.01-0.14
EbC	Erie channery silt loam	8-15	D	7-14"	10-21"	0.01-.014
EcA	Chippewa and Alden soils	0-8	C/D	>80"	>80"	0.06-0.57
Em	Eel silt loam	0-2	B/D	18-24"	>80"	0.57-1.98
ErA	Erie-Chippewa channery silt loams	0-3	D	7-14"	10-21"	0.01-0.14
Gn	Genesee silt loam	0-2	B	36-60"	>80"	0.57-1.98

Ha	Halsey silt loam	0-2	B/D	0-6"	>80"	0.57-1.98
Hc	Halsey mucky silt loam	0-2	B/D	0-6"	>80"	0.57-1.98
HdA	Howard gravelly loam	0-5	A	>80"	>80"	0.57-5.95
HdC	Howard gravelly loam	5-15	A	>80"	>80"	0.57-5.95
HsB	Hudson silty clay loam	2-6	C/D	18-24"	>80"	0.06-0.20
HwB	Hudson and Collamer silt loams	2-6	C/D	18-24"	>80"	0.06-0.20
LaB	Langford channery silt loam	2-8	D	15-24"	15-28"	0.06-0.20
LaC3	Langford channery silt loam	8-15	D	15-24"	15-28"	0.06-0.20
Mm	Madalin mucky silty clay loam	0-2	C/D	0"	>80"	0.06-0.20
PhA	Phelps gravelly silt loam	0-3	B/D	15-24"	>80"	0.57-1.98
PhB	Phelps gravelly silt loam	3-8	B/D	15-24"	>80"	0.57-1.98
RkA	Rhinebeck silt loam	0-2	C/D	6-18"	>80"	0.06-0.20
RkB	Rhinebeck silt loam	2-6	C/D	6-18"	>80"	0.06-0.20
W	Water	N/A	N/A	N/A	N/A	N/A
Ws	Wayland soils complex	0-3	B/D	0-6"	>80"	0.14-14.17

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

N/A = Not Available

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

SG = Soil Group

1.5. Existing (Pre-Development) Conditions.

The site is located in the Town of Dryden, North of Route 13. Wood Road defines the western edge of the site, West Dryden Road is on the northern edge, Mill Street and Main Street (Route 366) define the eastern and northern edge, and Caswell Road bisects the middle of the site. The site and the modeled drainage areas are composed of undeveloped woodlands, row crops, water surfaces (ponds and streams), one residential lot and roadway. The site was modeled as four separate drainage areas which generally flow east and south into Mill Creek, and other natural swales and ponds prior to discharging into Fall Creek. To be conservative, the site drainage area was restricted to the outermost property boundary and did not take offsite drainage into account. Refer to Figure No. 11 – Pre-development Drainage Area Map.

1.6. Proposed Future (Post-Development) Conditions.

As previously stated in Section 1.4, this project involves subdividing an 893-acre parcel into 40 individual lots where single family homes are planned for construction. This area of development is referred to as Mill Creek Preserve. The 40 lots range from 5 acres to 80 acres. For purposes of this report, each lot has been proposed with a 1,094 square foot home footprint with driveway off of existing road access as well as proposed lawns measuring roughly 1.5 to 2.5 acres in size. There is a 22.81-acre area of wetland on the eastern side of the site along Fall Creek that will be conveyed to the Town of Dryden for conservation of land, as well as a 3.5 acre parcel off Wood Road on the west side of the property. The site layout was provided by the Client as shown on Sheet C100 – Overall Stormwater Plan provided in Appendix E. Post-development Drainage Area Mapping is shown on Figure No. 12.

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. This SWPPP was modeled using a typical home footprint of 1,094 square feet and conservative driveway area of 8,605 square feet (total impervious area of 0.22 acres). As such, implementation of this SWPPP is intended to cover each of the 40 proposed home sites. Variances in home size and driveway size (including construction of standard decking and/or pool) should not impact the selected stormwater management practices (grassed filter strips) described below in Section 2.2. It is the responsibility of each individual property owner to implement this overall SWPPP plan at their specific lot. **For clarification purposes, it is our understanding that if less than one acre is disturbed at any one lot and the appropriate grassed filter strip is implemented, then preparation of a SWPPP and associated Notice of Intent submittal is not required for the lot owner. However, if any lot owner disturbs greater than one acre of land, the State requires that an individual SWPPP be prepared for that property, which would be the responsibility of that individual lot owner. If so, note that increased land disturbances would not necessarily change the selected stormwater management practice (grassed filter strip) and stormwater quantity control requirements (discussed below in Section 3.0) typically defaults to the overall build out which does not require detention for this site or any individual lots.**

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).

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). 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.

Based on the site's planning to preserve natural features and reduction of impervious cover, applicable green infrastructure practices to treat RRv include both rooftop disconnect as well as grassed filter strips. Since the development includes only the construction of homes and driveways on large parcels of flat, grassed lands, each lot naturally meets the qualifications of rooftop disconnect per Section 5.3.5 of the NYS Design Manual (refer to Appendix E). However, due to the formula for WQv the reduction of all impervious surface via Rooftop Disconnect still requires treatment of some RRv. Therefore, grassed filter strips have been proposed at each lot per Section 5.3.2 of the NYS Design Manual (refer to Appendix E). This method for treatment was selected because it reduced 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. Using this method of treatment, the entire house and driveway drains into a grassed filter strip, essentially removing all new impervious areas from the water quality calculations and therefore bringing our required WQv and RRv to zero. In addition, in utilizing stormwater management practices as recommended by the Manual, it is assumed that a reduction in pollutant loading would occur with releasing the runoff generated from the storm event over 24 hours to allow for pollutant fallout and biological uptake in the green infrastructure practice.

Grassed filter strips are vegetated surfaces that are designed to treat sheet flow from adjacent surfaces and remove pollutants through filtration and infiltration. To ensure that properly sized grassed filter strips will be provided by each lot owner, appropriate grassed filter strip sizes with associated notes have been provided on Sheet C100 – Overall Stormwater Plan. Refer to the Typical Lot Layout and associated Legend. In general, slopes from 0-8% require a 60 foot minimum width filter strip consisting of "dense turf cover." Slopes from 8-12% require a minimum width of 90 feet, and slopes of 12-15% require a minimum width of 120 feet. These values have been increased by 20% of the Design Manual minimums due to the site's Hydraulic Soil Group D type soils (as required). If such criteria cannot be achieved downgradient of the home and driveway, then an individual lot SWPPP modification may be required. The objective in using natural areas for stormwater infiltration is to intercept runoff before it has become substantially concentrated and then distribute this flow evenly as sheet flow. As such, a level spreader must be provided at the top of the filter strip where slopes are greater than 3%. Use of this practice varies across the site due to variances in slope and proposed home and driveway layouts. Refer to Level Spreader and Filter Strip Detail on Sheet No. C200 – Erosion and Sediment Control Details. With the exception of grassed filter strip construction and/or designation, other stormwater management practice techniques are not required. For clarification purposes, variances in home size and driveway size (including construction of standard decking and/or pool) should not impact sizing of the grassed filter strips as they are primarily designed with minimal lengths based on gentle slopes and not necessarily on the amount of impervious surfaces they treat at residential sites. Refer to Appendix E – Stormwater Management Plans, Details and Specifications. Also refer to Sheet C300 Stormwater Notes.

The required WQv calculations are shown on the Green Infrastructure Worksheets provided in Appendix C. For modeling purposes, the lot with the largest driveway and impervious area was used in our calculations. This way the site was modeled conservatively so that this method can be applied to all 40 lots. Note that each lot's development is the responsibility of the lot owner and associated grassed filter strips must be constructed to meet the criteria listed in the Design Manual. These criteria include but is not limited to; use of a pea gravel diaphragm (level spreader) at slopes greater than 3%, a maximum average grade of 15% through a natural grass area, a distance of at least 10 feet from downspouts to impervious area, a 75 feet maximum length of flow path from impervious surfaces and a 150 foot contributing length of pervious area. For this project, 100% of the WQv (RRv) was reduced at each catchment area using grassed filter strips, therefore criteria of the NYS Design Manual have been met.

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. Undisturbed areas were preserved by conveying 26.3 acres of wetland area and 3.5 acres of non wetland area to the Town of Dryden for land conservation. 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 areas, by conveying 23 acres of wetland area and 3.5 acres of non wetland area and their buffer areas to the Town of Dryden as well as locations for each home were selected to avoid any disturbance to the naturally vegetated buffers along perennial streams, rivers, shorelines and wetlands.

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. Reduction of clearing and grading measures are an acceptable practice for this project, clearing and grading of the site will be limited to the minimum amount needed for the work (e.g., future home, garage, deck, pool, driveway, slope tie-outs and temporary erosion control measures).

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. Each home location was carefully selected to avoid any disturbance to wetlands, mature forests, 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 filter strip 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 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, 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 homes is dependent on the property buyer. 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. Natural areas were conserved by conveying 26.3 acres of land to the Town of Dryden as well as choosing locations for each home that avoid any disturbance to wetlands and their buffers, existing streams, ponds and existing woods.

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 naturally achieved by using the existing land with qualities that adhere to the qualification of grassed filter strips. This method was primarily used as a form of treatment for water quality

(RRv and WQv). Refer to Typical Lot Layout and associated Legend on Sheet C100 – Overall Stormwater Plan.

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.

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 each lot. However, since rooftop disconnect doesn't eliminate all RRv requirements, filter strips were selected in order to meet the criteria for RRv and WQv. The criteria and design of rooftop disconnect is previously described above in section 2.2.

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. Vegetated swales were not used on this project because the existing natural landscape allowed utilization of rooftop disconnect and filter strips therefore treating 100% of the required RRv.

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. Rain gardens were not used on this project because the existing natural landscape allowed utilization of rooftop disconnect and filter strips therefore treating 100% of the required RRv.

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. Stormwater planters were not used on this project because the

existing natural landscape allowed utilization of rooftop disconnect and filter strips therefore treating 100% of the required RRv.

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. Rain tanks/cisterns were not needed since 100% of the required RRv was treated via filter strips.

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. 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. Green roofs were not needed since the 100% of the required RRv was treated via filter strips.

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. Infiltration basins/trenches were not used on this project because the existing natural landscape allowed us to utilize filter strips to treat 100% of the required RRv.

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. Drywells were not needed since 100% of the required RRv was treated via filter strips.

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 was not used on this project because the existing natural landscape allowed us to utilize filter strips to treat 100% RRv required.

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. Dry/wet swales were not used on this project because the existing natural landscape allowed utilization of filter strips to treat 100% of the required RRv.

3.0 COMPARISON OF PRE-DEVELOPMENT TO POST-DEVELOPMENT RUNOFF

3.1. Approach and Concept.

The addition of impervious surfaces causes 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, 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 either equal to or less than 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).

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 data is presented in Appendix D.

The project was modeled with four drainage areas, identified as Drainage Area 1, Drainage Area 2, Drainage Area 3, and Drainage Area 4, which are identified in Figure No. 11- Pre-Development Drainage Area Map and Figure No. 12 – 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 East and South and ultimately drain into Fall Creek.

The post drainage areas were modeled to match the existing drainage, with the exception of the proposed 40 houses, driveways and lawn areas. 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 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 and the change from row crop to grass at several locations actually lowered and improved the curve numbers in Drainage Area #1. 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 Area 1				**Storm Event/Peak Flow (cfs)**					
Description	Area (acres)	CN	Tc (min)	1-Yr.	2-Yr.	10-Yr.	25-Yr.	50-Yr.	100-Yr.
Rainfall (inches)	NA	NA	NA	2.02	2.47	3.82	4.66	5.28	5.95
Pre 1	702.2	83	115.5	151.93	228.63	486.64	658.47	787.76	928.85
Post 1	702.2	82	115.5	139.71	214.01	466.73	636.73	765.08	905.46
Is Post Peak Runoff </= Pre Peak Runoff?				Yes	Yes	Yes	Yes	Yes	Yes
Drainage Area 2				**Storm Event/Peak Flow (cfs)**					
Description	Area (acres)	CN	Tc (min)	1-Yr.	2-Yr.	10-Yr.	25-Yr.	50-Yr.	100-Yr.
Pre 2	59.44	79	94.9	10.43	17.00	40.23	56.30	68.56	82.07
Post 2	59.44	79	94.9	10.43	17.00	40.23	56.30	68.56	82.07
Is Post Peak Runoff </= Pre Peak Runoff?				Yes	Yes	Yes	Yes	Yes	Yes
Drainage Area 3				**Storm Event/Peak Flow (cfs)**					
Description	Area (acres)	CN	Tc (min)	1-Yr.	2-Yr.	10-Yr.	25-Yr.	50-Yr.	100-Yr.
Pre 3	113.36	80	93.1	22.19	35.43	81.59	113.04	137.05	163.43
Post 3	113.36	80	93.1	22.19	35.43	81.59	113.04	137.05	163.43
Is Post Peak Runoff </= Pre Peak Runoff?				Yes	Yes	Yes	Yes	Yes	Yes
Drainage Area 4				**Storm Event/Peak Flow (cfs)**					
Description	Area (acres)	CN	Tc (min)	1-Yr.	2-Yr.	10-Yr.	25-Yr.	50-Yr.	100-Yr.
Pre 4	37.01	79	106.5	5.96	9.68	22.91	32.05	39.03	46.71
Post 4	37.01	79	106.5	5.96	9.68	22.91	32.05	39.03	46.71
Is Post Peak Runoff </= Pre Peak Runoff?				Yes	Yes	Yes	Yes	Yes	Yes
Combined Drainage Areas 1, 2, 3 & 4				**Storm Event/Peak Flow (cfs)**					
Description	Area (acres)	CN	Tc (min)	1-Yr.	2-Yr.	10-Yr.	25-Yr.	50-Yr.	100-Yr.
Out Pre Combined	912.01	82	115.5	187.39	286.46	622.74	849.17	1,020.50	1,207.70
Out Post Combined	912.01	81	115.5	175.09	271.52	602.62	826.97	997.28	1,183.70
Difference:	0	-1	0	-12.30	-14.94	-20.12	-22.20	-23.22	-24.00
Is Post Peak Runoff </= Pre Peak Runoff?				Yes	Yes	Yes	Yes	Yes	Yes
*Combined Drainage Area 1,2,3 & 4 is addition of the individual drainage areas. Tc is longest overall. CN is a weighted value. The combined Peak Flows are a summary of their respective combined drainage areas and are for informational purposes only *(use if subareas modeled to one outlet)* .									
Legend: cfs = Cubic Feet per Second CN = Runoff Curve Number Tc = Time of Concentration Area measured in Acres Tc measured in minutes 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, as the hydrology and hydraulic analysis for the project site shows that the post-construction 1-year 24 hour discharge rate and velocity is less than or equal to the pre-construction discharge rate, 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.
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.
5. Assume current row crop area will be converted to grass, meadow or brush, improving the post curve number.

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 and proposed cover types improved the curve numbers, the post-development peak stormwater runoff rates and volumes are equal to or lower than 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 discharging to Fall Creek. 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 grassed filter strips 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. A description of Post-Construction Stormwater Management Practices requiring long term maintenance (filter strips) are discussed in Section 2.2.

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, grassed swales, check dams, 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). An Individual Home Typical Erosion Control Plan (Sheet C110) and Erosion and Sediment Control Details (Sheet C200) is included in Appendix E, which sets 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 accomplished 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 E – Stormwater Management Plans, Details, and Specifications. 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.

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. Grassed filter strips.

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. In general, once weekly inspections are required for sites which disturb less than five (5) acres. Twice weekly inspections are required for sites which have been authorized to disturb greater than five (5) acres. For this project, note that weekly Construction Duration Inspections (CDIs) will not be required unless specifically triggered by disturbance of greater than one acre at any one lot. In that case, CDIs would be required at only that lot in accordance with general permit requirements and is the responsibility of the lot owner. Specific E&S requirements are identified in the permit and must be followed.

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. As required by the State, lots with greater than one acre of proposed disturbance must prepare an Individual SWPPP and submit a Notice of Intent (NO1) for Stormwater Discharges Associated with Construction Activity Under the SPDES General Permit (GP-0-015-002). Regardless, each lot must install an on-site mailbox with combination lock (preferred) or other storage method to hold the SWPPP, Notice of Intent (if applicable), Permit Authorization Notice (if applicable), and Construction Duration Inspection Reports (if applicable). Note that weekly Construction Duration Inspections (CDIs) will not be required unless specifically triggered by disturbance of greater than one acre at any one lot. In that case, CDIs would be required at only that lot in accordance with general permit requirements and is the responsibility of the lot owner.
3. Hold Pre-construction Conference.
4. Regardless of NOI submission applicability, each lot's selected Contractor(s) shall sign a Contractor's Certification Statement binding them to obligations of the overall SWPPP and that individual lot's construction activities. Blank copies are provided in the SWPPP's Appendix A.
5. Install temporary stabilized construction entrance/exits as required.
6. Install fabric silt fence.
7. Clear/grub site.

8. Construct temporary drainage swales and concrete washout area.
9. Strip and stockpile topsoil, rough grade site.
10. Prepare subgrade and construct subbase course for drive.
11. Prepare foundation and build home/garage.
12. Construct utilities.
13. Construct final drainage grassed swales and grassed filter strip(s)
14. Construct final surface courses for drives.
15. Topsoil: fine grade: and seed, fertilize and mulch all disturbed areas.
16. Inspect all erosion and sediment controls weekly and after rainfall events and repair as required.
17. Water vegetation as required.
18. 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.
19. If a NOI was required and submitted (refer to Comment No. 2 above), the owner must submit Notice of Termination (NOT) form for Stormwater Discharges Associated with Construction Activity under the SPDES General Permit. Note that if an NOI is filed, a deed covenant would be required to ensure the perpetuity of that lot's associated grassed filter strip(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 accordance with the Stormwater Construction Site Logbook (Appendix F) prepared for the project.

The Construction Site Logbook including signed NOI (if applicable), NOI acknowledgement letter (if applicable), contractor's certification statements, Stormwater Management and Pollution Prevention Plan, and weekly SWPPP inspections (if applicable) shall be kept on-site and up to date at all times during construction. The Stormwater Construction Site Logbook shall be placed in an on-site mailbox 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 the NOI (if applicable), NOI acknowledgment letter (if applicable), SWPPP, 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 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 Logbook, provided separately. The logbook 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 logbook will meet the inspection requirements for the NYSDEC SPDES General Permit for Construction Activities. The logbook and completed forms and this 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 owner/operator will be responsible for maintaining those facilities located within its property boundaries and designated easements, if any. The municipality shall be responsible for maintaining the stormwater systems within their existing highway right-of-ways and or 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 owner. Maintenance scheduling is provided 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. Grassed Filter Strips and Pea Gravel Diaphragms are to be maintained as follows:

1. The grassed filter system can be maintained as typical grassed lawn areas. The grassed filter strips must be maintained with dense turf cover however there are no restrictions on grass height or other forms of native vegetation or plantings. The pea gravel diaphragms must be cleaned as necessary to prevent sedimentation and provide free flow of stormwater as sheet flow into the grassed filter strip.

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.
Grassed Filter Strips & Pea Gravel Diaphragm	weekly	2+”	Monthly	2+”	Semi-Annually	2+” - Maintain Dense Turf Cover

REFERENCES

New York Land and Lakes Development LLC, March 4, 2019 Sketch Map of Mill Creek Preserve, 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

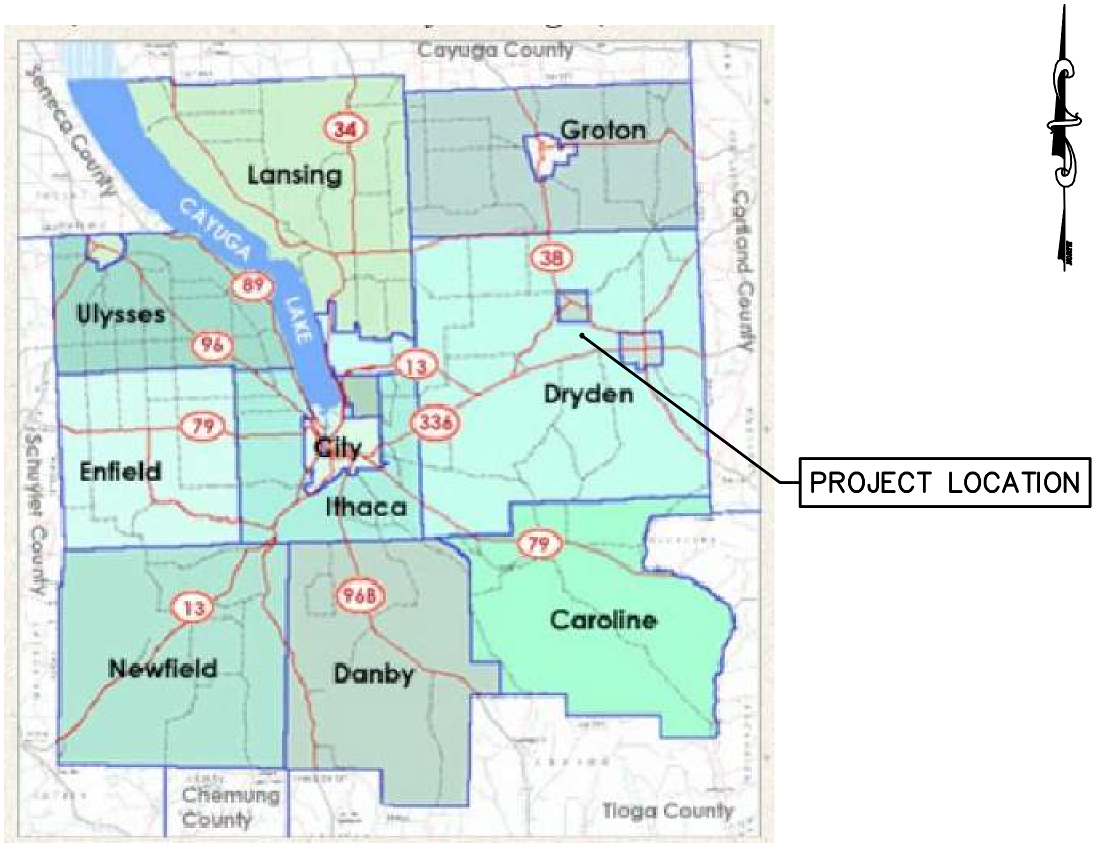
United States Department of Agriculture Natural Resources Conservation Service's Web Soil Survey. www.websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

Soil Survey Tompkins County New York. July 1965. USDA/Cornell University. Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

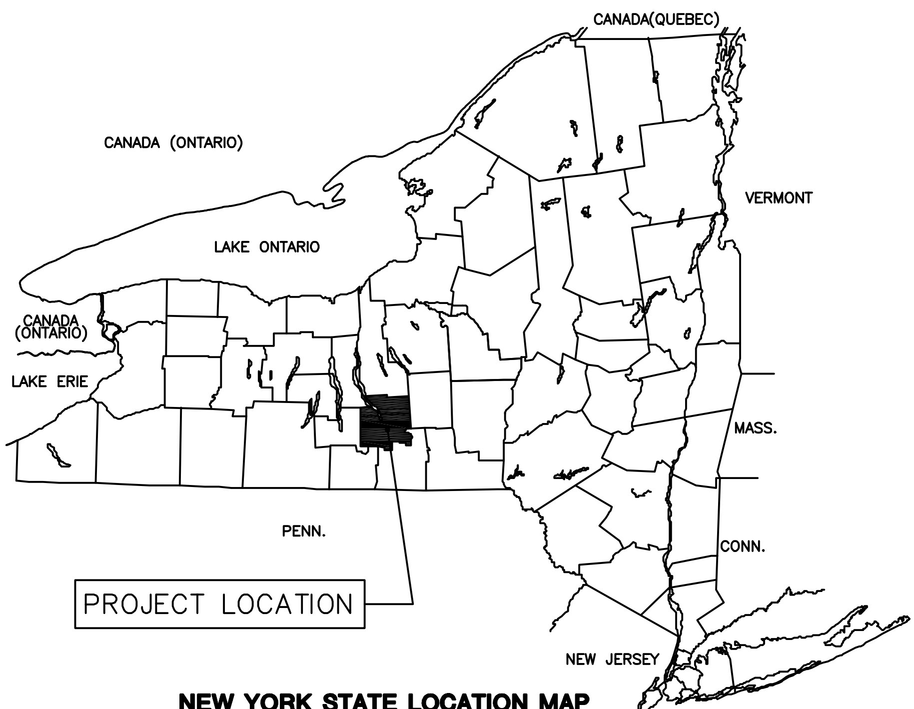
Federal Emergency Management Service (FEMA) online map service center. www.msc.fema.gov

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

FIGURES



TOMPKINS COUNTY LOCATION MAP
NOT TO SCALE



NEW YORK STATE LOCATION MAP
NOT TO SCALE

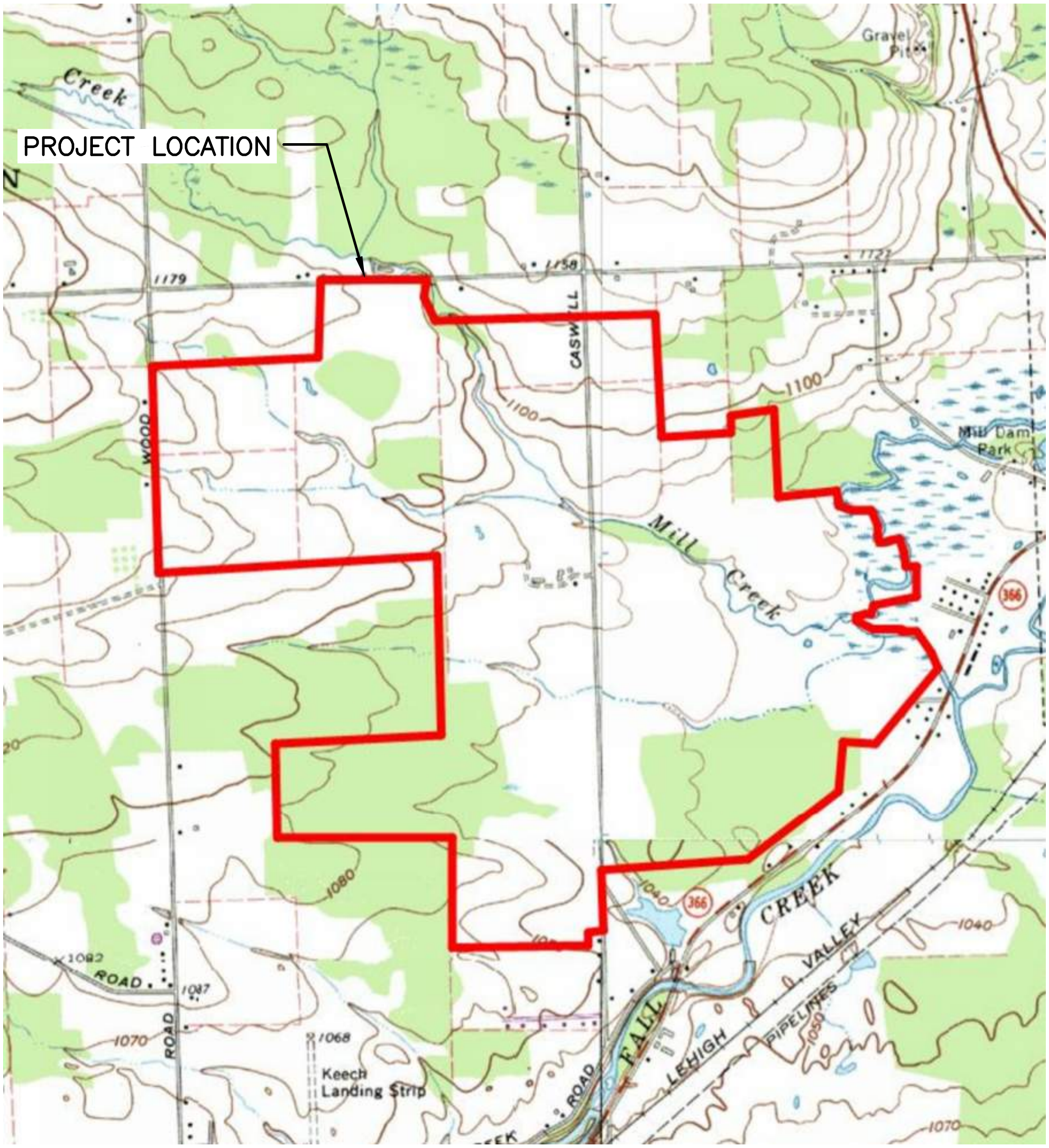
KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

CASWELL ROAD
MILL CREEK PRESERVE

TOWN OF DRYDEN
TOMPKINS COUNTY NEW YORK STATE
KEYSTONE PROJECT #0392.10819

FIGURE NO. 1

LOCATION MAP



SCALE: 1" = 2,000'

QUAD NAME:
WEST GROTON

KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

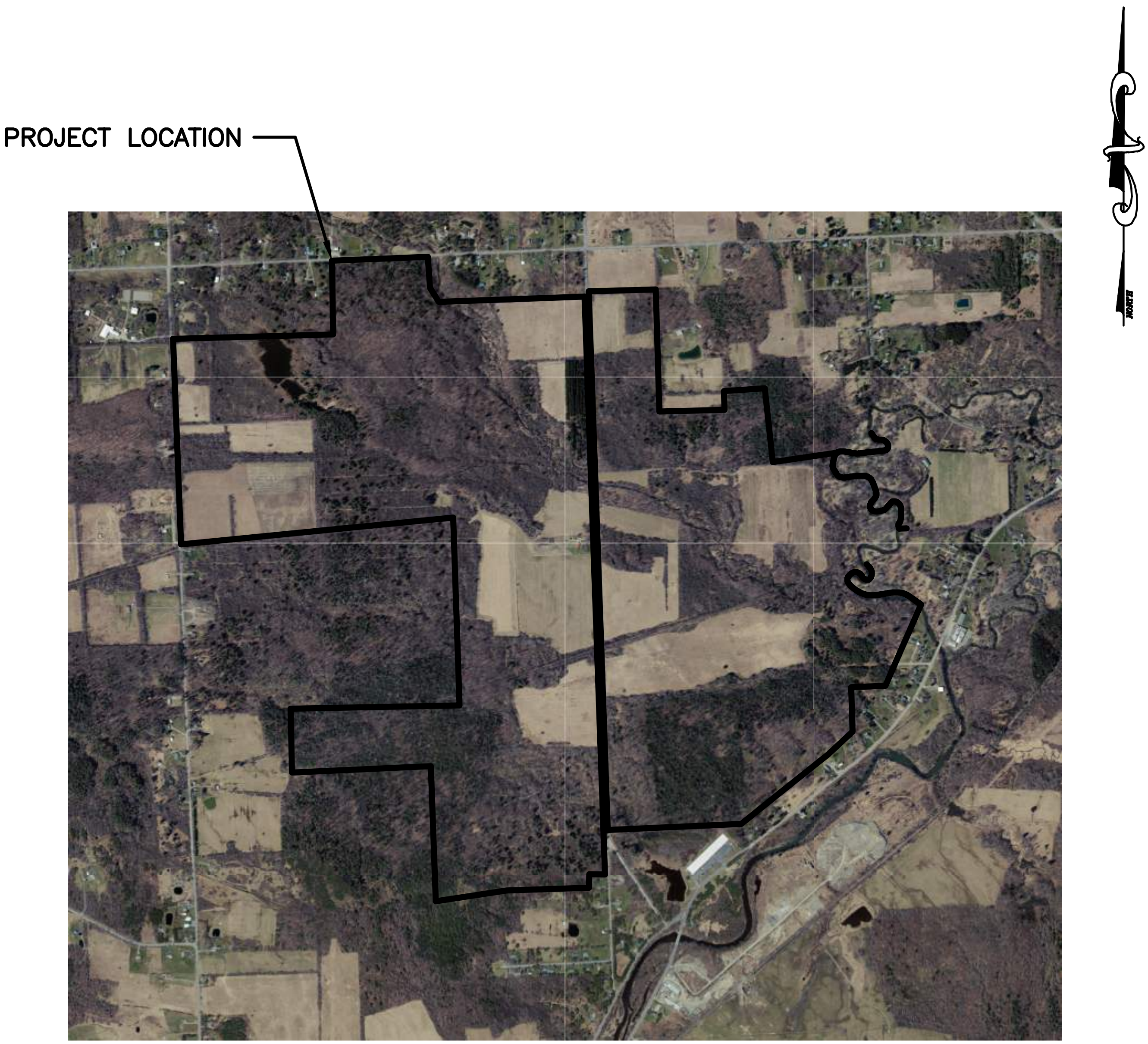
CASWELL ROAD
MILL CREEK PRESERVE

TOWN OF DRYDEN
TOMPKINS COUNTY NEW YORK STATE

KEYSTONE PROJECT #0392.10819

FIGURE NO. 2

USGS VICINITY MAP



SCALE: 1" = 2,000'

KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

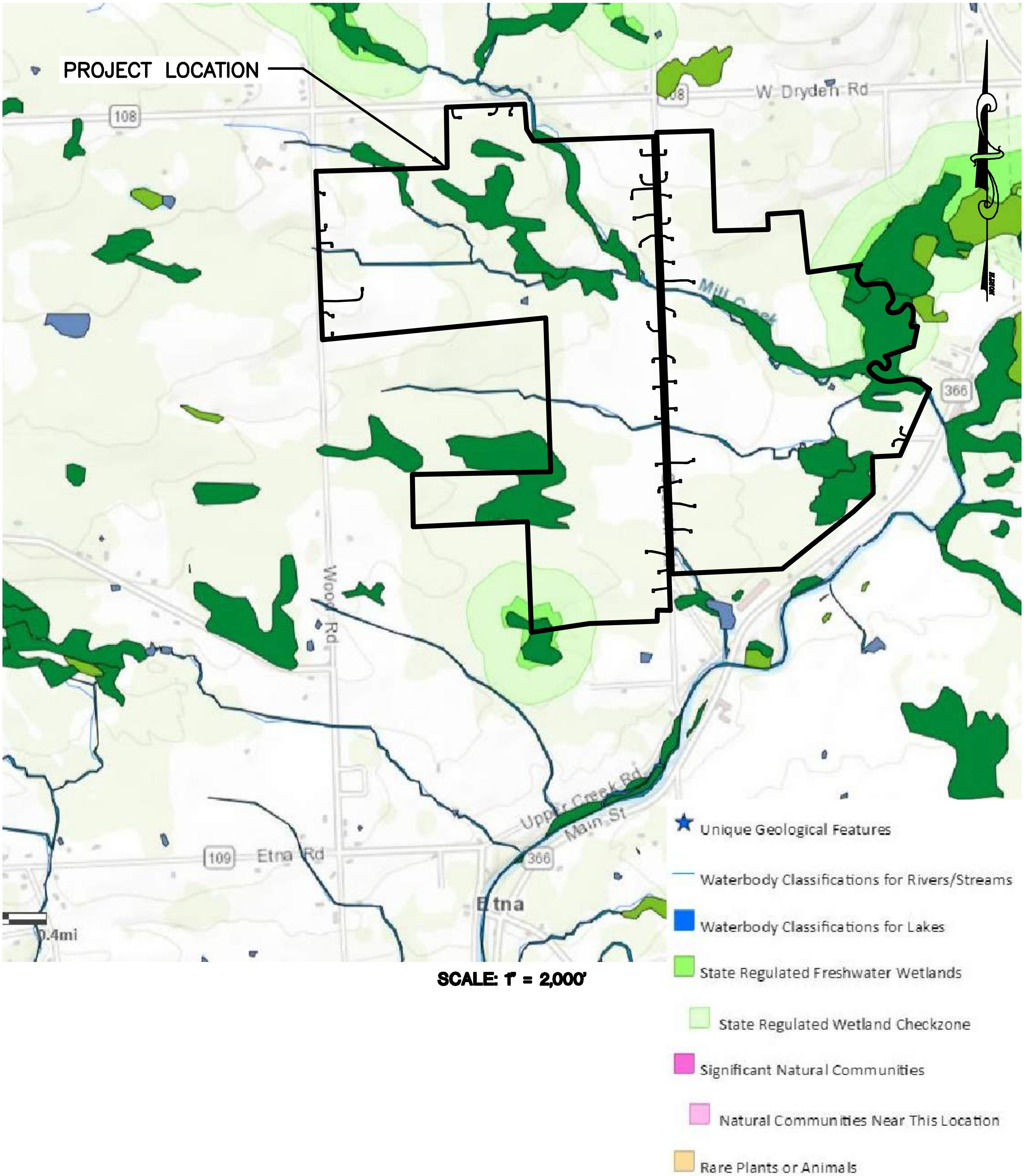
CASWELL ROAD
MILL CREEK PRESERVE

TOWN OF DRYDEN
TOMPKINS COUNTY NEW YORK STATE

KEYSTONE PROJECT #0392.10819

FIGURE NO. 3

AERIAL PHOTO



SCALE: 1" = 2,000'

KEYSTONE ASSOCIATES
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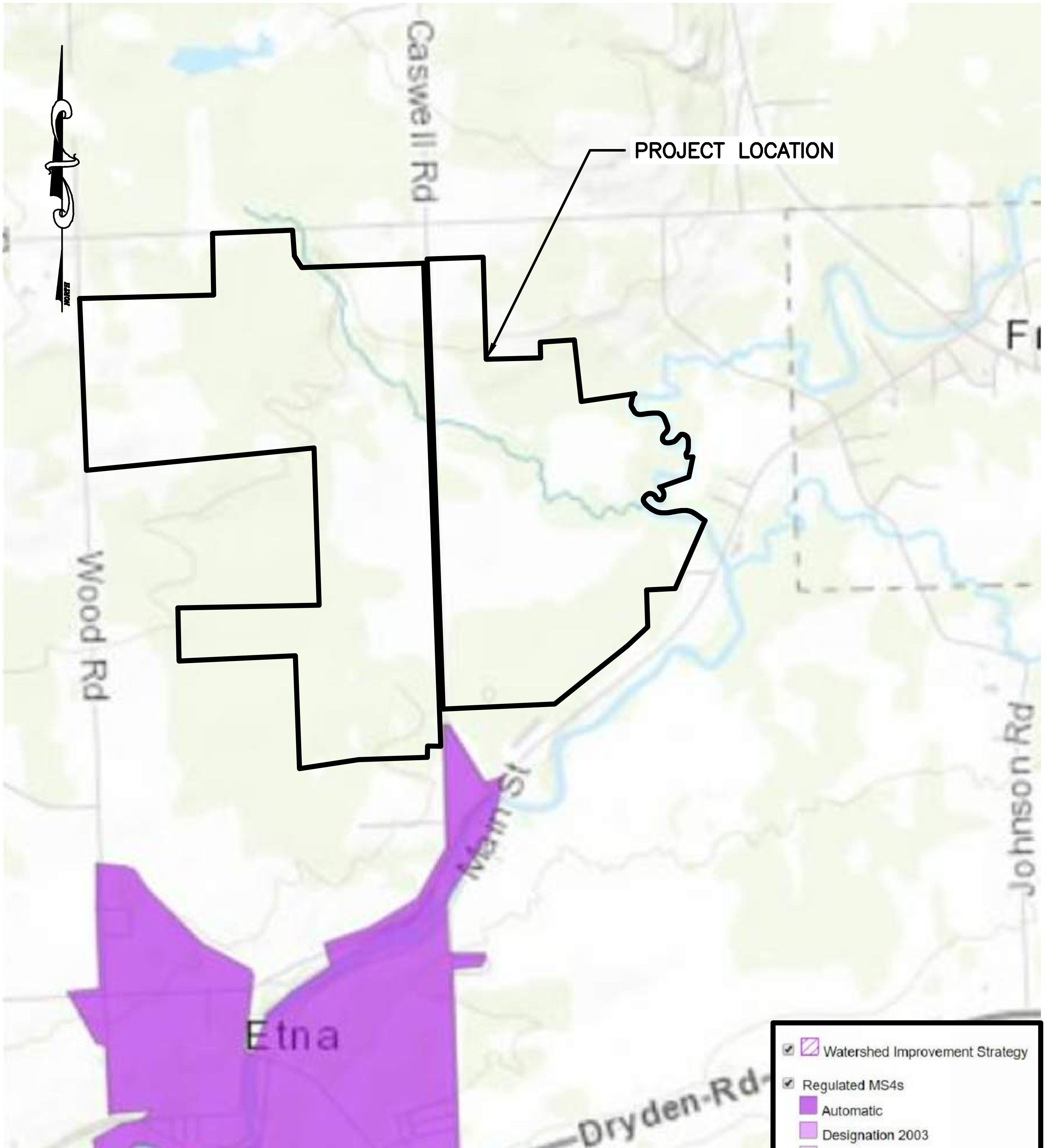
CASWELL ROAD
MILL CREEK PRESERVE

TOWN OF DRYDEN
TOMPKINS COUNTY NEW YORK STATE

KEYSTONE PROJECT #0392.10819

FIGURE NO. 4

NYSDEC
ENVIRONMENTAL
RESOURCE MAP



SCALE: 1" = 2,000'

KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

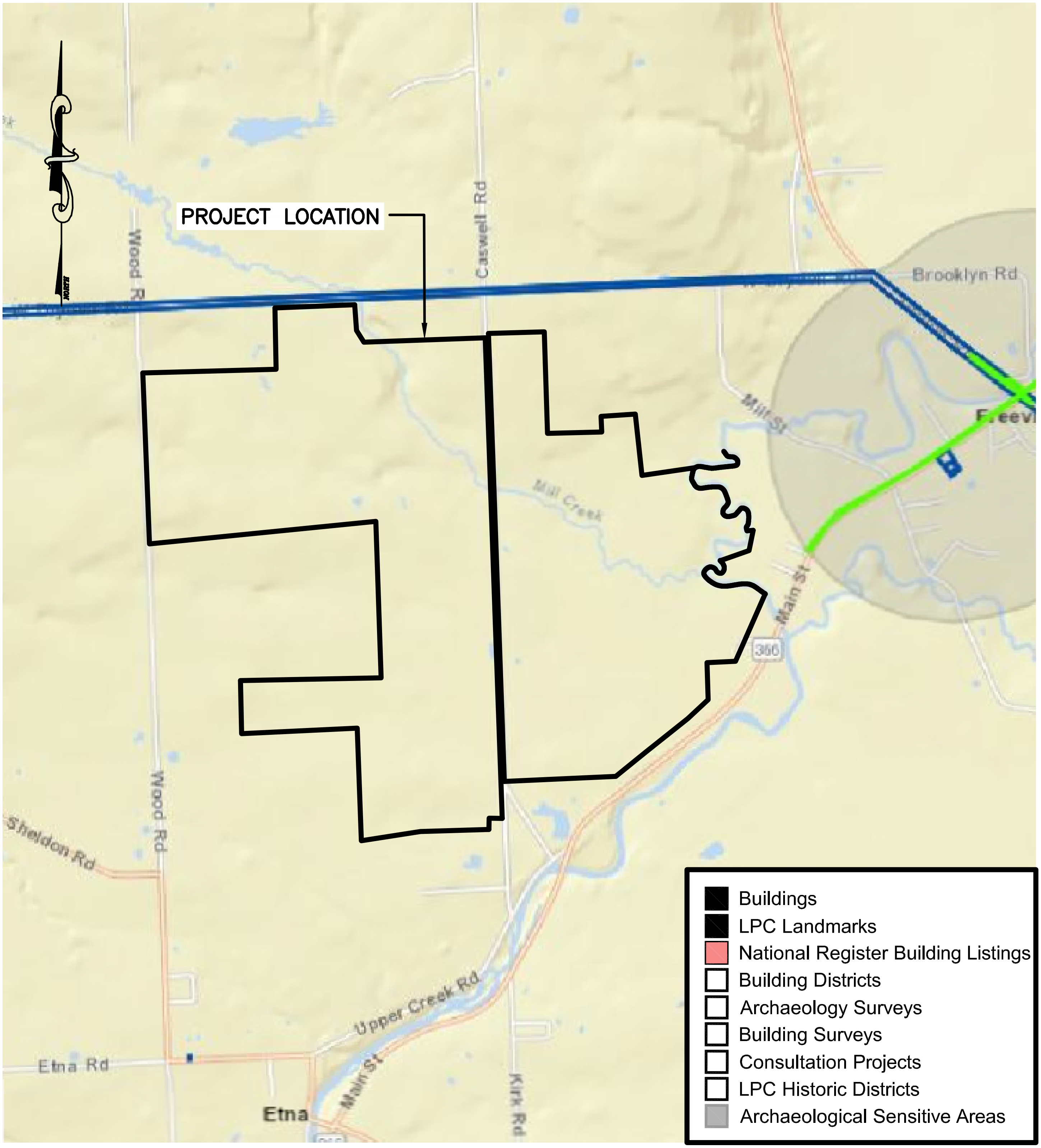
CASWELL ROAD
MILL CREEK PRESERVE

TOWN OF DRYDEN
TOMPKINS COUNTY NEW YORK STATE

KEYSTONE PROJECT #0392.10819

FIGURE NO. 5

NYSDEC STORMWATER INTERACTIVE MAP



SCALE: 1" = 2,000'

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CASWELL ROAD
MILL CREEK PRESERVE

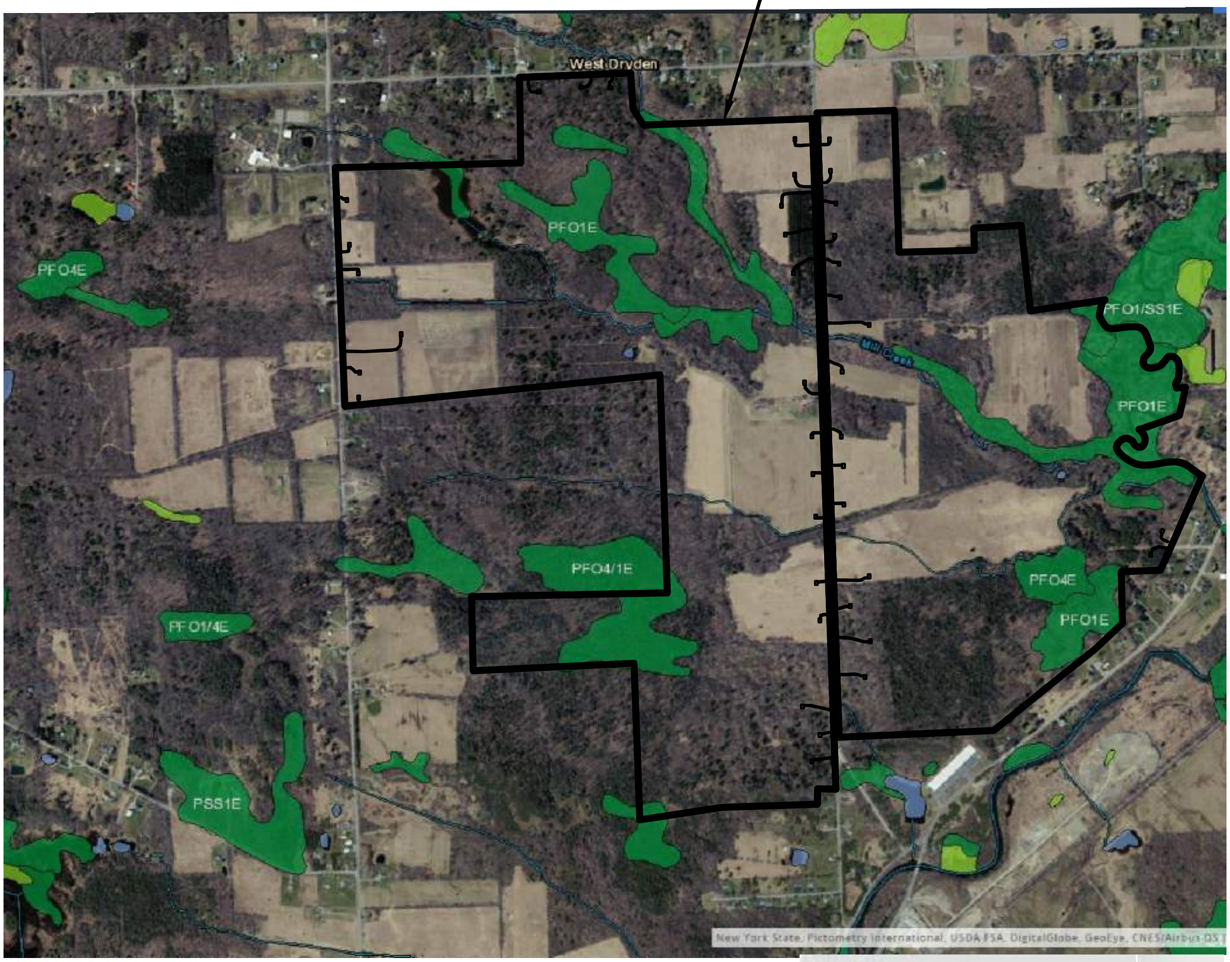
TOWN OF DRYDEN
TOMPKINS COUNTY NEW YORK STATE

KEYSTONE PROJECT #0392.10819

FIGURE NO. 6

NYS
CULTURAL RESOURCE
INFORMATION MAP

PROJECT LOCATION



SCALE: 1" = 2,000'

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Riparian

Riparian

- Forested/Shrub
- Herbaceous

KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

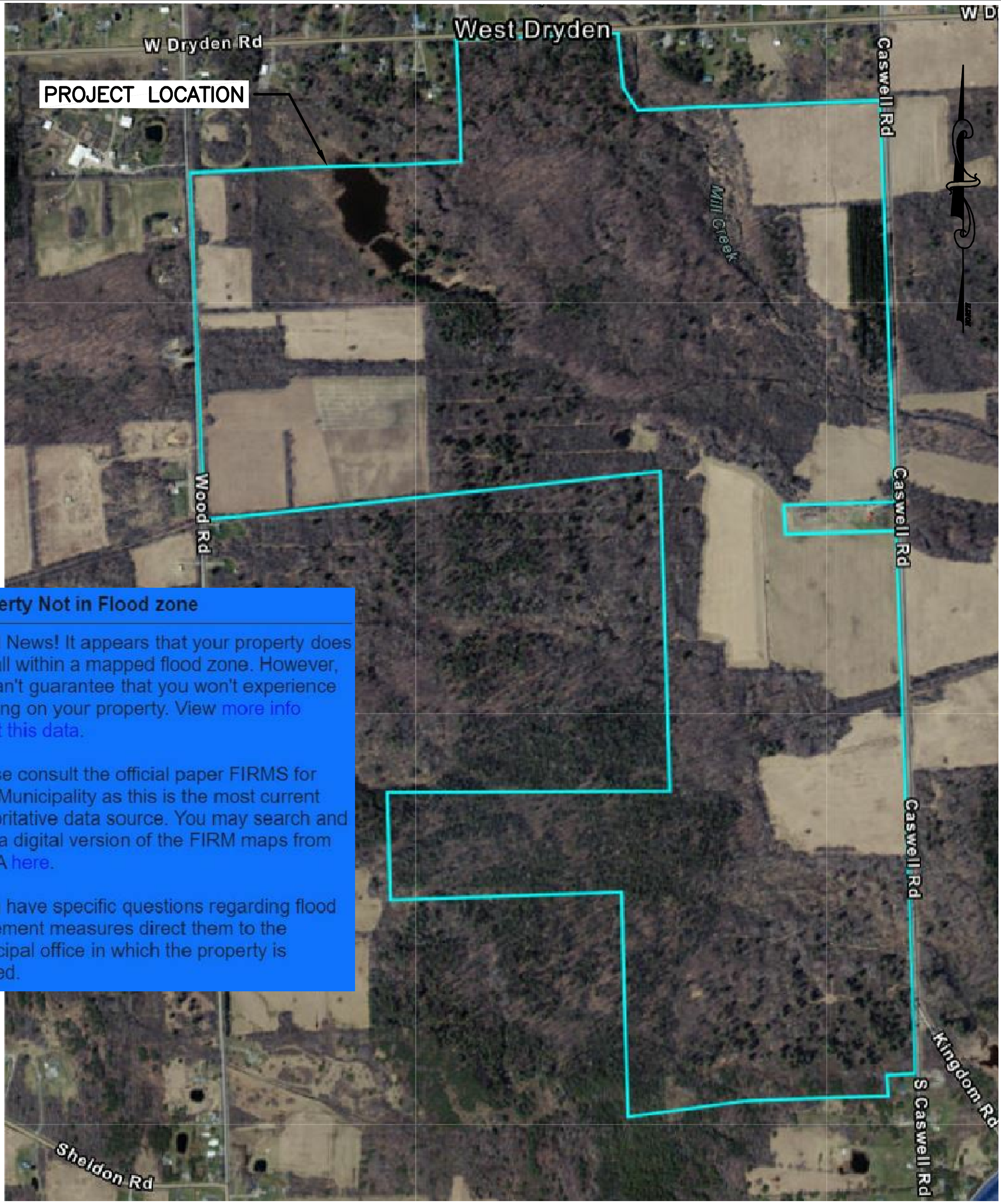
CASWELL ROAD
MILL CREEK PRESERVE

TOWN OF DRYDEN
TOMPKINS COUNTY NEW YORK STATE

KEYSTONE PROJECT #0392.10819

FIGURE NO. 7

NATIONAL WETLAND INVENTORY MAP



Property Not in Flood zone

Good News! It appears that your property does not fall within a mapped flood zone. However, we can't guarantee that you won't experience flooding on your property. View more info about this data.

Please consult the official paper FIRMS for your Municipality as this is the most current authoritative data source. You may search and view a digital version of the FIRM maps from FEMA here.

If you have specific questions regarding flood abatement measures direct them to the Municipal office in which the property is located.

SCALE: 1" = 1,000'

KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

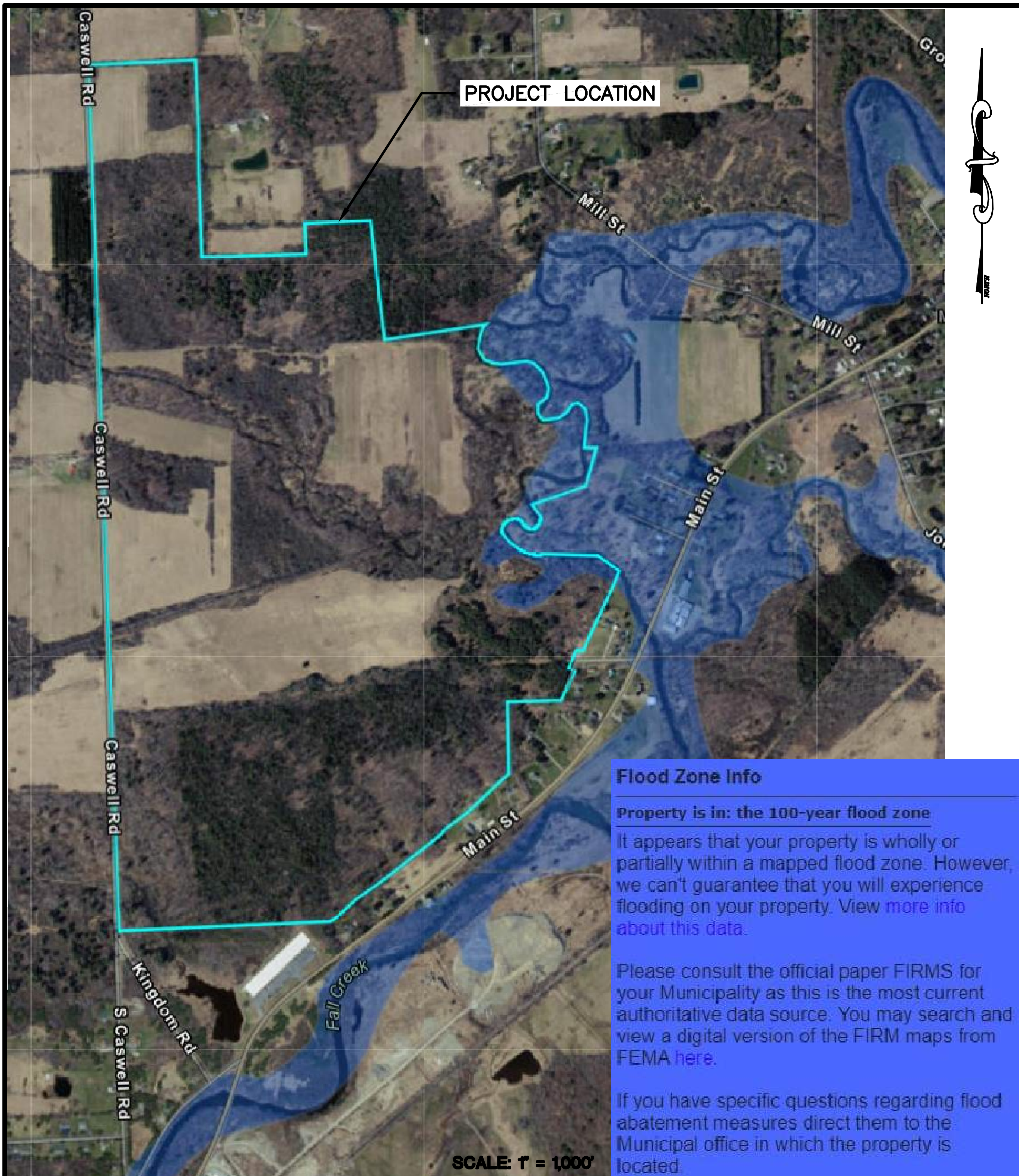
CASWELL ROAD
MILL CREEK PRESERVE

TOWN OF DRYDEN
TOMPKINS COUNTY NEW YORK STATE

KEYSTONE PROJECT #0392.10819

FIGURE NO. 8

FLOOD ZONE
WEST MAP



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CASWELL ROAD
MILL CREEK PRESERVE

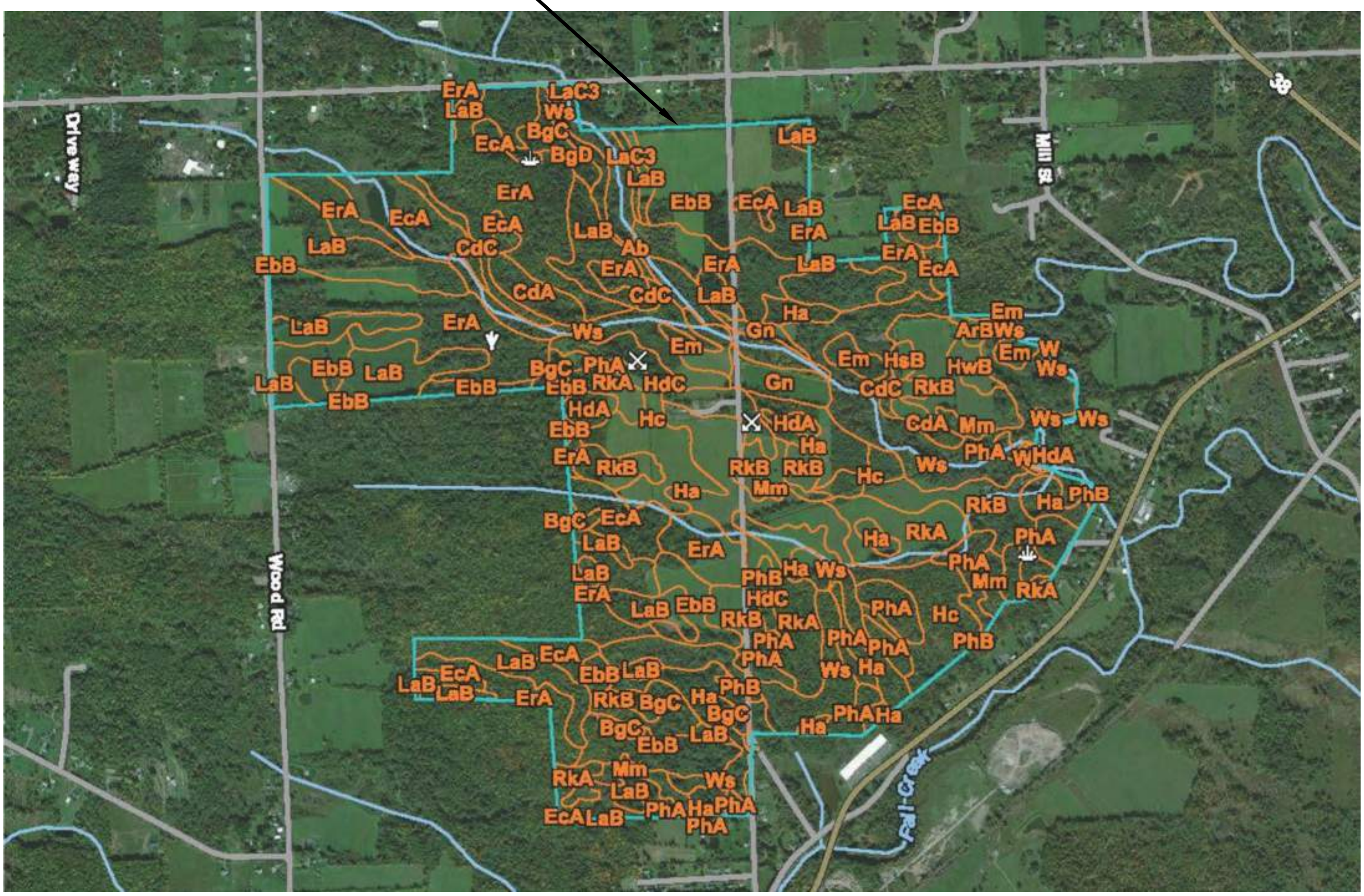
TOWN OF DRYDEN
TOMPKINS COUNTY NEW YORK STATE

KEYSTONE PROJECT #0392.10819

FIGURE NO. 9

FLOOD ZONE
EAST MAP

PROJECT LOCATION



SCALE: 1" = 2,000'

CASWELL ROAD
MILL CREEK PRESERVE

TOWN OF DRYDEN
TOMPKINS COUNTY NEW YORK STATE

KEYSTONE PROJECT #0392.10819

FIGURE NO. 10

SOILS MAP

PRE DRAINAGE AREA 1

ROAD SOIL GROUP D (CN=98)	=	3.72 ACRES
WATER SURFACE SOIL GROUP D (CN=98)	=	9.94 ACRES
ROW CROPS SOIL GROUP D (CN=89)	=	226.08 ACRES
RESIDENTIAL SOIL GROUP D (CN=82)	=	3.95 ACRES
WOODS SOIL GROUP D (CN=79)	=	458.51 ACRES
TOTAL AREA (SITE)	=	702.20 ACRES
Tc pre (SITE)	=	115.5 MINS
CN pre (SITE)	=	83
FLOW DIRECTION	=	→

PRE DRAINAGE AREA 2

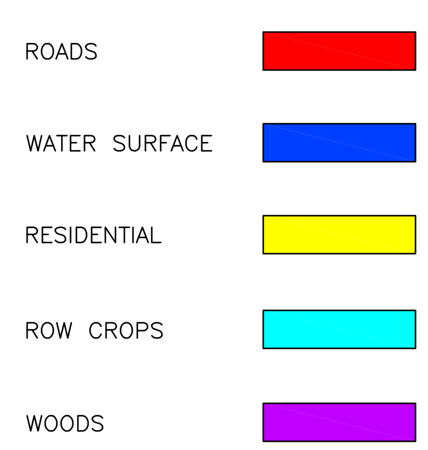
WOODS SOIL GROUP D (CN=79)	=	59.44 ACRES
TOTAL AREA (SITE)	=	59.44 ACRES
Tc pre (SITE)	=	94.9 MINS
CN pre (SITE)	=	79
FLOW DIRECTION	=	→

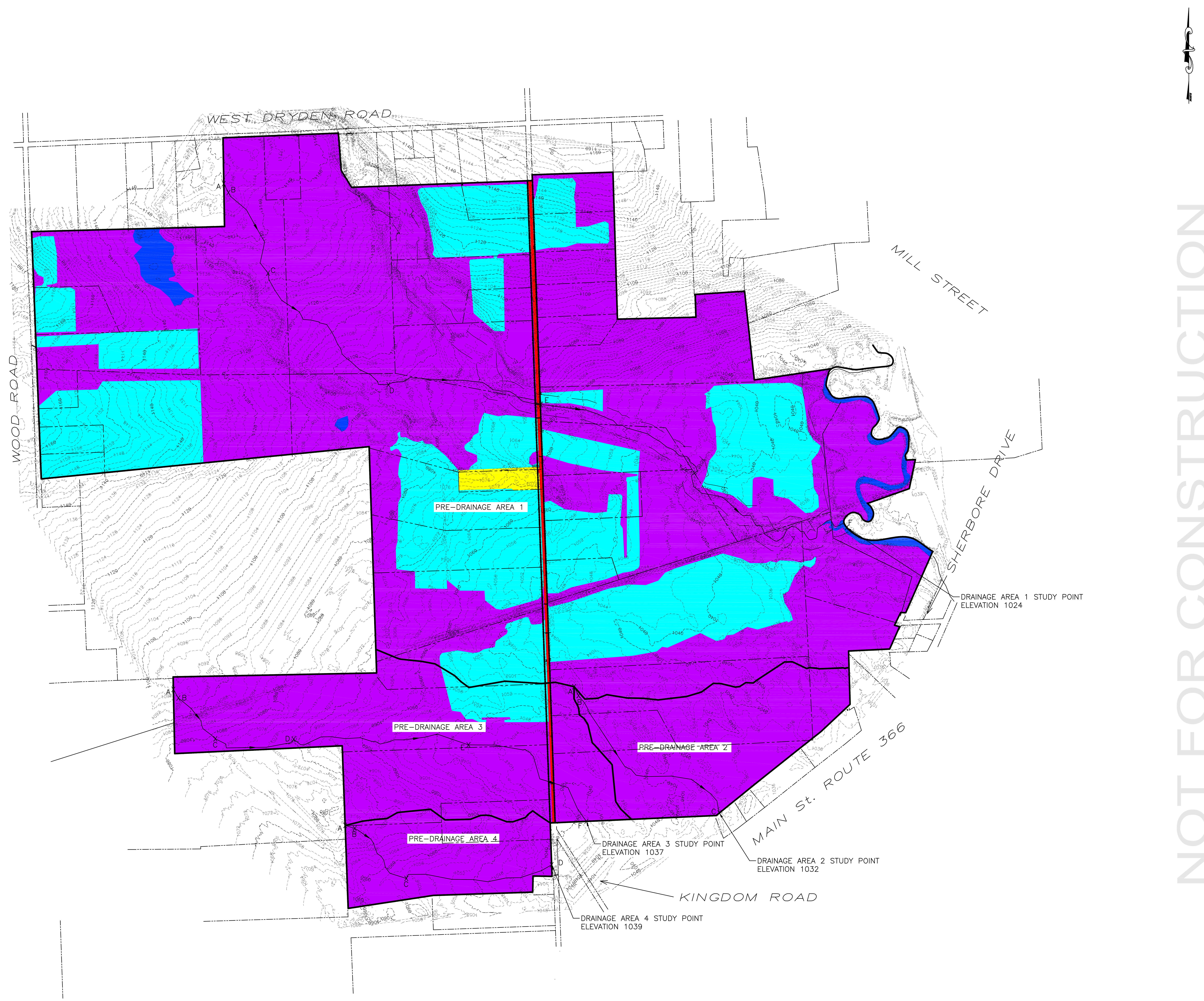
PRE DRAINAGE AREA 3

ROAD SOIL GROUP D (CN=98)	=	1.03 ACRES
ROW CROPS SOIL GROUP D (CN=89)	=	8.58 ACRES
WOODS SOIL GROUP D (CN=79)	=	103.75 ACRES
TOTAL AREA (SITE)	=	113.36 ACRES
Tc pre (SITE)	=	93.1 MINS
CN pre (SITE)	=	80
FLOW DIRECTION	=	→

PRE DRAINAGE AREA 4

WOODS SOIL GROUP D (CN=79)	=	37.01 ACRES
TOTAL DRAINAGE AREA	=	37.01 ACRES
Tc pre (SITE)	=	106.5 MINS
CN pre (SITE)	=	79
FLOW DIRECTION	=	→





GRAPHIC SCALE

(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

NO. | REVISIONS AND DESCRIPTIONS | DATE

CASWELL ROAD MILL CREEK PRESERVE

TOWN OF DRYDEN TOMPKINS COUNTY, NY

PRE-DEVELOPMENT DRAINAGE AREA MAP

FIGURE NO. 11

PROJECT NO. 0392.10819

DATE: 6/10/19

CAD FILE NO: 039210819-SWPPP FIGURE

POST DRAINAGE AREA 1

NEW BUILDING SOIL GROUP D (CN=98)	=	0.83 ACRES
NEW DRIVEWAY SOIL GROUP D (CN=98)	=	2.01 ACRES
NEW LAWN SOIL GROUP D (CN=80)	=	50.07 ACRES
ROAD SOIL GROUP D (CN=98)	=	3.72 ACRES
WATER SURFACE SOIL GROUP D (CN=98)	=	9.94 ACRES
ROW CROPS SOIL GROUP D (CN=89)	=	193.07 ACRES
RESIDENTIAL SOIL GROUP D (CN=82)	=	3.95 ACRES
WOODS SOIL GROUP D (CN=79)	=	438.61 ACRES
TOTAL AREA (SITE)	=	702.20 ACRES
Tc pre (SITE)	=	115.5 MINS
CN pre (SITE)	=	82
FLOW DIRECTION	=	→

POST DRAINAGE AREA 2

NEW BUILDING SOIL GROUP D (CN=98)	=	0.02 ACRES
NEW LAWN SOIL GROUP D (CN=80)	=	0.83 ACRES
WOODS SOIL GROUP D (CN=79)	=	58.59 ACRES
TOTAL AREA (SITE)	=	59.44 ACRES
Tc pre (SITE)	=	94.9 MINS
CN pre (SITE)	=	79
FLOW DIRECTION	=	→

POST DRAINAGE AREA 3

NEW BUILDING SOIL GROUP D (CN=98)	=	0.10 ACRES
NEW DRIVEWAY SOIL GROUP D (CN=98)	=	0.38 ACRES
NEW LAWN SOIL GROUP D (CN=80)	=	6.74 ACRES
ROAD SOIL GROUP D (CN=98)	=	1.03 ACRES
ROW CROPS SOIL GROUP D (CN=89)	=	7.29 ACRES
WOODS SOIL GROUP D (CN=79)	=	97.82 ACRES
TOTAL AREA (SITE)	=	113.36 ACRES
Tc pre (SITE)	=	93.1 MINS
CN pre (SITE)	=	80
FLOW DIRECTION	=	→

POST DRAINAGE AREA 4

NEW BUILDING SOIL GROUP D (CN=98)	=	0.05 ACRES
NEW DRIVEWAY SOIL GROUP D (CN=98)	=	0.08 ACRES
NEW LAWN SOIL GROUP D (CN=80)	=	2.27 ACRES
WOODS SOIL GROUP D (CN=79)	=	34.61 ACRES
TOTAL DRAINAGE AREA	=	37.01 ACRES
Tc pre (SITE)	=	106.5 MINS
CN pre (SITE)	=	79
FLOW DIRECTION	=	→

EXISTING ROADS

WATER SURFACE

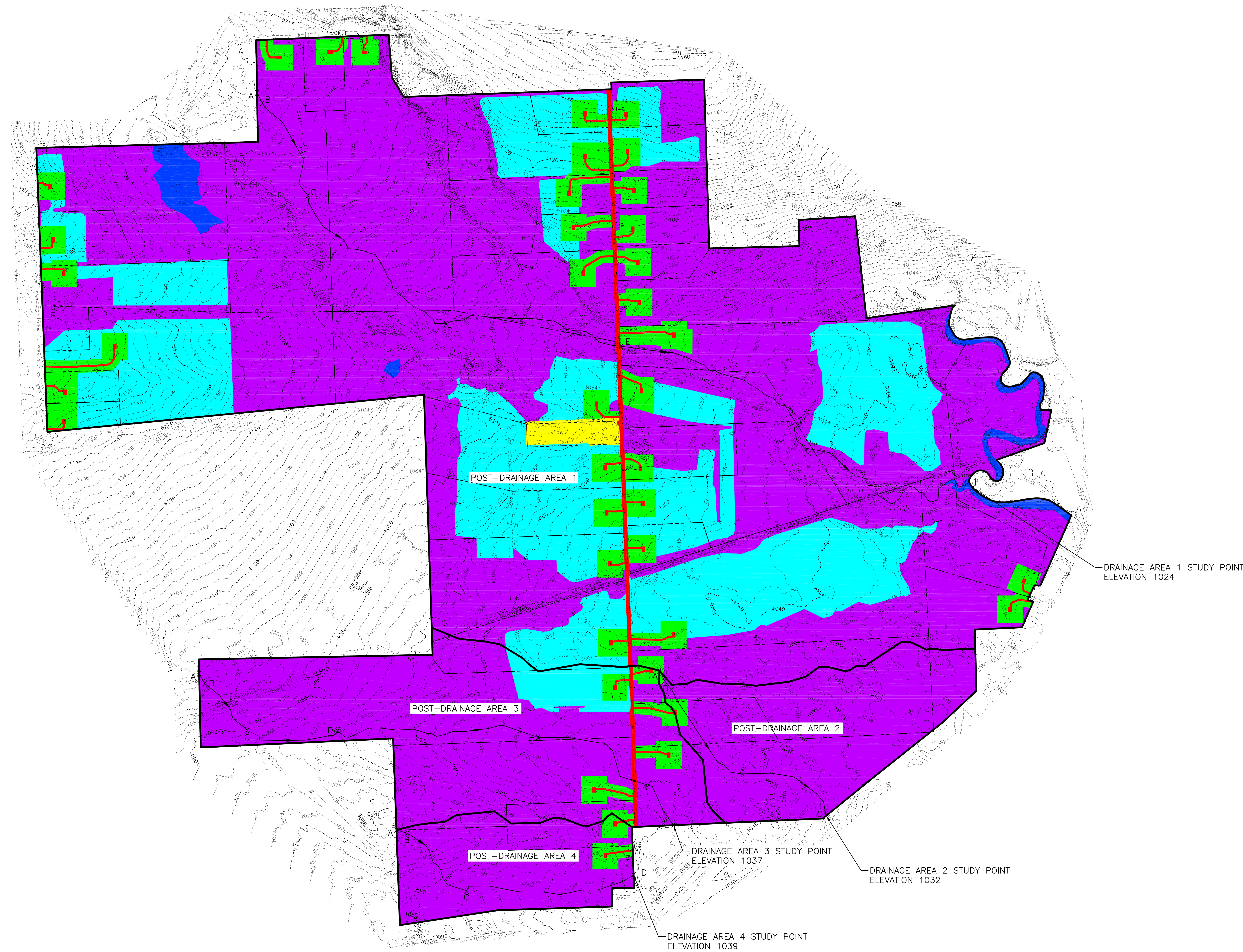
RESIDENTIAL

ROW CROPS

WOODS

NEW HOUSES AND DRIVEWAYS

NEW LAWN



NOT FOR CONSTRUCTION

GRAPHIC SCALE

(IN FEET)
1 inch = 500 ft.

58 Exchange Street
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Phone: 607.722.1100
Fax: 607.722.2515
Email: info@keyscomp.com
www.keyscomp.com

NO. | REVISIONS AND DESCRIPTIONS | DATE:

CASWELL ROAD
MILL CREEK PRESERVE

TOWN OF DRYDEN — TOMPKINS COUNTY, NY

POST-DEVELOPMENT DRAINAGE AREA MAP

FIGURE NO. 12

PROJECT NO. 0392.10819

DATE: 6/10/19

CAD FILE NO.: 039210819-SWPPP FIGURE

APPENDIX A
STORMWATER DISCHARGE PERMIT INFORMATION

0644089821

Prepared for informational purposes only.

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
297 River Street, Suite 3

City
Oneonta

State
NY

Zip
13820 -

Phone (Owner/Operator)
607 - 353 - 8068

Fax (Owner/Operator)
- -

Email (Owner/Operator)
alord@nylandandlakes.com

FED TAX ID
 - (not required for individuals)

6401089828

Project Site Information

Project/Site Name
Mill Creek Preserve Project

Street Address (NOT P.O. BOX)
Caswell Road

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

City/Town/Village (THAT ISSUES BUILDING PERMIT)
Town od Dryden

State	Zip	County	DEC Region
NY	13068 -	Tompkins	7

Name of Nearest Cross Street
W Dryden Road

Distance to Nearest Cross Street (Feet)
0

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

Tax Map Numbers
Section-Block-Parcel
33.-1-3.2

Tax Map Numbers
33.-1-3.2

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)**
386957	4706809

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 — Number of Lots: 40
- ○ 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
912.0	63.4	0.0	3.5

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
4 %	1 %	3 %	92 %

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

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

Start Date 06/20/2019 - **End Date** __/__/____

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

Name

Mill Creek and Fall Creek

9a. Type of waterbody identified in Question 9?

- [x] Wetland / State Jurisdiction On Site (Answer 9b)
- [ ] Wetland / State Jurisdiction Off Site
- [x] 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?

- [x] 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? [x] **Yes** [ ] **No**

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

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? [ ] **Yes** [x] **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** [x] **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?

Town of Dryden

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**

0251089825

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

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

0.025 **acre-feet**

Total WQv for the largest proposed single lot development. Shown for informational purposes only. Not provided for all 40 lots as each lot would be less than this value and will be treated via filter strips at each respective lot.

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)	2.0	and/or 0.22
○ 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

0.025 **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 622.74 **CFS**

Post-development 1,207.70 ~~[ ][ ][ ].[ ][ ][ ]~~ **CFS**

Total Extreme Flood Control Criteria (Qf)

Pre-Development 602.62 **CFS**

Post-development 1,183.70 ~~[ ][ ][ ].[ ][ ][ ]~~ **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

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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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 — Number of Lots
- ○ 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. 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? **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)? ○ 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)

RR Techniques (Area Reduction)	Total Contributing Area (acres)		Total Contributing Impervious Area(acres)
○ 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

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.:_________
  Mill Creek Preserve
  Caswell Road
  Town of Dryden, County of Tompkins, NY

- Operator:
  Name:____
  Address:____

- Site Plan:
  Mill Creek Preserve
  Caswell Road
  Prepared by: New York Land and Lakes Development LLC
  297 River Street, Suite 3, Oneonta, NY 13820

- Storm Water Management and Pollution Prevention Plan:
  Mill Creek Preserve
  Caswell Road
  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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CONTRACTOR'S CERTIFICATION STATEMENT
FOR
COMPLIANCE WITH STORMWATER MANAGEMENT AND POLLUTION PREVENTION PLAN

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

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- Subject Site:
  Lot No.:_________
  Mill Creek Preserve
  Caswell Road
  Town of Dryden, County of Tompkins, NY

- Operator:
  Name:____
  Address:____

- Site Plan:
  Mill Creek Preserve
  Caswell Road
  Prepared by: New York Land and Lakes Development LLC
  297 River Street, Suite 3, Oneonta, NY 13820

- Storm Water Management and Pollution Prevention Plan:
  Mill Creek Preserve
  Caswell Road
  Prepared by: Keystone Associates Architects, Engineers, and Surveyors, LLC., 58 Exchange Street, Binghamton, New York 13901. 2019.

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"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)

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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 *Discharge*s.** 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.

(Part I.C.2.c.iv)

(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

(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. *Discharge*s 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* <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. 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,* <u>and</u> 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;

(Part IV.C.4.i)

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 <u>licensed to practice in the State of New York.</u>.

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

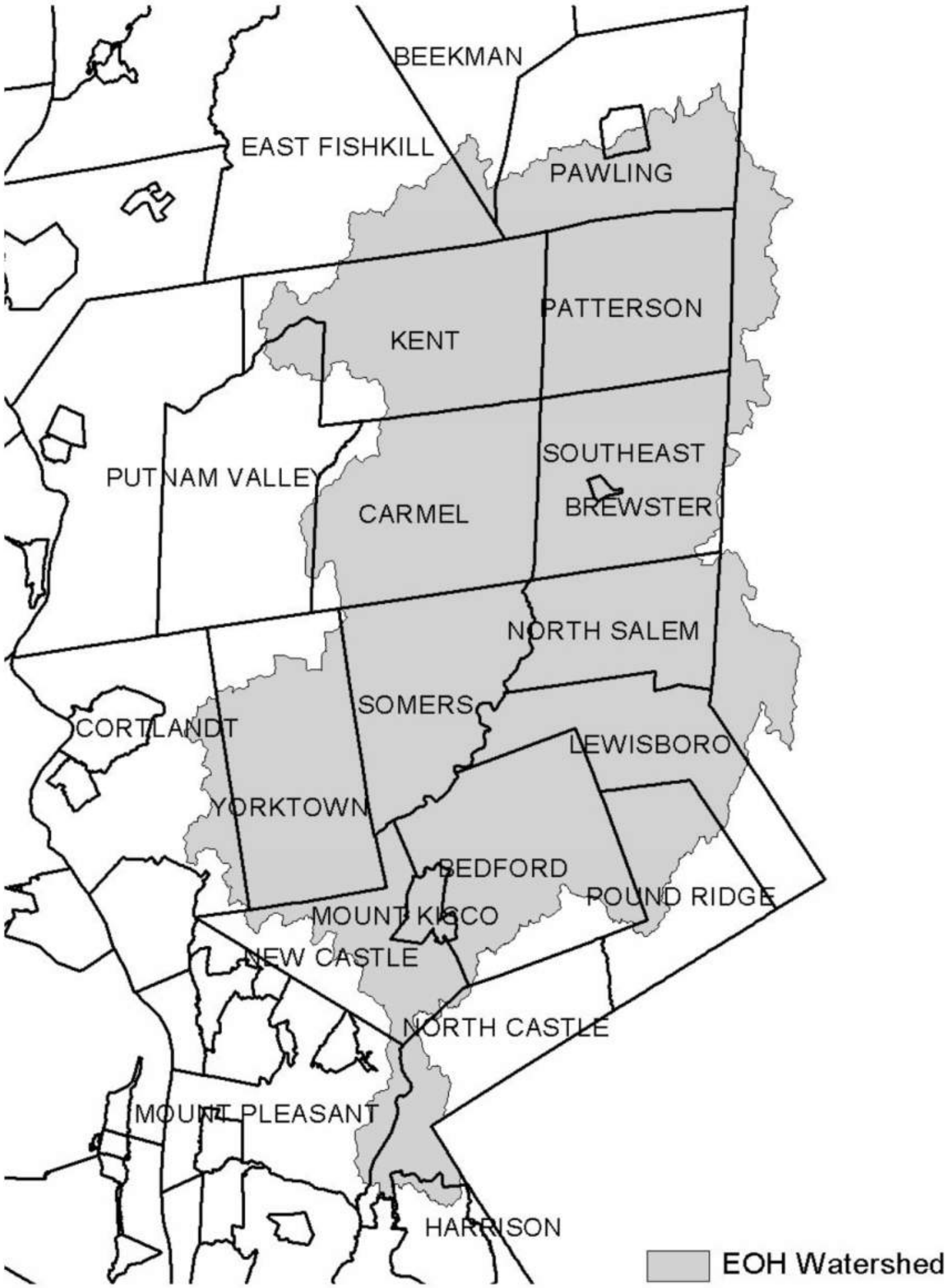


Figure 2 - Onondaga Lake Watershed

Figure 3 - Greenwood Lake Watershed

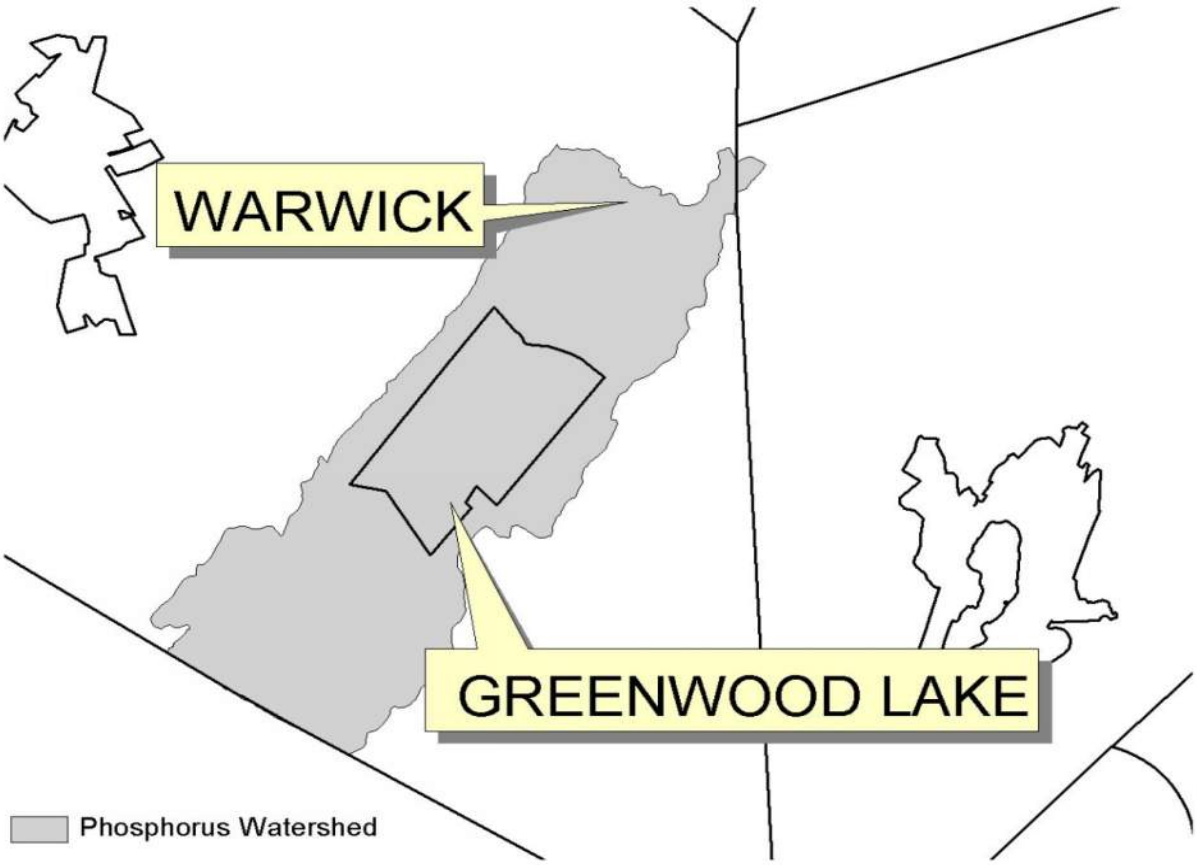


__Figure 4 - Oscawana Lake Watershed__

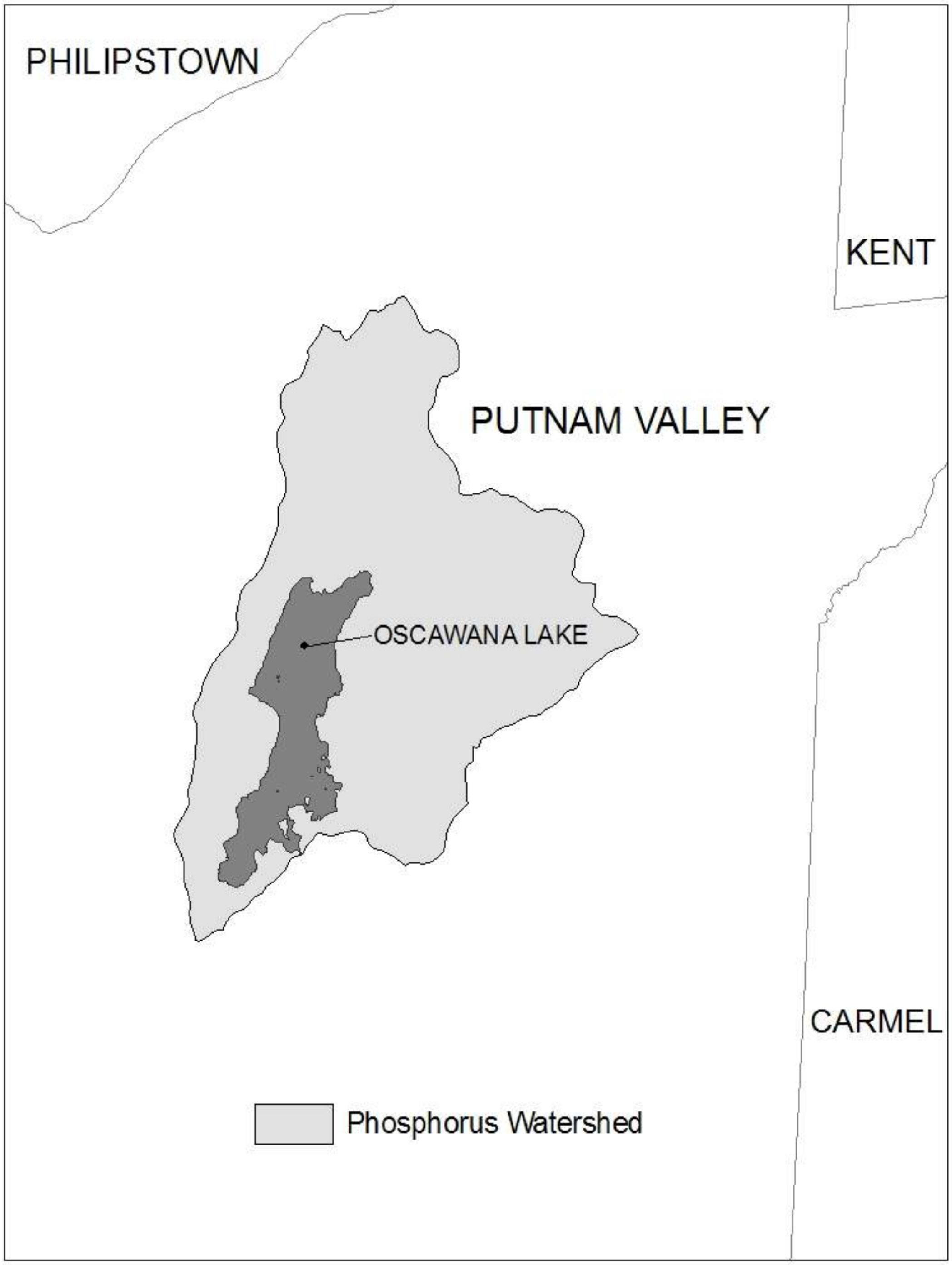
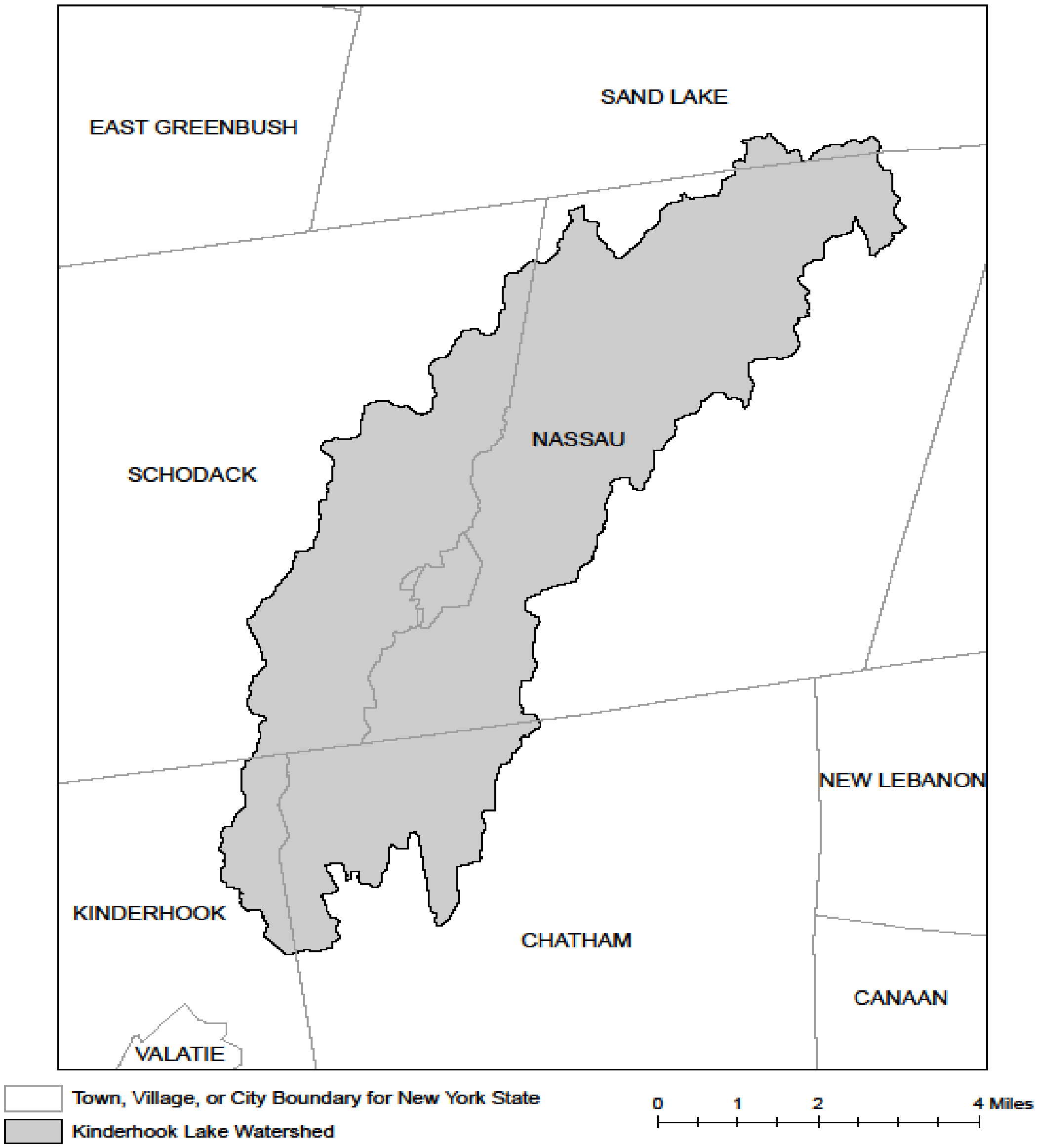


Figure 5: Kinderhook Lake Watershed



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

APPENDIX E

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

COUNTY	WATERBODY	COUNTY	WATERBODY
Onondaga	Onondaga Creek, Middle and tribs	Suffolk	Great South Bay, West
Onondaga	Onondaga Creek, Upp, and minor tribs	Suffolk	Mill and Seven Ponds
Onondaga	Harbor Brook, Lower, and tribs	Suffolk	Moriches Bay, East
Onondaga	Ninemile Creek, Lower, and tribs	Suffolk	Moriches Bay, West
Onondaga	Minor tribs to Onondaga Lake	Suffolk	Quantuck Bay
Onondaga	Onondaga Creek, Lower, and tribs	Suffolk	Shinnecock Bay (and Inlet)
Ontario	Honeoye Lake	Sullivan	Bodine, Montgomery Lakes
Ontario	Hemlock Lake Outlet and minor tribs	Sullivan	Davies Lake
Ontario	Great Brook and minor tribs	Sullivan	Pleasure Lake
Orange	Monhagen Brook and tribs	Sullivan	Swan Lake
Orange	Orange Lake	Tompkins	Cayuga Lake, Southern End
Orleans	Lake Ontario Shoreline, Western	Tompkins	Owasco Inlet, Upper, and tribs
Oswego	Pleasant Lake	Ulster	Ashokan Reservoir
Oswego	Lake Neatahwanta	Ulster	Esopus Creek, Upper, and minor
Putnam	Oscawana Lake		tribs
Putnam	Palmer Lake	Ulster	Esopus Creek, Lower, Main Stem
Putnam	Lake Carmel	Ulster	Esopus Creek, Middle, and minor
Queens	Jamaica Bay, Eastern, and tribs (Queens)		tribs
Queens	Bergen Basin	Warren	Lake George
Queens	Shellbank Basin	Warren	Tribs to L.George, Village of L
Rensselaer	Nassau Lake		George
Rensselaer	Snyders Lake	Warren	Huddle/Finkle Brooks and tribs
Richmond	Grasmere, Arbutus and Wolfes Lakes	Warren	Indian Brook and tribs
Rockland	Congers Lake, Swartout Lake	Warren	Hague Brook and tribs
Rockland	Rockland Lake	Washington	Tribs to L.George, East Shr Lk
Saratoga	Ballston Lake		George
Saratoga	Round Lake	Washington	Cossayuna Lake
Saratoga	Dwaas Kill and tribs	Washington	Wood Cr/Champlain Canal, minor
Saratoga	Tribs to Lake Lonely		tribs
Saratoga	Lake Lonely	Wayne	Port Bay
Schenectady	Collins Lake	Wayne	Marbletown Creek and tribs
Schenectady	Duane Lake	Westchester	Lake Katonah
Schenectady	Mariaville Lake	Westchester	Lake Mohegan
Schoharie	Engleville Pond	Westchester	Lake Shenorock
Schoharie	Summit Lake	Westchester	Reservoir No.1 (Lake Isle)
Schuyler	Cayuta Lake	Westchester	Saw Mill River, Middle, and tribs
St. Lawrence	Fish Creek and minor tribs	Westchester	Silver Lake
St. Lawrence	Black Lake Outlet/Black Lake	Westchester	Teatown Lake
Steuben	Lake Salubria	Westchester	Truesdale Lake
Steuben	Smith Pond	Westchester	Wallace Pond
Suffolk	Millers Pond	Westchester	Peach Lake
Suffolk	Mattituck (Marratooka) Pond	Westchester	Mamaroneck River, Lower
Suffolk	Tidal tribs to West Moriches Bay	Westchester	Mamaroneck River, Upp, and tribs
Suffolk	Canaan Lake	Westchester	Sheldrake River and tribs
Suffolk	Lake Ronkonkoma	Westchester	Blind Brook, Lower
Suffolk	Beaverdam Creek and tribs	Westchester	Blind Brook, Upper, and tribs
Suffolk	Big/Little Fresh Ponds	Westchester	Lake Lincolndale
Suffolk	Fresh Pond	Westchester	Lake Meahaugh
Suffolk	Great South Bay, East	Wyoming	Java Lake
Suffolk	Great South Bay, Middle	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

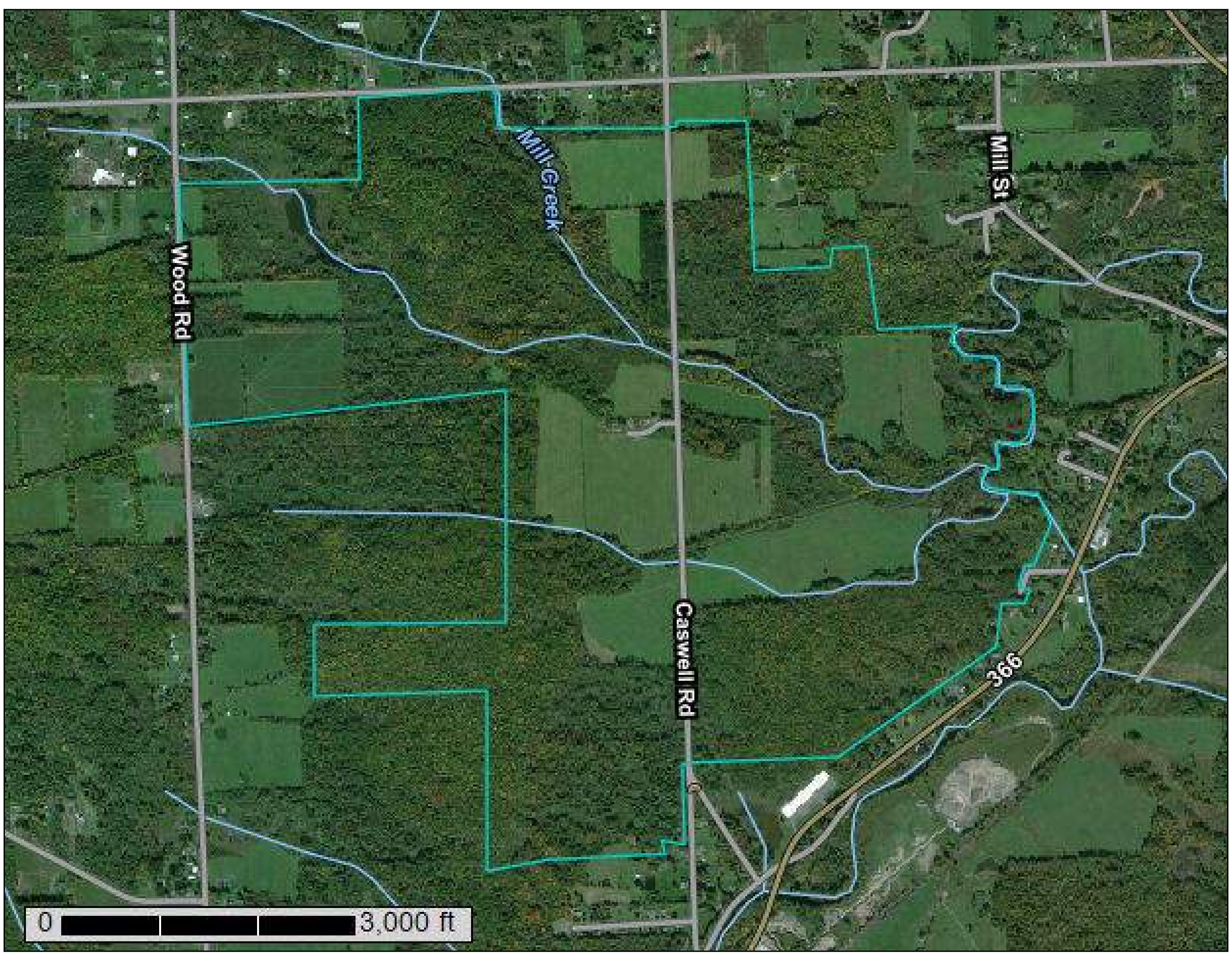
NRCS

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

Tompkins County, New York



May 14, 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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

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.

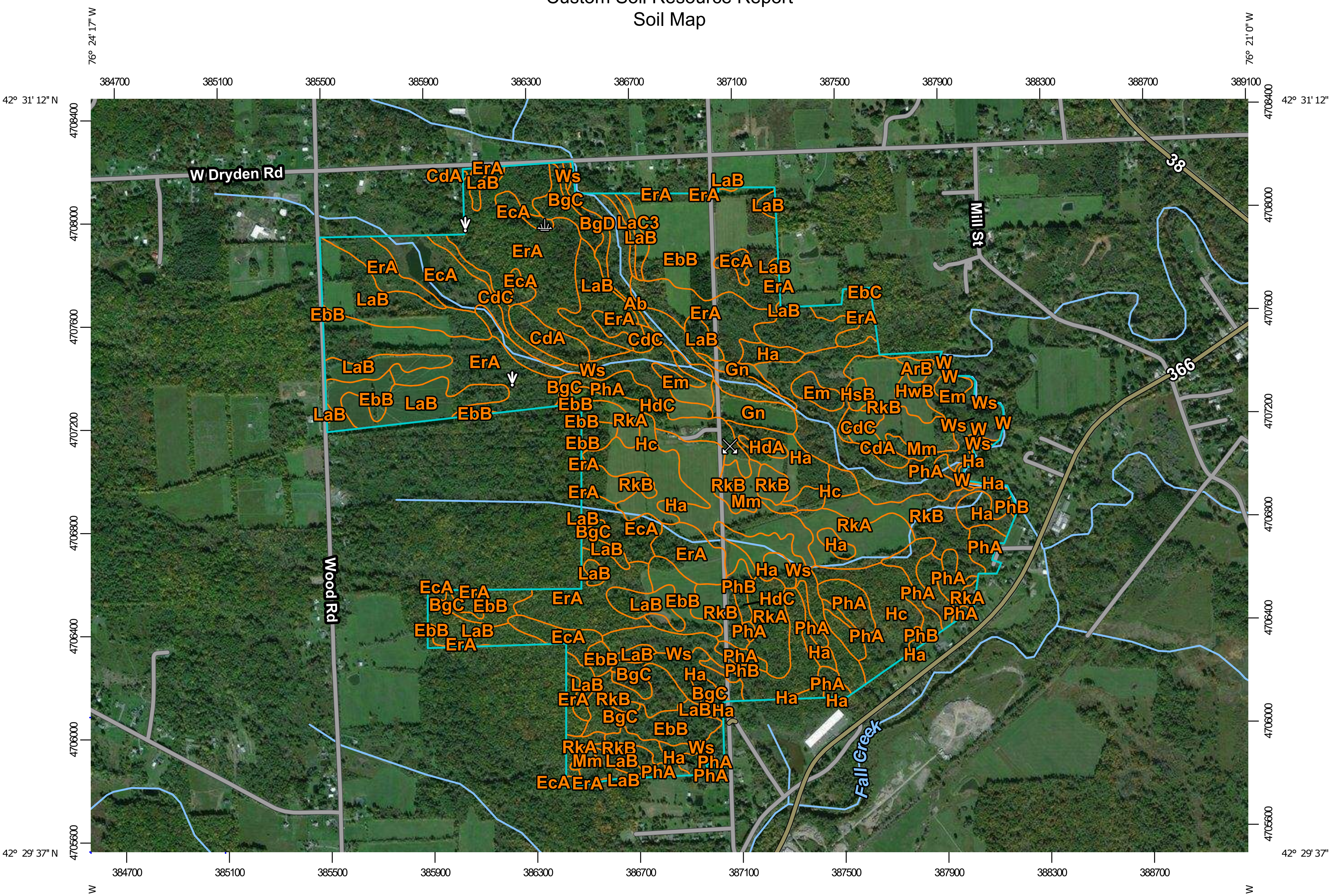
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree 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: 1:20,600 if printed on A landscape (11" x 8.5") sheet.

Meters: 0, 300, 600, 1200, 1800

Feet: 0, 1000, 2000, 4000, 6000

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 1:20,000.

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: Tompkins County, New York
Survey Area Data: Version 14, Sep 3, 2018

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

Date(s) aerial images were photographed: Aug 29, 2012—Nov 6, 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
Ab	Alluvial land	20.0	2.2%
ArB	Arkport fine sandy loam, 2 to 6 percent slopes	2.1	0.2%
BgC	Bath and Valois soils, 5 to 15 percent slopes	16.1	1.7%
BgD	Bath and Valois soils, 15 to 25 percent slopes, eroded	4.8	0.5%
CdA	Chenango gravelly loam, 0 to 5 percent slopes	11.9	1.3%
CdC	Chenango gravelly loam, 5 to 15 percent slopes	9.8	1.1%
EbB	Erie channery silt loam, 3 to 8 percent slopes	100.9	10.9%
EbC	Erie channery silt loam, 8 to 15 percent slopes	0.4	0.0%
EcA	Chippewa and Alden soils, 0 to 8 percent slopes	44.5	4.8%
Em	Eel silt loam	13.0	1.4%
ErA	Erie-Chippewa channery silt loams, 0 to 3 percent slopes	159.9	17.3%
Gn	Genesee silt loam	11.3	1.2%
Ha	Halsey silt loam	67.6	7.3%
Hc	Halsey mucky silt loam	45.4	4.9%
HdA	Howard gravelly loam, 0 to 5 percent slopes	5.8	0.6%
HdC	Howard gravelly loam, 5 to 15 percent simple slopes	16.5	1.8%
HsB	Hudson silty clay loam, 2 to 6 percent slopes	2.1	0.2%
HwB	Hudson and Collamer silt loams, 2 to 6 percent slopes	4.3	0.5%
LaB	Langford channery silt loam, 2 to 8 percent slopes	101.0	10.9%
LaC3	Langford channery silt loam, 8 to 15 percent slopes, eroded	2.0	0.2%
Mm	Madalin mucky silty clay loam	17.5	1.9%
PhA	Phelps gravelly silt loam, 0 to 3 percent slopes	39.2	4.2%
PhB	Phelps gravelly silt loam, 3 to 8 percent slopes	4.2	0.5%
RkA	Rhinebeck silt loam, 0 to 2 percent slopes	38.1	4.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
RkB	Rhinebeck silt loam, 2 to 6 percent slopes	73.3	7.9%
W	Water	1.9	0.2%
Ws	Wayland soils complex, 0 to 3 percent slopes, frequently flooded	111.5	12.1%
Totals for Area of Interest		**924.9**	**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.

Tompkins County, New York

Ab—Alluvial land

Map Unit Setting

National map unit symbol: 9xkp
Elevation: 100 to 3,000 feet
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Fluvaquents and similar soils: 40 percent
Udifluvents and similar soils: 35 percent
Minor components: 25 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: silt loam
H2 - 5 to 72 inches: gravelly silt loam

Properties and qualities

Slope: 0 to 2 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: Frequent
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: A/D
Hydric soil rating: Yes

Description of Udifluvents

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 loam
H2 - 4 to 72 inches: very gravelly sand

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

Wayland

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

Sloan

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

Eel (teel)

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

Genesee (hamlin)

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

Fresh water marsh

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

ArB—Arkport fine sandy loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 9xkq
Elevation: 300 to 900 feet
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Arkport and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arkport

Setting

Landform: Deltas on lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Glaciofluvial or deltaic deposits with a high content of fine and very fine sand

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 22 inches: fine sandy loam
H3 - 22 to 36 inches: loamy fine sand
H4 - 36 to 60 inches: stratified very fine sand to loamy fine sand to fine sand

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Dunkirk

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

Collamer

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

Chenango

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

Howard

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

Williamson

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

BgC—Bath and Valois soils, 5 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2v32c
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

Bath and similar soils: 40 percent
Valois and similar soils: 35 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bath

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till derived mainly from gray and brown siltstone, sandstone, and shale

Typical profile

Ap - 0 to 9 inches: channery silt loam

Bw1 - 9 to 15 inches: channery silt loam
Bw2 - 15 to 25 inches: channery loam
E - 25 to 29 inches: channery loam
Bx - 29 to 52 inches: very channery silt loam
C - 52 to 72 inches: very channery silt loam

Properties and qualities

Slope: 5 to 15 percent
Percent of area covered with surface fragments: 0.0 percent
Depth to restrictive feature: 26 to 38 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 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Valois

Setting

Landform: Valley sides, lateral moraines, end moraines
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 sandstone, siltstone, and shale

Typical profile

H1 - 0 to 2 inches: gravelly silt loam
H2 - 2 to 32 inches: gravelly silt loam
H3 - 32 to 49 inches: gravelly silt loam
H4 - 49 to 60 inches: gravelly silt loam

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: 24 to 36 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 0.20 in/hr)
Depth to water table: About 24 to 35 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Volusia

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Mardin

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

Erie

Percent of map unit: 5 percent
Landform: Till plains, drumlinoid ridges, hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Langford

Percent of map unit: 5 percent
Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Lordstown

Percent of map unit: 5 percent
Landform: Hills, mountains
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

BgD—Bath and Valois soils, 15 to 25 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2v32d
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

Bath, eroded, and similar soils: 40 percent
Valois and similar soils: 35 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bath, Eroded

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till derived mainly from gray and brown siltstone, sandstone, and shale

Typical profile

Ap - 0 to 9 inches: channery silt loam
Bw1 - 9 to 13 inches: channery silt loam
Bw2 - 13 to 23 inches: channery loam
E - 23 to 27 inches: channery loam
Bx - 27 to 50 inches: very channery silt loam
C - 50 to 72 inches: very channery silt loam

Properties and qualities

Slope: 15 to 25 percent
Percent of area covered with surface fragments: 0.0 percent
Depth to restrictive feature: 26 to 38 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 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Valois

Setting

Landform: Lateral moraines, end moraines, valley sides
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 sandstone, siltstone, and shale

Typical profile

H1 - 0 to 2 inches: gravelly silt loam
H2 - 2 to 32 inches: gravelly silt loam
H3 - 32 to 49 inches: gravelly silt loam
H4 - 49 to 60 inches: gravelly silt loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 24 to 36 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 0.20 in/hr)
Depth to water table: About 24 to 35 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Mardin, eroded

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Volusia

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear

Hydric soil rating: No

Howard

Percent of map unit: 5 percent
Landform: Valley trains, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Langford

Percent of map unit: 5 percent
Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Lordstown

Percent of map unit: 5 percent
Landform: Hills, mountains
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

CdA—Chenango gravelly loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 9xl5
Elevation: 600 to 1,800 feet
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Chenango

Setting

Landform: Terraces, valley trains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread

Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile
H1 - 0 to 8 inches: gravelly loam
H2 - 8 to 26 inches: gravelly silt loam
H3 - 26 to 60 inches: very gravelly loamy coarse sand

Properties and qualities
Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 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 4.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

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

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

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

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

CdC—Chenango gravelly loam, 5 to 15 percent slopes

Map Unit Setting
National map unit symbol: 9xl6
Elevation: 600 to 1,800 feet
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F

Frost-free period: 120 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Chenango

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile

H1 - 0 to 8 inches: gravelly loam
H2 - 8 to 26 inches: gravelly silt loam
H3 - 26 to 60 inches: very gravelly loamy coarse sand

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 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 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Red hook

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

Braceville

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

Tioga

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

Howard

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

EbB—Erie channery silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2wn35
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

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

Description of Erie

Setting

Landform: Hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 9 inches: channery silt loam
E - 9 to 13 inches: channery silt loam
Bg - 13 to 15 inches: channery silt loam
Bx - 15 to 38 inches: channery silt loam
C - 38 to 72 inches: channery loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 10 to 21 inches to fragipan
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: About 7 to 14 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D

Hydric soil rating: No

Minor Components

Langford

Percent of map unit: 10 percent
Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Crest, side slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Hydric soil rating: No

Chippewa

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

Fremont

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

EbC—Erie channery silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2wn36
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

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

Description of Erie

Setting

Landform: Hills
Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 9 inches: channery silt loam
E - 9 to 13 inches: channery silt loam
Bg - 13 to 15 inches: channery silt loam
Bx - 15 to 38 inches: channery silt loam
C - 38 to 72 inches: channery loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 10 to 21 inches to fragipan
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: About 7 to 14 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Langford

Percent of map unit: 10 percent
Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, head slope
Down-slope shape: Convex, concave
Across-slope shape: Convex, linear
Hydric soil rating: No

Chippewa

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

Fremont

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

EcA—Chippewa and Alden soils, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2v32v
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

Chippewa and similar soils: 55 percent
Alden and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chippewa

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy till dominated by siltstone, sandstone, and shale fragments

Typical profile

Ap - 0 to 7 inches: silt loam
Eg - 7 to 15 inches: channery silt loam
Bxg - 15 to 45 inches: channery silt loam
C - 45 to 72 inches: channery silt loam

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 0.0 percent
Depth to restrictive feature: 8 to 20 inches to fragipan
Natural drainage class: 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 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Hydric soil rating: Yes

Description of Alden

Setting

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

Typical profile

H1 - 0 to 10 inches: mucky silt loam
H2 - 10 to 23 inches: silt loam
H3 - 23 to 36 inches: channery silt loam
H4 - 36 to 60 inches: channery 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 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: High (about 9.2 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

Volusia

Percent of map unit: 10 percent
Landform: Hills, mountains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Chippewa, very poorly drained

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

Em—Eel silt loam

Map Unit Setting

National map unit symbol: 9xll
Elevation: 600 to 1,800 feet
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Eel (teel) and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eel (teel)

Setting

Landform: Flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Silty alluvium

Typical profile

H1 - 0 to 10 inches: silt loam
H2 - 10 to 27 inches: fine sandy loam
H3 - 27 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 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 high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Hydric soil rating: No

Minor Components

Genesee (hamlin)

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

Tioga

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

Chenango

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

Wayland

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

Middlebury

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

ErA—Erie-Chippewa channery silt loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2vcj8
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

Erie and similar soils: 60 percent
Chippewa and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Erie

Setting

Landform: Hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 9 inches: channery silt loam

E - 9 to 13 inches: channery silt loam
Bg - 13 to 15 inches: channery silt loam
Bx - 15 to 38 inches: channery silt loam
C - 38 to 72 inches: channery loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 10 to 21 inches to fragipan
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: About 7 to 14 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Chippewa

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy till dominated by siltstone, sandstone, and shale fragments

Typical profile

Ap - 0 to 7 inches: channery silt loam
Eg - 7 to 15 inches: channery silt loam
Bxg - 15 to 45 inches: channery silt loam
C - 45 to 72 inches: channery silt loam

Properties and qualities

Slope: 0 to 3 percent
Percent of area covered with surface fragments: 0.0 percent
Depth to restrictive feature: 8 to 20 inches to fragipan
Natural drainage class: 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 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: D
Hydric soil rating: Yes

Minor Components

Chippewa, very poorly drained

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

Langford

Percent of map unit: 5 percent
Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest, interfluve, side slope
Down-slope shape: Concave, convex
Across-slope shape: Convex
Hydric soil rating: No

Gn—Genesee silt loam

Map Unit Setting

National map unit symbol: 9xlq
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Genesee and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Genesee

Setting

Landform: Flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Silty alluvium

Typical profile

H1 - 0 to 12 inches: silt loam
H2 - 12 to 38 inches: very fine sandy loam

H3 - 38 to 60 inches: stratified very gravelly loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Fredon

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

Eel (teel)

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

Tioga

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

Middlebury

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

Chenango

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

Ha—Halsey silt loam

Map Unit Setting

National map unit symbol: 9xlr
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Halsey and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Halsey

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: stratified sandy loam to very gravelly sand

Properties and qualities

Slope: 0 to 2 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 high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
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

Minor Components

Fredon

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

Phelps

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

Lamson

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

Muck and peat

Percent of map unit: 5 percent
Landform: Marshes, swamps

Hydric soil rating: Yes

Canandaigua

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

Hc—Halsey mucky silt loam

Map Unit Setting

National map unit symbol: 9xls
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Halsey and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Halsey

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: mucky silt loam
H2 - 8 to 28 inches: fine sandy loam
H3 - 28 to 60 inches: stratified very gravelly sand to sandy 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 (0.57 to 1.98 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: Moderate (about 6.6 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

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

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

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

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

Muck and peat
Percent of map unit: 5 percent
Landform: Swamps, marshes
Hydric soil rating: Yes

HdA—Howard gravelly loam, 0 to 5 percent slopes

Map Unit Setting
National map unit symbol: 9xlt
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Howard and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Howard

Setting
Landform: Valley trains, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex

Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Typical profile

H1 - 0 to 9 inches: gravelly loam
H2 - 9 to 25 inches: loam
H3 - 25 to 47 inches: gravelly silt loam
H4 - 47 to 60 inches: Error

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Fredon

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

Genesee (hamlin)

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

Eel (teel)

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

Phelps

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

Valois

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

HdC—Howard gravelly loam, 5 to 15 percent simple slopes

Map Unit Setting

National map unit symbol: 9xlv

Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Howard and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Howard

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Typical profile

H1 - 0 to 9 inches: gravelly loam
H2 - 9 to 25 inches: loam
H3 - 25 to 47 inches: gravelly silt loam
H4 - 47 to 60 inches: Error

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Phelps

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

Lansing

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

Fredon

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

Genesee (hamlin)

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

Valois

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

HsB—Hudson silty clay loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 9xm6
Elevation: 300 to 1,800 feet
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Hudson

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 12 inches: silty clay loam
H2 - 12 to 36 inches: silty clay loam
H3 - 36 to 60 inches: silt loam

Properties and qualities

Slope: 2 to 6 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 moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: High (about 9.4 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

Rhinebeck

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

Cayuga

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

Collamer

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

Niagara

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

HwB—Hudson and Collamer silt loams, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 9xmf
Elevation: 300 to 1,800 feet
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Hudson

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 12 inches: silt loam
H2 - 12 to 36 inches: silty clay loam
H3 - 36 to 60 inches: silt loam

Properties and qualities

Slope: 2 to 6 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 moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Description of Collamer

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 11 inches: silt loam
H3 - 11 to 27 inches: silt loam
H4 - 27 to 48 inches: stratified very fine sand to silt

Properties and qualities

Slope: 2 to 6 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 moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 6 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Moderate (about 8.2 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

Rhinebeck

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

Niagara

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

Dunkirk

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

Cayuga

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

LaB—Langford channery silt loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9xmm
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Langford and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Langford

Setting

Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived from siltstone, sandstone, shale, and some limestone

Typical profile

H1 - 0 to 7 inches: channery silt loam
H2 - 7 to 22 inches: channery silt loam
H3 - 22 to 52 inches: channery silt loam
H4 - 52 to 60 inches: channery silt loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 15 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 15 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Erie

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

Volusia

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

Mardin

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

Kendaia

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

Valois

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

LaC3—Langford channery silt loam, 8 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: 9xmq
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Langford and similar soils: 75 percent

Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Langford

Setting

Landform: Till plains, drumlinoid ridges, 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 siltstone, sandstone, shale, and some limestone

Typical profile

H1 - 0 to 7 inches: channery silt loam
H2 - 7 to 22 inches: channery silt loam
H3 - 22 to 52 inches: channery silt loam
H4 - 52 to 60 inches: channery silt loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 15 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 15 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
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: D
Hydric soil rating: No

Minor Components

Erie

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

Volusia

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

Mardin

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

Conesus

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

Valois

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

Mm—Madalin mucky silty clay loam

Map Unit Setting

National map unit symbol: 9xng
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Madalin and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Madalin

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 8 inches: mucky silty clay loam
H2 - 8 to 26 inches: silty clay
H3 - 26 to 60 inches: clay

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 low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 10 percent
Available water storage in profile: Moderate (about 8.4 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

Ovid

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

Canandaigua

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

Muck and peat

Percent of map unit: 5 percent
Landform: Swamps, marshes
Hydric soil rating: Yes

Rhinebeck

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

Hudson

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

PhA—Phelps gravelly silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9xnx
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Phelps and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Phelps

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Typical profile

H1 - 0 to 9 inches: gravelly silt loam

H2 - 9 to 15 inches: gravelly loam
H3 - 15 to 25 inches: silt loam
H4 - 25 to 60 inches: stratified gravelly loam to silt

Properties and qualities

Slope: 0 to 3 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 high to high (0.57 to 1.98 in/hr)
Depth to water table: About 15 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Hydric soil rating: No

Minor Components

Fredon

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

Palmyra

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

Howard

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

Braceville

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

Arkport

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

PhB—Phelps gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9xny
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Phelps and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Phelps

Setting

Landform: Terraces, valley trains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 15 inches: gravelly loam
H3 - 15 to 25 inches: silt loam
H4 - 25 to 60 inches: stratified gravelly loam to silt

Properties and qualities

Slope: 3 to 8 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 high to high (0.57 to 1.98 in/hr)
Depth to water table: About 15 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B/D
Hydric soil rating: No

Minor Components

Howard

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

Palmyra

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

Fredon

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

Arkport

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

Braceville

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

RkA—Rhinebeck silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 9xp0
Elevation: 80 to 1,000 feet
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Rhinebeck and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rhinebeck

Setting

Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 12 inches: silt loam
H2 - 12 to 23 inches: silty clay loam
H3 - 23 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
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: 10 percent
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D

Hydric soil rating: No

Minor Components

Ovid

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

Niagara

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

Hudson

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

Madalin

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

Canandaigua

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

RkB—Rhinebeck silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 9xp1
Elevation: 80 to 1,000 feet
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Rhinebeck and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rhinebeck

Setting

Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 12 inches: silt loam
H2 - 12 to 23 inches: silty clay loam
H3 - 23 to 60 inches: silty clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
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: 10 percent
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Canandaigua

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

Ovid

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

Hudson

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

Niagara

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

Madalin

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

W—Water

Map Unit Setting

National map unit symbol: 1nc3d
Mean annual precipitation: 32 to 42 inches

Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 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.

Ws—Wayland soils complex, 0 to 3 percent slopes, frequently flooded

Map Unit Setting
National map unit symbol: 2srgv
Elevation: 160 to 1,970 feet
Mean annual precipitation: 31 to 68 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
A - 0 to 6 inches: silt loam
Bg1 - 6 to 12 inches: silt loam
Bg2 - 12 to 18 inches: silt loam
C1 - 18 to 46 inches: silt loam
C2 - 46 to 72 inches: silty clay 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: 15 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Very high (about 12.6 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 6 inches: mucky silt loam
Bg1 - 6 to 12 inches: silt loam
Bg2 - 12 to 18 inches: silt loam
C1 - 18 to 46 inches: silt loam
C2 - 46 to 72 inches: silty clay 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: 15 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Very high (about 12.8 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

Wakeville

Percent of map unit: 10 percent
Landform: Flood plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

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)?..						No
Design Point:	1		*Manually enter P, Total Area and Impervious Cover.*			
P=	1.00	*inch*				
Breakdown of Subcatchments						
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Description**
1	2.00	0.22	11%	0.15	1,082	Filter Strips
2						
3						
4						
5						
6						
7						
8						
9						
10						
Subtotal (1-30)	2.00	0.22	11%	0.15	**1,082**	**Subtotal 1**
Total	2.00	0.22	11%	0.15	**1,082**	**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	2.00	0.22	
Tree Planting	0.00	0.00	*Up to 100 sf directly connected impervious area may be subtracted per tree*
Total	**2.00**	**0.22**	

Recalculate WQv after application of Area Reduction Techniques					
	Total Area *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Runoff Coefficient Rv**	**WQv** *(ft^3)*
"<<Initial WQv"	2.00	0.22	11%	0.15	1,082
Subtract Area	-2.00	-0.22			
WQv adjusted after Area Reductions	**0.00**	**0.00**	0%	0.05	0
Disconnection of Rooftops		0.00			
Adjusted WQv after Area Reduction and Rooftop Disconnect	0.00	0.00	0%	0.05	**0**
WQv reduced by Area Reduction techniques					1,082

Disconnection of Roof Tops

Design Point:	1

<table>
<tr><th colspan="5">Enter Site Data For Drainage Area to be Treated by Practice</th></tr>
<tr><th>Catchment Number</th><th>Impervious Area To Be Disconnected (Acres)</th><th colspan="2"></th><th>Description</th></tr>
<tr><td>1</td><td>0.22</td><td colspan="2"></td><td>Disconnection of Rooftops</td></tr>
<tr><th colspan="5">Design Elements</th></tr>
<tr><td colspan="2">Is another area based practice applied to this area?</td><td>No</td><td colspan="2"></td></tr>
<tr><td colspan="2">Soil Type</td><td>D</td><td colspan="2"></td></tr>
<tr><td colspan="2">Has an evaluation by licensed or certified professional determined if soil enhancement & spreading device needed to provide sheet flowover grass surfaces?</td><td>Yes</td><td>Y/N</td><td>required for C or D soils.</td></tr>
<tr><td colspan="2">Hotspot Area?</td><td>No</td><td></td><td></td></tr>
<tr><td colspan="2">Length of flow path from Impervious Surfaces</td><td>50</td><td>ft</td><td>75 feet maximum</td></tr>
<tr><td colspan="2">Distance of downspouts from impervious areas</td><td>25</td><td>ft</td><td>>10 feet</td></tr>
<tr><td colspan="2">Contributing Area of Rooftop to Downspout</td><td>275</td><td>sf</td><td>Okay</td></tr>
<tr><td colspan="2">Contributing Area of Rooftop</td><td>1100</td><td>sf</td><td>500 sf maximum. Up to 2000 sf with suitable flow dispersion technique</td></tr>
<tr><td colspan="2">Method of flow dispersion</td><td></td><td></td><td>required If area to downspout >500 sf</td></tr>
<tr><td colspan="2">Flow length thru vegetated channel, swale or filter</td><td>50</td><td>ft</td><td>vegetated area must be equal to or greater than the length of contributing impervious</td></tr>
<tr><td colspan="2">Slope of vegetated area receiving flow</td><td>4</td><td>%</td><td>Average slope ≤5%</td></tr>
<tr><td colspan="2">Will overflow occur to undesignated Areas?</td><td>No</td><td colspan="2"></td></tr>
<tr><td colspan="2">Are All Criteria in Section 5.3.5 met?</td><td>Yes</td><td colspan="2"></td></tr>
<tr><th colspan="5">Area Reduction Adjustments</th></tr>
<tr><td colspan="2">Subtract</td><td>0.22</td><td>Acres from the Total Impervious Area of Sub-catchment Number</td><td>1</td></tr>
</table>

Filter Strip

Design Point:	1

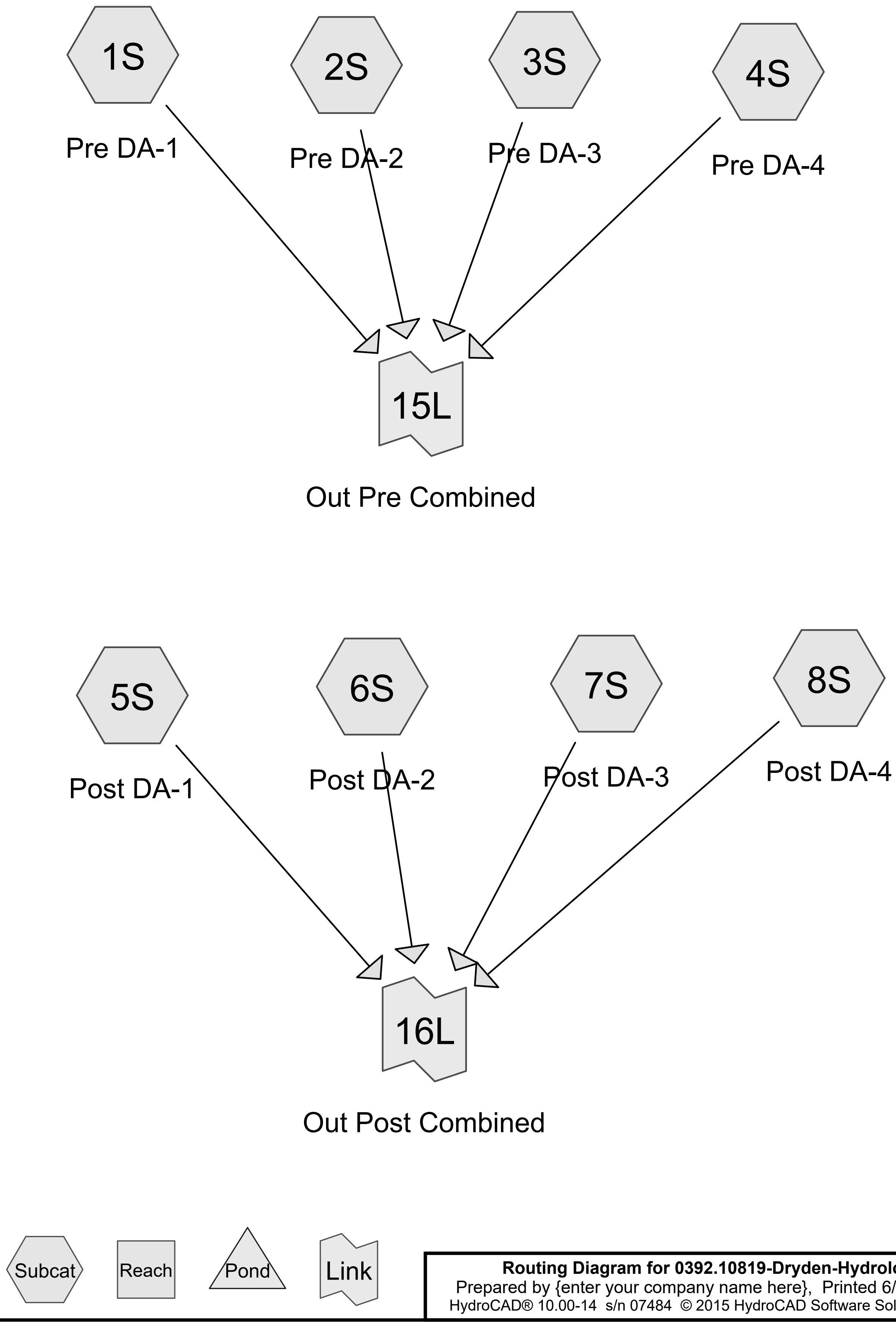
Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
1	2.00	0.22	0.11	0.15	1081.74	1.00	Rooftop Disconnect

Design Elements			
Is another area based practice applied to this area?	*No*	*Y/N*	
Amended Soils & Dense Turf Cover?	*No*	*Y/N*	
Is area protected from compaction from heavy equipment during construction?	*Yes*	*Y/N*	
Small Area of Impervious Area & close to source?	*Yes*	*Y/N*	
Composte Amendments?	*No*	*Y/N*	
Boundary Spreader?	*No*	*Y/N*	*Gravel Diaphram at top*
Boundary Zone?	*Yes*	*Y/N*	*25 feet of level grass*
Specify how sheet flow will be ensured.			*level spreader shall be used for buffer slopes ranging from 3-15%*
Average contributing slope	3	*%*	*3% maximum unless a level spreader is*
Slope of first 10 feet of Filter Strip	2	*%*	*2% maximum*
Overall Slope	5	*%*	*8% maximum*
Contributing Length of Pervious Areas (PC)	150	*ft*	*150 ft maximum*
Contributing Length of Impervious areas (IC)	75	*ft*	*75 ft maximum*
Maximum PC Contributing Length for combination of PC & IC	75	*ft*	
Soil Group (HSG)	D		
Filter Strip Width	50	*ft*	*50 ft minimum for slopes 0-8%* *75 ft minimum for slopes 8-12%* *100 ft minimum for slopes 12-15%* *HSG C or D increase by 15-20%*
Are All Criteria for Filter Strips in Section 5.3.2 met?	*Yes*		

Area Reduction Adjustments		
Subtract	**2.00**	***Acres from total Area***
Subtract	**0.22**	***Acres from total Impervious Area***

Note: The values included in these Runoff Reduction and Water Quality Complutaions worksheets are designed for a single lot, based on the lot with the largest driveway and standard house size therefore it is a conservative design that can be used for any typical residential lot development for this project.

APPENDIX D
HYDROLOGIC AND HYDRAULIC COMPUTATIONS



Routing Diagram for 0392.10819-Dryden-Hydrology
Prepared by {enter your company name here}, Printed 6/10/2019
HydroCAD® 10.00-14 s/n 07484 © 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-1 Runoff Area=702.200 ac 2.01% Impervious Runoff Depth=0.71"
Flow Length=8,508' Tc=115.5 min CN=83 Runoff=151.93 cfs 41.478 af

Subcatchment2S: Pre DA-2 Runoff Area=59.440 ac 0.00% Impervious Runoff Depth=0.53"
Flow Length=2,117' Tc=94.9 min CN=79 Runoff=10.43 cfs 2.646 af

Subcatchment3S: Pre DA-3 Runoff Area=113.360 ac 0.91% Impervious Runoff Depth=0.57"
Flow Length=4,946' Tc=93.1 min CN=80 Runoff=22.19 cfs 5.429 af

Subcatchment4S: Pre DA-4 Runoff Area=37.010 ac 0.00% Impervious Runoff Depth=0.53"
Flow Length=2,390' Tc=106.5 min CN=79 Runoff=5.96 cfs 1.648 af

Subcatchment5S: Post DA-1 Runoff Area=702.200 ac 2.42% Impervious Runoff Depth=0.66"
Flow Length=8,508' Tc=115.5 min CN=82 Runoff=139.71 cfs 38.733 af

Subcatchment6S: Post DA-2 Runoff Area=59.440 ac 0.03% Impervious Runoff Depth=0.53"
Flow Length=2,117' Tc=94.9 min CN=79 Runoff=10.43 cfs 2.646 af

Subcatchment7S: Post DA-3 Runoff Area=113.360 ac 1.33% Impervious Runoff Depth=0.57"
Flow Length=4,946' Tc=93.1 min CN=80 Runoff=22.19 cfs 5.429 af

Subcatchment8S: Post DA-4 Runoff Area=37.010 ac 0.35% Impervious Runoff Depth=0.53"
Flow Length=2,390' Tc=106.5 min CN=79 Runoff=5.96 cfs 1.648 af

Link 15L: Out Pre Combined Inflow=187.39 cfs 51.201 af
Primary=187.39 cfs 51.201 af

Link 16L: Out Post Combined Inflow=175.09 cfs 48.457 af
Primary=175.09 cfs 48.457 af

Total Runoff Area = 1,824.020 ac Runoff Volume = 99.658 af Average Runoff Depth = 0.66"
98.15% Pervious = 1,790.222 ac 1.85% Impervious = 33.798 ac

Summary for Subcatchment 1S: Pre DA-1

Runoff = 151.93 cfs @ 13.47 hrs, Volume= 41.478 af, Depth= 0.71"

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=2.02"

Area (ac)	CN	Description
3.720	98	Paved roads w/curbs & sewers, HSG D
9.940	98	Water Surface, HSG D
3.950	82	2 acre lots, 12% imp, HSG D
226.080	89	Row crops, straight row, Good, HSG D
458.510	79	Woods, Fair, HSG D
702.200	83	Weighted Average
688.066		97.99% Pervious Area
14.134		2.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
25.9	967	0.0155	0.62		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
37.1	1,774	0.0254	0.80		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
2.3	1,608	0.0168	11.83	1,040.71	**Channel Flow, D to E** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
7.9	4,059	0.0089	8.61	757.48	**Channel Flow, E to F** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
115.5	8,508	Total			

Summary for Subcatchment 2S: Pre DA-2

Runoff = 10.43 cfs @ 13.18 hrs, Volume= 2.646 af, Depth= 0.53"

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=2.02"

Area (ac)	CN	Description
59.440	79	Woods, Fair, HSG D
59.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.3	100	0.0600	0.06		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
67.6	2,017	0.0099	0.50		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
94.9	2,117	Total			

Summary for Subcatchment 3S: Pre DA-3

Runoff = 22.19 cfs @ 13.14 hrs, Volume= 5.429 af, Depth= 0.57"

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=2.02"

Area (ac)	CN	Description
103.750	79	Woods, Fair, HSG D
8.580	89	Row crops, straight row, Good, HSG D
1.030	98	Paved roads w/curbs & sewers, HSG D
113.360	80	Weighted Average
112.330		99.09% Pervious Area
1.030		0.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.0	100	0.0300	0.05		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
11.6	567	0.0265	0.81		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
27.6	852	0.0106	0.51		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
7.8	1,830	0.0126	3.93	19.67	**Channel Flow, D to E** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
10.1	1,597	0.0056	2.62	13.11	**Channel Flow, E to F** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
93.1	4,946	Total			

Summary for Subcatchment 4S: Pre DA-4

Runoff = 5.96 cfs @ 13.37 hrs, Volume= 1.648 af, Depth= 0.53"

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=2.02"

Area (ac)	CN	Description
37.010	79	Woods, Fair, HSG D
37.010		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
16.3	770	0.0247	0.79		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
47.9	1,520	0.0112	0.53		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
106.5	2,390	Total			

Summary for Subcatchment 5S: Post DA-1

Runoff = 139.71 cfs @ 13.47 hrs, Volume= 38.733 af, Depth= 0.66"

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=2.02"

Area (ac)	CN	Description
3.720	98	Paved roads w/curbs & sewers, HSG D
9.940	98	Water Surface, HSG D
3.950	82	2 acre lots, 12% imp, HSG D
193.070	89	Row crops, straight row, Good, HSG D
438.610	79	Woods, Fair, HSG D
0.830	98	Unconnected roofs, HSG D
2.010	98	Paved parking, HSG D
50.070	80	>75% Grass cover, Good, HSG D
702.200	82	Weighted Average
685.226		97.58% Pervious Area
16.974		2.42% Impervious Area
0.830		4.89% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
25.9	967	0.0155	0.62		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
37.1	1,774	0.0254	0.80		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
2.3	1,608	0.0168	11.83	1,040.71	**Channel Flow, D to E** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
7.9	4,059	0.0089	8.61	757.48	**Channel Flow, E to F** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
115.5	8,508	Total			

Summary for Subcatchment 6S: Post DA-2

Runoff = 10.43 cfs @ 13.18 hrs, Volume= 2.646 af, Depth= 0.53"

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=2.02"

Area (ac)	CN	Description
58.590	79	Woods, Fair, HSG D
0.020	98	Unconnected roofs, HSG D
0.830	80	>75% Grass cover, Good, HSG D
59.440	79	Weighted Average
59.420		99.97% Pervious Area
0.020		0.03% Impervious Area
0.020		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.3	100	0.0600	0.06		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
67.6	2,017	0.0099	0.50		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
94.9	2,117	Total			

Summary for Subcatchment 7S: Post DA-3

Runoff = 22.19 cfs @ 13.14 hrs, Volume= 5.429 af, Depth= 0.57"

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=2.02"

Area (ac)	CN	Description
97.820	79	Woods, Fair, HSG D
7.290	89	Row crops, straight row, Good, HSG D
1.030	98	Paved roads w/curbs & sewers, HSG D
0.380	98	Paved parking, HSG D
0.100	98	Unconnected roofs, HSG D
6.740	80	>75% Grass cover, Good, HSG D
113.360	80	Weighted Average
111.850		98.67% Pervious Area
1.510		1.33% Impervious Area
0.100		6.62% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.0	100	0.0300	0.05		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
11.6	567	0.0265	0.81		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
27.6	852	0.0106	0.51		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
7.8	1,830	0.0126	3.93	19.67	**Channel Flow, D to E** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
10.1	1,597	0.0056	2.62	13.11	**Channel Flow, E to F** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
93.1	4,946	Total			

Summary for Subcatchment 8S: Post DA-4

Runoff = 5.96 cfs @ 13.37 hrs, Volume= 1.648 af, Depth= 0.53"

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=2.02"

Area (ac)	CN	Description
34.610	79	Woods, Fair, HSG D
0.080	98	Paved parking, HSG D
0.050	98	Unconnected roofs, HSG D
2.270	80	>75% Grass cover, Good, HSG D
37.010	79	Weighted Average
36.880		99.65% Pervious Area
0.130		0.35% Impervious Area
0.050		38.46% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
16.3	770	0.0247	0.79		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
47.9	1,520	0.0112	0.53		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
106.5	2,390	Total			

Summary for Link 15L: Out Pre Combined

Inflow Area = 912.010 ac, 1.66% Impervious, Inflow Depth = 0.67" for 1 yr event
Inflow = 187.39 cfs @ 13.39 hrs, Volume= 51.201 af
Primary = 187.39 cfs @ 13.39 hrs, Volume= 51.201 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link 16L: Out Post Combined

Inflow Area = 912.010 ac, 2.04% Impervious, Inflow Depth = 0.64" for 1 yr event
Inflow = 175.09 cfs @ 13.45 hrs, Volume= 48.457 af
Primary = 175.09 cfs @ 13.45 hrs, Volume= 48.457 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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-1 Runoff Area=702.200 ac 2.01% Impervious Runoff Depth=1.03"
Flow Length=8,508' Tc=115.5 min CN=83 Runoff=228.63 cfs 60.461 af

Subcatchment2S: Pre DA-2 Runoff Area=59.440 ac 0.00% Impervious Runoff Depth=0.82"
Flow Length=2,117' Tc=94.9 min CN=79 Runoff=17.00 cfs 4.049 af

Subcatchment3S: Pre DA-3 Runoff Area=113.360 ac 0.91% Impervious Runoff Depth=0.87"
Flow Length=4,946' Tc=93.1 min CN=80 Runoff=35.43 cfs 8.202 af

Subcatchment4S: Pre DA-4 Runoff Area=37.010 ac 0.00% Impervious Runoff Depth=0.82"
Flow Length=2,390' Tc=106.5 min CN=79 Runoff=9.68 cfs 2.521 af

Subcatchment5S: Post DA-1 Runoff Area=702.200 ac 2.42% Impervious Runoff Depth=0.98"
Flow Length=8,508' Tc=115.5 min CN=82 Runoff=214.01 cfs 57.115 af

Subcatchment6S: Post DA-2 Runoff Area=59.440 ac 0.03% Impervious Runoff Depth=0.82"
Flow Length=2,117' Tc=94.9 min CN=79 Runoff=17.00 cfs 4.049 af

Subcatchment7S: Post DA-3 Runoff Area=113.360 ac 1.33% Impervious Runoff Depth=0.87"
Flow Length=4,946' Tc=93.1 min CN=80 Runoff=35.43 cfs 8.202 af

Subcatchment8S: Post DA-4 Runoff Area=37.010 ac 0.35% Impervious Runoff Depth=0.82"
Flow Length=2,390' Tc=106.5 min CN=79 Runoff=9.68 cfs 2.521 af

Link 15L: Out Pre Combined Inflow=286.46 cfs 75.233 af
Primary=286.46 cfs 75.233 af

Link 16L: Out Post Combined Inflow=271.52 cfs 71.886 af
Primary=271.52 cfs 71.886 af

Total Runoff Area = 1,824.020 ac Runoff Volume = 147.119 af Average Runoff Depth = 0.97"
98.15% Pervious = 1,790.222 ac 1.85% Impervious = 33.798 ac

Summary for Subcatchment 1S: Pre DA-1

Runoff = 228.63 cfs @ 13.47 hrs, Volume= 60.461 af, Depth= 1.03"

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=2.47"

Area (ac)	CN	Description
3.720	98	Paved roads w/curbs & sewers, HSG D
9.940	98	Water Surface, HSG D
3.950	82	2 acre lots, 12% imp, HSG D
226.080	89	Row crops, straight row, Good, HSG D
458.510	79	Woods, Fair, HSG D
702.200	83	Weighted Average
688.066		97.99% Pervious Area
14.134		2.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
25.9	967	0.0155	0.62		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
37.1	1,774	0.0254	0.80		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
2.3	1,608	0.0168	11.83	1,040.71	**Channel Flow, D to E** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
7.9	4,059	0.0089	8.61	757.48	**Channel Flow, E to F** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
115.5	8,508	Total			

Summary for Subcatchment 2S: Pre DA-2

Runoff = 17.00 cfs @ 13.18 hrs, Volume= 4.049 af, Depth= 0.82"

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=2.47"

Area (ac)	CN	Description
59.440	79	Woods, Fair, HSG D
59.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.3	100	0.0600	0.06		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
67.6	2,017	0.0099	0.50		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
94.9	2,117	Total			

Summary for Subcatchment 3S: Pre DA-3

Runoff = 35.43 cfs @ 13.14 hrs, Volume= 8.202 af, Depth= 0.87"

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=2.47"

Area (ac)	CN	Description
103.750	79	Woods, Fair, HSG D
8.580	89	Row crops, straight row, Good, HSG D
1.030	98	Paved roads w/curbs & sewers, HSG D
113.360	80	Weighted Average
112.330		99.09% Pervious Area
1.030		0.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.0	100	0.0300	0.05		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
11.6	567	0.0265	0.81		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
27.6	852	0.0106	0.51		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
7.8	1,830	0.0126	3.93	19.67	**Channel Flow, D to E** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
10.1	1,597	0.0056	2.62	13.11	**Channel Flow, E to F** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
93.1	4,946	Total			

Summary for Subcatchment 4S: Pre DA-4

Runoff = 9.68 cfs @ 13.37 hrs, Volume= 2.521 af, Depth= 0.82"

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=2.47"

Area (ac)	CN	Description
37.010	79	Woods, Fair, HSG D
37.010		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
16.3	770	0.0247	0.79		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
47.9	1,520	0.0112	0.53		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
106.5	2,390	Total			

Summary for Subcatchment 5S: Post DA-1

Runoff = 214.01 cfs @ 13.47 hrs, Volume= 57.115 af, Depth= 0.98"

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=2.47"

Area (ac)	CN	Description
3.720	98	Paved roads w/curbs & sewers, HSG D
9.940	98	Water Surface, HSG D
3.950	82	2 acre lots, 12% imp, HSG D
193.070	89	Row crops, straight row, Good, HSG D
438.610	79	Woods, Fair, HSG D
0.830	98	Unconnected roofs, HSG D
2.010	98	Paved parking, HSG D
50.070	80	>75% Grass cover, Good, HSG D
702.200	82	Weighted Average
685.226		97.58% Pervious Area
16.974		2.42% Impervious Area
0.830		4.89% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
25.9	967	0.0155	0.62		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
37.1	1,774	0.0254	0.80		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
2.3	1,608	0.0168	11.83	1,040.71	**Channel Flow, D to E** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
7.9	4,059	0.0089	8.61	757.48	**Channel Flow, E to F** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
115.5	8,508	Total			

Summary for Subcatchment 6S: Post DA-2

Runoff = 17.00 cfs @ 13.18 hrs, Volume= 4.049 af, Depth= 0.82"

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=2.47"

Area (ac)	CN	Description
58.590	79	Woods, Fair, HSG D
0.020	98	Unconnected roofs, HSG D
0.830	80	>75% Grass cover, Good, HSG D
59.440	79	Weighted Average
59.420		99.97% Pervious Area
0.020		0.03% Impervious Area
0.020		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.3	100	0.0600	0.06		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
67.6	2,017	0.0099	0.50		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
94.9	2,117	Total			

Summary for Subcatchment 7S: Post DA-3

Runoff = 35.43 cfs @ 13.14 hrs, Volume= 8.202 af, Depth= 0.87"

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=2.47"

Area (ac)	CN	Description
97.820	79	Woods, Fair, HSG D
7.290	89	Row crops, straight row, Good, HSG D
1.030	98	Paved roads w/curbs & sewers, HSG D
0.380	98	Paved parking, HSG D
0.100	98	Unconnected roofs, HSG D
6.740	80	>75% Grass cover, Good, HSG D
113.360	80	Weighted Average
111.850		98.67% Pervious Area
1.510		1.33% Impervious Area
0.100		6.62% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.0	100	0.0300	0.05		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
11.6	567	0.0265	0.81		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
27.6	852	0.0106	0.51		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
7.8	1,830	0.0126	3.93	19.67	**Channel Flow, D to E** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
10.1	1,597	0.0056	2.62	13.11	**Channel Flow, E to F** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
93.1	4,946	Total			

Summary for Subcatchment 8S: Post DA-4

Runoff = 9.68 cfs @ 13.37 hrs, Volume= 2.521 af, Depth= 0.82"

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=2.47"

Area (ac)	CN	Description
34.610	79	Woods, Fair, HSG D
0.080	98	Paved parking, HSG D
0.050	98	Unconnected roofs, HSG D
2.270	80	>75% Grass cover, Good, HSG D
37.010	79	Weighted Average
36.880		99.65% Pervious Area
0.130		0.35% Impervious Area
0.050		38.46% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
16.3	770	0.0247	0.79		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
47.9	1,520	0.0112	0.53		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
106.5	2,390	Total			

Summary for Link 15L: Out Pre Combined

Inflow Area = 912.010 ac, 1.66% Impervious, Inflow Depth = 0.99" for 2 yr event
Inflow = 286.46 cfs @ 13.35 hrs, Volume= 75.233 af
Primary = 286.46 cfs @ 13.35 hrs, Volume= 75.233 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link 16L: Out Post Combined

Inflow Area = 912.010 ac, 2.04% Impervious, Inflow Depth = 0.95" for 2 yr event
Inflow = 271.52 cfs @ 13.35 hrs, Volume= 71.886 af
Primary = 271.52 cfs @ 13.35 hrs, Volume= 71.886 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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-1 Runoff Area=702.200 ac 2.01% Impervious Runoff Depth=1.62"
Flow Length=8,508' Tc=115.5 min CN=83 Runoff=365.86 cfs 94.645 af

Subcatchment2S: Pre DA-2 Runoff Area=59.440 ac 0.00% Impervious Runoff Depth=1.34"
Flow Length=2,117' Tc=94.9 min CN=79 Runoff=29.26 cfs 6.658 af

Subcatchment3S: Pre DA-3 Runoff Area=113.360 ac 0.91% Impervious Runoff Depth=1.41"
Flow Length=4,946' Tc=93.1 min CN=80 Runoff=59.87 cfs 13.316 af

Subcatchment4S: Pre DA-4 Runoff Area=37.010 ac 0.00% Impervious Runoff Depth=1.34"
Flow Length=2,390' Tc=106.5 min CN=79 Runoff=16.62 cfs 4.146 af

Subcatchment5S: Post DA-1 Runoff Area=702.200 ac 2.42% Impervious Runoff Depth=1.55"
Flow Length=8,508' Tc=115.5 min CN=82 Runoff=348.29 cfs 90.475 af

Subcatchment6S: Post DA-2 Runoff Area=59.440 ac 0.03% Impervious Runoff Depth=1.34"
Flow Length=2,117' Tc=94.9 min CN=79 Runoff=29.26 cfs 6.658 af

Subcatchment7S: Post DA-3 Runoff Area=113.360 ac 1.33% Impervious Runoff Depth=1.41"
Flow Length=4,946' Tc=93.1 min CN=80 Runoff=59.87 cfs 13.316 af

Subcatchment8S: Post DA-4 Runoff Area=37.010 ac 0.35% Impervious Runoff Depth=1.34"
Flow Length=2,390' Tc=106.5 min CN=79 Runoff=16.62 cfs 4.146 af

Link 15L: Out Pre Combined Inflow=465.56 cfs 118.765 af
Primary=465.56 cfs 118.765 af

Link 16L: Out Post Combined Inflow=447.49 cfs 114.596 af
Primary=447.49 cfs 114.596 af

Total Runoff Area = 1,824.020 ac Runoff Volume = 233.361 af Average Runoff Depth = 1.54"
98.15% Pervious = 1,790.222 ac 1.85% Impervious = 33.798 ac

Summary for Subcatchment 1S: Pre DA-1

Runoff = 365.86 cfs @ 13.36 hrs, Volume= 94.645 af, Depth= 1.62"

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 5 yr Rainfall=3.21"

Area (ac)	CN	Description
3.720	98	Paved roads w/curbs & sewers, HSG D
9.940	98	Water Surface, HSG D
3.950	82	2 acre lots, 12% imp, HSG D
226.080	89	Row crops, straight row, Good, HSG D
458.510	79	Woods, Fair, HSG D
702.200	83	Weighted Average
688.066		97.99% Pervious Area
14.134		2.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
25.9	967	0.0155	0.62		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
37.1	1,774	0.0254	0.80		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
2.3	1,608	0.0168	11.83	1,040.71	**Channel Flow, D to E** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
7.9	4,059	0.0089	8.61	757.48	**Channel Flow, E to F** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
115.5	8,508	Total			

Summary for Subcatchment 2S: Pre DA-2

Runoff = 29.26 cfs @ 13.18 hrs, Volume= 6.658 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 5 yr Rainfall=3.21"

Area (ac)	CN	Description
59.440	79	Woods, Fair, HSG D
59.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.3	100	0.0600	0.06		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
67.6	2,017	0.0099	0.50		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
94.9	2,117	Total			

Summary for Subcatchment 3S: Pre DA-3

Runoff = 59.87 cfs @ 13.13 hrs, Volume= 13.316 af, Depth= 1.41"

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 5 yr Rainfall=3.21"

Area (ac)	CN	Description
103.750	79	Woods, Fair, HSG D
8.580	89	Row crops, straight row, Good, HSG D
1.030	98	Paved roads w/curbs & sewers, HSG D
113.360	80	Weighted Average
112.330		99.09% Pervious Area
1.030		0.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.0	100	0.0300	0.05		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
11.6	567	0.0265	0.81		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
27.6	852	0.0106	0.51		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
7.8	1,830	0.0126	3.93	19.67	**Channel Flow, D to E** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
10.1	1,597	0.0056	2.62	13.11	**Channel Flow, E to F** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
93.1	4,946	Total			

Summary for Subcatchment 4S: Pre DA-4

Runoff = 16.62 cfs @ 13.36 hrs, Volume= 4.146 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 5 yr Rainfall=3.21"

Area (ac)	CN	Description
37.010	79	Woods, Fair, HSG D
37.010		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
16.3	770	0.0247	0.79		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
47.9	1,520	0.0112	0.53		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
106.5	2,390	Total			

Summary for Subcatchment 5S: Post DA-1

Runoff = 348.29 cfs @ 13.47 hrs, Volume= 90.475 af, Depth= 1.55"

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 5 yr Rainfall=3.21"

Area (ac)	CN	Description
3.720	98	Paved roads w/curbs & sewers, HSG D
9.940	98	Water Surface, HSG D
3.950	82	2 acre lots, 12% imp, HSG D
193.070	89	Row crops, straight row, Good, HSG D
438.610	79	Woods, Fair, HSG D
0.830	98	Unconnected roofs, HSG D
2.010	98	Paved parking, HSG D
50.070	80	>75% Grass cover, Good, HSG D
702.200	82	Weighted Average
685.226		97.58% Pervious Area
16.974		2.42% Impervious Area
0.830		4.89% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
25.9	967	0.0155	0.62		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
37.1	1,774	0.0254	0.80		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
2.3	1,608	0.0168	11.83	1,040.71	**Channel Flow, D to E** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
7.9	4,059	0.0089	8.61	757.48	**Channel Flow, E to F** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
115.5	8,508	Total			

Summary for Subcatchment 6S: Post DA-2

Runoff = 29.26 cfs @ 13.18 hrs, Volume= 6.658 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 5 yr Rainfall=3.21"

Area (ac)	CN	Description
58.590	79	Woods, Fair, HSG D
0.020	98	Unconnected roofs, HSG D
0.830	80	>75% Grass cover, Good, HSG D
59.440	79	Weighted Average
59.420		99.97% Pervious Area
0.020		0.03% Impervious Area
0.020		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.3	100	0.0600	0.06		**Sheet Flow, A to B**
					Woods: Dense underbrush n= 0.800 P2= 2.50"
67.6	2,017	0.0099	0.50		**Shallow Concentrated Flow, B to C**
					Woodland Kv= 5.0 fps
94.9	2,117	Total			

Summary for Subcatchment 7S: Post DA-3

Runoff = 59.87 cfs @ 13.13 hrs, Volume= 13.316 af, Depth= 1.41"

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 5 yr Rainfall=3.21"

Area (ac)	CN	Description
97.820	79	Woods, Fair, HSG D
7.290	89	Row crops, straight row, Good, HSG D
1.030	98	Paved roads w/curbs & sewers, HSG D
0.380	98	Paved parking, HSG D
0.100	98	Unconnected roofs, HSG D
6.740	80	>75% Grass cover, Good, HSG D
113.360	80	Weighted Average
111.850		98.67% Pervious Area
1.510		1.33% Impervious Area
0.100		6.62% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.0	100	0.0300	0.05		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
11.6	567	0.0265	0.81		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
27.6	852	0.0106	0.51		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
7.8	1,830	0.0126	3.93	19.67	**Channel Flow, D to E** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
10.1	1,597	0.0056	2.62	13.11	**Channel Flow, E to F** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
93.1	4,946	Total			

Summary for Subcatchment 8S: Post DA-4

Runoff = 16.62 cfs @ 13.36 hrs, Volume= 4.146 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 5 yr Rainfall=3.21"

Area (ac)	CN	Description
34.610	79	Woods, Fair, HSG D
0.080	98	Paved parking, HSG D
0.050	98	Unconnected roofs, HSG D
2.270	80	>75% Grass cover, Good, HSG D
37.010	79	Weighted Average
36.880		99.65% Pervious Area
0.130		0.35% Impervious Area
0.050		38.46% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
16.3	770	0.0247	0.79		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
47.9	1,520	0.0112	0.53		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
106.5	2,390	Total			

Summary for Link 15L: Out Pre Combined

Inflow Area = 912.010 ac, 1.66% Impervious, Inflow Depth = 1.56" for 5 yr event
Inflow = 465.56 cfs @ 13.34 hrs, Volume= 118.765 af
Primary = 465.56 cfs @ 13.34 hrs, Volume= 118.765 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link 16L: Out Post Combined

Inflow Area = 912.010 ac, 2.04% Impervious, Inflow Depth = 1.51" for 5 yr event
Inflow = 447.49 cfs @ 13.34 hrs, Volume= 114.596 af
Primary = 447.49 cfs @ 13.34 hrs, Volume= 114.596 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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-1 Runoff Area=702.200 ac 2.01% Impervious Runoff Depth=2.13"
Flow Length=8,508' Tc=115.5 min CN=83 Runoff=486.64 cfs 124.682 af

Subcatchment2S: Pre DA-2 Runoff Area=59.440 ac 0.00% Impervious Runoff Depth=1.82"
Flow Length=2,117' Tc=94.9 min CN=79 Runoff=40.23 cfs 9.007 af

Subcatchment3S: Pre DA-3 Runoff Area=113.360 ac 0.91% Impervious Runoff Depth=1.89"
Flow Length=4,946' Tc=93.1 min CN=80 Runoff=81.59 cfs 17.891 af

Subcatchment4S: Pre DA-4 Runoff Area=37.010 ac 0.00% Impervious Runoff Depth=1.82"
Flow Length=2,390' Tc=106.5 min CN=79 Runoff=22.91 cfs 5.608 af

Subcatchment5S: Post DA-1 Runoff Area=702.200 ac 2.42% Impervious Runoff Depth=2.05"
Flow Length=8,508' Tc=115.5 min CN=82 Runoff=466.73 cfs 119.959 af

Subcatchment6S: Post DA-2 Runoff Area=59.440 ac 0.03% Impervious Runoff Depth=1.82"
Flow Length=2,117' Tc=94.9 min CN=79 Runoff=40.23 cfs 9.007 af

Subcatchment7S: Post DA-3 Runoff Area=113.360 ac 1.33% Impervious Runoff Depth=1.89"
Flow Length=4,946' Tc=93.1 min CN=80 Runoff=81.59 cfs 17.891 af

Subcatchment8S: Post DA-4 Runoff Area=37.010 ac 0.35% Impervious Runoff Depth=1.82"
Flow Length=2,390' Tc=106.5 min CN=79 Runoff=22.91 cfs 5.608 af

Link 15L: Out Pre Combined Inflow=622.74 cfs 157.188 af
Primary=622.74 cfs 157.188 af

Link 16L: Out Post Combined Inflow=602.62 cfs 152.465 af
Primary=602.62 cfs 152.465 af

Total Runoff Area = 1,824.020 ac Runoff Volume = 309.653 af Average Runoff Depth = 2.04"
98.15% Pervious = 1,790.222 ac 1.85% Impervious = 33.798 ac

Summary for Subcatchment 1S: Pre DA-1

Runoff = 486.64 cfs @ 13.35 hrs, Volume= 124.682 af, Depth= 2.13"

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=3.82"

Area (ac)	CN	Description
3.720	98	Paved roads w/curbs & sewers, HSG D
9.940	98	Water Surface, HSG D
3.950	82	2 acre lots, 12% imp, HSG D
226.080	89	Row crops, straight row, Good, HSG D
458.510	79	Woods, Fair, HSG D
702.200	83	Weighted Average
688.066		97.99% Pervious Area
14.134		2.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
25.9	967	0.0155	0.62		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
37.1	1,774	0.0254	0.80		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
2.3	1,608	0.0168	11.83	1,040.71	**Channel Flow, D to E** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
7.9	4,059	0.0089	8.61	757.48	**Channel Flow, E to F** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
115.5	8,508	Total			

Summary for Subcatchment 2S: Pre DA-2

Runoff = 40.23 cfs @ 13.17 hrs, Volume= 9.007 af, Depth= 1.82"

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=3.82"

Area (ac)	CN	Description
59.440	79	Woods, Fair, HSG D
59.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.3	100	0.0600	0.06		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
67.6	2,017	0.0099	0.50		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
94.9	2,117	Total			

Summary for Subcatchment 3S: Pre DA-3

Runoff = 81.59 cfs @ 13.13 hrs, Volume= 17.891 af, Depth= 1.89"

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=3.82"

Area (ac)	CN	Description
103.750	79	Woods, Fair, HSG D
8.580	89	Row crops, straight row, Good, HSG D
1.030	98	Paved roads w/curbs & sewers, HSG D
113.360	80	Weighted Average
112.330		99.09% Pervious Area
1.030		0.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.0	100	0.0300	0.05		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
11.6	567	0.0265	0.81		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
27.6	852	0.0106	0.51		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
7.8	1,830	0.0126	3.93	19.67	**Channel Flow, D to E** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
10.1	1,597	0.0056	2.62	13.11	**Channel Flow, E to F** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
93.1	4,946	Total			

Summary for Subcatchment 4S: Pre DA-4

Runoff = 22.91 cfs @ 13.26 hrs, Volume= 5.608 af, Depth= 1.82"

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=3.82"

Area (ac)	CN	Description
37.010	79	Woods, Fair, HSG D
37.010		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
16.3	770	0.0247	0.79		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
47.9	1,520	0.0112	0.53		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
106.5	2,390	Total			

Summary for Subcatchment 5S: Post DA-1

Runoff = 466.73 cfs @ 13.35 hrs, Volume= 119.959 af, Depth= 2.05"

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=3.82"

Area (ac)	CN	Description
3.720	98	Paved roads w/curbs & sewers, HSG D
9.940	98	Water Surface, HSG D
3.950	82	2 acre lots, 12% imp, HSG D
193.070	89	Row crops, straight row, Good, HSG D
438.610	79	Woods, Fair, HSG D
0.830	98	Unconnected roofs, HSG D
2.010	98	Paved parking, HSG D
50.070	80	>75% Grass cover, Good, HSG D
702.200	82	Weighted Average
685.226		97.58% Pervious Area
16.974		2.42% Impervious Area
0.830		4.89% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
25.9	967	0.0155	0.62		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
37.1	1,774	0.0254	0.80		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
2.3	1,608	0.0168	11.83	1,040.71	**Channel Flow, D to E** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
7.9	4,059	0.0089	8.61	757.48	**Channel Flow, E to F** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
115.5	8,508	Total			

Summary for Subcatchment 6S: Post DA-2

Runoff = 40.23 cfs @ 13.17 hrs, Volume= 9.007 af, Depth= 1.82"

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=3.82"

Area (ac)	CN	Description
58.590	79	Woods, Fair, HSG D
0.020	98	Unconnected roofs, HSG D
0.830	80	>75% Grass cover, Good, HSG D
59.440	79	Weighted Average
59.420		99.97% Pervious Area
0.020		0.03% Impervious Area
0.020		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.3	100	0.0600	0.06		**Sheet Flow, A to B**
					Woods: Dense underbrush n= 0.800 P2= 2.50"
67.6	2,017	0.0099	0.50		**Shallow Concentrated Flow, B to C**
					Woodland Kv= 5.0 fps
94.9	2,117	Total			

Summary for Subcatchment 7S: Post DA-3

Runoff = 81.59 cfs @ 13.13 hrs, Volume= 17.891 af, Depth= 1.89"

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=3.82"

Area (ac)	CN	Description
97.820	79	Woods, Fair, HSG D
7.290	89	Row crops, straight row, Good, HSG D
1.030	98	Paved roads w/curbs & sewers, HSG D
0.380	98	Paved parking, HSG D
0.100	98	Unconnected roofs, HSG D
6.740	80	>75% Grass cover, Good, HSG D
113.360	80	Weighted Average
111.850		98.67% Pervious Area
1.510		1.33% Impervious Area
0.100		6.62% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.0	100	0.0300	0.05		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
11.6	567	0.0265	0.81		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
27.6	852	0.0106	0.51		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
7.8	1,830	0.0126	3.93	19.67	**Channel Flow, D to E** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
10.1	1,597	0.0056	2.62	13.11	**Channel Flow, E to F** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
93.1	4,946	Total			

Summary for Subcatchment 8S: Post DA-4

Runoff = 22.91 cfs @ 13.26 hrs, Volume= 5.608 af, Depth= 1.82"

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=3.82"

Area (ac)	CN	Description
34.610	79	Woods, Fair, HSG D
0.080	98	Paved parking, HSG D
0.050	98	Unconnected roofs, HSG D
2.270	80	>75% Grass cover, Good, HSG D
37.010	79	Weighted Average
36.880		99.65% Pervious Area
0.130		0.35% Impervious Area
0.050		38.46% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
16.3	770	0.0247	0.79		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
47.9	1,520	0.0112	0.53		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
106.5	2,390	Total			

Summary for Link 15L: Out Pre Combined

Inflow Area = 912.010 ac, 1.66% Impervious, Inflow Depth = 2.07" for 10 yr event
Inflow = 622.74 cfs @ 13.26 hrs, Volume= 157.188 af
Primary = 622.74 cfs @ 13.26 hrs, Volume= 157.188 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link 16L: Out Post Combined

Inflow Area = 912.010 ac, 2.04% Impervious, Inflow Depth = 2.01" for 10 yr event
Inflow = 602.62 cfs @ 13.29 hrs, Volume= 152.465 af
Primary = 602.62 cfs @ 13.29 hrs, Volume= 152.465 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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-1 Runoff Area=702.200 ac 2.01% Impervious Runoff Depth=2.87"
Flow Length=8,508' Tc=115.5 min CN=83 Runoff=658.47 cfs 167.838 af

Subcatchment2S: Pre DA-2 Runoff Area=59.440 ac 0.00% Impervious Runoff Depth=2.51"
Flow Length=2,117' Tc=94.9 min CN=79 Runoff=56.30 cfs 12.439 af

Subcatchment3S: Pre DA-3 Runoff Area=113.360 ac 0.91% Impervious Runoff Depth=2.60"
Flow Length=4,946' Tc=93.1 min CN=80 Runoff=113.04 cfs 24.547 af

Subcatchment4S: Pre DA-4 Runoff Area=37.010 ac 0.00% Impervious Runoff Depth=2.51"
Flow Length=2,390' Tc=106.5 min CN=79 Runoff=32.05 cfs 7.745 af

Subcatchment5S: Post DA-1 Runoff Area=702.200 ac 2.42% Impervious Runoff Depth=2.78"
Flow Length=8,508' Tc=115.5 min CN=82 Runoff=636.73 cfs 162.493 af

Subcatchment6S: Post DA-2 Runoff Area=59.440 ac 0.03% Impervious Runoff Depth=2.51"
Flow Length=2,117' Tc=94.9 min CN=79 Runoff=56.30 cfs 12.439 af

Subcatchment7S: Post DA-3 Runoff Area=113.360 ac 1.33% Impervious Runoff Depth=2.60"
Flow Length=4,946' Tc=93.1 min CN=80 Runoff=113.04 cfs 24.547 af

Subcatchment8S: Post DA-4 Runoff Area=37.010 ac 0.35% Impervious Runoff Depth=2.51"
Flow Length=2,390' Tc=106.5 min CN=79 Runoff=32.05 cfs 7.745 af

Link 15L: Out Pre Combined Inflow=849.17 cfs 212.569 af
Primary=849.17 cfs 212.569 af

Link 16L: Out Post Combined Inflow=826.97 cfs 207.224 af
Primary=826.97 cfs 207.224 af

Total Runoff Area = 1,824.020 ac Runoff Volume = 419.794 af Average Runoff Depth = 2.76"
98.15% Pervious = 1,790.222 ac 1.85% Impervious = 33.798 ac

Summary for Subcatchment 1S: Pre DA-1

Runoff = 658.47 cfs @ 13.35 hrs, Volume= 167.838 af, Depth= 2.87"

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=4.66"

Area (ac)	CN	Description
3.720	98	Paved roads w/curbs & sewers, HSG D
9.940	98	Water Surface, HSG D
3.950	82	2 acre lots, 12% imp, HSG D
226.080	89	Row crops, straight row, Good, HSG D
458.510	79	Woods, Fair, HSG D
702.200	83	Weighted Average
688.066		97.99% Pervious Area
14.134		2.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
25.9	967	0.0155	0.62		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
37.1	1,774	0.0254	0.80		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
2.3	1,608	0.0168	11.83	1,040.71	**Channel Flow, D to E** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
7.9	4,059	0.0089	8.61	757.48	**Channel Flow, E to F** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
115.5	8,508	Total			

Summary for Subcatchment 2S: Pre DA-2

Runoff = 56.30 cfs @ 13.08 hrs, Volume= 12.439 af, Depth= 2.51"

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=4.66"

Area (ac)	CN	Description
59.440	79	Woods, Fair, HSG D
59.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.3	100	0.0600	0.06		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
67.6	2,017	0.0099	0.50		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
94.9	2,117	Total			

Summary for Subcatchment 3S: Pre DA-3

Runoff = 113.04 cfs @ 13.04 hrs, Volume= 24.547 af, Depth= 2.60"

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=4.66"

Area (ac)	CN	Description
103.750	79	Woods, Fair, HSG D
8.580	89	Row crops, straight row, Good, HSG D
1.030	98	Paved roads w/curbs & sewers, HSG D
113.360	80	Weighted Average
112.330		99.09% Pervious Area
1.030		0.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.0	100	0.0300	0.05		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
11.6	567	0.0265	0.81		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
27.6	852	0.0106	0.51		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
7.8	1,830	0.0126	3.93	19.67	**Channel Flow, D to E** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
10.1	1,597	0.0056	2.62	13.11	**Channel Flow, E to F** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
93.1	4,946	Total			

Summary for Subcatchment 4S: Pre DA-4

Runoff = 32.05 cfs @ 13.25 hrs, Volume= 7.745 af, Depth= 2.51"

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=4.66"

Area (ac)	CN	Description
37.010	79	Woods, Fair, HSG D
37.010		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
16.3	770	0.0247	0.79		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
47.9	1,520	0.0112	0.53		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
106.5	2,390	Total			

Summary for Subcatchment 5S: Post DA-1

Runoff = 636.73 cfs @ 13.35 hrs, Volume= 162.493 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 25 yr Rainfall=4.66"

Area (ac)	CN	Description
3.720	98	Paved roads w/curbs & sewers, HSG D
9.940	98	Water Surface, HSG D
3.950	82	2 acre lots, 12% imp, HSG D
193.070	89	Row crops, straight row, Good, HSG D
438.610	79	Woods, Fair, HSG D
0.830	98	Unconnected roofs, HSG D
2.010	98	Paved parking, HSG D
50.070	80	>75% Grass cover, Good, HSG D
702.200	82	Weighted Average
685.226		97.58% Pervious Area
16.974		2.42% Impervious Area
0.830		4.89% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
25.9	967	0.0155	0.62		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
37.1	1,774	0.0254	0.80		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
2.3	1,608	0.0168	11.83	1,040.71	**Channel Flow, D to E** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
7.9	4,059	0.0089	8.61	757.48	**Channel Flow, E to F** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
115.5	8,508	Total			

Summary for Subcatchment 6S: Post DA-2

Runoff = 56.30 cfs @ 13.08 hrs, Volume= 12.439 af, Depth= 2.51"

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=4.66"

Area (ac)	CN	Description
58.590	79	Woods, Fair, HSG D
0.020	98	Unconnected roofs, HSG D
0.830	80	>75% Grass cover, Good, HSG D
59.440	79	Weighted Average
59.420		99.97% Pervious Area
0.020		0.03% Impervious Area
0.020		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.3	100	0.0600	0.06		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
67.6	2,017	0.0099	0.50		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
94.9	2,117	Total			

Summary for Subcatchment 7S: Post DA-3

Runoff = 113.04 cfs @ 13.04 hrs, Volume= 24.547 af, Depth= 2.60"

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=4.66"

Area (ac)	CN	Description
97.820	79	Woods, Fair, HSG D
7.290	89	Row crops, straight row, Good, HSG D
1.030	98	Paved roads w/curbs & sewers, HSG D
0.380	98	Paved parking, HSG D
0.100	98	Unconnected roofs, HSG D
6.740	80	>75% Grass cover, Good, HSG D
113.360	80	Weighted Average
111.850		98.67% Pervious Area
1.510		1.33% Impervious Area
0.100		6.62% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.0	100	0.0300	0.05		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
11.6	567	0.0265	0.81		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
27.6	852	0.0106	0.51		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
7.8	1,830	0.0126	3.93	19.67	**Channel Flow, D to E** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
10.1	1,597	0.0056	2.62	13.11	**Channel Flow, E to F** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
93.1	4,946	Total			

Summary for Subcatchment 8S: Post DA-4

Runoff = 32.05 cfs @ 13.25 hrs, Volume= 7.745 af, Depth= 2.51"

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=4.66"

Area (ac)	CN	Description
34.610	79	Woods, Fair, HSG D
0.080	98	Paved parking, HSG D
0.050	98	Unconnected roofs, HSG D
2.270	80	>75% Grass cover, Good, HSG D
37.010	79	Weighted Average
36.880		99.65% Pervious Area
0.130		0.35% Impervious Area
0.050		38.46% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
16.3	770	0.0247	0.79		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
47.9	1,520	0.0112	0.53		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
106.5	2,390	Total			

Summary for Link 15L: Out Pre Combined

Inflow Area = 912.010 ac, 1.66% Impervious, Inflow Depth = 2.80" for 25 yr event
Inflow = 849.17 cfs @ 13.23 hrs, Volume= 212.569 af
Primary = 849.17 cfs @ 13.23 hrs, Volume= 212.569 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link 16L: Out Post Combined

Inflow Area =	912.010 ac,	2.04% Impervious,	Inflow Depth = 2.73"	for 25 yr event
Inflow =	826.97 cfs @	13.23 hrs,	Volume=	207.224 af
Primary =	826.97 cfs @	13.23 hrs,	Volume=	207.224 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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-1 Runoff Area=702.200 ac 2.01% Impervious Runoff Depth=3.43"
Flow Length=8,508' Tc=115.5 min CN=83 Runoff=787.76 cfs 200.626 af

Subcatchment2S: Pre DA-2 Runoff Area=59.440 ac 0.00% Impervious Runoff Depth=3.04"
Flow Length=2,117' Tc=94.9 min CN=79 Runoff=68.56 cfs 15.079 af

Subcatchment3S: Pre DA-3 Runoff Area=113.360 ac 0.91% Impervious Runoff Depth=3.14"
Flow Length=4,946' Tc=93.1 min CN=80 Runoff=137.05 cfs 29.649 af

Subcatchment4S: Pre DA-4 Runoff Area=37.010 ac 0.00% Impervious Runoff Depth=3.04"
Flow Length=2,390' Tc=106.5 min CN=79 Runoff=39.03 cfs 9.389 af

Subcatchment5S: Post DA-1 Runoff Area=702.200 ac 2.42% Impervious Runoff Depth=3.33"
Flow Length=8,508' Tc=115.5 min CN=82 Runoff=765.08 cfs 194.901 af

Subcatchment6S: Post DA-2 Runoff Area=59.440 ac 0.03% Impervious Runoff Depth=3.04"
Flow Length=2,117' Tc=94.9 min CN=79 Runoff=68.56 cfs 15.079 af

Subcatchment7S: Post DA-3 Runoff Area=113.360 ac 1.33% Impervious Runoff Depth=3.14"
Flow Length=4,946' Tc=93.1 min CN=80 Runoff=137.05 cfs 29.649 af

Subcatchment8S: Post DA-4 Runoff Area=37.010 ac 0.35% Impervious Runoff Depth=3.04"
Flow Length=2,390' Tc=106.5 min CN=79 Runoff=39.03 cfs 9.389 af

Link 15L: Out Pre Combined Inflow=1,020.50 cfs 254.742 af
Primary=1,020.50 cfs 254.742 af

Link 16L: Out Post Combined Inflow=997.28 cfs 249.017 af
Primary=997.28 cfs 249.017 af

Total Runoff Area = 1,824.020 ac Runoff Volume = 503.758 af Average Runoff Depth = 3.31"
98.15% Pervious = 1,790.222 ac 1.85% Impervious = 33.798 ac

Summary for Subcatchment 1S: Pre DA-1

Runoff = 787.76 cfs @ 13.35 hrs, Volume= 200.626 af, Depth= 3.43"

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=5.28"

Area (ac)	CN	Description
3.720	98	Paved roads w/curbs & sewers, HSG D
9.940	98	Water Surface, HSG D
3.950	82	2 acre lots, 12% imp, HSG D
226.080	89	Row crops, straight row, Good, HSG D
458.510	79	Woods, Fair, HSG D
702.200	83	Weighted Average
688.066		97.99% Pervious Area
14.134		2.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
25.9	967	0.0155	0.62		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
37.1	1,774	0.0254	0.80		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
2.3	1,608	0.0168	11.83	1,040.71	**Channel Flow, D to E** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
7.9	4,059	0.0089	8.61	757.48	**Channel Flow, E to F** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
115.5	8,508	Total			

Summary for Subcatchment 2S: Pre DA-2

Runoff = 68.56 cfs @ 13.08 hrs, Volume= 15.079 af, Depth= 3.04"

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=5.28"

Area (ac)	CN	Description
59.440	79	Woods, Fair, HSG D
59.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.3	100	0.0600	0.06		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
67.6	2,017	0.0099	0.50		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
94.9	2,117	Total			

Summary for Subcatchment 3S: Pre DA-3

Runoff = 137.05 cfs @ 13.04 hrs, Volume= 29.649 af, Depth= 3.14"

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=5.28"

Area (ac)	CN	Description
103.750	79	Woods, Fair, HSG D
8.580	89	Row crops, straight row, Good, HSG D
1.030	98	Paved roads w/curbs & sewers, HSG D
113.360	80	Weighted Average
112.330		99.09% Pervious Area
1.030		0.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.0	100	0.0300	0.05		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
11.6	567	0.0265	0.81		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
27.6	852	0.0106	0.51		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
7.8	1,830	0.0126	3.93	19.67	**Channel Flow, D to E** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
10.1	1,597	0.0056	2.62	13.11	**Channel Flow, E to F** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
93.1	4,946	Total			

Summary for Subcatchment 4S: Pre DA-4

Runoff = 39.03 cfs @ 13.25 hrs, Volume= 9.389 af, Depth= 3.04"

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=5.28"

Area (ac)	CN	Description
37.010	79	Woods, Fair, HSG D
37.010		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
16.3	770	0.0247	0.79		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
47.9	1,520	0.0112	0.53		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
106.5	2,390	Total			

Summary for Subcatchment 5S: Post DA-1

Runoff = 765.08 cfs @ 13.35 hrs, Volume= 194.901 af, Depth= 3.33"

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=5.28"

Area (ac)	CN	Description
3.720	98	Paved roads w/curbs & sewers, HSG D
9.940	98	Water Surface, HSG D
3.950	82	2 acre lots, 12% imp, HSG D
193.070	89	Row crops, straight row, Good, HSG D
438.610	79	Woods, Fair, HSG D
0.830	98	Unconnected roofs, HSG D
2.010	98	Paved parking, HSG D
50.070	80	>75% Grass cover, Good, HSG D
702.200	82	Weighted Average
685.226		97.58% Pervious Area
16.974		2.42% Impervious Area
0.830		4.89% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
25.9	967	0.0155	0.62		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
37.1	1,774	0.0254	0.80		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
2.3	1,608	0.0168	11.83	1,040.71	**Channel Flow, D to E** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
7.9	4,059	0.0089	8.61	757.48	**Channel Flow, E to F** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
115.5	8,508	Total			

Summary for Subcatchment 6S: Post DA-2

Runoff = 68.56 cfs @ 13.08 hrs, Volume= 15.079 af, Depth= 3.04"

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=5.28"

Area (ac)	CN	Description
58.590	79	Woods, Fair, HSG D
0.020	98	Unconnected roofs, HSG D
0.830	80	>75% Grass cover, Good, HSG D
59.440	79	Weighted Average
59.420		99.97% Pervious Area
0.020		0.03% Impervious Area
0.020		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.3	100	0.0600	0.06		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
67.6	2,017	0.0099	0.50		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
94.9	2,117	Total			

Summary for Subcatchment 7S: Post DA-3

Runoff = 137.05 cfs @ 13.04 hrs, Volume= 29.649 af, Depth= 3.14"

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=5.28"

Area (ac)	CN	Description
97.820	79	Woods, Fair, HSG D
7.290	89	Row crops, straight row, Good, HSG D
1.030	98	Paved roads w/curbs & sewers, HSG D
0.380	98	Paved parking, HSG D
0.100	98	Unconnected roofs, HSG D
6.740	80	>75% Grass cover, Good, HSG D
113.360	80	Weighted Average
111.850		98.67% Pervious Area
1.510		1.33% Impervious Area
0.100		6.62% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.0	100	0.0300	0.05		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
11.6	567	0.0265	0.81		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
27.6	852	0.0106	0.51		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
7.8	1,830	0.0126	3.93	19.67	**Channel Flow, D to E** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
10.1	1,597	0.0056	2.62	13.11	**Channel Flow, E to F** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
93.1	4,946	Total			

Summary for Subcatchment 8S: Post DA-4

Runoff = 39.03 cfs @ 13.25 hrs, Volume= 9.389 af, Depth= 3.04"

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=5.28"

Area (ac)	CN	Description
34.610	79	Woods, Fair, HSG D
0.080	98	Paved parking, HSG D
0.050	98	Unconnected roofs, HSG D
2.270	80	>75% Grass cover, Good, HSG D
37.010	79	Weighted Average
36.880		99.65% Pervious Area
0.130		0.35% Impervious Area
0.050		38.46% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
16.3	770	0.0247	0.79		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
47.9	1,520	0.0112	0.53		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
106.5	2,390	Total			

Summary for Link 15L: Out Pre Combined

Inflow Area = 912.010 ac, 1.66% Impervious, Inflow Depth = 3.35" for 50 yr event
Inflow = 1,020.50 cfs @ 13.22 hrs, Volume= 254.742 af
Primary = 1,020.50 cfs @ 13.22 hrs, Volume= 254.742 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link 16L: Out Post Combined

Inflow Area =	912.010 ac,	2.04% Impervious, Inflow Depth = 3.28"	for 50 yr event	
Inflow =	997.28 cfs @	13.22 hrs, Volume=	249.017 af	
Primary =	997.28 cfs @	13.22 hrs, Volume=	249.017 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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-1 Runoff Area=702.200 ac 2.01% Impervious Runoff Depth=4.04"
Flow Length=8,508' Tc=115.5 min CN=83 Runoff=928.85 cfs 236.699 af

Subcatchment2S: Pre DA-2 Runoff Area=59.440 ac 0.00% Impervious Runoff Depth=3.64"
Flow Length=2,117' Tc=94.9 min CN=79 Runoff=82.07 cfs 18.005 af

Subcatchment3S: Pre DA-3 Runoff Area=113.360 ac 0.91% Impervious Runoff Depth=3.74"
Flow Length=4,946' Tc=93.1 min CN=80 Runoff=163.43 cfs 35.294 af

Subcatchment4S: Pre DA-4 Runoff Area=37.010 ac 0.00% Impervious Runoff Depth=3.64"
Flow Length=2,390' Tc=106.5 min CN=79 Runoff=46.71 cfs 11.211 af

Subcatchment5S: Post DA-1 Runoff Area=702.200 ac 2.42% Impervious Runoff Depth=3.94"
Flow Length=8,508' Tc=115.5 min CN=82 Runoff=905.46 cfs 230.623 af

Subcatchment6S: Post DA-2 Runoff Area=59.440 ac 0.03% Impervious Runoff Depth=3.64"
Flow Length=2,117' Tc=94.9 min CN=79 Runoff=82.07 cfs 18.005 af

Subcatchment7S: Post DA-3 Runoff Area=113.360 ac 1.33% Impervious Runoff Depth=3.74"
Flow Length=4,946' Tc=93.1 min CN=80 Runoff=163.43 cfs 35.294 af

Subcatchment8S: Post DA-4 Runoff Area=37.010 ac 0.35% Impervious Runoff Depth=3.64"
Flow Length=2,390' Tc=106.5 min CN=79 Runoff=46.71 cfs 11.211 af

Link 15L: Out Pre Combined Inflow=1,207.70 cfs 301.210 af
Primary=1,207.70 cfs 301.210 af

Link 16L: Out Post Combined Inflow=1,183.70 cfs 295.133 af
Primary=1,183.70 cfs 295.133 af

Total Runoff Area = 1,824.020 ac Runoff Volume = 596.343 af Average Runoff Depth = 3.92"
98.15% Pervious = 1,790.222 ac 1.85% Impervious = 33.798 ac

Summary for Subcatchment 1S: Pre DA-1

Runoff = 928.85 cfs @ 13.35 hrs, Volume= 236.699 af, Depth= 4.04"

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=5.95"

Area (ac)	CN	Description
3.720	98	Paved roads w/curbs & sewers, HSG D
9.940	98	Water Surface, HSG D
3.950	82	2 acre lots, 12% imp, HSG D
226.080	89	Row crops, straight row, Good, HSG D
458.510	79	Woods, Fair, HSG D
702.200	83	Weighted Average
688.066		97.99% Pervious Area
14.134		2.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
25.9	967	0.0155	0.62		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
37.1	1,774	0.0254	0.80		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
2.3	1,608	0.0168	11.83	1,040.71	**Channel Flow, D to E** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
7.9	4,059	0.0089	8.61	757.48	**Channel Flow, E to F** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
115.5	8,508	Total			

Summary for Subcatchment 2S: Pre DA-2

Runoff = 82.07 cfs @ 13.08 hrs, Volume= 18.005 af, Depth= 3.64"

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=5.95"

Area (ac)	CN	Description
59.440	79	Woods, Fair, HSG D
59.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.3	100	0.0600	0.06		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
67.6	2,017	0.0099	0.50		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
94.9	2,117	Total			

Summary for Subcatchment 3S: Pre DA-3

Runoff = 163.43 cfs @ 13.04 hrs, Volume= 35.294 af, Depth= 3.74"

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=5.95"

Area (ac)	CN	Description
103.750	79	Woods, Fair, HSG D
8.580	89	Row crops, straight row, Good, HSG D
1.030	98	Paved roads w/curbs & sewers, HSG D
113.360	80	Weighted Average
112.330		99.09% Pervious Area
1.030		0.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.0	100	0.0300	0.05		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
11.6	567	0.0265	0.81		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
27.6	852	0.0106	0.51		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
7.8	1,830	0.0126	3.93	19.67	**Channel Flow, D to E** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
10.1	1,597	0.0056	2.62	13.11	**Channel Flow, E to F** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
93.1	4,946	Total			

Summary for Subcatchment 4S: Pre DA-4

Runoff = 46.71 cfs @ 13.25 hrs, Volume= 11.211 af, Depth= 3.64"

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=5.95"

Area (ac)	CN	Description
37.010	79	Woods, Fair, HSG D
37.010		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
16.3	770	0.0247	0.79		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
47.9	1,520	0.0112	0.53		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
106.5	2,390	Total			

Summary for Subcatchment 5S: Post DA-1

Runoff = 905.46 cfs @ 13.35 hrs, Volume= 230.623 af, Depth= 3.94"

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=5.95"

Area (ac)	CN	Description
3.720	98	Paved roads w/curbs & sewers, HSG D
9.940	98	Water Surface, HSG D
3.950	82	2 acre lots, 12% imp, HSG D
193.070	89	Row crops, straight row, Good, HSG D
438.610	79	Woods, Fair, HSG D
0.830	98	Unconnected roofs, HSG D
2.010	98	Paved parking, HSG D
50.070	80	>75% Grass cover, Good, HSG D
702.200	82	Weighted Average
685.226		97.58% Pervious Area
16.974		2.42% Impervious Area
0.830		4.89% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
25.9	967	0.0155	0.62		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
37.1	1,774	0.0254	0.80		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
2.3	1,608	0.0168	11.83	1,040.71	**Channel Flow, D to E** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
7.9	4,059	0.0089	8.61	757.48	**Channel Flow, E to F** Area= 88.0 sf Perim= 35.2' r= 2.50' n= 0.030 Stream, clean & straight
115.5	8,508	Total			

Summary for Subcatchment 6S: Post DA-2

Runoff = 82.07 cfs @ 13.08 hrs, Volume= 18.005 af, Depth= 3.64"

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=5.95"

Area (ac)	CN	Description
58.590	79	Woods, Fair, HSG D
0.020	98	Unconnected roofs, HSG D
0.830	80	>75% Grass cover, Good, HSG D
59.440	79	Weighted Average
59.420		99.97% Pervious Area
0.020		0.03% Impervious Area
0.020		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.3	100	0.0600	0.06		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
67.6	2,017	0.0099	0.50		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
94.9	2,117	Total			

Summary for Subcatchment 7S: Post DA-3

Runoff = 163.43 cfs @ 13.04 hrs, Volume= 35.294 af, Depth= 3.74"

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=5.95"

Area (ac)	CN	Description
97.820	79	Woods, Fair, HSG D
7.290	89	Row crops, straight row, Good, HSG D
1.030	98	Paved roads w/curbs & sewers, HSG D
0.380	98	Paved parking, HSG D
0.100	98	Unconnected roofs, HSG D
6.740	80	>75% Grass cover, Good, HSG D
113.360	80	Weighted Average
111.850		98.67% Pervious Area
1.510		1.33% Impervious Area
0.100		6.62% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.0	100	0.0300	0.05		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
11.6	567	0.0265	0.81		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
27.6	852	0.0106	0.51		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
7.8	1,830	0.0126	3.93	19.67	**Channel Flow, D to E** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
10.1	1,597	0.0056	2.62	13.11	**Channel Flow, E to F** Area= 5.0 sf Perim= 8.4' r= 0.60' n= 0.030 Stream, clean & straight
93.1	4,946	Total			

Summary for Subcatchment 8S: Post DA-4

Runoff = 46.71 cfs @ 13.25 hrs, Volume= 11.211 af, Depth= 3.64"

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=5.95"

Area (ac)	CN	Description
34.610	79	Woods, Fair, HSG D
0.080	98	Paved parking, HSG D
0.050	98	Unconnected roofs, HSG D
2.270	80	>75% Grass cover, Good, HSG D
37.010	79	Weighted Average
36.880		99.65% Pervious Area
0.130		0.35% Impervious Area
0.050		38.46% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	100	0.0200	0.04		**Sheet Flow, A to B** Woods: Dense underbrush n= 0.800 P2= 2.50"
16.3	770	0.0247	0.79		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
47.9	1,520	0.0112	0.53		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
106.5	2,390	Total			

Summary for Link 15L: Out Pre Combined

Inflow Area = 912.010 ac, 1.66% Impervious, Inflow Depth = 3.96" for 100 yr event
Inflow = 1,207.70 cfs @ 13.22 hrs, Volume= 301.210 af
Primary = 1,207.70 cfs @ 13.22 hrs, Volume= 301.210 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link 16L: Out Post Combined

Inflow Area = 912.010 ac, 2.04% Impervious, Inflow Depth = 3.88" for 100 yr event
Inflow = 1,183.70 cfs @ 13.22 hrs, Volume= 295.133 af
Primary = 1,183.70 cfs @ 13.22 hrs, Volume= 295.133 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

NOAA Atlas 14, Volume 10, Version 3
Location name: Freeville, New York, USA*
Latitude: 42.5065°, Longitude: -76.3761°
Elevation: 1056 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	**0.301** (0.237-0.378)	**0.366** (0.287-0.460)	**0.472** (0.370-0.596)	**0.559** (0.435-0.711)	**0.680** (0.512-0.903)	**0.770** (0.568-1.05)	**0.866** (0.620-1.22)	**0.975** (0.659-1.40)	**1.13** (0.736-1.69)	**1.26** (0.801-1.92)
10-min	**0.426** (0.335-0.536)	**0.518** (0.407-0.652)	**0.668** (0.523-0.843)	**0.793** (0.618-1.01)	**0.964** (0.725-1.28)	**1.09** (0.805-1.48)	**1.23** (0.878-1.73)	**1.38** (0.933-1.99)	**1.61** (1.04-2.39)	**1.79** (1.13-2.72)
15-min	**0.502** (0.395-0.630)	**0.609** (0.479-0.767)	**0.785** (0.614-0.991)	**0.932** (0.725-1.18)	**1.13** (0.853-1.51)	**1.29** (0.947-1.74)	**1.44** (1.03-2.03)	**1.63** (1.10-2.34)	**1.89** (1.23-2.81)	**2.11** (1.33-3.20)
30-min	**0.681** (0.535-0.855)	**0.823** (0.647-1.04)	**1.06** (0.826-1.33)	**1.25** (0.973-1.59)	**1.52** (1.14-2.01)	**1.72** (1.27-2.33)	**1.93** (1.38-2.72)	**2.17** (1.47-3.12)	**2.52** (1.64-3.75)	**2.81** (1.78-4.27)
60-min	**0.859** (0.676-1.08)	**1.04** (0.815-1.31)	**1.33** (1.04-1.68)	**1.57** (1.22-1.99)	**1.90** (1.43-2.52)	**2.15** (1.59-2.92)	**2.41** (1.73-3.40)	**2.71** (1.83-3.90)	**3.15** (2.05-4.69)	**3.52** (2.23-5.34)
2-hr	**1.07** (0.848-1.34)	**1.27** (1.00-1.59)	**1.60** (1.26-2.00)	**1.87** (1.46-2.36)	**2.24** (1.70-2.96)	**2.52** (1.87-3.40)	**2.82** (2.03-3.95)	**3.16** (2.14-4.51)	**3.68** (2.39-5.43)	**4.10** (2.61-6.18)
3-hr	**1.21** (0.957-1.50)	**1.42** (1.13-1.77)	**1.78** (1.41-2.23)	**2.08** (1.64-2.61)	**2.49** (1.89-3.27)	**2.79** (2.08-3.75)	**3.12** (2.26-4.36)	**3.50** (2.38-4.98)	**4.07** (2.65-5.99)	**4.55** (2.89-6.82)
6-hr	**1.45** (1.16-1.80)	**1.73** (1.38-2.14)	**2.18** (1.73-2.70)	**2.55** (2.02-3.18)	**3.06** (2.34-4.00)	**3.45** (2.58-4.60)	**3.85** (2.80-5.35)	**4.33** (2.96-6.12)	**5.05** (3.30-7.38)	**5.64** (3.60-8.41)
12-hr	**1.73** (1.39-2.12)	**2.09** (1.68-2.57)	**2.69** (2.15-3.31)	**3.18** (2.53-3.94)	**3.86** (2.97-5.01)	**4.37** (3.29-5.79)	**4.91** (3.58-6.77)	**5.54** (3.79-7.77)	**6.47** (4.24-9.39)	**7.25** (4.64-10.7)
24-hr	**2.02** (1.64-2.47)	**2.47** (2.00-3.02)	**3.21** (2.59-3.93)	**3.82** (3.06-4.70)	**4.66** (3.60-6.01)	**5.28** (4.00-6.97)	**5.95** (4.37-8.16)	**6.73** (4.63-9.38)	**7.89** (5.20-11.4)	**8.86** (5.69-13.0)
2-day	**2.35** (1.92-2.85)	**2.86** (2.33-3.46)	**3.68** (2.99-4.47)	**4.36** (3.52-5.34)	**5.30** (4.13-6.80)	**6.00** (4.57-7.87)	**6.75** (4.99-9.22)	**7.64** (5.27-10.6)	**8.97** (5.93-12.9)	**10.1** (6.50-14.8)
3-day	**2.59** (2.12-3.12)	**3.12** (2.56-3.77)	**4.00** (3.26-4.84)	**4.72** (3.82-5.75)	**5.72** (4.47-7.30)	**6.46** (4.94-8.44)	**7.26** (5.38-9.87)	**8.20** (5.68-11.3)	**9.63** (6.38-13.7)	**10.8** (6.99-15.8)
4-day	**2.80** (2.30-3.36)	**3.35** (2.75-4.03)	**4.26** (3.48-5.14)	**5.01** (4.07-6.09)	**6.05** (4.74-7.70)	**6.82** (5.22-8.88)	**7.65** (5.67-10.4)	**8.63** (5.98-11.9)	**10.1** (6.70-14.4)	**11.3** (7.33-16.5)
7-day	**3.36** (2.77-4.02)	**3.95** (3.26-4.73)	**4.91** (4.04-5.90)	**5.72** (4.66-6.90)	**6.82** (5.36-8.61)	**7.64** (5.87-9.86)	**8.52** (6.33-11.4)	**9.53** (6.64-13.0)	**11.0** (7.34-15.6)	**12.3** (7.96-17.7)
10-day	**3.92** (3.25-4.67)	**4.53** (3.75-5.40)	**5.53** (4.56-6.62)	**6.36** (5.21-7.66)	**7.50** (5.92-9.42)	**8.36** (6.43-10.7)	**9.27** (6.88-12.3)	**10.3** (7.18-14.0)	**11.8** (7.85-16.6)	**13.0** (8.42-18.7)
20-day	**5.66** (4.72-6.69)	**6.33** (5.27-7.50)	**7.43** (6.16-8.83)	**8.34** (6.87-9.97)	**9.60** (7.60-11.9)	**10.6** (8.14-13.4)	**11.5** (8.54-15.1)	**12.5** (8.81-16.9)	**13.9** (9.33-19.4)	**15.0** (9.73-21.4)
30-day	**7.13** (5.97-8.40)	**7.86** (6.58-9.27)	**9.06** (7.54-10.7)	**10.0** (8.31-12.0)	**11.4** (9.06-14.1)	**12.5** (9.63-15.7)	**13.5** (10.00-17.5)	**14.5** (10.2-19.5)	**15.9** (10.7-22.0)	**16.8** (11.0-23.9)
45-day	**8.98** (7.55-10.5)	**9.79** (8.23-11.5)	**11.1** (9.31-13.1)	**12.2** (10.2-14.5)	**13.8** (11.0-16.8)	**15.0** (11.6-18.7)	**16.1** (11.9-20.7)	**17.2** (12.1-23.0)	**18.5** (12.5-25.6)	**19.4** (12.7-27.5)
60-day	**10.5** (8.88-12.3)	**11.4** (9.63-13.4)	**12.9** (10.8-15.2)	**14.1** (11.8-16.7)	**15.8** (12.6-19.3)	**17.1** (13.3-21.3)	**18.4** (13.6-23.5)	**19.5** (13.8-26.0)	**20.9** (14.1-28.8)	**21.8** (14.3-30.8)

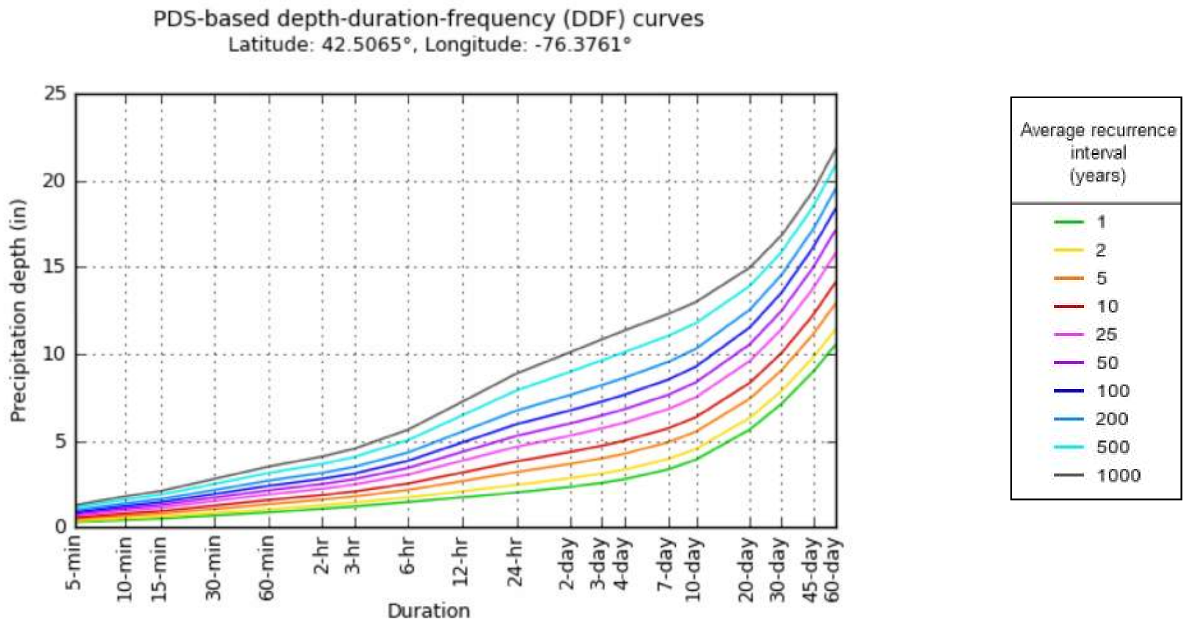
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

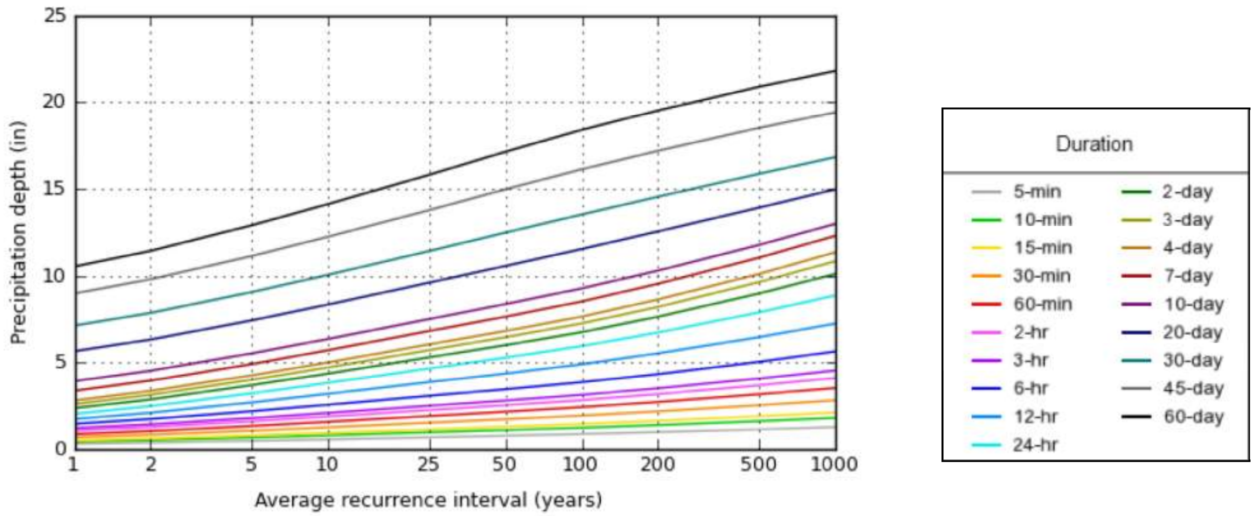
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper 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.

Back to Top

PF graphical





NOAA Atlas 14, Volume 10, Version 3

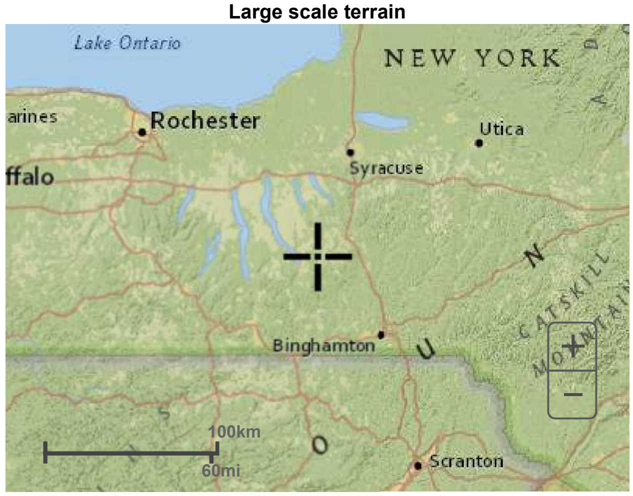
Created (GMT): Wed May 15 18:22:53 2019

Back to Top

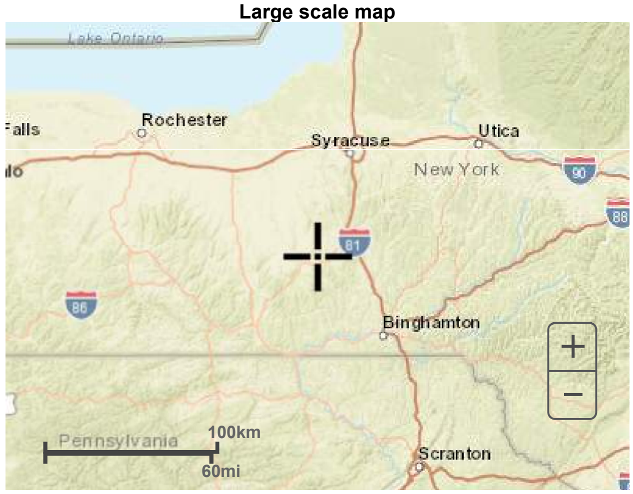
Maps & aerials

Small scale terrain

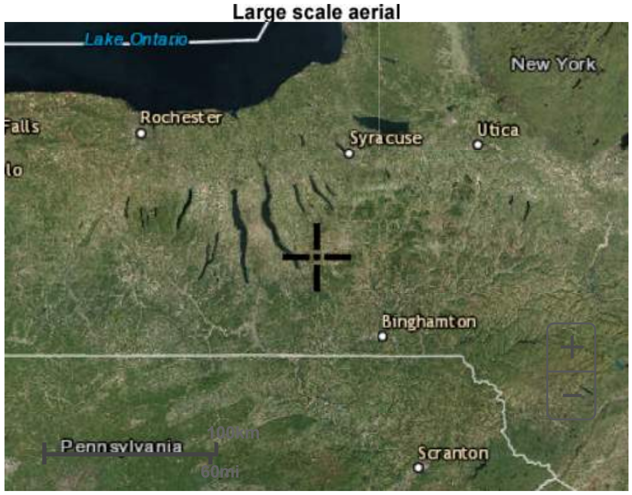
Large scale terrain



Large scale map



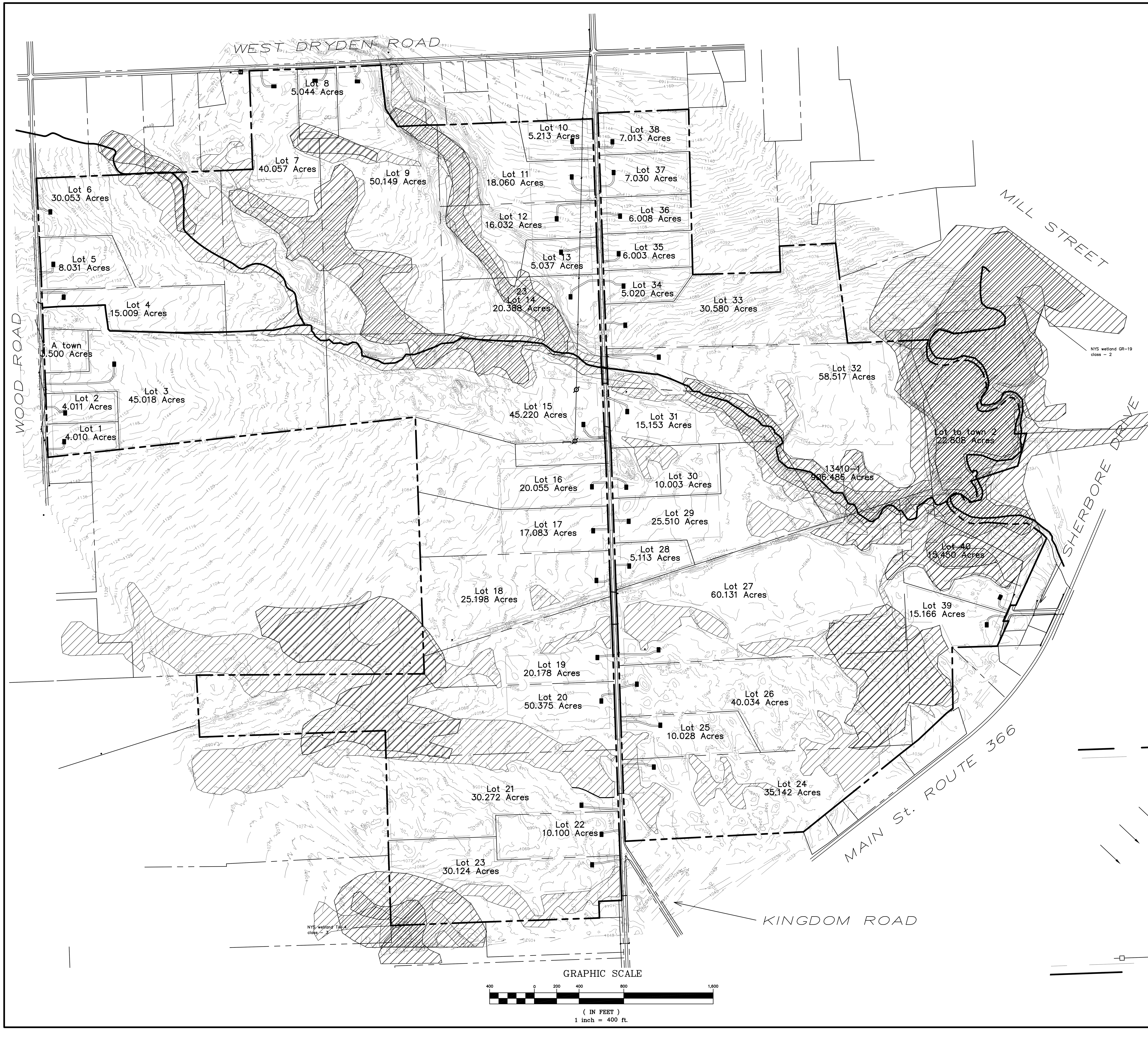
Large scale aerial



Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

APPENDIX E
STORMWATER MANAGEMENT PLANS, DETAILS AND SPECIFICATIONS



NOT FOR CONSTRUCTION

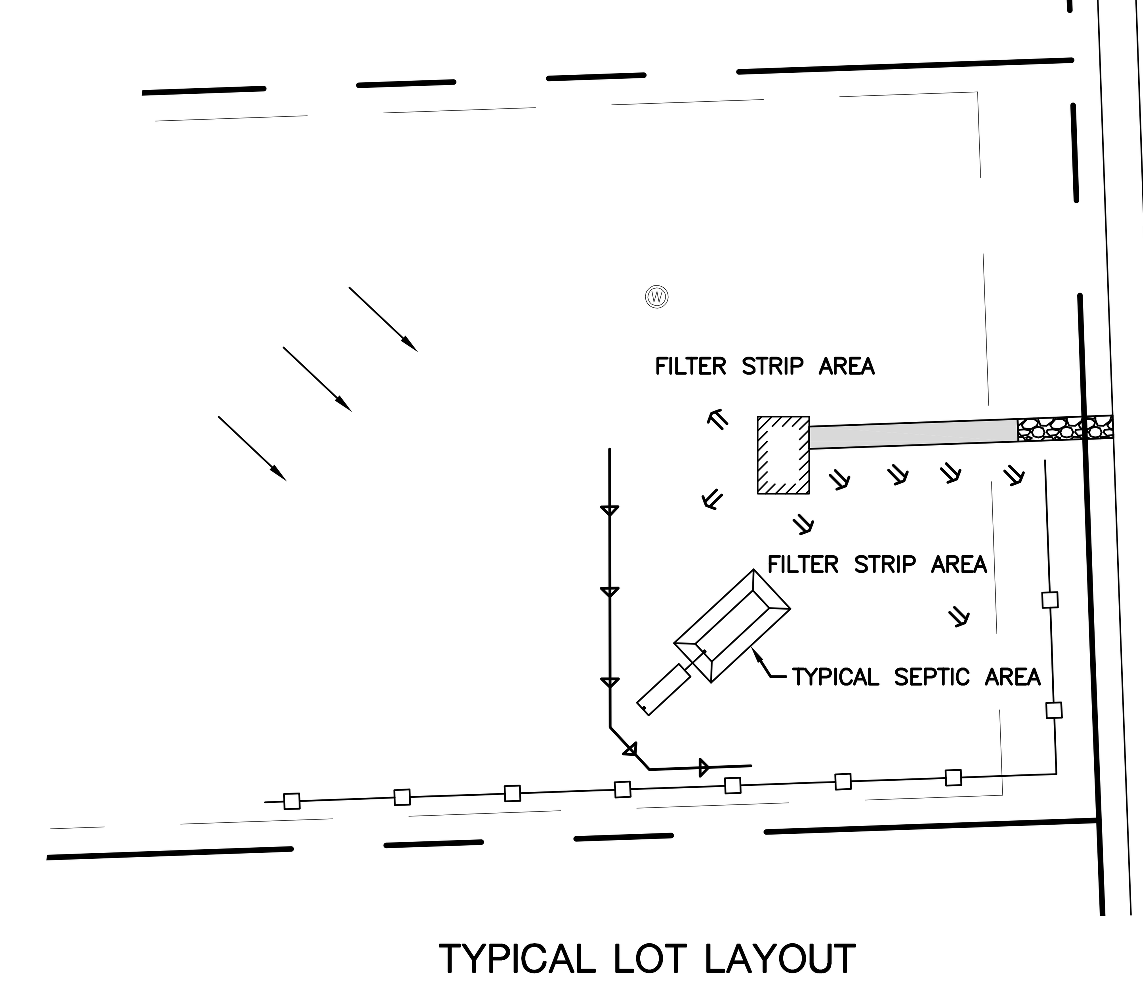
WELL	
EXISTING RUNOFF FLOW	
LOT GRADING DIRECTIION	
SILT FENCE	
STABILIZED CONSTRUCTION ENTRANCE	
UPGRADIENT CUTOFF SWALE W/ DIRECTION	
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	STANDARD SYMBOLS

TYPICAL LOT LAYOUT LEGEND

FILTER STRIP SIZES:

FOR SLOPES 0–8% – 60' MIN. WIDTH
FOR SLOPES 8–12% – 90' MIN. WIDTH
FOR SLOPES 12–15% – 120' MIN. WIDTH

*NOTE THAT THE TYPICAL WIDTHS HAVE BEEN INCREASED BY 20% FOR HYDRAULIC SOIL GROUP D ON-SITE, PER REQUIREMENTS.



TYPICAL LOT LAYOUT

N.T.S.

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

WARNING:
It is a violation of Section 7209, Subdivision 2, of the New York State Education Law for any person unless acting under the direction of a Licensed Professional Architect, Engineer , or Surveyor to alter in any way; any plans, specifications, plats or reports to which the seal of a Professional Architect, Engineer or Surveyor has been applied.

NO.	REVISIONS AND DESCRIPTIONS	DATE:

CASWELL ROAD
MILL CREEK PRESERVE

TOWN OF DRYDEN TOMPKINS COUNTY, NY

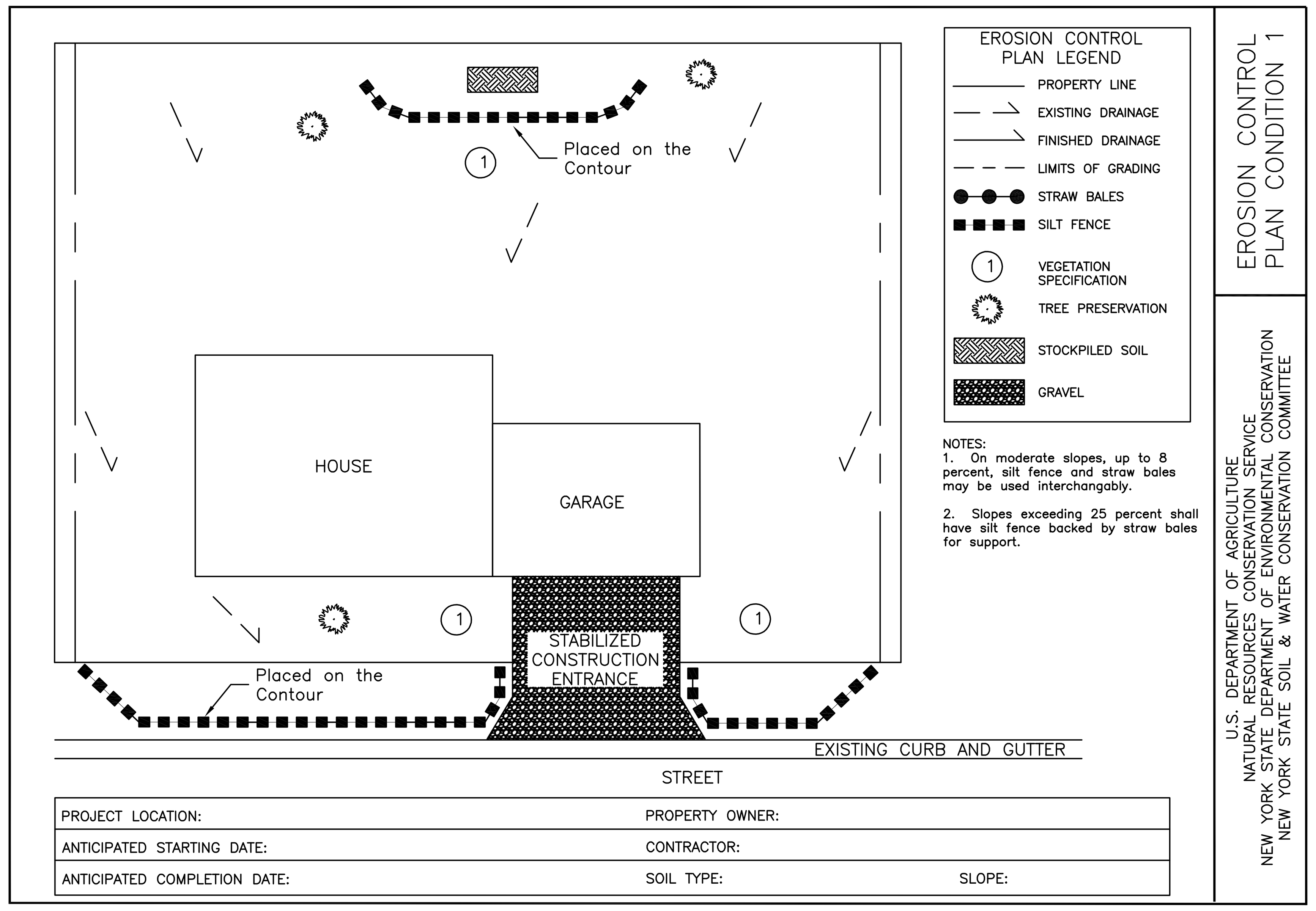
OVERALL STORMWATER PLAN

SHEET NO.
C100

PROJECT NO.
0392.10819

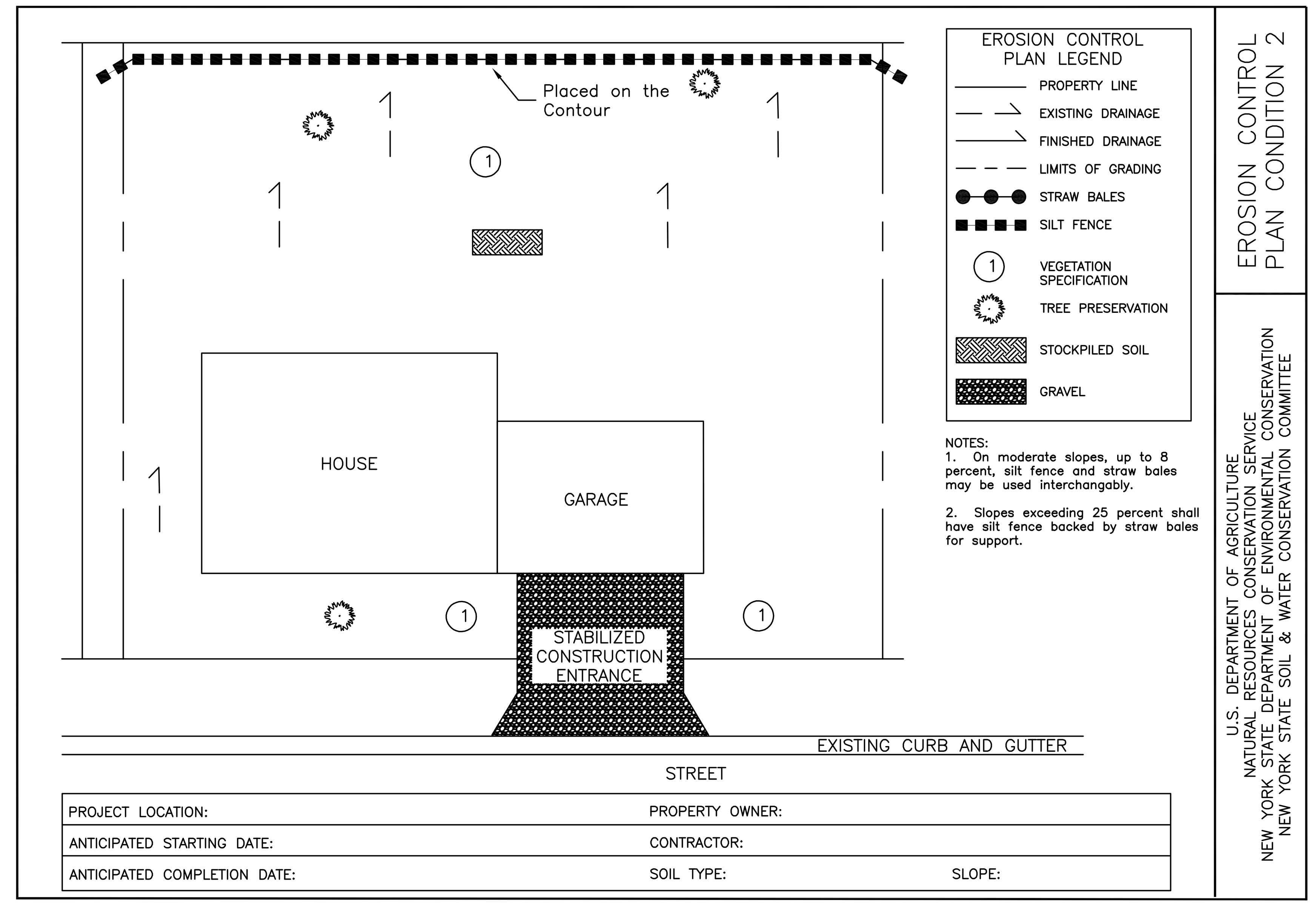
DATE: 6/17/19

CAD FILE NO.: 039210819–SITE



1 C120 INDIVIDUAL HOME TYPICAL EROSION CONTROL PLAN CONDITION 1

N.T.S.



2 C120 INDIVIDUAL HOME TYPICAL EROSION CONTROL PLAN CONDITION 2

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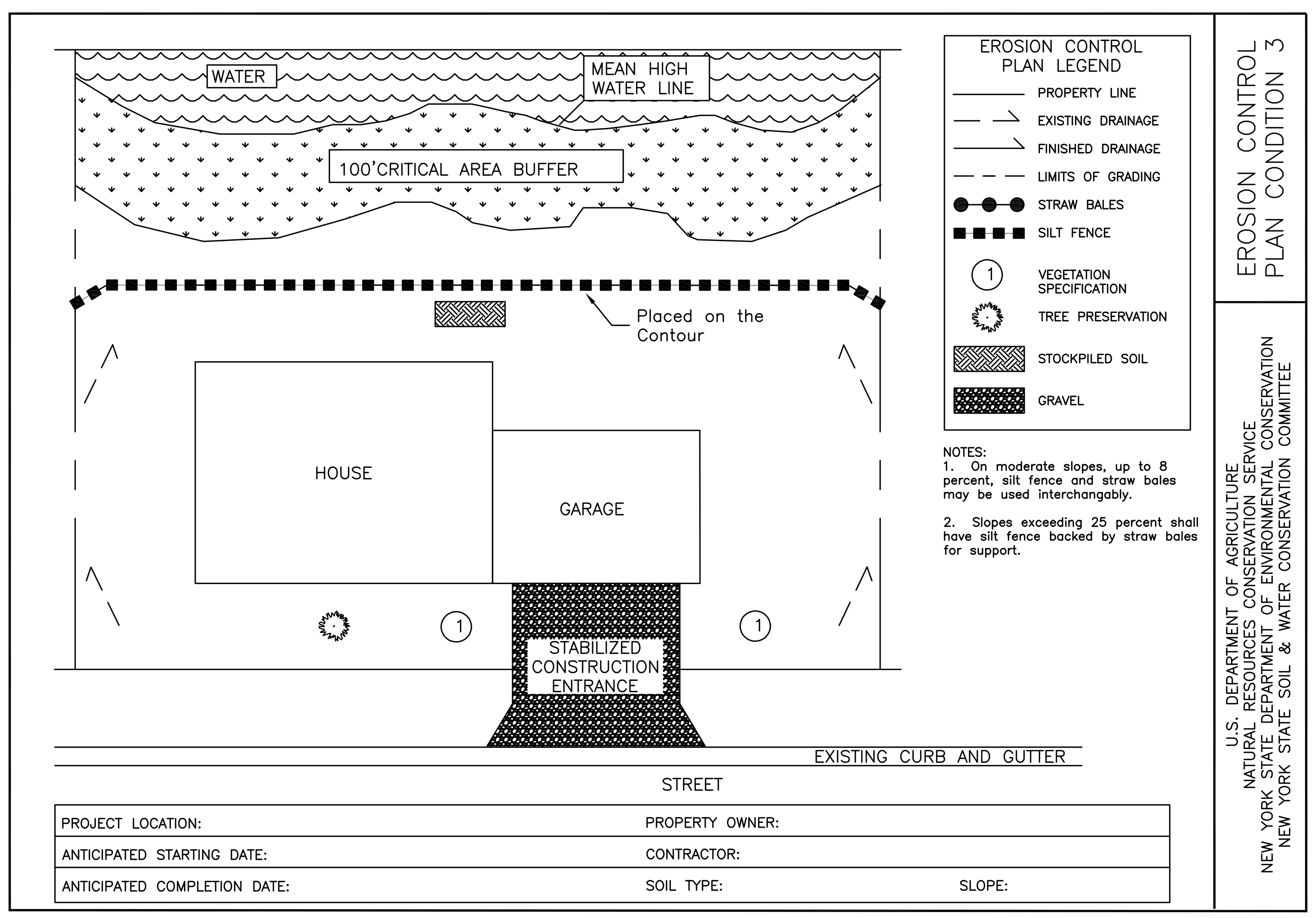

3 C120 INDIVIDUAL HOME TYPICAL EROSION CONTROL PLAN CONDITION 3

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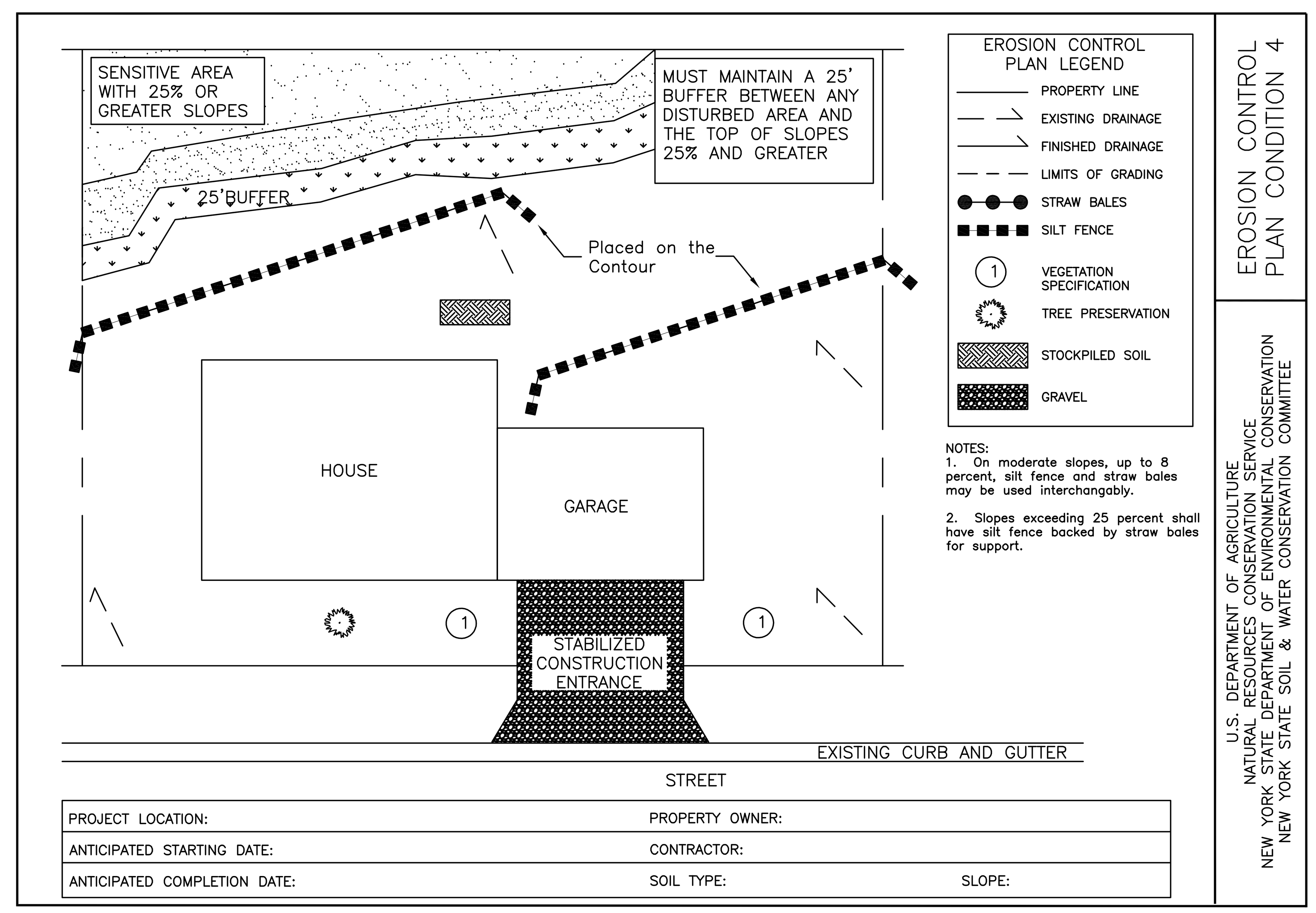


4 C120 INDIVIDUAL HOME TYPICAL EROSION CONTROL PLAN CONDITION 4

N.T.S.

NOT FOR CONSTRUCTION

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

NO. | REVISIONS AND DESCRIPTIONS | DATE

CASWELL ROAD MILL CREEK PRESERVE

TOWN OF DRYDEN TOMPKINS COUNTY, NY

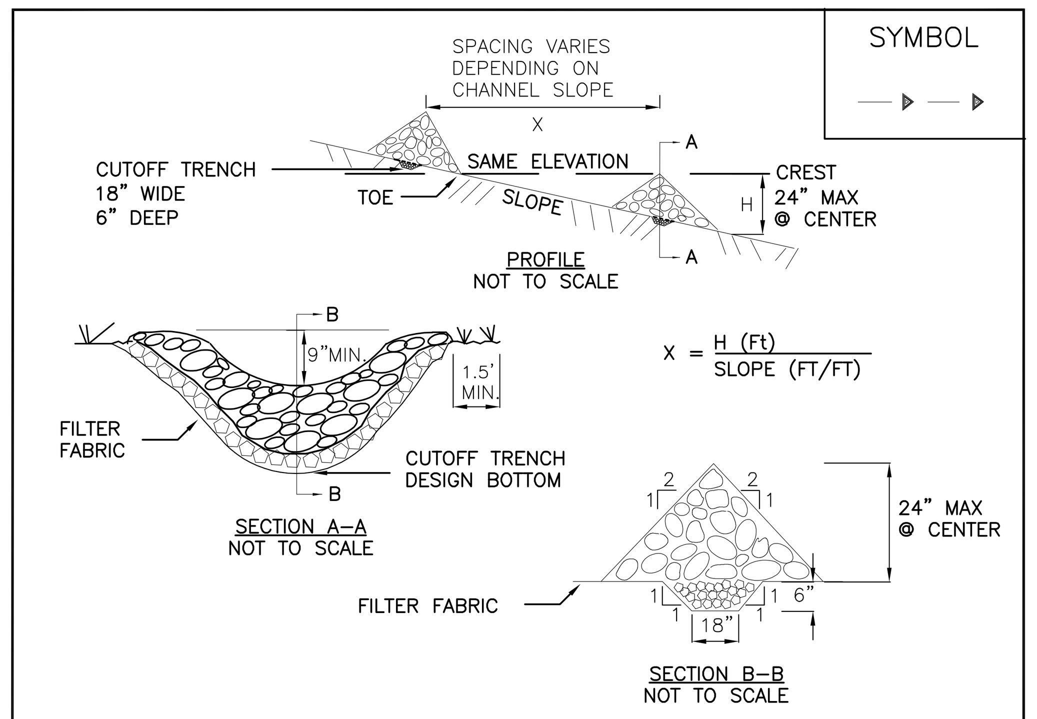
INDIVIDUAL HOME TYPICAL EROSION CONTROL PLAN

SHEET NO. **C110**

PROJECT NO. 0392.10819

DATE: 6/17/19

CAD FILE NO. 039210819-SITE



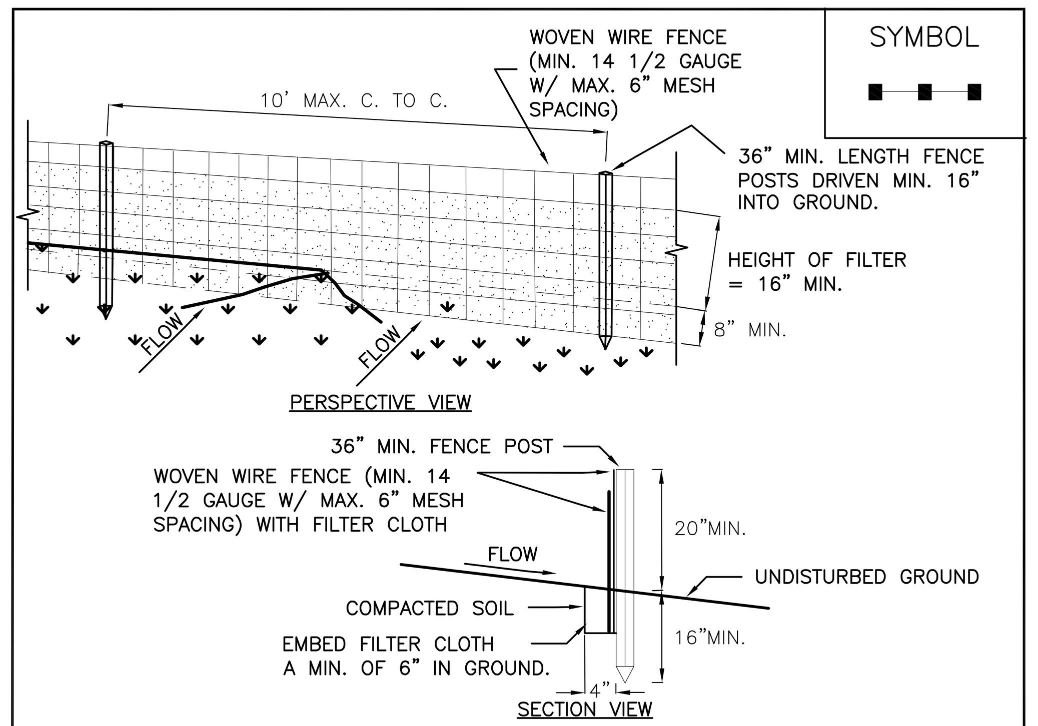
CONSTRUCTION SPECIFICATIONS

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.

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

1 / C200 — CHECK DAM DETAIL
N.T.S.

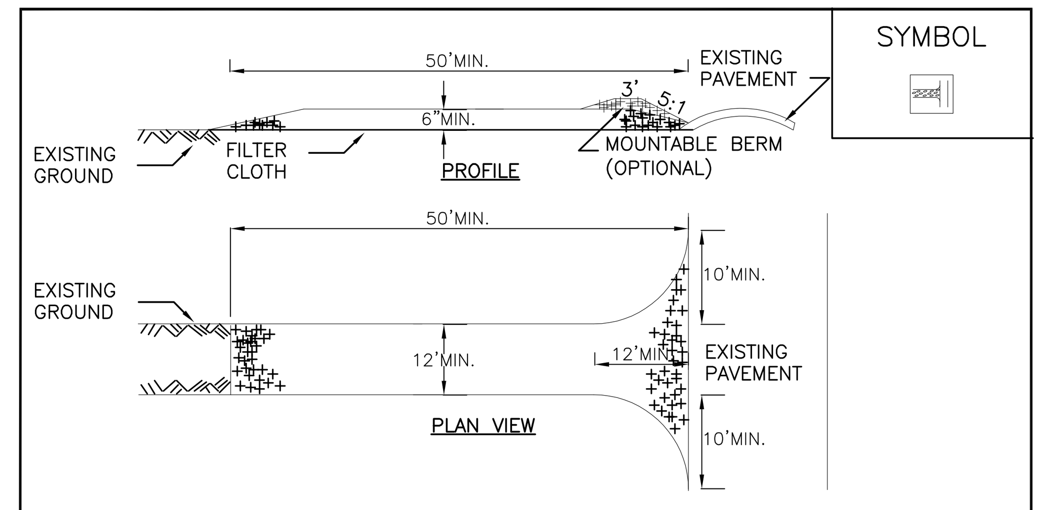


CONSTRUCTION SPECIFICATIONS

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

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

2 / C200 — SILT FENCE DETAIL
N.T.S.

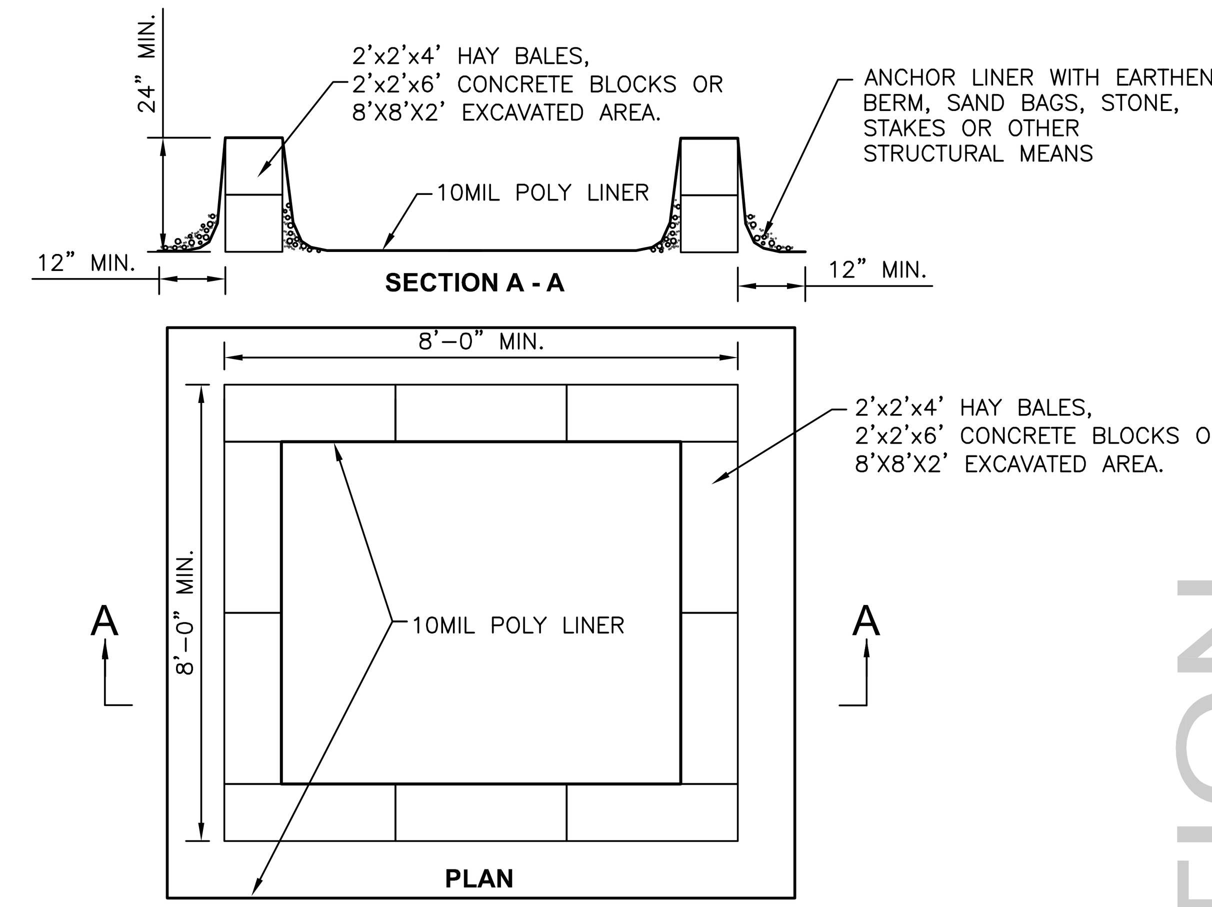


CONSTRUCTION SPECIFICATIONS

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

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

3 / C200 — STABILIZED CONSTRUCTION ENTRANCE
N.T.S.

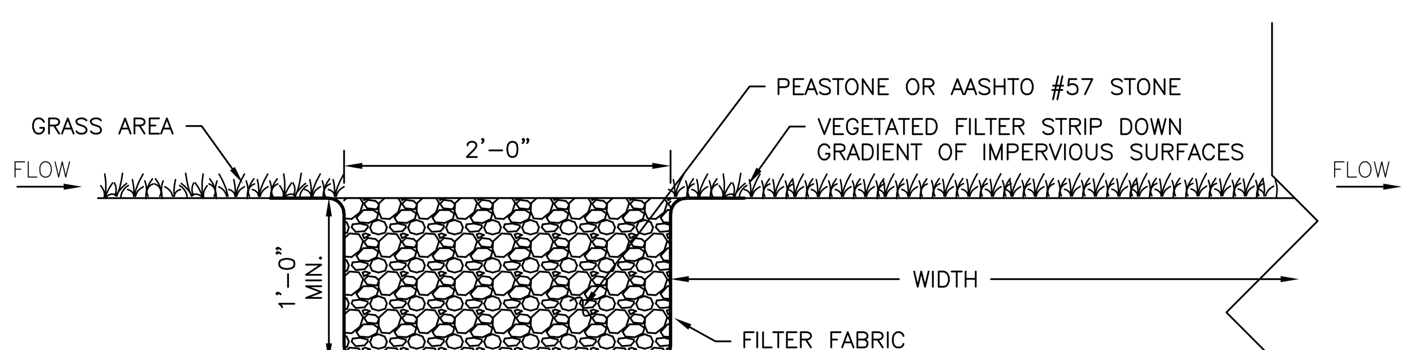


NOTES:

1. ACTUAL ABOVE GROUND OR EXCAVATED LAYOUT DETERMINED IN FIELD.
2. LOCATE THE FACILITY A MINIMUM OF 100' FROM DRAINAGE SWALES, STORM DRAIN INLETS, WETLANDS, STREAMS AND OTHER SURFACE WATERS. WASH WATER SHALL NOT BE ALLOWED TO INFILTRATE INTO SOIL OR ENTER SURFACE WATERS. EXCESS RAINWATER SHALL BE PUMPED TO A STABILIZED AREA SUCH AS A GRASSED FILTER STRIP.
3. EXCAVATED WASHOUT STRUCTURES SHALL BE A MINIMUM OF 2' DEEP WITH SIDE SLOPES OF 2:1.
4. PROVIDE APPROPRIATE ACCESS TO THE STRUCTURE.
5. SIGNS SHALL BE INSTALLED TO DIRECT DRIVERS TO THE CONCRETE WASHOUT LOCATION.
6. ALL WASHOUT FACILITIES WILL BE LINED. THE LINER SHALL BE PLASTIC SHEETING WITH A MINIMUM THICKNESS OF 10 MILS WITH NO HOLES OR TEARS. LINER SHALL BE REPLACED WITH EACH CLEANING OF STRUCTURE.
7. ALL CONCRETE WASHOUT FACILITIES SHALL BE INSPECTED DAILY. DAMAGED OR LEAKING STRUCTURES SHALL BE DEACTIVATED AND REPAIRED OR REPLACED IMMEDIATELY.
8. ACCUMULATED HARDENED MATERIAL SHALL BE REMOVED WHEN 75% OF STORAGE CAPACITY OF THE STRUCTURE IS FILLED. THE MATERIAL SHALL BE DISPOSED OF IN A LEGAL MANNER.
9. INSPECT THE PROJECT SITE FREQUENTLY TO ENSURE THAT NO CONCRETE DISCHARGES ARE TAKING PLACE IN NON–DESIGNATED AREAS.

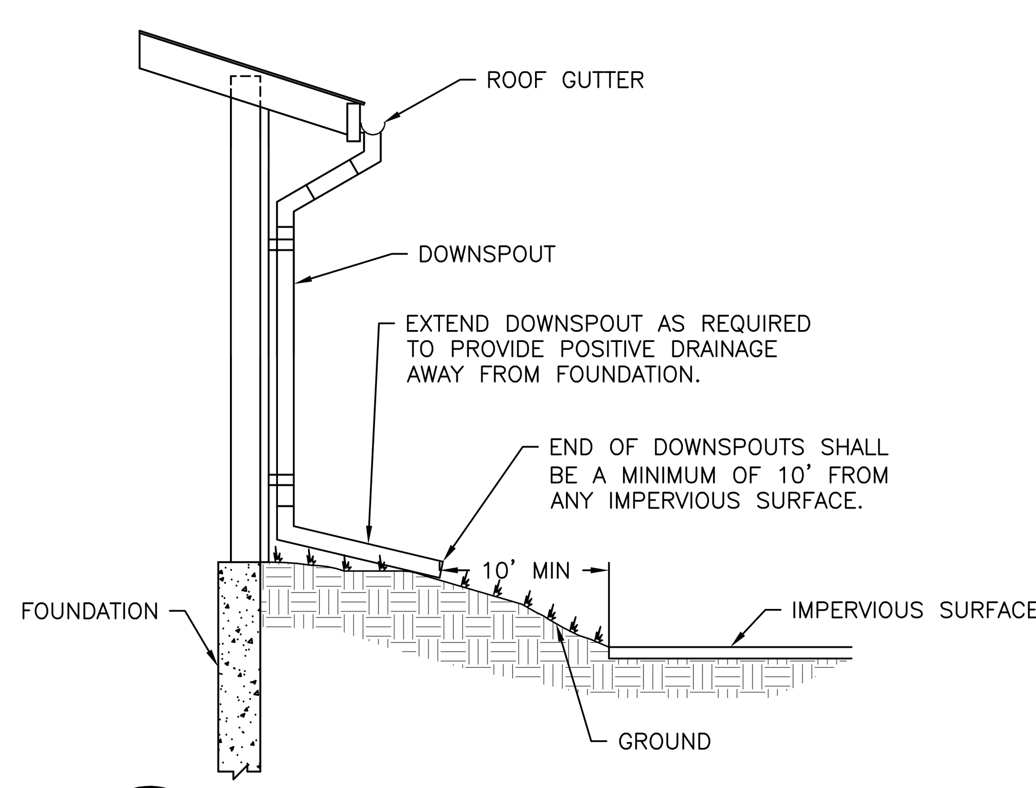
4 / C200 — CONCRETE WASHOUT STRUCTURE
N.T.S.

NOT FOR CONSTRUCTION

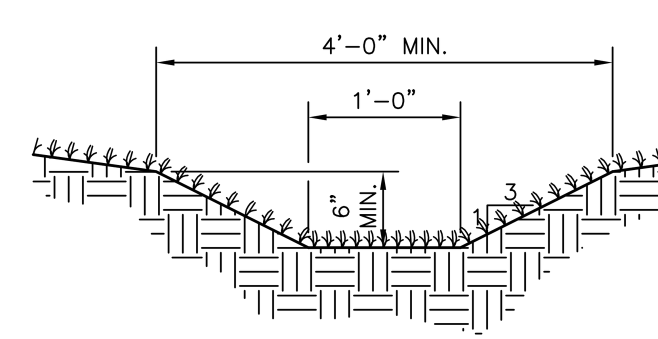


NOTES:
1. LEVEL SPREADER IS ONLY REQUIRED FOR SLOPES GREATER THAN 3%.
2. THE MAXIMUM SLOPE ALLOWED FOR FILTER STRIPS IS 15%.
3. VEGETATED FILTER STRIPS SHOULD BE CLEARLY MARKED BEFORE CONSTRUCTION STARTS.
4. NO VEHICULAR TRAFFIC SHOULD BE ALLOWED ON THE FILTER STRIP.
5. FLOW SPREADERS MUST BE CONSTRUCTED LEVEL ALONG THE CONTOUR TO DISTRIBUTE FLOWS EVENLY ACROSS THE FILTER STRIP.
6. VEGETATION SHALL CONSIST OF INDIGENOUS GRASSES MAINTAINED AS DENSE TURF COVER. AREAS MAY BE ENHANCED WITH WILDFLOWERS AND GROUND COVERS. SMALL TREES AND SHRUBS MAY BE SPARINGLY PLANTED FOR AESTHETICS.

5 / C200 — LEVEL SPREADER AND FILTER STRIP DETAIL
N.T.S.



6 / C200 — DOWNSPOUT DETAIL
N.T.S.



7 / C200 — CUTOFF SWALE DETAIL
N.T.S.

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NO.	REVISIONS AND DESCRIPTIONS	DATE:

CASWELL ROAD
MILL CREEK PRESERVE
TOWN OF DRYDEN — TOMPKINS COUNTY, NY

EROSION AND SEDIMENT CONTROL DETAILS

SHEET NO.
C200

PROJECT NO.
0392.10819

DATE: 6/17/19

CAD FILE NO.: 039210819–SITE

NOT FOR CONSTRUCTION

IMPLEMENTATION SCHEDULE AND MAINTENANCE

A. IMPLEMENTATION SCHEDULE FOR LOT OWNERS

1. THE FOLLOWING SCHEDULE (SEQUENCE OF OPERATIONS) FOR EROSION AND SEDIMENT CONTROL FACILITIES SHALL BE IMPLEMENTED BY EACH INDIVIDUAL LOT OWNER:

   a. OBTAIN PLAN APPROVAL AND BUILDING PERMIT FROM MUNICIPAL AND REGULATORY AGENCIES FOR PROJECT AND FOR EACH LOT AS REQUIRED.
   b. AS REQUIRED BY THE STATE, LOTS WITH GREATER THAN ONE ACRE OF PROPOSED DISTURBANCE MUST PREPARE AN INDIVIDUAL SWPPP AND SUBMIT A NOTICE OF INTENT (NOI) FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE SPDES GENERAL PERMIT (GP–0–015–002). REGARDLESS, EACH LOT MUST INSTALL AN ON–SITE MAILBOX WITH COMBINATION LOCK (PREFERRED) OR OTHER STORAGE METHOD TO HOLD THE SWPPP, NOTICE OF INTENT (IF APPLICABLE), PERMIT AUTHORIZATION NOTICE (IF APPLICABLE), AND CONSTRUCTION DURATION INSPECTION REPORTS (IF APPLICABLE). NOTE THAT WEEKLY CONSTRUCTION DURATION INSPECTIONS (CDIs) WILL NOT BE REQUIRED UNLESS SPECIFICALLY TRIGGERED BY DISTURBANCE OF GREATER THAN ONE ACRE AT ANY ONE LOT. IN THAT CASE, CDIs WOULD BE REQUIRED AT ONLY THAT LOT IN ACCORDANCE WITH GENERAL PERMIT REQUIREMENTS AND IS THE RESPONSIBILITY OF THE LOT OWNER.
   c. HOLD PRE–CONSTRUCTION CONFERENCE.
   d. REGARDLESS OF NOI SUBMISSION APPLICABILITY, EACH LOT'S SELECTED CONTRACTOR(S) SHALL SIGN A CONTRACTOR'S CERTIFICATION STATEMENT BINDING THEM TO OBLIGATIONS OF THE OVERALL SWPPP AND THAT INDIVIDUAL LOT'S CONSTRUCTION ACTIVITIES. BLANK COPIES ARE PROVIDED IN THE SWPPP'S APPENDIX A.
   e. INSTALL TEMPORARY STABILIZED CONSTRUCTION ENTRANCE/EXITS AS REQUIRED.
   f. INSTALL FABRIC SILT FENCE
   g. CLEAR/GRUB SITE.
   h. CONSTRUCT TEMPORARY DRAINAGE SWALES AND CONCRETE WASHOUT AREAS.
   i. STRIP AND STOCKPILE TOPSOIL, ROUGH GRADE SITE.
   j. PREPARE SUBGRADE AND CONSTRUCT SUBBASE COURSE FOR DRIVE.
   k. PREPARE FOUNDATION AND BUILD HOME/GARAGE.
   l. CONSTRUCT UTILITIES.
   m. CONSTRUCT FINAL DRAINAGE GRASSED SWALES AND GRASS FILTER STRIP(S).
   n. CONSTRUCT FINAL SURFACE COURSES FOR DRIVES.
   o. TOPSOIL: FINE GRADE: AND SEED, FERTILIZE AND MULCH ALL DISTURBED AREAS.
   p. INSPECT ALL EROSION AND SEDIMENT CONTROLS WEEKLY AND AFTER RAINFALL EVENTS AND REPAIR AS REQUIRED.
   q. WATER VEGETATION AS REQUIRED.
   r. 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.
   s. IF A NOI WAS REQUIRED AND SUBMITTED (REFER TO COMMENT NO. 2 ABOVE), THE OWNER MUST SUBMIT NOTICE OF TERMINATION (NOT) FORM FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE SPDES GENERAL PERMIT. NOTE THAT IF AN NOI IS FILED, A DEED COVENANT WOULD BE REQUIRED TO ENSURE THE PERPETUITY OF THAT LOT'S ASSOCIATED GRASSED FILTER STRIP(S) OR OTHER STORMWATER MANAGEMENT PRACTICE(S), AS APPLICABLE.

1. EACH LOT OWNER, CONTRACTOR, AND HOMEOWNER 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, STORMWATER PLANS AND SPECIFICATIONS, AND THE STORMWATER MANAGEMENT AND POLLUTION PREVENTION PLAN. DOCUMENTATION OF INSTALLATION OF STORMWATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL PRACTICES SHOULD BE ACCORDANCE WITH APPENDIX F – CONSTRUCTION SITE STORMWATER INSPECTION LOGBOOK.

2. 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.

RECORD KEEPING DURING CONSTRUCTION

1. THE STORMWATER RECORD KEEPING REQUIREMENTS AND REPORT FORMS ARE INCLUDED IN THE STORMWATER POLLUTION PREVENTION PLANS. THE CONSTRUCTION SITE LOGBOOK (SEE APPENDIX F – STORMWATER CONSTRUCTION SITE LOGBOOK) ADDRESSES RECORD KEEPING, CERTIFICATIONS, SITE ASSESSMENTS AND INSPECTIONS, REPORTING, AND FINAL INSPECTION. PROPERLY COMPLETING THE FORMS CONTAINED IN THE CONSTRUCTION SITE LOGBOOK WILL MEET THE INSPECTION REQUIREMENTS FOR THE NYSDEC SPDES GENERAL PERMIT FOR CONSTRUCTION ACTIVITIES. THE LOGBOOK AND COMPLETED FORMS AND THIS STORMWATER MANAGEMENT AND POLLUTION PREVENTION PLAN SHALL BE KEPT ON SITE AT ALL TIMES DURING CONSTRUCTION AND MADE AVAILABLE TO AUTHORITIES UPON REQUEST.

CONSTRUCTION AND WASTE MATERIALS AND SPILL CONTROLS

1. 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.

2. WASTE MATERIALS EXPECTED TO BE TEMPORARILY STORED ON THE SITE DURING THE CONSTRUCTION INCLUDE WOOD AND BRUSH FROM ROAD CLEARING OPERATIONS, SOIL FROM DRIVEWAY GRADING OPERATIONS, TRIMMINGS FROM GEOTEXTILE SOIL STABILIZATION MATERIALS, EXCESS CONCRETE AND ASPHALT FROM FOUNDATIONS AND PAVEMENT CONSTRUCTION.

3. TEMPORARY EXCESS SOIL MATERIAL STOCKPILES SHALL HAVE SILT FENCE FOR EROSION CONTROL INSTALLED AT THE TOE OF SLOPE. WOOD AND BRUSH SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LEGAL MATTER. EXCESS SOILS SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LEGAL MATTER. 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.

4. 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 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 DIRT OR GRAVEL PARKING LOT IS CONSIDERED TO HAVE IMPACTED LAND AND IS REPORTABLE.

GENERAL CONSTRUCTION CONDITIONS

1. EROSION CONTROL IS NECESSARY WHEN SEDIMENT, DUST, EROSION, OR CONTAMINATED RUN–OFF MAY OCCUR. THE CONTRACTOR SHALL BE RESPONSIBLE TO PLACE AND MAINTAIN EROSION CONTROL OR RUN–OFF PROTECTION AS REQUIRED TO PROTECT HIS WORK, THE WORK OF HIS SUBCONTRACTORS, OR OTHER PARTIES ASSOCIATED WITH THE PROJECT, ADJACENT PROPERTIES AND THE HEALTH AND WELL BEING OF THE WORKERS, PUBLIC AND SURROUNDING NATURAL RESOURCES. THE CONTRACTOR SHALL BE FAMILIAR WITH ALL FEDERAL, STATE AND LOCAL REQUIREMENTS REGARDING EROSION AND RUN–OFF CONTROL AND SHALL SIGN A CERTIFICATION STATEMENT INDICATING THAT HE UNDERSTANDS AND WILL COMPLY WITH THE SITE'S STORMWATER POLLUTION PREVENTION PLAN IF ONE WAS PREPARED FOR THE PROJECT.

EROSION CONTROL

1. PRIOR TO CONSTRUCTION EQUIPMENT ENTERING OR EXITING THE SITE, A CONSTRUCTION ENTRANCE SHALL BE BUILT UNLESS EXISTING CONDITIONS PREVENT ANY TRACKING OF DIRT, MUD, OR DEBRIS OFF THE SITE. THE CONTRACTOR WILL BE RESPONSIBLE TO KEEP ALL ROADS, PARKING LOTS, SIDEWALKS AND ADJACENT PROPERTIES FREE OF DIRT, MUD OR OTHER DEBRIS. THIS WILL INCLUDE BUILDING THE CONSTRUCTION ENTRANCE, SWEEPING, SCRAPING AND WASHING THE PAVEMENT SURFACES WHENEVER NEEDED. THE CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED AS SHOWN ON THE PLANS. WIDTH SHALL BE THE FULL WIDTH OF THE DRIVE OR A MINIMUM OF 12 FEET IF SINGLE ENTRANCE TO SITE. THE ENTRANCE SHOULD BE LOCATED SO THAT ALL VEHICLES LEAVING THE SITE WILL UTILIZE IT.

2. ALL EROSION CONTROL DEVICES SHALL BE PLACED AS SHOWN ON THE DRAWINGS AND IN ACCORDANCE WITH FEDERAL, STATE, LOCAL AND MANUFACTURES RECOMMENDATIONS. THE CONTRACTOR SHALL PLACE AND MAINTAIN ALL EROSION CONTROL DEVICES AS NEEDED THROUGHOUT THE PROJECT.

3. SILT FENCE SHALL HAVE HARD WOOD STAKES 2X2 INCH AND 4 FEET LONG WOVEN INTO THE FABRIC. THE BASE OF THE SILT FENCE SHALL BE EXCAVATED SO AS TO PROVIDE AN AREA TO BURY THE BOTTOM OF THE FABRIC AT LEAST 6 INCHES INTO THE GROUND. THE STAKES SHALL BE DRIVEN TO A DEPTH THAT WILL PLACE THE BOTTOM FABRIC AT THE BOTTOM OF THE TRENCH. THEN BACKFILL THE BOTTOM FABRIC ON THE UPSTREAM SIDE WITH THE MATERIAL THAT WAS EXCAVATED.

4. SILT FENCE SHALL BE PLACED WHEREVER SURFACE DRAINAGE CAN LEAVE THE SITE.

5. TEMPORARY SEDIMENT TRAPS SHALL BE PLACED AND MAINTAINED AS NEEDED. THEY SHALL BE SIZED TO PROVIDE ADEQUATE STORAGE TO ALLOW SEDIMENT TO PRECIPITATE OUT PRIOR DISCHARGING DOWN STREAM.

6. TEMPORARY SEEDING SHALL CONSIST OF LIME @ 1/2 TON PER ACRE, FERTILIZER 5–10–10 @ 600 POUNDS PER ACRE, RYEGRASS (ANNUAL OR PERENNIAL) @ 40 POUNDS PER ACRE AND STRAW MULCH @ 2 TON PER ACRE. JUTE MESH SHALL BE PLACED OVER MULCH AND STAKED WHENEVER WINDS OR SLOPE WILL CAUSE THE MULCH AND SEED TO BECOME DEPLETED OR ERODED. AREAS SHALL BE TEMPORARY SEEDED WHEN THEY ARE SUBJECT TO EROSION AND WILL LIE DORMANT FOR A MONTH OR MORE.

SEEDING AND LANDSCAPING

1. ALL DISTURBED AREAS SHALL BE FINE GRADED REMOVING ALL ROOTS, STICKS, STONES AND DEBRIS GREATER THAN 2 INCHES IN ANY DIMENSION.

2. SEED, MULCH AND FERTILIZE AS NECESSARY TO RESTORE ALL DISTURBED AREAS TO ORIGINAL CONDITION OR BETTER.

3. LAWN FERTILIZER SHALL BE 55% NITROGEN, 10% PHOSPHORUS AND 10% POTASH WHERE 50% OF THE NITROGEN IS DERIVED FROM UREAFORM SOURCE.

4. LAWN SEED WHEN NOT GIVEN ON THE PLANS SHALL BE "50% BY WEIGHT, 85% PURITY, 85% GERMINATION OF PENNFINE PERENNIAL RYE", "30% BY WEIGHT, 97% PURITY, 85% GERMINATION OF PENNLAWN RED FESCUE", "20% BY WEIGHT, 85% PURITY, 80% GERMINATION OF COMMON KENTUCKY BLUEGRASS".

5. WHEN PLACING BY HYDROSEEDING APPLICATION SEED SHALL BE PLACED AT 80 POUNDS PER ACRE, HYDROMULCH AT 1,200 POUNDS PER ACRE, WATER AT 500 GALLONS PER ACRE AND FERTILIZER AT A MINIMUM OF 220 POUNDS PER ACRE.

6. IF PLACING BY MECHANICAL MEANS FERTILIZER SHALL BE PLACED AT 25 POUNDS PER 1,000 SQUARE FEET, SEED AT 5 POUNDS PER 1,000 SQUARE FEET AND STRAW MULCH AT 2 TONS PER ACRE. PLACE FERTILIZER AND SEED THEN LIGHTLY RAKE AND THEN ROLL WITH 200 POUND ROLLER. MULCH THE AREA THEN WATER. STRAW MAY NEED TO BE SECURE TO PREVENT IT BLOWING AWAY.

7. WATER LAWN AREAS AS NEEDED TO PROMOTE GROWTH. THE CONTRACTOR WILL BE RESPONSIBLE TO WATER, RESEED OR WHATEVER WORK NECESSARY TO INSURE THE GROWTH OF THE LAWN UNTIL A COMPLETE AND UNIFORM STAND OF GRASS HAS GROWN AND BEEN CUT AT LEAST TWICE.

CONSTRUCTION NOTES

1) INSTALL SOIL EROSION AND SEDIMENT CONTROL FACILITIES PRIOR TO START OF EARTHWORK OPERATIONS PER LOCAL REGULATORY AGENCY AND SOIL AND WATER CONSERVATION DISTRICT RECOMMENDATIONS AND STANDARDS.

2) UNDERGROUND UTILITY LOCATIONS ARE NOT GUARANTEED, NOR IS THERE ANY GUARANTEE THAT ALL EXISTING UTILITIES WHETHER FUNCTIONAL OR ABANDONED WITHIN THE PROJECT AREA ARE SHOWN ON THIS DRAWING. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL UNDERGROUND UTILITIES BEFORE STARTING WORK & SHALL BE RESPONSIBLE FOR ALL DAMAGE RESULTING FROM HIS WORK. CONTRACTORS SHALL NOTIFY DIG SAFELY NY (FORMERLY UFPO) 1–800–962–7962 IN ACCORDANCE WITH 16 NYCRR PART 753.

3) LOT OWNER TO OBTAIN ALL REQUIRED PERMITS AND APPROVALS AND ARRANGE FOR ANY REQUIRED PRE CONSTRUCTION CONFERENCE AND/OR CONSTRUCTION INSPECTIONS.

4) ALL BOUNDARY INFORMATION OBTAINED FROM SURVEY TITLED "FINAL PLAT SUBDIVISION OF MILL CREEK PRESERVE CASWELL ROAD TOWN OF DRYDEN, TOMPKINS COUNTY NEW YORK", DATED MAY 28, 2019 BY PAUL B. KOERTS P.L.S. THE SURVEY DRAWING IS PROVIDED FOR INFORMATION ONLY. IT IS THE BASE INFORMATION USED TO PREPARE THE WORK INDICATED ON THE DRAWINGS. BY INCLUSION OF THIS SURVEY INFORMATION IN THIS SET OF DOCUMENTS, KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS LLC. DOES NOT ASSUME RESPONSIBILITY FOR ACCURACY OF THE SURVEY NOR FOR INTERPRETATIONS OR CONCLUSIONS DRAWN THEREFROM BY THE OWNERS OR CONTRACTORS.

NOTES

1) DRAWINGS BY KEYSTONE ASSOCIATES DO NOT SHOW REQUIRED SET BACKS OR LOCATIONS OF WELLS OR SEPTIC SYSTEMS HOWEVER, SUFFICIENT AREA IS PROVIDED TO ADDRESS FULL DEVELOPMENT OF EACH LOT. LOT OWNERS MUST MAINTAIN PROPER SETBACK DISTANCES FOR ALL UTILITIES.

2) THE HOME, GARAGE, DRIVEWAY, AND STORMWATER CONTROL LOCATIONS FOR EACH LOT IS ONLY FOR ILLUSTRATION OF A PLAN THAT WILL MEET STORMWATER DISCHARGE PERMIT REGULATIONS. EACH LOT OWNER IS RESPONSIBLE FOR THEIR OWN LOT PLAN, PERMITTING AND CONSTRUCTION THAT WILL MEET ALL LOCAL, STATE, AND FEDERAL LAWS, RULES, REGULATIONS, AND CODES. INDIVIDUAL LOT OWNERS THAT DISTURB GREATER THAN ONE (1) ACRE NEED TO PREPARE A STORMWATER POLLUTION PREVENTION PLAN PRIOR TO THE START OF ANY CONSTRUCTION ON THEIR PARCEL.

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www.keyscomp.com

NO.	REVISIONS AND DESCRIPTIONS	DATE:

CASWELL ROAD
MILL CREEK PRESERVE
TOWN OF DRYDEN TOMPKINS COUNTY, NY

STORMWATER NOTES

SHEET NO.
C300

PROJECT NO.
0392.10819

DATE: 6/17/19

CAD FILE NO.: 039210819–SITE

5.3.2 Sheetflow to Riparian Buffers or Filter Strips

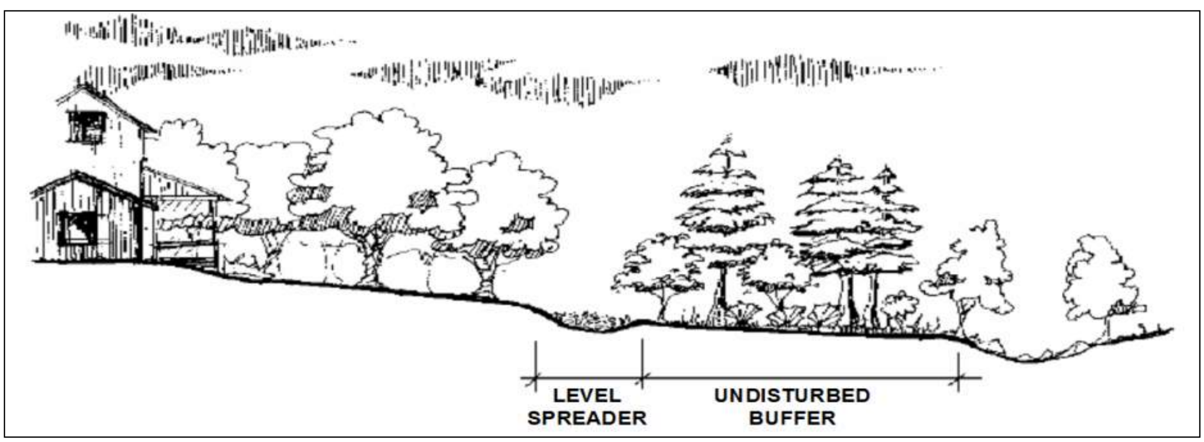
Description: Vegetated filter strips or undisturbed natural areas such as riparian buffers can be used to treat and control stormwater runoff from some areas of a development. Vegetated filter strips (a.k.a., grassed filter strips, filter strips, and grassed filters) are vegetated surfaces that are designed to treat sheet flow from adjacent surfaces and remove pollutants through filtration and infiltration. Riparian reforestation can be applied to existing impacted riparian area corridors.

Runoff can be directed towards riparian buffers and other undisturbed natural areas delineated in the initial stages of site planning to infiltrate runoff, reduce runoff velocity and remove pollutants. Natural depressions can be used to temporarily store (detain) and infiltrate water, particularly in areas with more permeable (hydrologic soil groups A and B) soils.

The objective in using natural areas for stormwater infiltration is to intercept runoff before it has become substantially concentrated and then distribute this flow evenly (as sheet flow) to the buffer or natural conservation area. This can typically be accomplished using a level spreader, as seen in Figure 5.33. A mechanism for the bypass of higher-flow events should be provided to reduce erosion or damage to a buffer or undisturbed natural area. Recommended buffer widths for various uses are indicated in Figure 5.34.

Carefully constructed berms can be placed around natural depressions and below undisturbed vegetated areas

Figure 5.32 Use of a level spreader with a riparian buffer



with porous soils to provide for additional runoff storage and/or infiltration of flows.

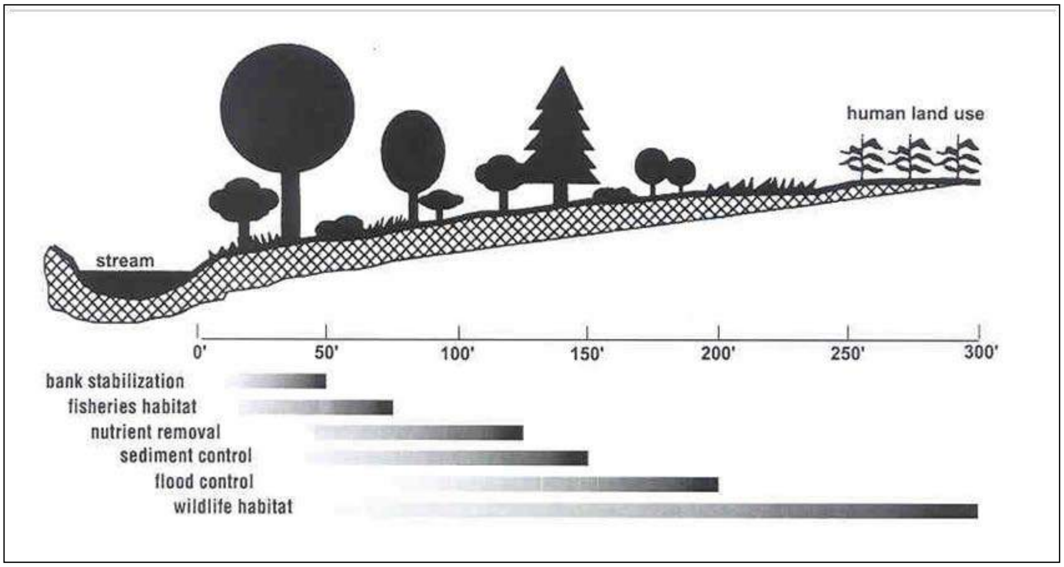
There are two design variants for sheet flow into filter strips and riparian buffers. The design, installation and management of these design variants are quite different, as shown in Table 5.8.

Table 5.8 The Two Design Variations of the Filter Strip and Vegetative Buffer		
Design Issue	**Sheetflow to Riparian Buffer**	**Sheetflow to Grass Filter Strip**
Soil and Ground Cover	Undisturbed Soils and Native Vegetation	Amended Soils and Dense Turf Cover
Construction Stage	Located Outside the Limits of Disturbance and Protected by ESC controls	Prevent Soil Compaction by Heavy Equipment
Typical Application	Adjacent Drainage to Stream Buffer or Forest Conservation Area	Treat small areas of impervious cover (e.g., 5,000 sf) close to source
Compost Amendments	No	Yes
Boundary Spreader	GD at top of filter	GD at top of filter PB at toe of filter
Boundary Zone	10 feet of level grass	At 25 feet of level grass
Concentrated Flow	ELS with 40 to 65 feet long level spreader* per one cfs of low, depending on width of conservation area	ELS with 1ength of level spreader per one cfs of flow
Maximum Slope, First Ten Feet of Filter	Less than 4%	Less than 2%
Maximum Overall Slope	6%	8%
GD: Gravel Diaphragm PB: Permeable Berm. ELS: Engineered Level Spreader, * See the NY Standards and Specifications for Erosion and Sediment Control for the design of level spreaders		

Recommended Application of Practice

- Direct runoff towards undisturbed riparian buffers or filter strips, using sheet flow or a level spreader to ensure sheet flow
- Use natural depressions for runoff storage
- Examine the slope, soils and vegetative cover of the buffer/filter strip
- Disconnect impervious areas to these areas
- Buffers may also be used as pretreatment

Figure 5.33 Preservation of buffers for various environmental quality goals



Benefits

- Riparian buffers and undisturbed vegetated areas can be used to filter and infiltrate stormwater runoff
- Natural depressions can provide inexpensive storage and detention of stormwater flows
- Can provide groundwater recharge
- Provides a valuable corridor for protection of stream or wetland and shoreline habitats
- Reduces the runoff volume that requires treatment and reduces SMP storage volume and size - See Figure 5.35
- Saves cost and possible land consumption for SMPs
- Promotes protection of natural hydrologic balance that maintains pre-developed groundwater recharge characteristics
- Reduces pollutant load delivery to receiving waters that will help meet water quality standard requirements

Figure 5.34 Use of a vegetated filter

Feasibility /Limitations

- Require space – Use in areas where land is available and land costs are not significantly high
- Will not be available to sites without riparian areas or already forested riparian areas

- May be inappropriate in areas of higher pollutant loading due to direct infiltration of pollutants–Integrate with other practices to ensure adequate treatment prior to discharge

- Channelization and premature failure can occur. This can be alleviated with proper design, construction and maintenance

- Requires delineation, permanent protection of natural areas, and enforcement for buffer area protections to be effective

- Sheet flow to a buffer is difficult to maintain and enforce

- Some sites may be too steep to effectively implement these practices

- Some residents may perceive natural buffer areas as potential nuisance areas for vermin and pests

- May be difficult to maintain minimum buffer distances and contributing flow paths

Required Elements

Filter Strip and Riparian Buffers to stream and wetland:

- Maximum contributing length shall be 150 feet for pervious and 75 feet for impervious surfaces

- Runoff shall enter the buffer as overland sheet flow; a flow spreader can be supplied to ensure this, if average contributing slope criteria cannot be met (Note: a level spreader shall be used between buffer slopes ranging between 3% and 15%; for buffer slopes beyond 15% this practice cannot be applied)

- Minimum width of a vegetated filter strip or undisturbed riparian buffer shall be 50 feet for slopes of 0% to 8%, 75 feet for slopes of 8% to 12% and 100 feet for slopes of 12 % to 15 %.

- Buffers must be fully vegetated.

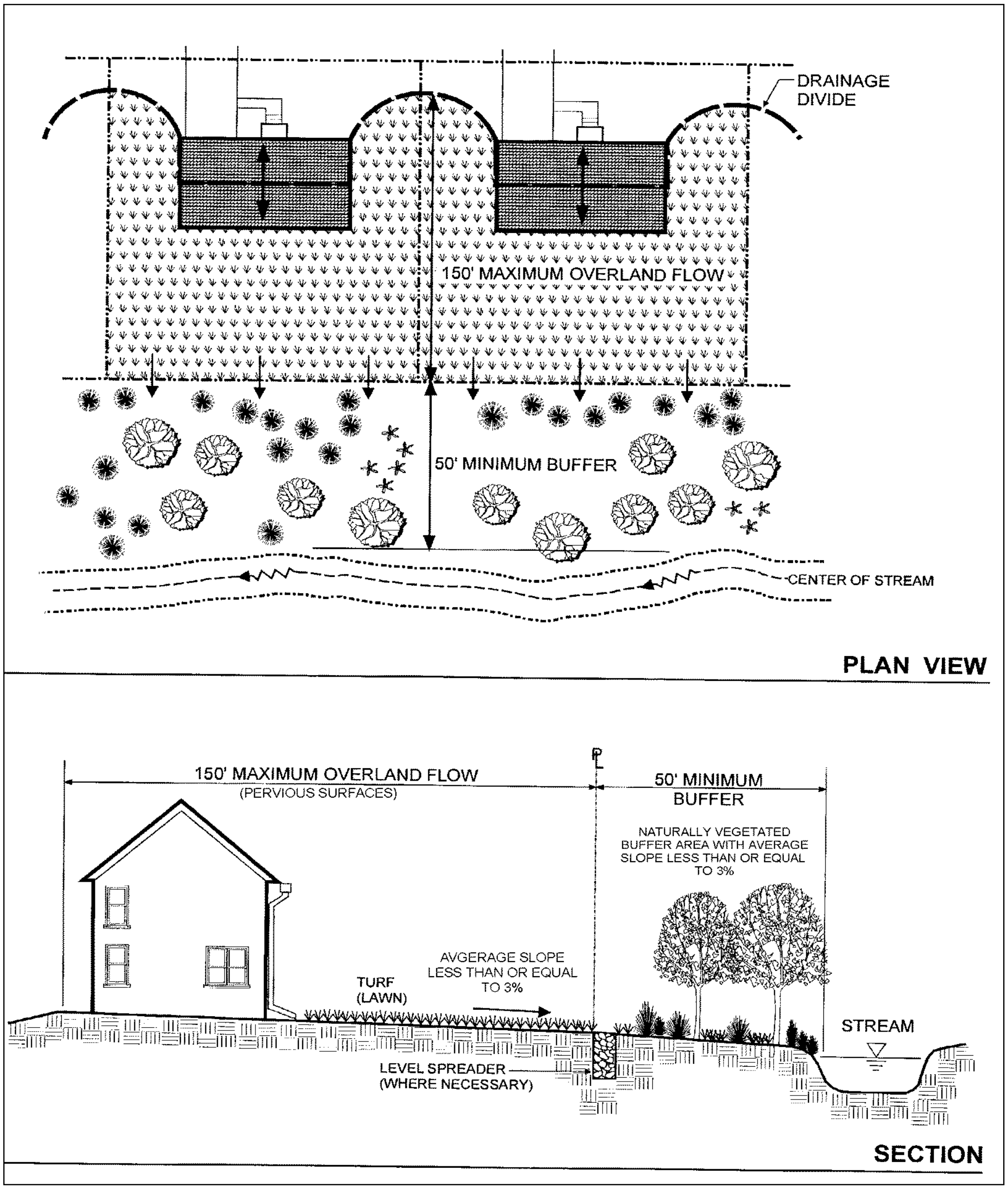
- Siting and sizing of this practice should address WQv and runoff reduction requirements and cannot result in overflow to undesignated areas.

Note: The NYS Freshwater Wetlands Act requires a 100-foot buffer for wetlands greater than 12.4 acres. Applicants required to meet other regulatory requirements are still eligible to meet the stream and wetland buffer credit provided the criteria cited above are also met.

Sizing and Design Criteria:

Subtract area draining by sheet flow to a riparian buffer or filter strip when computing the water quality volume. See Figure 5.36. If the area draining contains impervious surface, the Rv value is reduced as well. This practice is not applicable if the Disconnection of Rooftop Runoff or another area based practice is already being applied to this area.

Figure 5.35 Illustration of stream buffer practice. Site areas draining to stream buffer that meet the specified criteria are removed from site area when calculating storage volumes for water quality.



- Maximum contributing length shall be 150 feet for pervious surfaces and 75 feet for impervious cover

- In HSG C and D buffer length should be increased by 15%-20% respectively.

- For a combination of impervious cover (IC) and pervious cover (PC), use the following to determine the maximum length of each contributing area:

- 150 – IC = contributing length of PC (maximum IC = 75, maximum PC =150).

- Example: (75-IC)*2+IC= total of contributing length.
- The average contributing slope shall be 3% maximum unless a flow spreader is used
- Runoff shall enter the riparian corridor as overland sheet flow. A flow spreader can be supplied to ensure this, or if average contributing slope criteria cannot be met
- Not applicable if overland flow filtration/groundwater recharge is already credited for the same impervious cover
- Newly created riparian reforestation areas shall be maintained as a natural area

References/Further Resources

Center for Watershed Protection. 1998. *Better Site Design: A Handbook for Changing Development Rules in Your Community*. Available from www.cwp.org

City of Portland, Oregon. September 2004. *Stormwater Management Manual*. Bureau of Environmental Services, Portland, OR. Available from http://www.portlandonline.com/bes/

Prince George's County, MD. June 1999. *Low-Impact Development Design Strategies: An Integrated Design Approach.* Prince George's County, Maryland, Department of Environmental Resources, Largo, Maryland. Available from www.epa.gov

Virginia Department of Conservation and Recreation (VA DCR), Virginia DCR Stormwater Design Specification No.2, "Sheet Flow To A Filter Strip or Conserved Open Space", Version 1.6, Dated September 30, 2009.

5.3.5 Disconnection of Rooftop Runoff

Direct runoff from residential rooftop areas to designated pervious areas to reduce runoff volumes and rates. This practice may only be applied when "filtration/infiltration areas" are incorporated into the site design to receive runoff from rooftops. This can be achieved by grading the site to promote overland vegetative filtering or by providing infiltration areas (figure 5.38). If impervious areas are adequately disconnected, they can be treated as pervious area when computing the water quality volume requirements (resulting in a smaller Rv). Impervious areas are not deducted when calculating controls for larger storms but post-development peak discharges used to calculate "quantity" controls will likely be lower due to a longer time of concentration for the site.

Benefits

- Sending runoff to pervious areas and lower-impact practices increases overland flow time and reduces peak flows.
- Vegetated and pervious areas can filter and infiltrate runoff, thus increasing water quality.

Figure 5.37 Disconnection of rooftop to designated vegetated areas. Otter Creek, NY, NYSDEC.

Feasibility/Limitations

- Wet basements will result from re-directing rooftop runoff – *careful design and construction inspection will minimize this condition;*
- Re-directed rooftop runoff may increase a property owner's maintenance burden;
- Alternative rooftop runoff mitigation may be costly – *Rain barrels in fact are inexpensive and will reduce water use costs; green roofs reduce heating and cooling costs and roof replacement costs.*
- Local law may prohibit or limit rooftop disconnection.

Sizing and Design Criteria

If impervious areas are adequately disconnected, they can be deducted from the site's impervious total (Rv calculation) when computing WQv. Stormwater quantity and quality benefits can be achieved by routing runoff from rooftop areas to pervious areas such as lawns, landscaping, and depressed areas designated for infiltration. As with undisturbed buffers and natural areas, designated, revegetated areas such as lawns can act as biofilters for stormwater runoff and provide for infiltration in more permeable soils (hydrologic groups

A and B). Areas designated to receive runoff from rooftop disconnection must be properly graded for infiltration and conveyance in a non-erosive manner within the site boundary.

Required Elements

- Runoff from disconnected rooftop must be directed to a designated area that is appropriately graded for storage and infiltration of the runoff, re-vegetated and protected from other uses, and designed for conveyance in a non-erosive manner within the site boundary (Figure 5.39). Use splash pads or level spreaders (See the NY Standards and Specifications for Erosion and Sediment Control for the design of level spreaders) as required to distribute runoff to designated areas with infiltration capacity

- Disconnections are encouraged on permeable soils (HSGs A and B);

- In less permeable soils (HSGs C and D), permeability as well as water table depth and shall be evaluated by a certified/licensed professional to determine if a soil enhancement and spreading device is needed to provide sheet flow over grass surfaces. In some cases, soil restoration by deep tilling, de-compaction, compost amendment are needed to compensate for a poor infiltration capability;

Figure 5.38 Rooftop disconnection for storage and infiltration, Guilderland, NY, NYSDEC

- Runoff shall not come from a designated hotspot as listed in Section 4.11 of this Manual;

- The maximum contributing flow path length from impervious areas shall be 75 feet;

- Downspouts shall be at least 10 feet away from the nearest impervious surface to discourage “re-connections”;

- The contributing area of rooftop to each disconnected discharge shall be 500 square feet or less; larger roof areas up to 2,000 square feet may be acceptable with a suitable flow dispersion technique such as a level spreader;

- The disconnected, contributing impervious area shall drain through a vegetated channel, swale, or filter strip (filtration/infiltration areas) for a distance equal to or greater than the disconnected, contributing impervious area length;

- The entire vegetative filtration/infiltration area shall have an average slope of less than five (5) percent;

- Siting and sizing of this practice should address WQv and runoff reduction requirements and cannot not result in overflow to undesignated areas.

- For those areas draining directly to a buffer, either the Disconnection of Rooftop Runoff or Sheetflow to Riparian Buffer runoff reduction method can be used, but not both;
- Use splash pads or level spreaders as required to distribute runoff to designated areas with infiltration capacity.

Example Calculation

Base Data

Site Data: 108 Single Family Residential Lots (~ ½ acre lots, Figure 5.40)

Assume site is in Saratoga Springs, NY, where 90% rainfall = 1.0 inch.

Site Area = 45.1 ac

Original Impervious Area = 12.0 ac; or I = 12.0/45.1 = 26.6%

Original R_v = 0.05 + 0.009(26.6) = 0.29

Original WQv = (1.0 inch) (0.29) (45.1 acres)/12 = 1.09 acre-feet

Disconnection of Rooftop Runoff (see Figure 5.39)

42 houses disconnected to a designated, permanent, vegetated easement

Average house area = 2,000 ft^2

Net impervious area reduction = (42)(2,000 ft^2) / (43,560 ft^2/ac) = 1.93 acres

New impervious area = 12.0 – 1.93 = 10.1 acres; or I = 10.1/45.1 = 22.4%

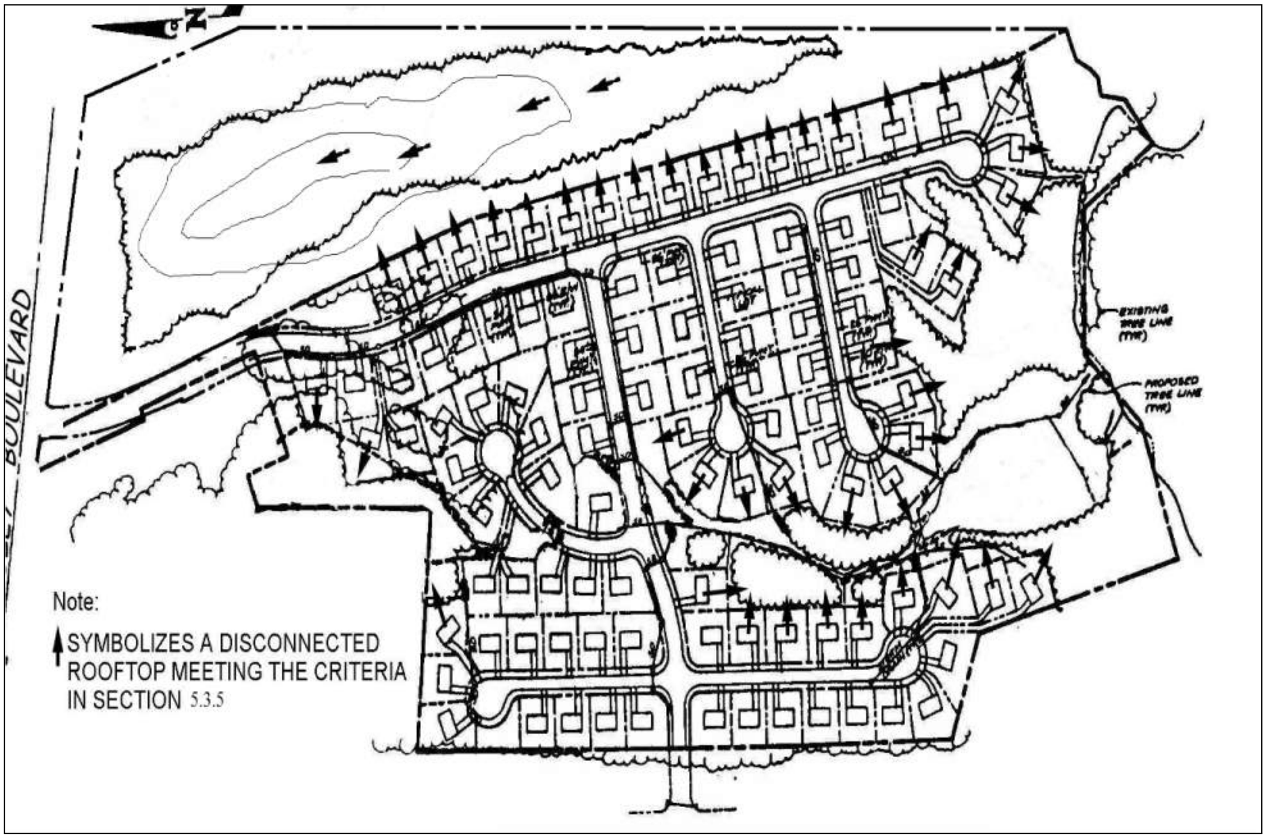
New R_v = 0.05 + .009(22.4) = 0.25

New WQv= (P)(R_v)(A)/12 = (1.0 in)(0.25)(45.1)/12 = 0.95 acre-feet

Percent Reduction Using Disconnection of Rooftop Runoff:

WQv = (1.09 – 0.95) / 1.09 = 13.3%

Figure 5.39 Schematic of rooftop disconnection to Filtration/Infiltration Zones. Impervious rooftop areas are treated as pervious for the calculation of water quality volume.



References/Further Resources

Virginia DCR Stormwater Design Specification No. 1, Rooftop (Impervious Surface) Disconnection, Version 1.7, 2010

http://www.chesapeakestormwater.net/all-things-stormwater/rooftop-disconnection-design-specification.html

Maryland Stormwater Design Manual, Volumes I & II, Chapter 5(Effective October 2000)

http://www.mde.state.md.us/programs/waterprograms/sedimentandstormwater/stormwater_design/index.asp

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.

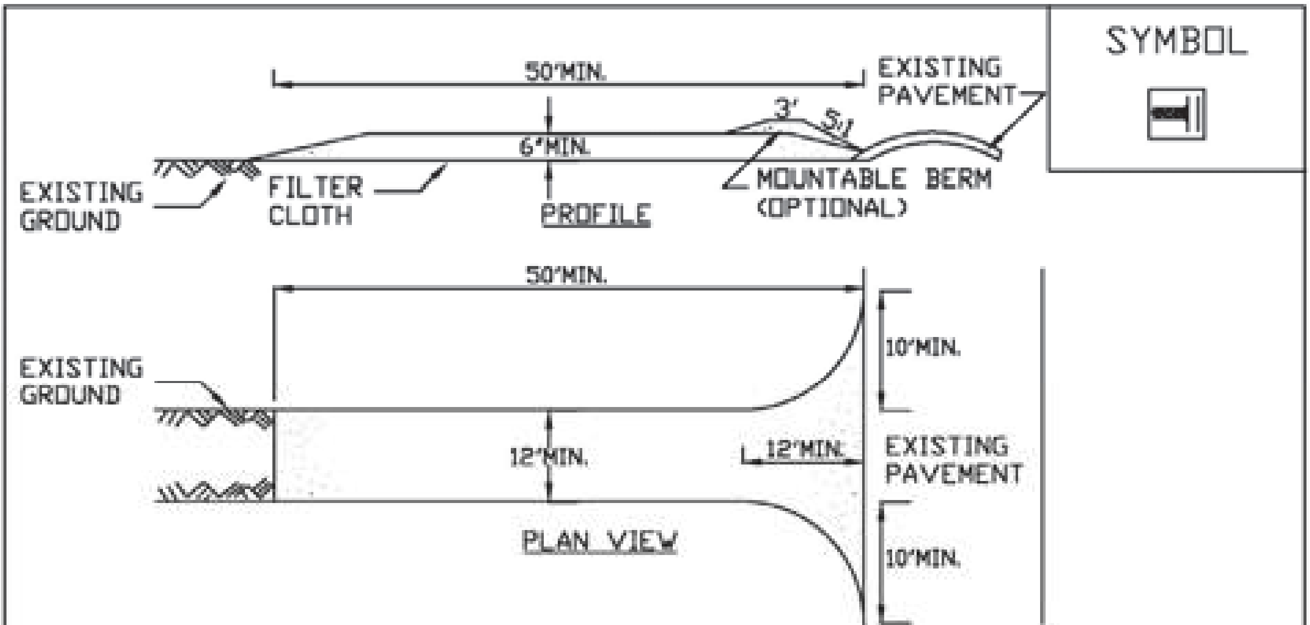
[3]Fabrics not meeting these specifications may be used only when design procedure and supporting documentation are supplied to determine aggregate depth and fabric strength.

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.

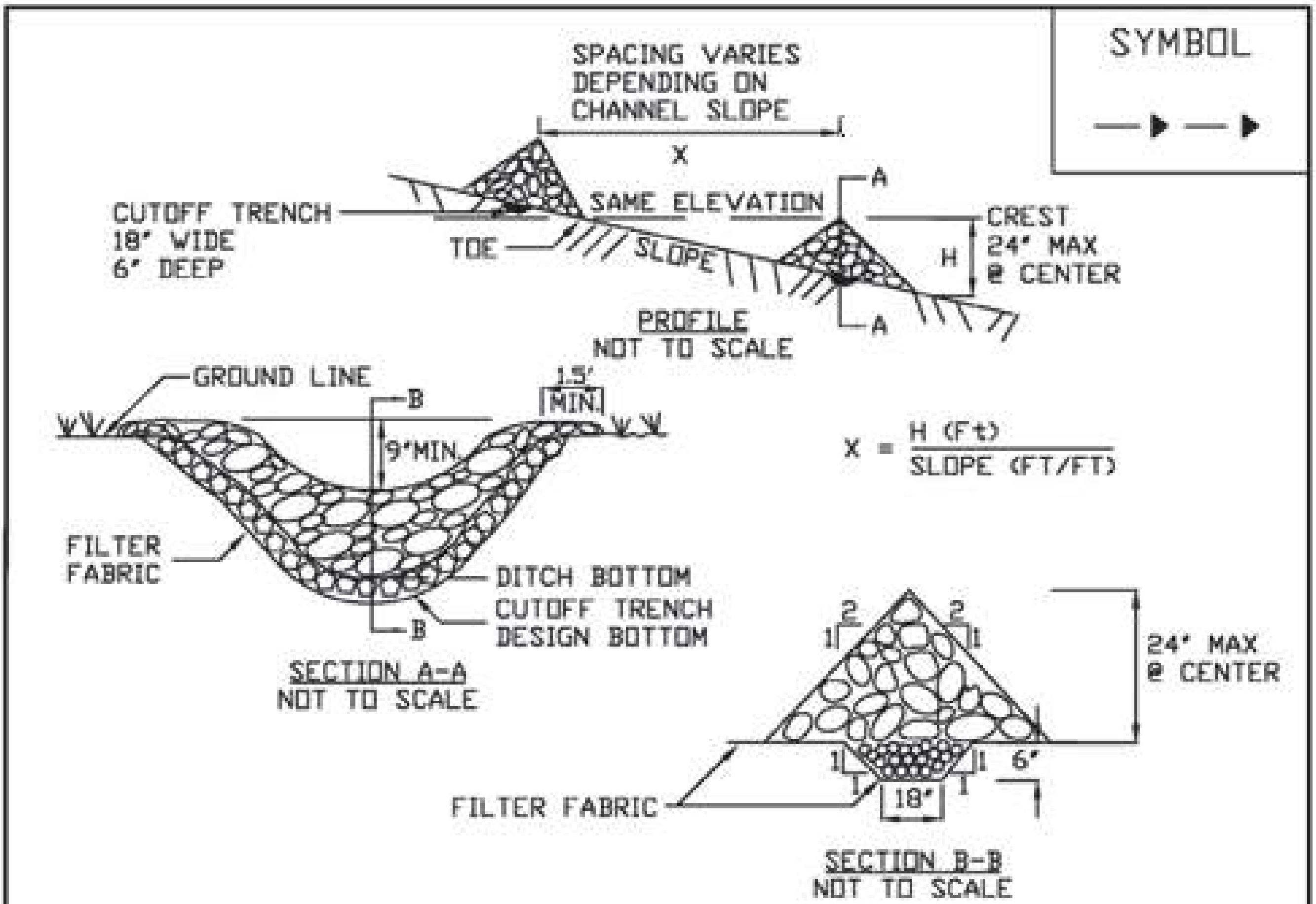
For filter sock or fiber roll check dams: The check dams will be anchored by staking the dam to the earth contact surface. The dam will extend to the top of the bank. The check dam will have a splash apron of NYS DOT #2 crushed stone extending a minimum 3 feet downstream from the dam and 1 foot up the 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.

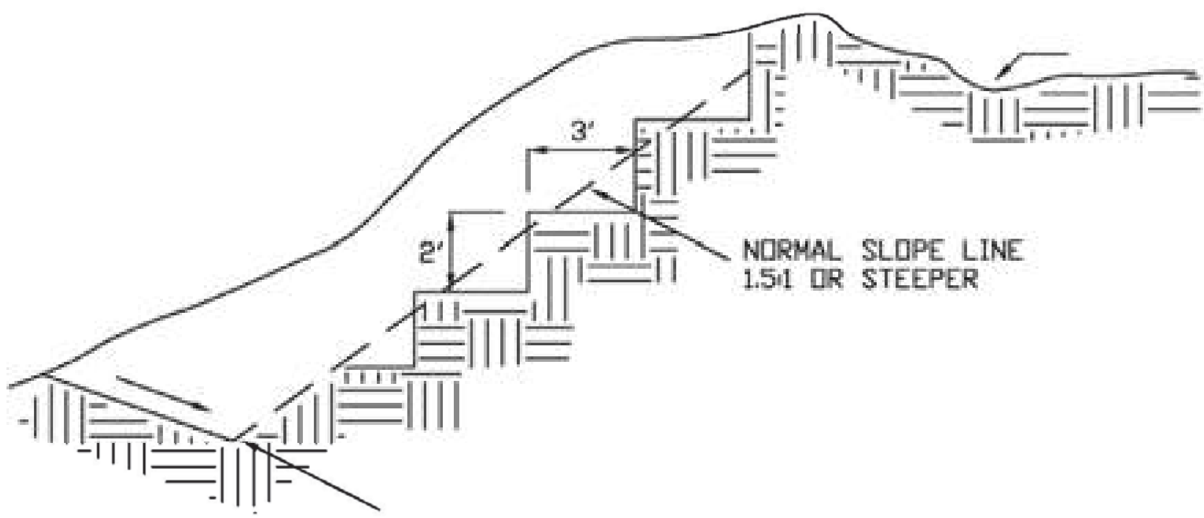
11. All benches shall be kept free of sediment during all phases of development.

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.

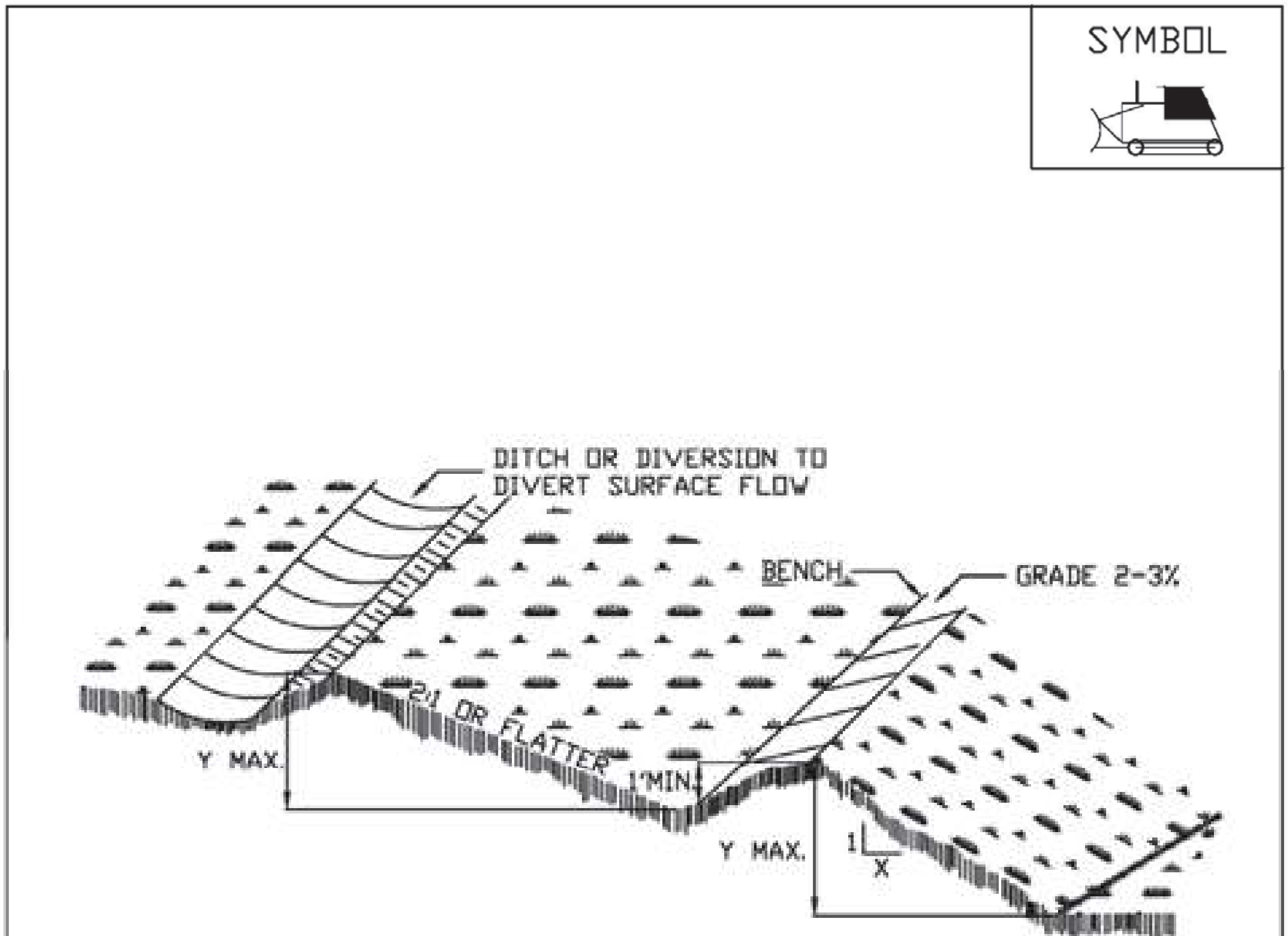
14. Stockpiles, borrow areas, and spoil areas shall be shown on the plans and shall be subject to the provisions of this Standard and Specifications.

Figure 4.9
Typical Section of Serrated Cut Slope



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	TYPICAL SECTION OF SERRATED CUT SLOPE

Figure 4.10
Landgrading



X	Y(MAX)
2	20'
3	30'
4	40'

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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.

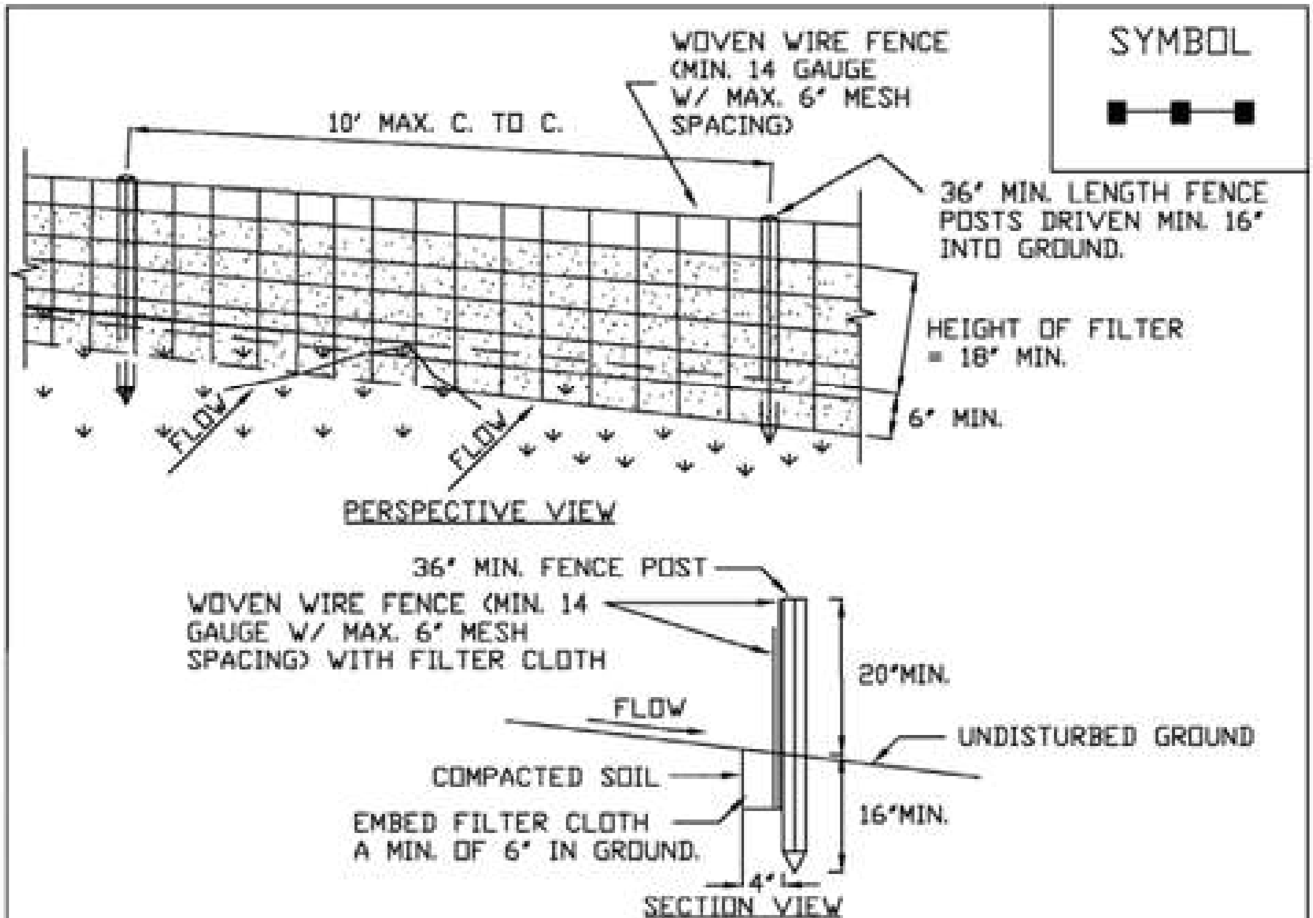
3. Wire Fence for reinforced silt fence: Wire fencing shall be a minimum 14 gage with a maximum 6 in. mesh opening, or as approved.

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

APPENDIX F
STORMWATER CONSTRUCTION SITE LOGBOOK

Stormwater Construction Site Logbook

Mill Creek Preserve Project
Caswell Road
Town of Dryden
Tompkins County, New York

Prepared For:
New York Land and Lakes Development LLC
415 State Highway 41
Smithville Flats, New York 13841

KEYSTONE ASSOCIATES
ARCHITECTS • ENGINEERS • SURVEYORS, LLC

58 Exchange Street • Binghamton, NY 13901 • Phone: 607.722.1100 • Fax: 607.722.2515 •www.keyscomp.com

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM
FOR CONSTRUCTION ACTIVITIES

CONSTRUCTION SITE LOG BOOK

Table of Contents

Properly completing forms such as those contained in this document meet the inspection requirement of NYSDEC SPDES GP for Construction Activities. Completed forms shall be kept on site at all times and made available to authorities upon request.

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 professional[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.

When construction starts, site inspections shall be conducted by the qualified professional at least every 7 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater (Construction Duration Inspections). 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. The Operator shall post at the site, in a publicly accessible location, a summary of the site inspection activities on a monthly basis (Monthly Summary Report).

The operator shall also prepare a written summary of compliance with this general permit at a minimum frequency of every three months (Operator's Compliance Response Form), while coverage exists. The summary should address the status of achieving each component of the SWPPP.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified professional perform a final site inspection. The qualified professional 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 "Qualified Professional means a person knowledgeable in the principles and practice of erosion and sediment controls, such as a Certified Professional in Erosion and Sediment Control (CPESC), soil scientist, licensed engineer or someone working under the direction and supervision of a licensed engineer (person must have experience in the principles and practices of erosion and sediment control).

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. Operators Certification

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

Name (please print):____

Title _______________________________________Date:______________

Address: ____

Phone: ___________ Email:_______________________________________

Signature:____

c. Qualified Professional's Credentials & Certification

" I hereby certify that I meet the criteria set forth in the General Permit to conduct site inspections for this project and that the appropriate erosion and sediment controls described in the SWPPP and as described in the following Pre-construction Site Assessment Checklist have been adequately installed or implemented, ensuring the overall preparedness of this site for the commencement of construction."

Name (please print):____

Title _______________________________________Date:______________

Address: ____

Phone: ___________ Email:_______________________________________

Signature:____

d. 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?

Pre-construction Site Assessment Checklist (continued)

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 Entrance

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. Perimeter 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;

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 Professional (print name) **Qualified Professional 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?

[ ] [ ] [ ] Is there residue from oil and floating substances, visible oil film, or globules or grease?

[ ] [ ] [ ] 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 and debris 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.

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.

2. Level 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

Runoff Control Practices (continued)

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

1. Stabilized Construction Entrance

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?

2. Silt Fence

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 (continued)

3. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated 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.

Sediment accumulation ___% of design capacity.

4. 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 accumulation is ___% of design capacity.

5. 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 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.
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:

III. Monthly Summary of Site Inspection Activities

Name of Permitted Facility:	Today's Date:	Reporting Month:
Location:	Permit Identification #:	
Name and Telephone Number of Site Inspector:		

Date of Inspection	Regular / Rainfall based Inspection	Name of Inspector	Items of Concern

Owner/Operator Certification:

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

____ ____

Signature of Permittee or Duly Authorized Representative   Name of Permittee or Duly Authorized Representative   date

Duly authorized representatives <u>must</u> have written authorization, submitted to DEC, to sign any permit documents.

APPENDIX G
EROSION AND SEDIMENT CONTROL
FOR SMALL HOMESITE CONSTRUCTION

APPENDIX G
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.

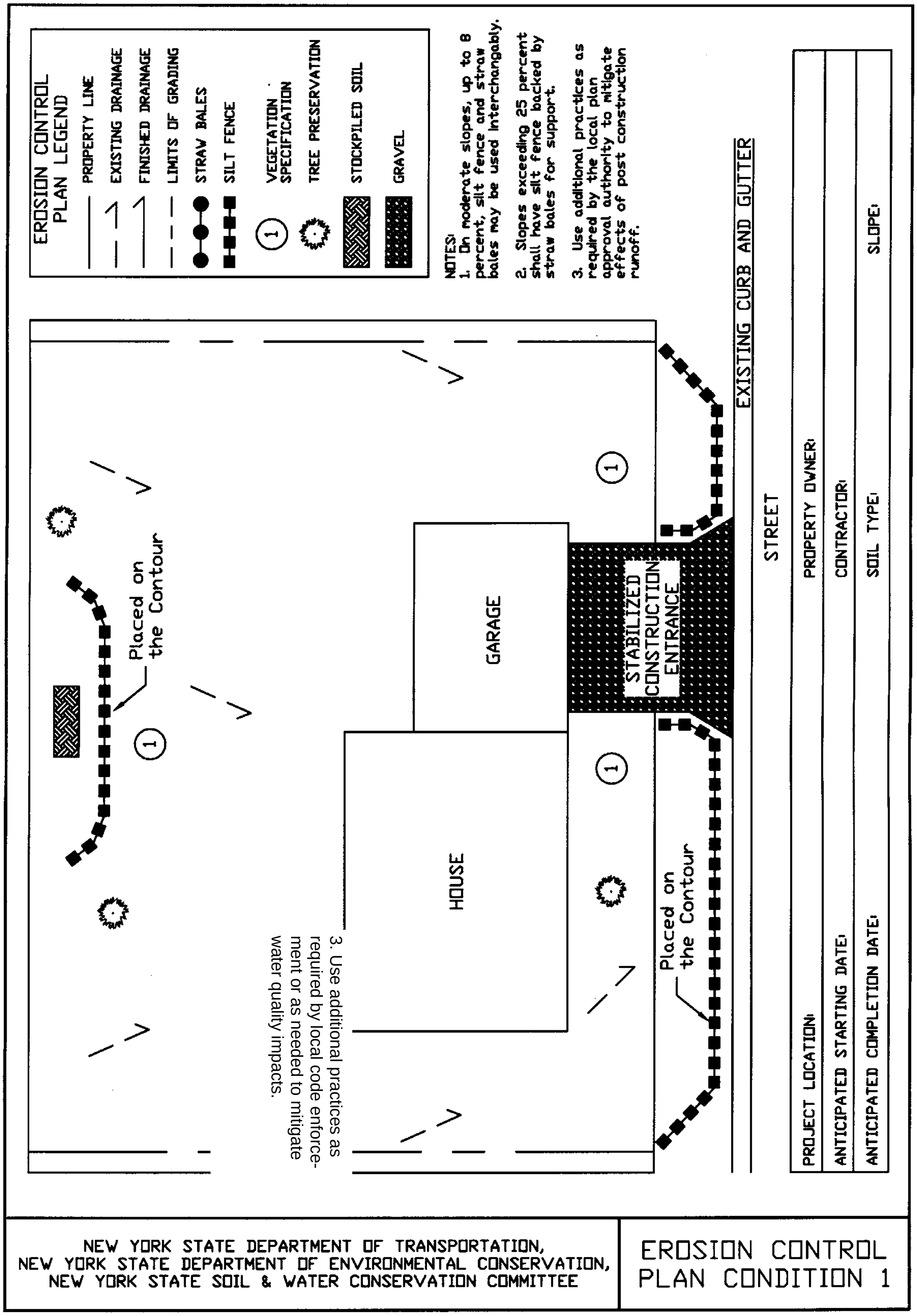
When excavating basement soils, move the soil to a location that is, or will be, vegetated, such as in the backyard or side yard area. This will increase the distance eroded soil must travel, through vegetation, to reach the storm sewer system. Piles should be situated so that sediment does not run into 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.**

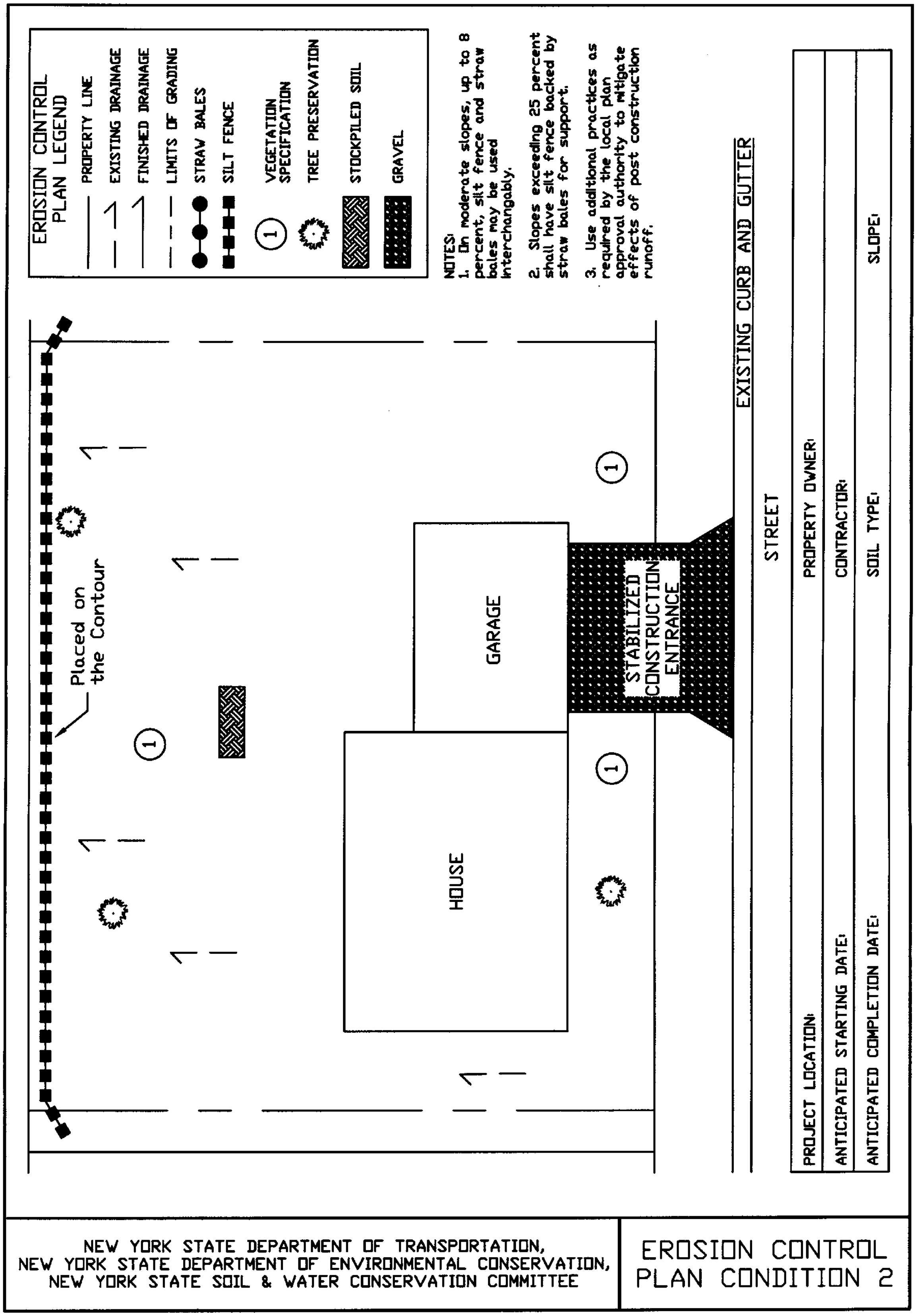
"I certify under penalty of law that I understand and agree to comply with the terms and conditions of the ESC plan for the construction site identified in such ESC plan as a condition of authorization to discharge stormwater. I also understand that the operator must comply with the terms and conditions 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:

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.

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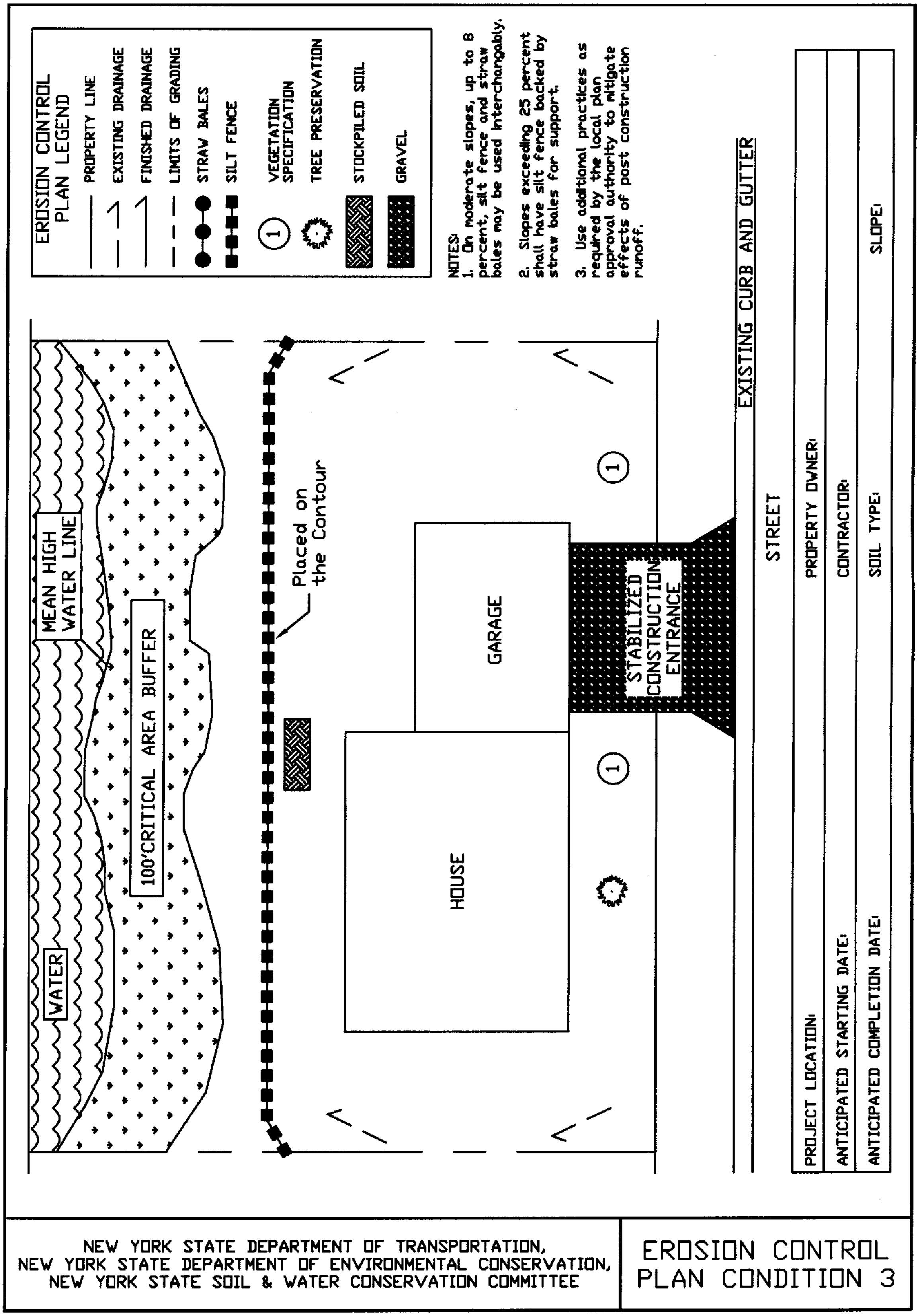
Builder/Contractor (print) Signature

Address

Telephone Fax E-mail

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.

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.

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Builder/Contractor (print) Signature

Address

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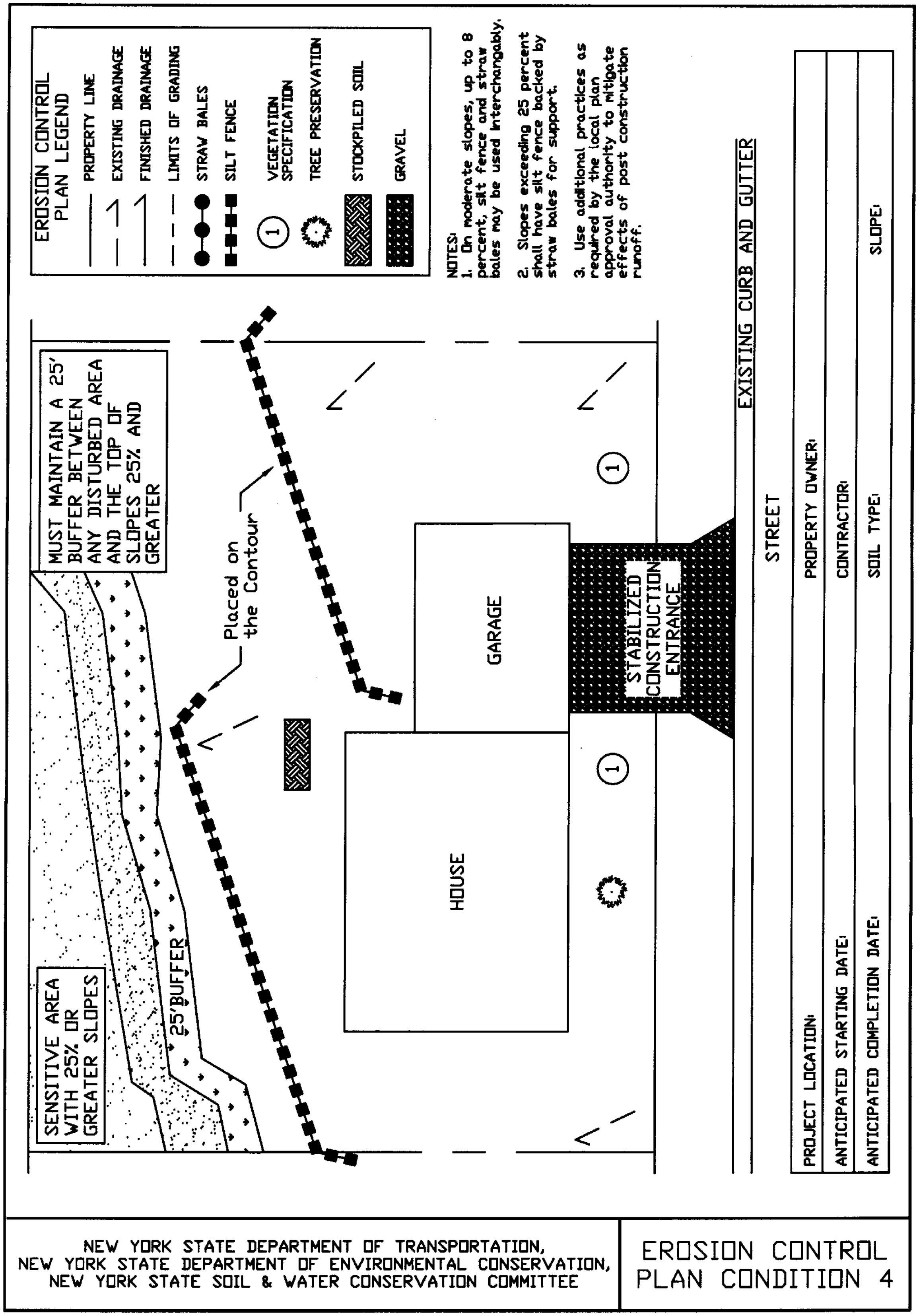
Figure E.4
Erosion Control Plan Condition 4



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
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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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.

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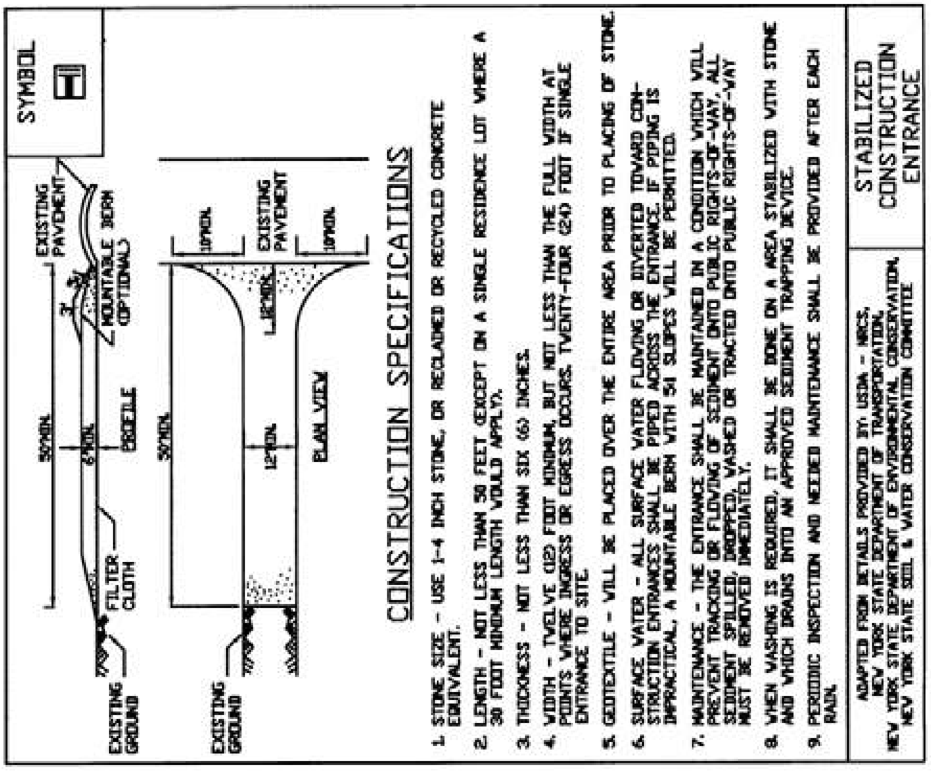
Builder/Contractor (print) Signature

Address

Telephone Fax E-mail

Figure E.5
Construction Details for Stabilized Construction Entrance and Silt Fence



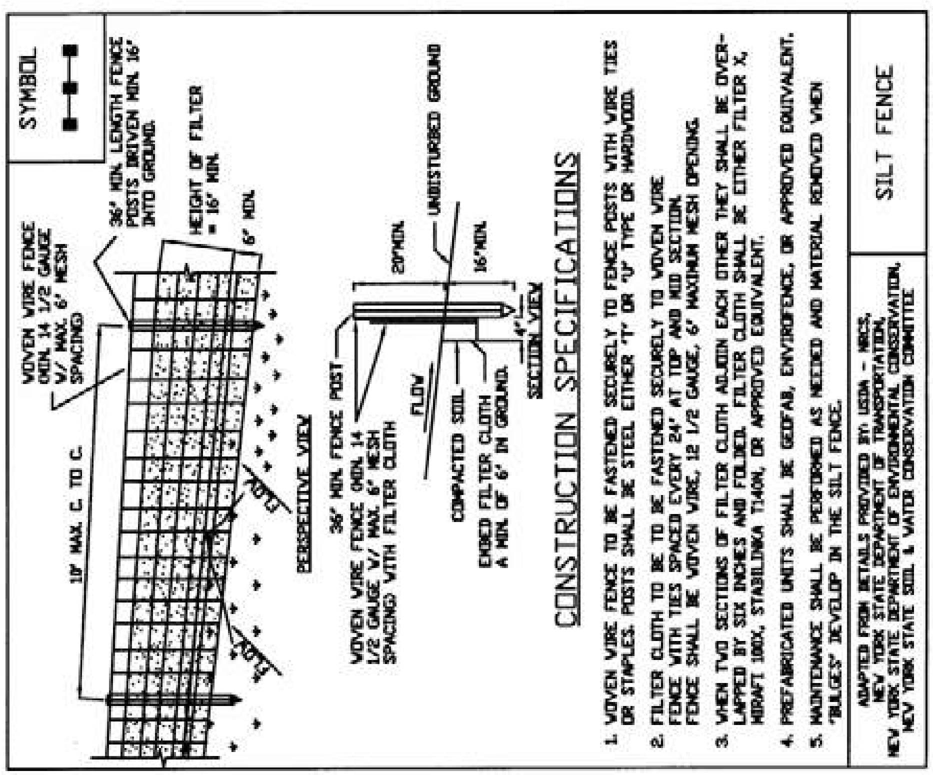


Figure E.6
Construction Details for Straw Bale Dike and Check Dam