STORMWATER POLLUTION PREVENTION PLAN

Garden World Associates, LLC
1262-1268 NY Route 9
Moreau, NY 12804

July 28, 2026

Prepared For:
Garden World Associates, LLC

Contractor:
To be determined

Prepared By:
Studio A Landscape Architecture + Engineering D.P.C.
74 Warren Street
Saratoga Springs, NY 12866

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DESCRIPTION OF EXISTING SITE

The project site is located at 1262-1268 NY Route 9 in Moreau, NY (Tax Map ID 76.-3-83.2). The site is approximately 39.04 acres. The existing site is undeveloped and has no impervious surfaces. The cover on the existing site is wooded with mature vegetation. A wetland exists in the northeast side of the parcel. The wetland ultimately drains to a stream which continues off-site.

The existing site primarily drains to the wetland at the eastern boundary and the ditch at the southern boundary at slopes ranging from 1% to 50%. No threatened or endangered species of plants or animals are located within the project site.

DESCRIPTION OF EXISTING SOILS

The United States Department of Agriculture (USDA) Soil Survey obtained from the Natural Resource Conservation Service website indicates the surficial soil on the property to be 89.1% Elmridge very fine sandy loam, 3 to 8% slopes (ElB), and 10.9% Wareham loamy sand (WA).

The ElB series is identified by the USDA as hydrologic soil group (HSG) “C/D”. These soils typically consist of very fine sandy loam before transitioning to silty clay, and eventually, deeper on the soil profile, clay. These soils exhibit the characteristics of HSG “C” when drained and seasonal high-water remains at least 24” below the existing surface. When saturated, these soils exhibit the characteristics of soil group “D”, which have a high run off potential. Stormwater calculations will assume the more conservative classification of HSG “D”.

The WA series is identified by the USDA as hydrologic soil group (HSG) “A/D”. These soils typically consist of loamy sand before transitioning to sand deeper on the soil profile. These soils exhibit the characteristics of HSG “A” when drained and seasonal high-water remains at least 24” below the existing surface. When saturated, these soils exhibit the characteristics of soil group “D”, which have a high run off potential. Stormwater calculations will assume the more conservative classification of HSG “D”.

DESCRIPTION OF PROPOSED DEVELOPMENT

Proposed site development includes the construction of a new office, equipment storage, a greenhouse, a crushed stone display area, an asphalt parking lot, landscaping, septic tank, and an extensive stormwater management system. Pervious areas remaining after development will be landscaped with native trees, or restored with grass, meadow, and flowering seed mixes. Anticipated disturbance areas, pervious and impervious areas are as follows:

Disturbance Area	±159,442 ft^2
Impervious *(existing/proposed)*	±0 ft^2 /±118,429 ft^2
Pervious *(existing/proposed)*	±473,717 ft^2 / ±355,288 ft^2

CONSTRUCTION PHASING

All proposed demolition and development are anticipated to be completed in a single phase, during the fall of 2026. Installation of silt fences shall be in accordance with the construction drawings prior to any disturbance of the existing ground surface. Immediately following the installation of silt fence, a stabilized construction entrance consisting of crushed stone and geotextile stabilization fabric will be installed as shown on the construction drawings. No land disturbance at any phase in construction shall proceed prior to the installation and establishment of required E&SC measures indicated on the construction drawings. All upstream construction shall be completed and stabilized before connection to the downstream infiltration facilities. A dense and vigorous vegetative cover shall be established over the contributing pervious drainage areas before runoff can be accepted into the facilities.

POLLUTION PREVENTION MEASURES

Any litter on site, including construction debris, will be picked up each day and disposed of into solid waste containers. The contractor shall provide an approved secondary containment system for all fuel and petroleum temporarily stored on site. During the placement of concrete for the building foundation, measures will be taken to ensure that fresh concrete does not enter any defined drainage paths and a concrete washout area will be provided by the contractor in accordance with the construction drawings. Topsoil and imported fill materials will be stockpiled in the protected areas indicated on the construction drawings.

SEDIMENTATION AND EROSION CONTROL

Prior to commencing any land clearing, the silt fence will be installed in accordance with the construction drawings and in accordance with the New York State Stormwater Management Design Manual, January 2024 and the New York Standards and Specifications for Erosion and Sediment Control. A stabilized temporary construction entrance at the location indicated on the construction drawings will be required for all construction traffic entering and leaving the site. The contractor is required to maintain all erosion and sediment control measures throughout the construction period.

All exposed surfaces not covered with paving, structures, and similar finished surfaces will be covered with topsoil and seeded within 10-days following substantial completion of construction to establish a turf covering or will be landscaped in accordance with the construction drawings. The areas receiving seed will be mulched to minimize erosions. Silt fences shall be installed downslope of the newly seeded areas. The silt fences shall be maintained and replaced as required during the course of construction until a well-established vegetative cover is established.

PERMANENT STORMWATER CONTROLS

Permanent stormwater controls for the proposed development will include the construction of stormwater runoff reduction and structural standard management practices (SMP) designed to meet water quality reduction and treatment goals. Permanent storm water controls include infiltration basins, each with a sedimentation forebay, an infiltration trench, and a vegetated swale.

Green infrastructure (GI) practices, sized in accordance with the New York State Department of Environmental Conservation Stormwater Management Design Manual, were applied under the proposed stormwater management system to provide a total Runoff Reduction Volume (RRv) greater than or equal to the WQv generated from the proposed development. The applied GI technique is a sedimentation forebay provided for each infiltration basin.

The peak runoff discharge passing through the stormwater system for the channel protection volume (Cpv: 1 year 24-hour storm event), overbank flood (Qp:10-year storm event) and extreme storm ((Qf)h: 100-year storm event) will be attenuated to less than or equal to the pre-development flow rates at design points common to both the pre- and post-development conditions.

Based on the soil hydrologic groups in the proposed construction areas, the following curve numbers were assumed for the hydrologic analyses:

Land Cover Type	Curve Number
Road	98
Building	98
Grass, Good, HSG D	80
Woods, Good, HSG D	77
Crushed Stone	67

The site was divided into 3 subcatchment areas based on the flow direction of runoff generated from the proposed structures, paved areas, landscaped areas, and undisturbed areas. Subcatchment land cover and runoff control descriptions are provided in Table 1.

Table 1. Subcatchment Area Descriptions

Subcatchment	Landcover	Stormwater Control Measures
1S	Asphalt Road & Parking, Building Roof, Grass, Undisturbed Forest	Runoff is conveyed via overland flow to a forebay. The forebay outlets via broad crested weir to a swale. The vegetated swale conveys water to an infiltration basin which ultimately discharges to Design Point #1 via a broad crested weir.
2S	Crushed Stone Display Area	The crushed stone display area functions as an infiltration trench. Runoff is conveyed to the display area which overflows to subcatchment 3 and ultimately discharges to design point 2.
3S	Grass, Undisturbed Forest	No stormwater controls are necessary, and runoff ultimately discharges to design point 2.

Notes:
1.Refer to the Construction Drawings for stormwater management practice locations and details.
2. Stormwater management control measures shall be in accordance with New York State Stormwater Management Design Manual, January 2024.

Design storm events were assumed to be customized storm curves based upon Extreme Precipitation Data in New York & New England available through a joint collaboration between the Northeast Regional Climate Center and Natural Resources Conservation Service for Type II, 24-hour 1-year, 10-year, and 100-year storm events. Rainfall magnitudes for the storm events were determined as follows: 2.24 inches, 3.72 inches, and 6.25 inches. The runoff rates were modeled using HydroCAD version 10.0 software which calculates runoff based on the modified SCS TR-20 method. The peak runoff discharge passing through the proposed stormwater management system will be attenuated to be less than or equal to the pre-development flow rates for the 1-year, 10-year, and 100-year 24-hour storm at established discharge design points.

Peak off-site discharge rates for the 24-hour 1-yr, 10-year, and 100-year storm, as well as the volume for the 1-year storm are summarized in the following table:

Table 2. Peak Off-site Discharge Volume and Rates

Location	1-year Storm Vol. (ft^3/s)		10-year Storm Peak Discharge (ft^3/s)		100-year Storm Peak Discharge (ft^3/s)	
	Pre	Post	Pre	Post	Pre	Post
Design Point # 1	2.10	0.00	6.76	0.00	16.32	3.84
Design Point # 2	1.30	0.95	3.85	2.80	8.94	6.51

Water Quality volumes (WQv) were established in accordance with the New York State Department of Environmental Conservation Stormwater Management Design Manual, January 2024, with a 90% recurrence interval storm event rainfall magnitude assumed to be 1.20-inches based on site locality. The following table summarizes the RRv and treated WQv values of the Green Infrastructure Practices and Standard Management Practices used to pre-treat a RRv min.= 1,484 cubic feet and a WQv = 8,569 cubic feet.:

Table 4. Green Infrastructure and Standard Management Practice Summary

Subcatchment	Green Infrastructure/SMP Provided	RRv Provided (ft^3)	WQv Treated (ft^3)
1	Infiltration Basin (IF-2)	5,820	10,941
2	N/A	-	-
3	N/A	-	-

RRv total = 5,820 $ft^3 \geq$ Min. RRv; RRv + $WQv_{treated}$ = 16,761 $ft^3 \geq$ WQv

SITE INSPECTIONS DURING CONSTRUCTION

A qualified inspector as defined in Appendix A of the New York State Department of Environmental Conservation SPDES General Permit for Stormwater Discharges from Construction Activity Permit No. GP-0-25-001 shall conduct construction inspections in accordance with Part IV.C of GP-0-25-001.

MAINTENANCE OF STORMWATER MANAGEMENT SYSTEM

The broad crested weirs, catch basins, and basin outlet structure should be checked for the accumulation of debris that may constrict runoff from flowing freely at the outlet invert elevations. In addition to the maintenance of the stormwater practices described, the lawns and landscaped areas shall be maintained in good condition to prevent erosion. Any deteriorated areas of lawn shall be re-seeded, and a stable turf reestablished. Additionally, the property owner shall provide arrangements for the future maintenance of the post-construction stormwater control measures in accordance with the *Sample Stormwater Control Facility Maintenance Agreement* (Appendix E) and the *Operation and Maintenance Manual* (Appendix F) to be recorded in the office of the County Clerk or its terms shall be incorporated into covenants appearing in the deed, declarations of covenants and restrictions or other such documents to ensure that record notice of its terms is provided to future owners of the site.

RETENTION OF RECORDS

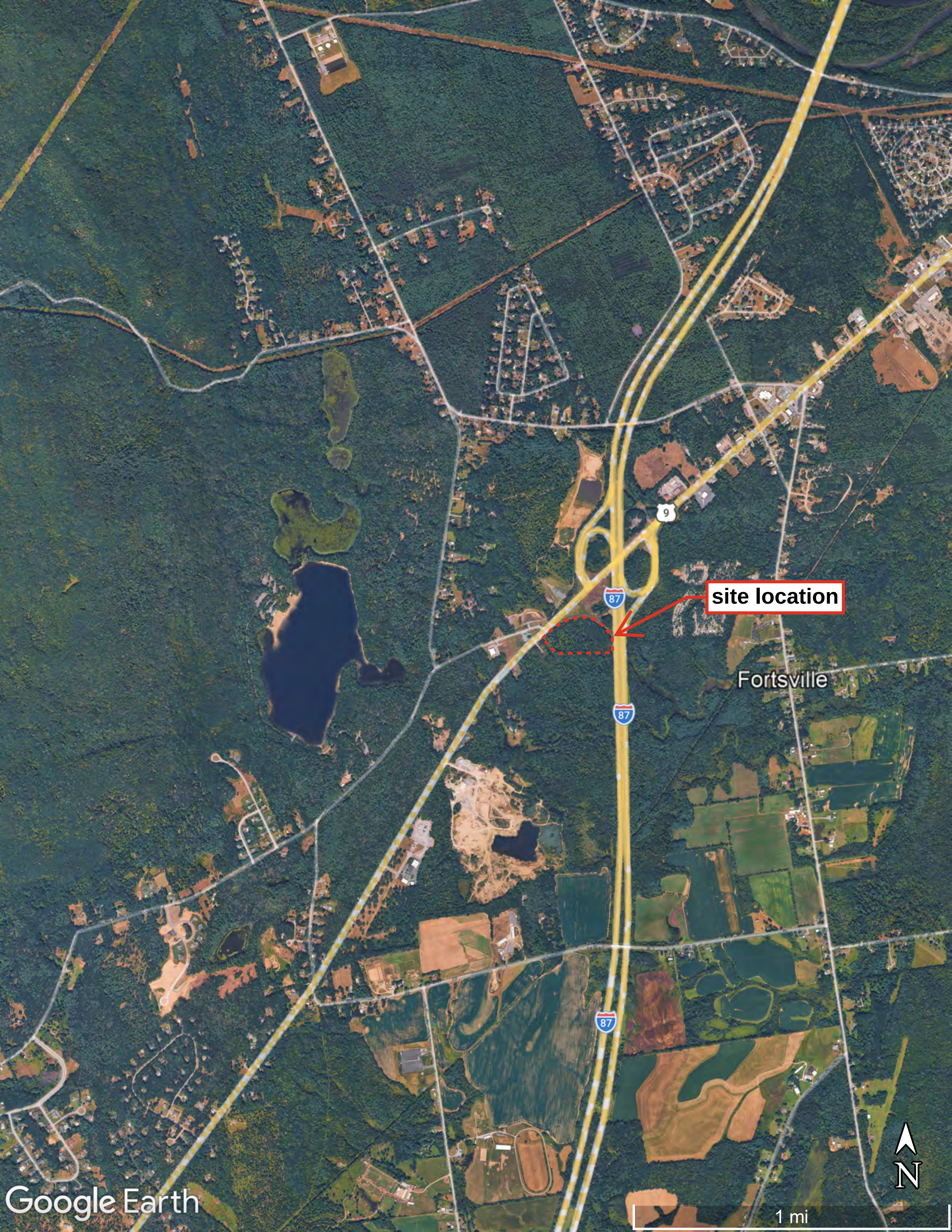
The contractor shall maintain at the project site a copy of this Storm Water Pollution Prevention Plan (SWPPP). In addition, the contractor shall maintain a site logbook which will contain all storm water and erosion control inspection reports to be prepared by the qualified professional. A current copy of the construction drawings shall also be kept in the logbook with comments that may have been added by the qualified inspector.

SWPPP Report Prepared by:

Matthew Huntington

Matthew E. Huntington, PE
Principal
For Studio A | Landscape Architecture + Engineering

APPENDIX A PROJECT LOCATION MAP


site location
Fortsville
9
87
87
87
Google Earth
1 mi
N

APPENDIX B USDA SOIL SURVEY

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

Saratoga County, New York

July 20, 2026

Preface

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

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

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

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

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

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

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Contents

How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

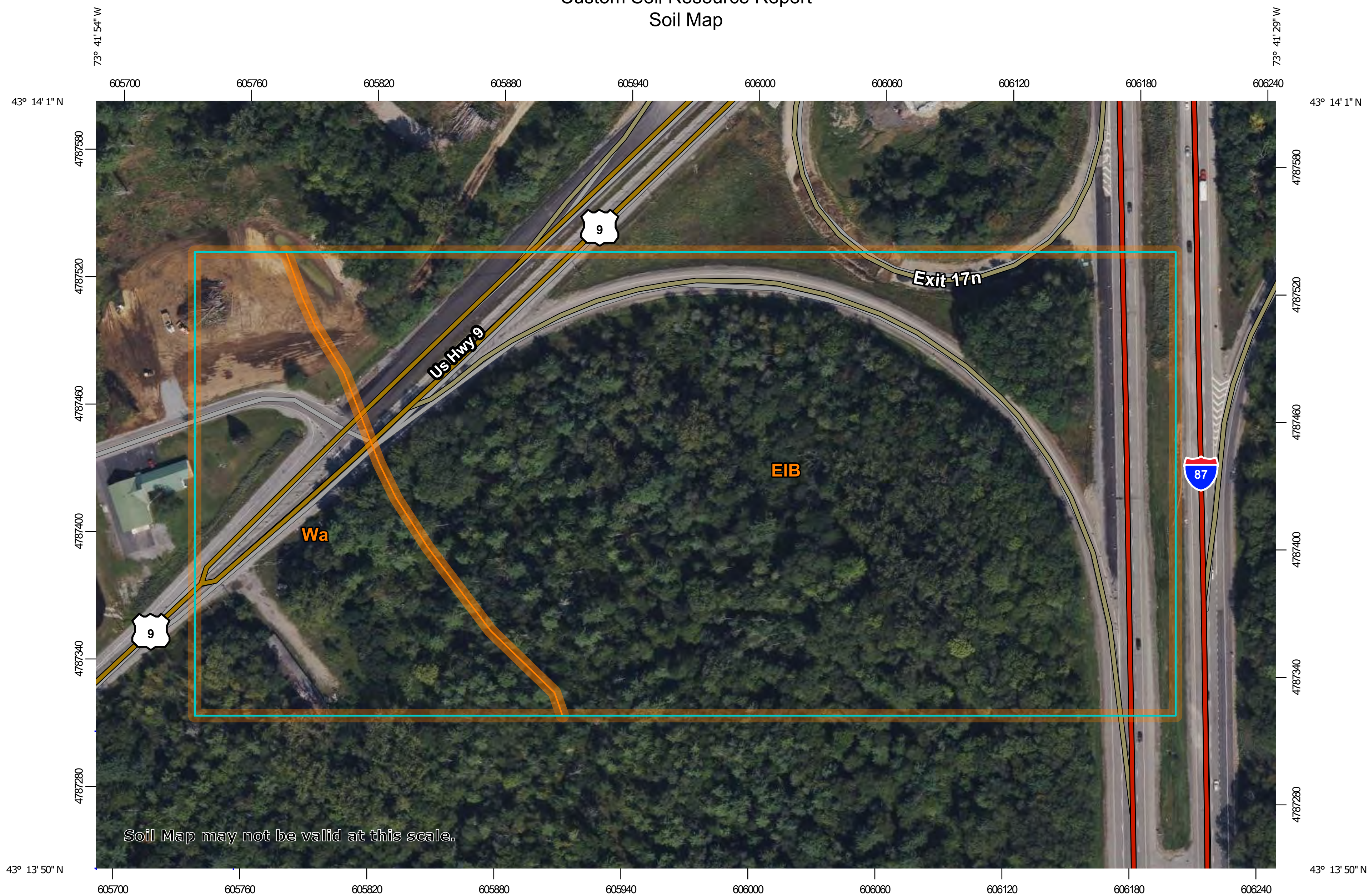
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree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

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

Soil Map

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

Soil Map



Map Scale: 1:2,550 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0, 35, 70, 140, 210

Feet: 0, 100, 200, 400, 600

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil 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 1:24,000.

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

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

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

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

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

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

Soil Survey Area: Saratoga County, New York
Survey Area Data: Version 25, Sep 2, 2025

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

Date(s) aerial images were photographed: Sep 9, 2022—Oct 22, 2022

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
ElB	Elmridge very fine sandy loam, 3 to 8 percent slopes	19.7	78.6%
Wa	Wareham loamy sand	5.4	21.4%
Totals for Area of Interest		**25.1**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

Saratoga County, New York

ElB—Elmridge very fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9w9w
Elevation: 130 to 410 feet
Mean annual precipitation: 36 to 48 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Elmridge and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Elmridge

Setting

Landform: Proglacial lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy over clayey glaciolacustrine or marine deposits

Typical profile

H1 - 0 to 8 inches: very fine sandy loam
H2 - 8 to 18 inches: very fine sandy loam
2Bw - 18 to 39 inches: silty clay
2C - 39 to 72 inches: clay

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 40 inches to strongly contrasting textural stratification
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 15 percent

Oakville

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

Deerfield

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

Shaker

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

Wa—Wareham loamy sand

Map Unit Setting

National map unit symbol: 9wd4
Elevation: 100 to 1,000 feet
Mean annual precipitation: 36 to 48 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Wareham, poorly drained, and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wareham, Poorly Drained

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy glaciofluvial or deltaic deposits

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
H2 - 2 to 8 inches: loamy sand
H3 - 8 to 19 inches: loamy sand
C - 19 to 72 inches: sand

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F144AY028MA - Wet Outwash
Hydric soil rating: Yes

Minor Components

Wareham, somewhat poorly drained

Percent of map unit: 10 percent
Hydric soil rating: No

Deerfield

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

Raynham

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

Cheektowaga

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

Scarboro

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

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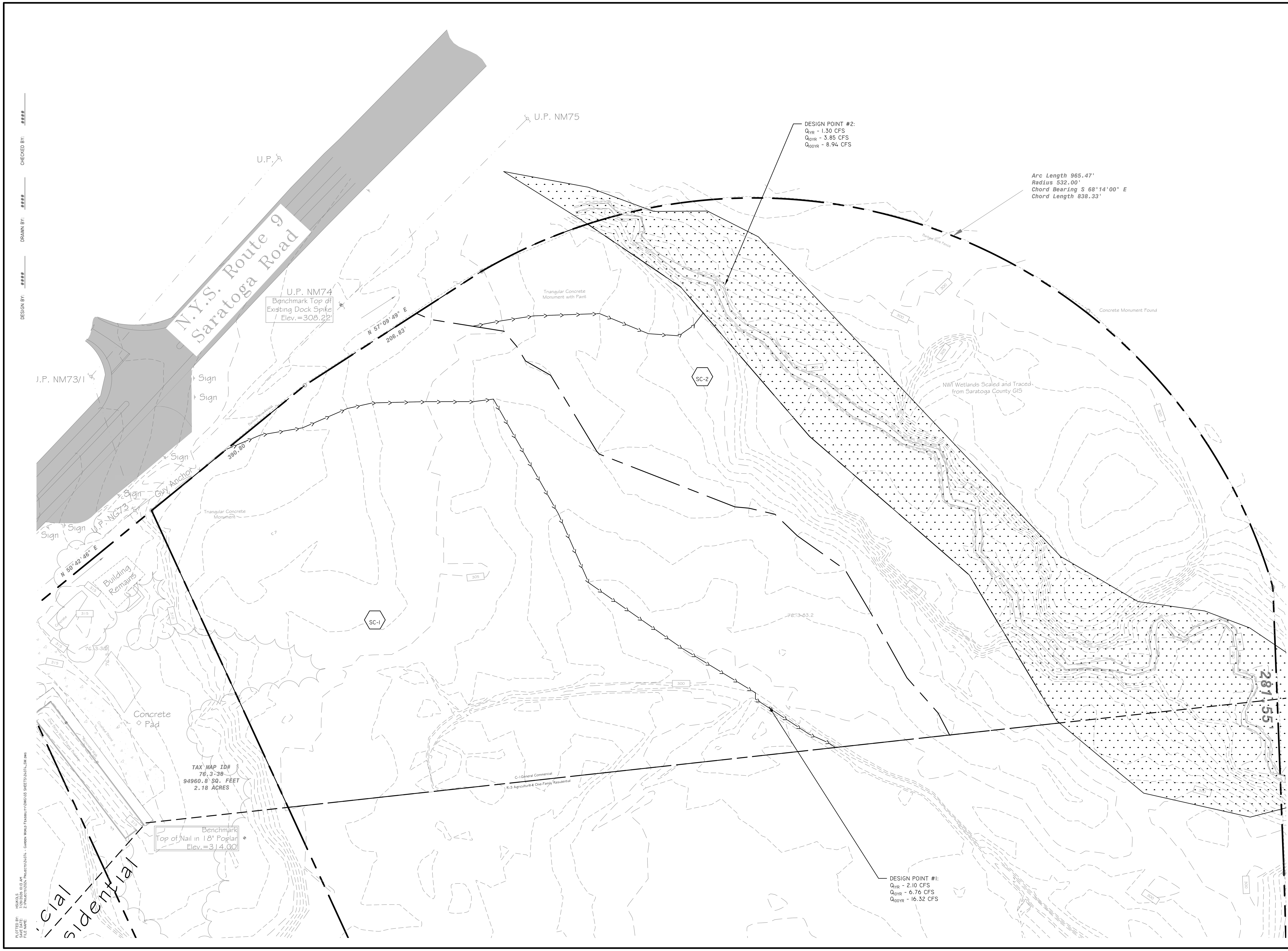
APPENDIX C SUBCATCHMENT PLANS



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LEGEND
- PROPERTY LINE
- SUBCATCHMENT BOUNDARY
- TIME OF CONCENTRATION

NORTH

GRAPHIC SCALE
40 0 20 40 80
1 INCH = 40 FEET
ON 24" X 36" SHEET

MAP INFORMATION:
BASE MAP INFORMATION OBTAINED FROM MAP SURVEY FOR GARDEN WORLD ASSOCIATES BY VAN DUSEN & STEVES, LAND SURVEYORS, AUGUST 8, 2024.

DIG SAFE NOTE:
THIS PLAN SET WAS DRAFTED WITHOUT THE BENEFIT OF "DIG SAFE" MARKINGS. UTILITIES SHOWN ARE NOT WARRANTED TO BE EXACT OR COMPLETE. THE CONTRACTOR SHALL CONTACT "DIG SAFE" AT 811 BEFORE COMMENCING ANY WORK AND SHALL PRESERVE EXISTING UTILITIES WHICH ARE NOT SPECIFIED TO BE REMOVED IN THIS PLAN SET.

REVISIONS

DATE	DESCRIPTION

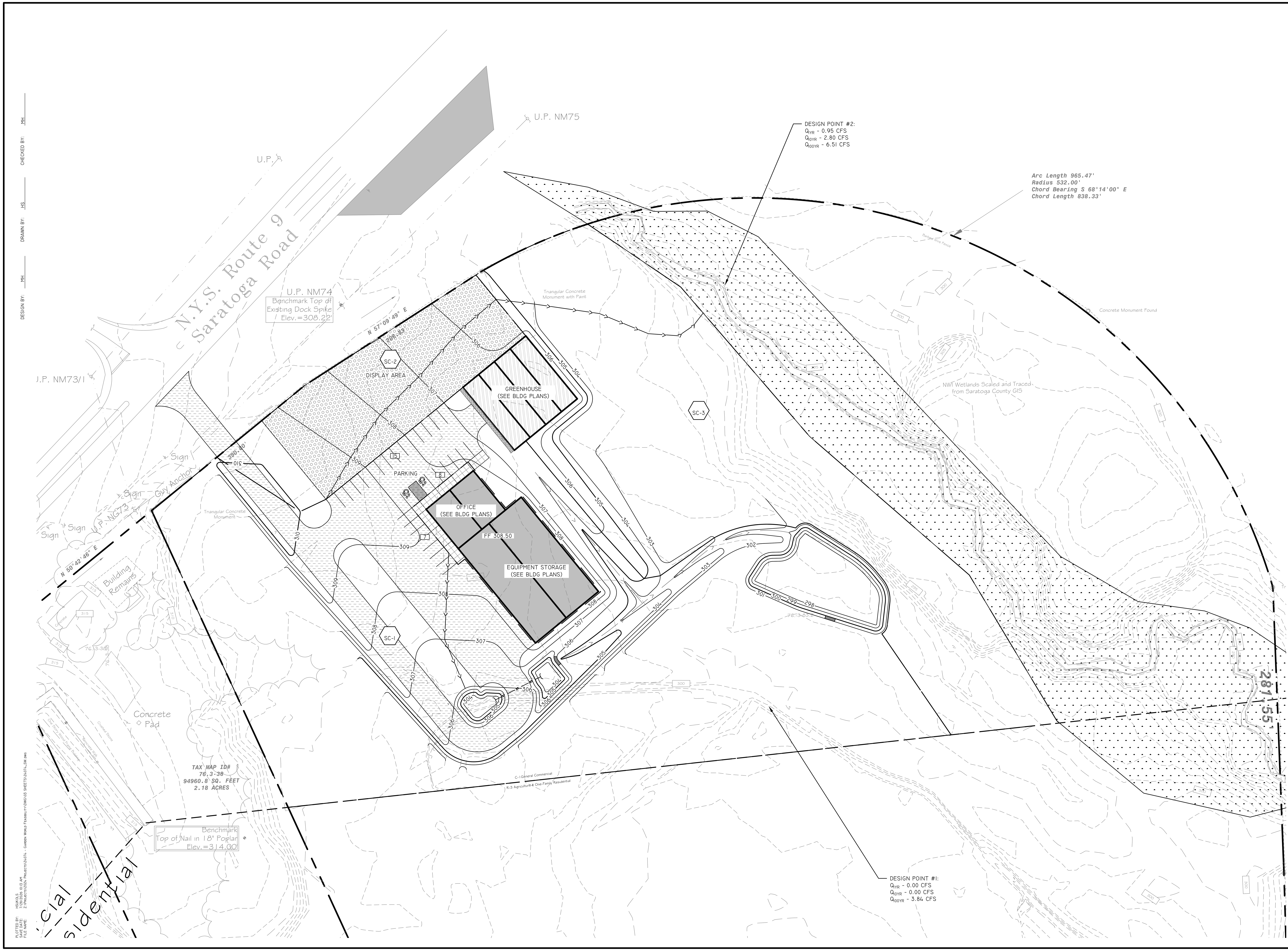
DRAWINGS NOT FOR CONSTRUCTION

PREPARED FOR
GARDEN WORLD ASSOCIATES, LLC

PROJECT
OFFICE AND PRODUCT DISPLAY SITE PLAN
MOREAU, NY

DRAWING TITLE
STORMWATER PRE

PROJECT NO. 24074
DATE: 07/28/2026
DRAWING NO.
DWG OF 11



DESIGN BY: MH
DRAWN BY: HS
CHECKED BY: MH

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REVISIONS

DATE	DESCRIPTION

DRAWINGS NOT FOR CONSTRUCTION

PREPARED FOR
GARDEN WORLD ASSOCIATES, LLC

PROJECT
OFFICE AND PRODUCT DISPLAY SITE PLAN
MOREAU, NY

DRAWING TITLE
STORMWATER POST

PROJECT NO. 24074
DATE: 07/28/2026
DRAWING NO.
DWG OF 11

APPENDIX D STORMWATER CALCULATIONS

Green Infrastrucure Calculations

PROPOSED SITE COVERAGE DATA

		Impervious Cover			Pervious Cover				
DP-ID	Total Area	Road	Building	Gravel	Woods, Good, HSG D	Grass, Good, HSG D	1-yr Storm Runoff Vol.	*Check Total Area*	*Site Coverage*
	SF	SF	SF	SF	SF	SF	CF	*sf*	*25.4%*
1	192,394	33,654	20,320	-	88,511	49,909	13,849	*192,394*	
2	27,187	985	-	23,159	-	3,043	764	*27,187*	
3	88,039	-	-	-	62,699	25,340	4,583	*88,039*	
4								*0*	
5								*0*	
6								*0*	
7								*0*	
8								*0*	
9								*0*	
10								*0*	
11								*0*	
12								*0*	
13								*0*	
Total	307,620	34,639	20,320	23,159	151,210	78,292	19,196		

EXISTING SITE COVERAGE DATA

		Impervious Cover			Pervious Cover				
DP-ID	Total Area	Road	Building		Woods, Good, HSG D	Grass, Good, HSG D	Disturbed Imp	*Check Total Area*	*Site Coverage*
	SF	SF	SF	SF	SF	SF	CF	*sf*	*0.0%*
1	227,508	-	-	-	223,331	4,177		*227,508*	
2	80,112	-	-	-	80,112	-		*80,112*	
3								*0*	
4								*0*	
5								*0*	
6								*0*	
7								*0*	
8								*0*	
9								*0*	
10								*0*	
Total	307,620	0	0	0	303,443	4,177	0		

Green Infrastrucure Calculations

NOI SUMMARY

#	Question	Value *cf*	Value *af*
28	Total WQv Req'd	8,569	0.197
30	Total RRv Prov.	5,820	0.134
31	RRv. Prov. > WQv Req'd	no	
32	Min. RRv	1,484	0.034
32a	RRv Prov. > Min. RRv	yes	
33a	Total WQv Prov.	10,941	0.251
34	WQv Prov. + RRv Prov.	16,761	0.385
35	WQv + RRv > WQv Req'd	yes	
		Req'd *af*	Provided *af*
36	CPv	*0.190*	*0.385*
		Pre *cfs*	Post *cfs*
37	Overbank	10.6	0.0
38	Qf	25.3	6.0

WATER QUALITY VOLUME

P = 1.2 in.

		Proposed Imp.				
	Total Area	Imp. Area	Percent Imp.	Rv	WQv Req'd	SMP Description
DP-ID	*ac.*	*ac.*			*cf*	
1	4.417	1.239	28%	0.30	5820	IF-1
2	0.624	0.554	89%	0.85	2309	-
3	2.021	0.000	0%	0.05	440	-
4	-	0.000	-	-	-	-
5	-	0.000	-	-	-	-
6	-	0.000	-	-	-	-
7	-	0.000	-	-	-	-
8	-	0.000	-	-	-	-
9	-	0.000	-	-	-	-
10	-	0.000	-	-	-	-
11	-	0.000	-	-	-	-
12	-	0.000	-	-	-	-
13	-	0.000	-	-	-	-
Total	7.062	1.793	25%	0.28	8569	

Green Infrastrucure Calculations

SOILS DATA

Soil Group	Area	S
A		55%
B		40%
C		30%
D	473717.00	20%
Total	473717.00	20%

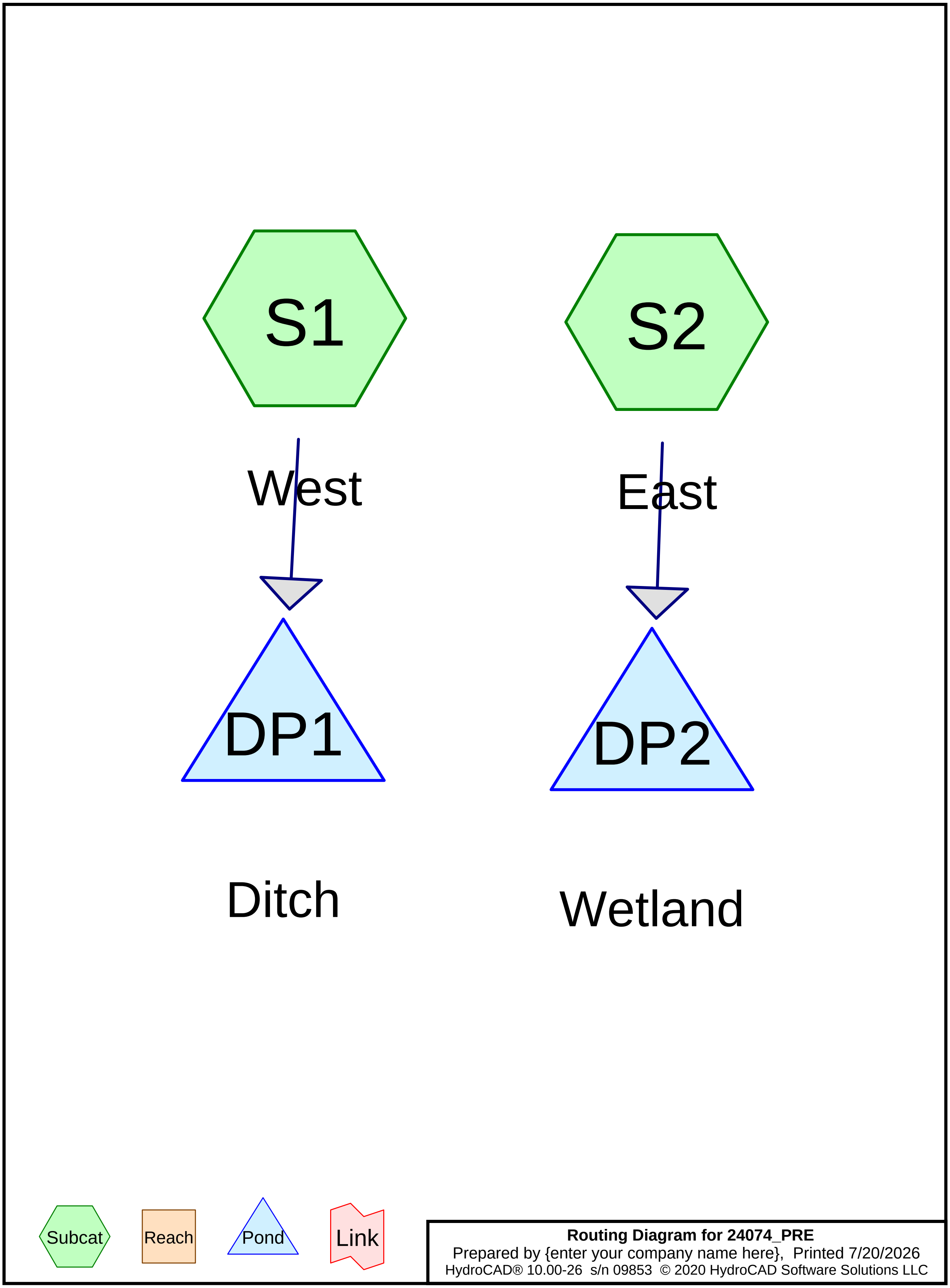
PRACTICE SUMMARY

GI Practice	Total Area	Total Imp. Area	RRv Prov.	WQv Treated
	ac.	*ac.*	*cf*	*cf*
IF-1	0.624	0.554	0	0
IF-2	4.417	1.239	5,820	10,941
IF-4	0.000	0.000	0	0
W-5	0.000	0.000	-	0
P-1	0.000	0.000	-	0
F-4	0.000	0.000	0	0
F-5	0.000	0.000	0	0
RR-1	0.000	0.000	0	-
Total	5.041	1.793	5,820	10,941

Infiltration Basin *(IF-2)*

Practice ID:	IF1					
Subcatchment Data						
SC-ID	**Total Area** *ac*	**Imp. Area** *ac*	**Percent Imp.**	**Rv**	**WQv** *cf*	**P** *in*
1	4.42	1.24	0.28	0.30	5820	1.2
Pretreatment						
In-situ soil infiltration rate					33.96	*in./hr.*
Pretreatment Sizing					50%	*WQv*
Req'd Pretreatment Vol.					2910	*cf*
Provided Pretreatment Vol.					3452	*cf*
Basin Sizing						
Design Vol.		5820	*cf*			
Basal Area Req'd		1940	*sf*			
Design Depth		3	*ft*	*from b/basin to first outlet device*		
Basal Area Provided		5587	*sf*			
Vol. Provided*		16761	*cf*			
Runoff Reduction						
RRv		5820	*cf*	*100% of basin vol.*		
WQV		10941	*cf*	*vol. not reduced*		
Are sizing req. met?		✓				

PRE CONSTRUCTION



Routing Diagram for 24074_PRE
Prepared by {enter your company name here}, Printed 7/20/2026

Summary for Subcatchment S1: West

Runoff = 2.10 cfs @ 12.27 hrs, Volume= 0.236 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.24"

Area (sf)	CN	Description
47,675	77	Woods, Good, HSG D
175,848	77	Woods, Good, HSG D
3,985	39	>75% Grass cover, Good, HSG A
227,508	76	Weighted Average
227,508		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	31	0.0157	0.05		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.60"
19.6	738	0.0157	0.63		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
29.9	769	Total			

Summary for Subcatchment S2: East

Runoff = 1.30 cfs @ 12.08 hrs, Volume= 0.089 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.24"

Area (sf)	CN	Description
80,112	77	Woods, Good, HSG D
80,112		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	35	0.0197	0.06		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.60"
3.4	142	0.0197	0.70		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
0.8	63	0.0625	1.25		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
14.5	240	Total			

Summary for Pond DP1: Ditch

Inflow Area = 5.223 ac, 0.00% Impervious, Inflow Depth = 0.54" for 1-yr event
Inflow = 2.10 cfs @ 12.27 hrs, Volume= 0.236 af
Primary = 2.10 cfs @ 12.27 hrs, Volume= 0.236 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond DP2: Wetland

Inflow Area = 1.839 ac, 0.00% Impervious, Inflow Depth = 0.58" for 1-yr event
Inflow = 1.30 cfs @ 12.08 hrs, Volume= 0.089 af
Primary = 1.30 cfs @ 12.08 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Subcatchment S1: West

Runoff = 6.76 cfs @ 12.26 hrs, Volume= 0.665 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=3.72"

Area (sf)	CN	Description
47,675	77	Woods, Good, HSG D
175,848	77	Woods, Good, HSG D
3,985	39	>75% Grass cover, Good, HSG A
227,508	76	Weighted Average
227,508		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	31	0.0157	0.05		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.60"
19.6	738	0.0157	0.63		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
29.9	769	Total			

Summary for Subcatchment S2: East

Runoff = 3.85 cfs @ 12.07 hrs, Volume= 0.245 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=3.72"

Area (sf)	CN	Description
80,112	77	Woods, Good, HSG D
80,112		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	35	0.0197	0.06		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.60"
3.4	142	0.0197	0.70		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
0.8	63	0.0625	1.25		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
14.5	240	Total			

Summary for Pond DP1: Ditch

Inflow Area = 5.223 ac, 0.00% Impervious, Inflow Depth = 1.53" for 10-yr event
Inflow = 6.76 cfs @ 12.26 hrs, Volume= 0.665 af
Primary = 6.76 cfs @ 12.26 hrs, Volume= 0.665 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond DP2: Wetland

Inflow Area = 1.839 ac, 0.00% Impervious, Inflow Depth = 1.60" for 10-yr event
Inflow = 3.85 cfs @ 12.07 hrs, Volume= 0.245 af
Primary = 3.85 cfs @ 12.07 hrs, Volume= 0.245 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Subcatchment S1: West

Runoff = 16.32 cfs @ 12.25 hrs, Volume= 1.565 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.25"

Area (sf)	CN	Description
47,675	77	Woods, Good, HSG D
175,848	77	Woods, Good, HSG D
3,985	39	>75% Grass cover, Good, HSG A
227,508	76	Weighted Average
227,508		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	31	0.0157	0.05		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.60"
19.6	738	0.0157	0.63		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
29.9	769	Total			

Summary for Subcatchment S2: East

Runoff = 8.94 cfs @ 12.07 hrs, Volume= 0.567 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.25"

Area (sf)	CN	Description
80,112	77	Woods, Good, HSG D
80,112		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	35	0.0197	0.06		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.60"
3.4	142	0.0197	0.70		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
0.8	63	0.0625	1.25		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
14.5	240	Total			

Summary for Pond DP1: Ditch

Inflow Area = 5.223 ac, 0.00% Impervious, Inflow Depth = 3.60" for 100-yr event
Inflow = 16.32 cfs @ 12.25 hrs, Volume= 1.565 af
Primary = 16.32 cfs @ 12.25 hrs, Volume= 1.565 af, Atten= 0%, Lag= 0.0 min

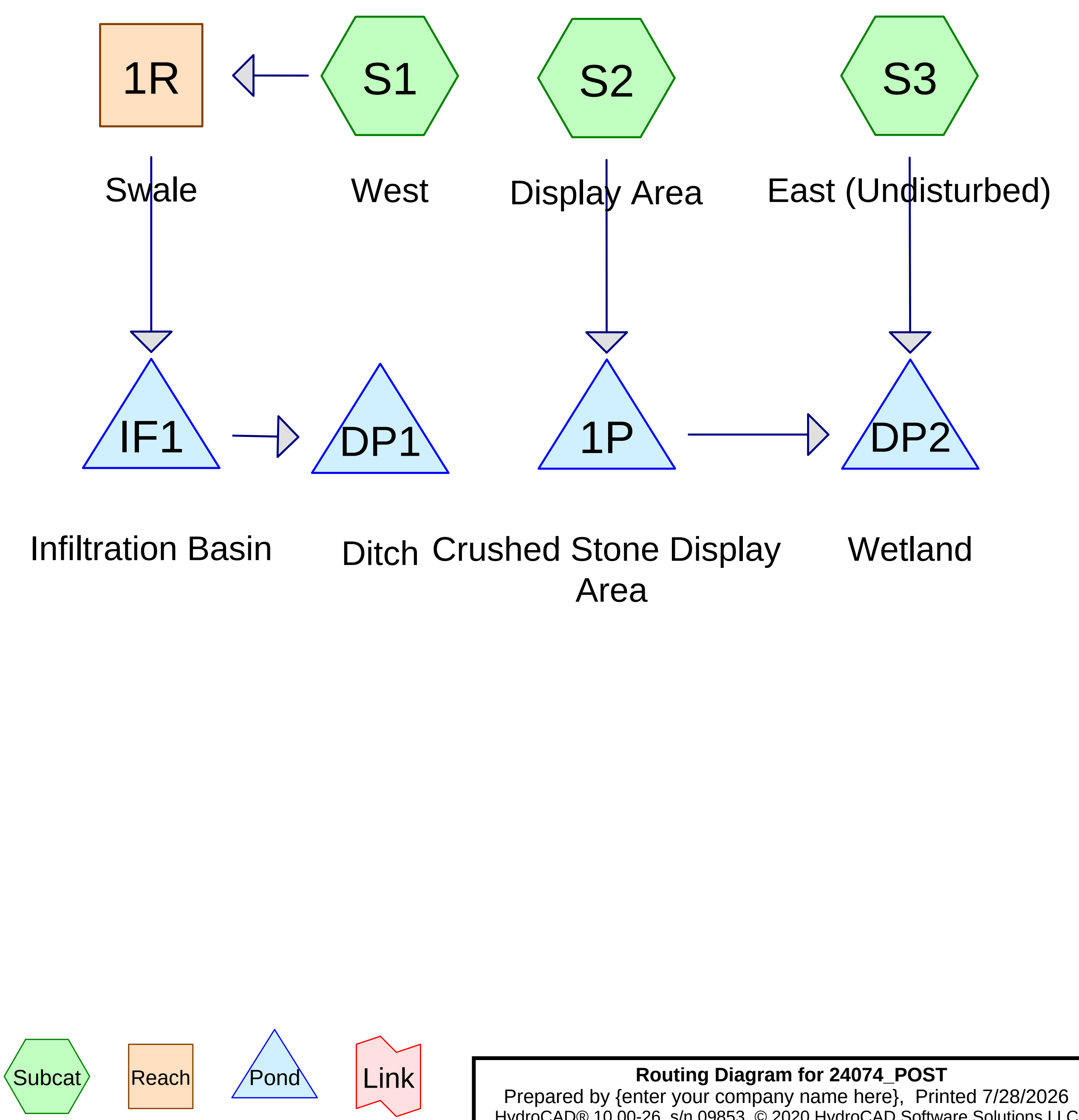
Routing by Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond DP2: Wetland

Inflow Area = 1.839 ac, 0.00% Impervious, Inflow Depth = 3.70" for 100-yr event
Inflow = 8.94 cfs @ 12.07 hrs, Volume= 0.567 af
Primary = 8.94 cfs @ 12.07 hrs, Volume= 0.567 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

POST CONSTRUCTION



Routing Diagram for 24074_POST
Prepared by {enter your company name here}, Printed 7/28/2026
HydroCAD® 10.00-26 s/n 09853 © 2020 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.797	80	>75% Grass cover, Good, HSG D (S1, S2, S3)
0.532	67	Crushed Stone Display Area (S2)
0.795	98	Paved parking, HSG D (S1, S2)
0.466	98	Unconnected roofs, HSG D (S1)
3.471	77	Woods, Good, HSG D (S1, S3)

Summary for Subcatchment S1: West

Runoff = 7.70 cfs @ 11.94 hrs, Volume= 0.318 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.24"

Area (sf)	CN	Adj	Description
88,511	77		Woods, Good, HSG D
49,909	80		>75% Grass cover, Good, HSG D
20,320	98		Unconnected roofs, HSG D
33,654	98		Paved parking, HSG D
192,394	84	83	Weighted Average, UI Adjusted
138,420			71.95% Pervious Area
53,974			28.05% Impervious Area
20,320			37.65% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	88	0.0180	1.16		**Sheet Flow, parking lot** Smooth surfaces n= 0.011 P2= 2.60"
1.5	15	0.0600	0.16		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.60"
0.1	47	0.0200	7.17	47.77	**Parabolic Channel, swale** W=10.00' D=1.00' Area=6.7 sf Perim=10.3' n= 0.022 Earth, clean & straight
2.9	150	Total			

Summary for Subcatchment S2: Display Area

Runoff = 0.40 cfs @ 11.90 hrs, Volume= 0.018 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.24"

	Area (sf)	CN	Description
	3,043	80	>75% Grass cover, Good, HSG D
*	23,159	67	Crushed Stone Display Area
	985	98	Paved parking, HSG D
	27,187	70	Weighted Average
	26,202		96.38% Pervious Area
	985		3.62% Impervious Area

Summary for Subcatchment S3: East (Undisturbed)

Runoff = 0.95 cfs @ 12.30 hrs, Volume= 0.105 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.24"

Area (sf)	CN	Description
62,699	77	Woods, Good, HSG D
25,340	80	>75% Grass cover, Good, HSG D
88,039	78	Weighted Average
88,039		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	39	0.0250	0.10		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.60"
18.4	27	0.0111	0.02		**Sheet Flow, woods** Woods: Dense underbrush n= 0.800 P2= 2.60"
4.3	89	0.0191	0.35		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
1.7	63	0.0644	0.63		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
31.2	218	Total			

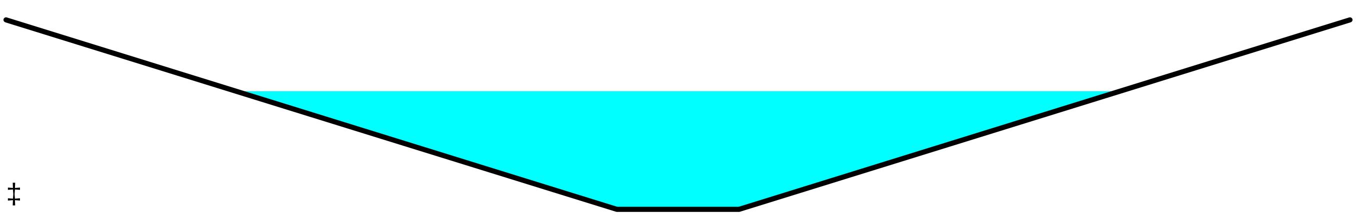
Summary for Reach 1R: Swale

Inflow Area = 4.417 ac, 28.05% Impervious, Inflow Depth = 0.86" for 1-yr event
Inflow = 7.70 cfs @ 11.94 hrs, Volume= 0.318 af
Outflow = 7.05 cfs @ 12.00 hrs, Volume= 0.318 af, Atten= 8%, Lag= 3.9 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.74 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 0.88 fps, Avg. Travel Time= 7.6 min

Peak Storage= 1,028 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 21.92 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 5.0 '/' Top Width= 11.00'
Length= 400.0' Slope= 0.0125 '/'
Inlet Invert= 306.00', Outlet Invert= 301.00'

‡


Summary for Pond 1P: Crushed Stone Display Area

Inflow Area = 0.624 ac, 3.62% Impervious, Inflow Depth = 0.34" for 1-yr event
Inflow = 0.40 cfs @ 11.90 hrs, Volume= 0.018 af
Outflow = 0.40 cfs @ 11.91 hrs, Volume= 0.018 af, Atten= 1%, Lag= 0.2 min
Discarded = 0.40 cfs @ 11.91 hrs, Volume= 0.017 af
Primary = 0.00 cfs @ 11.91 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 308.00' @ 11.91 hrs Surf.Area= 23,159 sf Storage= 2 cf

Plug-Flow detention time= 0.1 min calculated for 0.018 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (902.2 - 902.1)

Volume	Invert	Avail.Storage	Storage Description
#1	308.00'	9,264 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 23,159 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
308.00	23,159	0	0
309.00	23,159	23,159	23,159

Device	Routing	Invert	Outlet Devices
#1	Primary	308.00'	**75.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Discarded	308.00'	**40.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.40 cfs @ 11.91 hrs HW=308.00' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.40 cfs)

Primary OutFlow Max=0.00 cfs @ 11.91 hrs HW=308.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.00 cfs @ 0.03 fps)

Summary for Pond DP1: Ditch

Inflow Area = 4.417 ac, 28.05% Impervious, Inflow Depth = 0.00" for 1-yr event
Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond DP2: Wetland

Inflow Area = 2.645 ac, 0.85% Impervious, Inflow Depth = 0.48" for 1-yr event
Inflow = 0.95 cfs @ 12.30 hrs, Volume= 0.105 af
Primary = 0.95 cfs @ 12.30 hrs, Volume= 0.105 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond IF1: Infiltration Basin

Inflow Area = 4.417 ac, 28.05% Impervious, Inflow Depth = 0.86" for 1-yr event
Inflow = 7.05 cfs @ 12.00 hrs, Volume= 0.318 af
Outflow = 4.53 cfs @ 12.07 hrs, Volume= 0.318 af, Atten= 36%, Lag= 4.0 min
Discarded = 4.53 cfs @ 12.07 hrs, Volume= 0.318 af
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 298.17' @ 12.07 hrs Surf.Area= 5,757 sf Storage= 955 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1.1 min (853.3 - 852.3)

Volume	Invert	Avail.Storage	Storage Description
#1	298.00'	21,452 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
298.00	5,587	0	0
299.00	6,597	6,092	6,092
300.00	7,663	7,130	13,222
301.00	8,797	8,230	21,452

Device	Routing	Invert	Outlet Devices
#1	Discarded	298.00'	**33.960 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	300.50'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=4.53 cfs @ 12.07 hrs HW=298.17' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 4.53 cfs)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=298.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment S1: West

Runoff = 17.91 cfs @ 11.94 hrs, Volume= 0.753 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=3.72"

Area (sf)	CN	Adj	Description
88,511	77		Woods, Good, HSG D
49,909	80		>75% Grass cover, Good, HSG D
20,320	98		Unconnected roofs, HSG D
33,654	98		Paved parking, HSG D
192,394	84	83	Weighted Average, UI Adjusted
138,420			71.95% Pervious Area
53,974			28.05% Impervious Area
20,320			37.65% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	88	0.0180	1.16		**Sheet Flow, parking lot** Smooth surfaces n= 0.011 P2= 2.60"
1.5	15	0.0600	0.16		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.60"
0.1	47	0.0200	7.17	47.77	**Parabolic Channel, swale** W=10.00' D=1.00' Area=6.7 sf Perim=10.3' n= 0.022 Earth, clean & straight
2.9	150	Total			

Summary for Subcatchment S2: Display Area

Runoff = 1.58 cfs @ 11.90 hrs, Volume= 0.060 af, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=3.72"

	Area (sf)	CN	Description
	3,043	80	>75% Grass cover, Good, HSG D
*	23,159	67	Crushed Stone Display Area
	985	98	Paved parking, HSG D
	27,187	70	Weighted Average
	26,202		96.38% Pervious Area
	985		3.62% Impervious Area

Summary for Subcatchment S3: East (Undisturbed)

Runoff = 2.80 cfs @ 12.27 hrs, Volume= 0.281 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=3.72"

Area (sf)	CN	Description
62,699	77	Woods, Good, HSG D
25,340	80	>75% Grass cover, Good, HSG D
88,039	78	Weighted Average
88,039		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	39	0.0250	0.10		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.60"
18.4	27	0.0111	0.02		**Sheet Flow, woods** Woods: Dense underbrush n= 0.800 P2= 2.60"
4.3	89	0.0191	0.35		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
1.7	63	0.0644	0.63		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
31.2	218	Total			

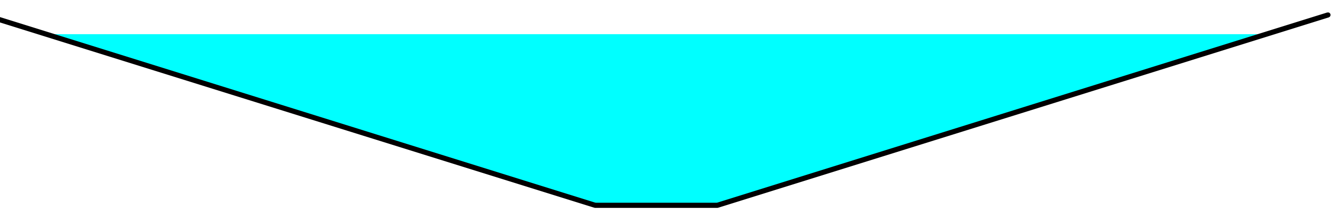
Summary for Reach 1R: Swale

Inflow Area = 4.417 ac, 28.05% Impervious, Inflow Depth = 2.05" for 10-yr event
Inflow = 17.91 cfs @ 11.94 hrs, Volume= 0.753 af
Outflow = 16.86 cfs @ 11.99 hrs, Volume= 0.753 af, Atten= 6%, Lag= 3.1 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.42 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 1.05 fps, Avg. Travel Time= 6.4 min

Peak Storage= 1,975 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.90'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 21.92 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 5.0 '/' Top Width= 11.00'
Length= 400.0' Slope= 0.0125 '/'
Inlet Invert= 306.00', Outlet Invert= 301.00'



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Summary for Pond 1P: Crushed Stone Display Area

Inflow Area = 0.624 ac, 3.62% Impervious, Inflow Depth = 1.15" for 10-yr event
Inflow = 1.58 cfs @ 11.90 hrs, Volume= 0.060 af
Outflow = 1.57 cfs @ 11.90 hrs, Volume= 0.060 af, Atten= 1%, Lag= 0.1 min
Discarded = 1.56 cfs @ 11.90 hrs, Volume= 0.059 af
Primary = 0.01 cfs @ 11.90 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 308.00' @ 11.90 hrs Surf.Area= 23,159 sf Storage= 7 cf

Plug-Flow detention time= 0.1 min calculated for 0.060 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (856.4 - 856.3)

Volume	Invert	Avail.Storage	Storage Description
#1	308.00'	9,264 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 23,159 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
308.00	23,159	0	0
309.00	23,159	23,159	23,159

Device	Routing	Invert	Outlet Devices
#1	Primary	308.00'	**75.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Discarded	308.00'	**40.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=1.55 cfs @ 11.90 hrs HW=308.00' (Free Discharge)
2=Exfiltration (Exfiltration Controls 1.55 cfs)

Primary OutFlow Max=0.00 cfs @ 11.90 hrs HW=308.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.00 cfs @ 0.07 fps)

Summary for Pond DP1: Ditch

Inflow Area = 4.417 ac, 28.05% Impervious, Inflow Depth = 0.00" for 10-yr event
Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond DP2: Wetland

Inflow Area = 2.645 ac, 0.85% Impervious, Inflow Depth = 1.28" for 10-yr event
Inflow = 2.80 cfs @ 12.27 hrs, Volume= 0.281 af
Primary = 2.80 cfs @ 12.27 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond IF1: Infiltration Basin

Inflow Area = 4.417 ac, 28.05% Impervious, Inflow Depth = 2.05" for 10-yr event
Inflow = 16.86 cfs @ 11.99 hrs, Volume= 0.753 af
Outflow = 5.26 cfs @ 12.10 hrs, Volume= 0.753 af, Atten= 69%, Lag= 6.8 min
Discarded = 5.26 cfs @ 12.10 hrs, Volume= 0.753 af
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 299.09' @ 12.10 hrs Surf.Area= 6,692 sf Storage= 6,682 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 6.1 min (832.0 - 825.9)

Volume	Invert	Avail.Storage	Storage Description
#1	298.00'	21,452 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
298.00	5,587	0	0
299.00	6,597	6,092	6,092
300.00	7,663	7,130	13,222
301.00	8,797	8,230	21,452

Device	Routing	Invert	Outlet Devices
#1	Discarded	298.00'	**33.960 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	300.50'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=5.26 cfs @ 12.10 hrs HW=299.09' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 5.26 cfs)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=298.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment S1: West

Runoff = 36.40 cfs @ 11.93 hrs, Volume= 1.591 af, Depth= 4.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.25"

Area (sf)	CN	Adj	Description
88,511	77		Woods, Good, HSG D
49,909	80		>75% Grass cover, Good, HSG D
20,320	98		Unconnected roofs, HSG D
33,654	98		Paved parking, HSG D
192,394	84	83	Weighted Average, UI Adjusted
138,420			71.95% Pervious Area
53,974			28.05% Impervious Area
20,320			37.65% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	88	0.0180	1.16		**Sheet Flow, parking lot** Smooth surfaces n= 0.011 P2= 2.60"
1.5	15	0.0600	0.16		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.60"
0.1	47	0.0200	7.17	47.77	**Parabolic Channel, swale** W=10.00' D=1.00' Area=6.7 sf Perim=10.3' n= 0.022 Earth, clean & straight
2.9	150	Total			

Summary for Subcatchment S2: Display Area

Runoff = 4.12 cfs @ 11.90 hrs, Volume= 0.156 af, Depth= 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.25"

	Area (sf)	CN	Description
	3,043	80	>75% Grass cover, Good, HSG D
*	23,159	67	Crushed Stone Display Area
	985	98	Paved parking, HSG D
	27,187	70	Weighted Average
	26,202		96.38% Pervious Area
	985		3.62% Impervious Area

Summary for Subcatchment S3: East (Undisturbed)

Runoff = 6.51 cfs @ 12.24 hrs, Volume= 0.640 af, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.25"

Area (sf)	CN	Description
62,699	77	Woods, Good, HSG D
25,340	80	>75% Grass cover, Good, HSG D
88,039	78	Weighted Average
88,039		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	39	0.0250	0.10		**Sheet Flow, grass** Grass: Dense n= 0.240 P2= 2.60"
18.4	27	0.0111	0.02		**Sheet Flow, woods** Woods: Dense underbrush n= 0.800 P2= 2.60"
4.3	89	0.0191	0.35		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
1.7	63	0.0644	0.63		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
31.2	218	Total			

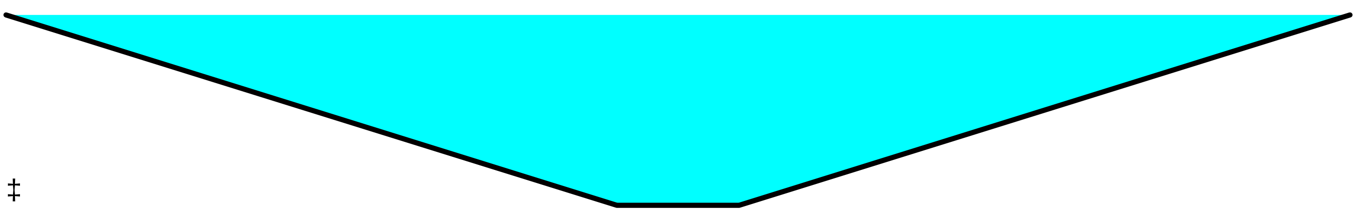
Summary for Reach 1R: Swale

Inflow Area = 4.417 ac, 28.05% Impervious, Inflow Depth = 4.32" for 100-yr event
Inflow = 36.40 cfs @ 11.93 hrs, Volume= 1.591 af
Outflow = 34.64 cfs @ 11.98 hrs, Volume= 1.591 af, Atten= 5%, Lag= 2.7 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.02 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 5.4 min

Peak Storage= 3,452 cf @ 11.95 hrs
Average Depth at Peak Storage= 1.24'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 21.92 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 5.0 '/' Top Width= 11.00'
Length= 400.0' Slope= 0.0125 '/'
Inlet Invert= 306.00', Outlet Invert= 301.00'



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Summary for Pond 1P: Crushed Stone Display Area

Inflow Area = 0.624 ac, 3.62% Impervious, Inflow Depth = 3.00" for 100-yr event
Inflow = 4.12 cfs @ 11.90 hrs, Volume= 0.156 af
Outflow = 4.10 cfs @ 11.90 hrs, Volume= 0.156 af, Atten= 0%, Lag= 0.1 min
Discarded = 4.07 cfs @ 11.90 hrs, Volume= 0.155 af
Primary = 0.03 cfs @ 11.90 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 308.00' @ 11.90 hrs Surf.Area= 23,159 sf Storage= 17 cf

Plug-Flow detention time= 0.1 min calculated for 0.156 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (827.5 - 827.5)

Volume	Invert	Avail.Storage	Storage Description
#1	308.00'	9,264 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 23,159 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
308.00	23,159	0	0
309.00	23,159	23,159	23,159

Device	Routing	Invert	Outlet Devices
#1	Primary	308.00'	**75.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Discarded	308.00'	**40.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=4.06 cfs @ 11.90 hrs HW=308.00' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 4.06 cfs)

Primary OutFlow Max=0.01 cfs @ 11.90 hrs HW=308.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.01 cfs @ 0.11 fps)

Summary for Pond DP1: Ditch

Inflow Area = 4.417 ac, 28.05% Impervious, Inflow Depth = 0.12" for 100-yr event
Inflow = 3.84 cfs @ 12.09 hrs, Volume= 0.043 af
Primary = 3.84 cfs @ 12.09 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond DP2: Wetland

Inflow Area = 2.645 ac, 0.85% Impervious, Inflow Depth = 2.91" for 100-yr event
Inflow = 6.51 cfs @ 12.24 hrs, Volume= 0.641 af
Primary = 6.51 cfs @ 12.24 hrs, Volume= 0.641 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond IF1: Infiltration Basin

Inflow Area = 4.417 ac, 28.05% Impervious, Inflow Depth = 4.32" for 100-yr event
Inflow = 34.64 cfs @ 11.98 hrs, Volume= 1.591 af
Outflow = 10.56 cfs @ 12.09 hrs, Volume= 1.591 af, Atten= 70%, Lag= 6.7 min
Discarded = 6.73 cfs @ 12.09 hrs, Volume= 1.549 af
Primary = 3.84 cfs @ 12.09 hrs, Volume= 0.043 af

Routing by Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 300.79' @ 12.09 hrs Surf.Area= 8,555 sf Storage= 19,600 cf

Plug-Flow detention time= 16.5 min calculated for 1.591 af (100% of inflow)
Center-of-Mass det. time= 16.5 min (820.1 - 803.6)

Volume	Invert	Avail.Storage	Storage Description
#1	298.00'	21,452 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
298.00	5,587	0	0
299.00	6,597	6,092	6,092
300.00	7,663	7,130	13,222
301.00	8,797	8,230	21,452

Device	Routing	Invert	Outlet Devices
#1	Discarded	298.00'	**33.960 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	300.50'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=6.73 cfs @ 12.09 hrs HW=300.79' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 6.73 cfs)

Primary OutFlow Max=3.83 cfs @ 12.09 hrs HW=300.79' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 3.83 cfs @ 1.34 fps)

APPENDIX E SOIL RESTORATION REQUIREMENTS

<table>
<tr><th colspan="4">Soil Restoration Requirements</th></tr>
<tr><th>Type of Soil Disturbance</th><th colspan="2">Soil Restoration Requirement</th><th>Comments/Examples</th></tr>
<tr><td>No soil disturbance</td><td colspan="2">Restoration not permitted</td><td>Preservation of Natural Features</td></tr>
<tr><td>Minimal soil disturbance</td><td colspan="2">Restoration not required</td><td>Clearing and grubbing</td></tr>
<tr><td rowspan="2">Areas where topsoil is stripped only - no change in grade</td><td>HSG A &B</td><td>HSG C&D</td><td rowspan="2">Protect area from any ongoing construction activities.</td></tr>
<tr><td>apply 6 inches of topsoil</td><td>Aerate* and apply 6 inches of topsoil</td></tr>
<tr><td rowspan="2">Areas of cut or fill</td><td>HSG A &B</td><td>HSG C & D</td><td rowspan="2"></td></tr>
<tr><td>Aerate and apply 6 inches of topsoil</td><td>Apply full Soil Restoration **</td></tr>
<tr><td>Heavy traffic areas on site (especially in a zone 5-25 feet around buildings but not within a 5 foot perimeter around foundation walls)</td><td colspan="2">Apply full Soil Restoration (de-compaction and compost enhancement)</td><td></td></tr>
<tr><td>Areas where Runoff Reduction and/or Infiltration practices are applied</td><td colspan="2">Restoration not required, but may be applied to enhance the reduction specified for appropriate practices.</td><td>Keep construction equipment from crossing these areas. To protect newly installed practice from any ongoing construction activities construct a single phase operation fence area</td></tr>
<tr><td>Redevelopment projects</td><td colspan="2">Soil Restoration is required on redevelopment projects in areas where existing impervious area will be converted to pervious area.</td><td></td></tr>
</table>

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

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

New York State
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Water

Deep-Ripping and Decompaction

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New York State
Department of Environmental Conservation

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Alternative Stormwater Management
Deep-Ripping and Decompaction

Description

The two-phase practice of 1) "Deep Ripping;" and 2) "Decompaction" (deep subsoiling), of the soil material as a step in the cleanup and restoration/landscaping of a construction site, helps mitigate the physically induced impacts of soil compression; i.e.: soil compaction or the substantial increase in the bulk density of the soil material.

Deep Ripping and Decompaction are key factors which help in restoring soil pore space and permeability for water infiltration. Conversely, the physical actions of cut-and-fill work, land grading, the ongoing movement of construction equipment and the transport of building materials throughout a site alter the architecture and structure of the soil, resulting in: the mixing of layers (horizons) of soil materials, compression of those materials and diminished soil porosity which, if left unchecked, severely impairs the soil's water holding capacity and vertical drainage (rainfall infiltration), from the surface downward.

In a humid climate region, compaction damage on a site is virtually guaranteed over the duration of a project. Soil in very moist to wet condition when compacted, will have severely reduced permeability. Figure 1 displays the early stage of the deep-ripping phase (Note that all topsoil was stripped prior to construction access, and it remains stockpiled until the next phase – decompaction – is complete). A heavy-duty tractor is pulling a three-shank ripper on the first of several series of incrementally deepening passes through the construction access corridor's densely compressed subsoil material. Figure 2 illustrates the approximate volumetric composition of a loam surface soil when conditions are good for plant growth, with adequate natural pore space for fluctuating moisture conditions.

Fig. 1. A typical deep ripping phase of this practice, during the first in a series of progressively deeper "rips" through severely compressed subsoil.

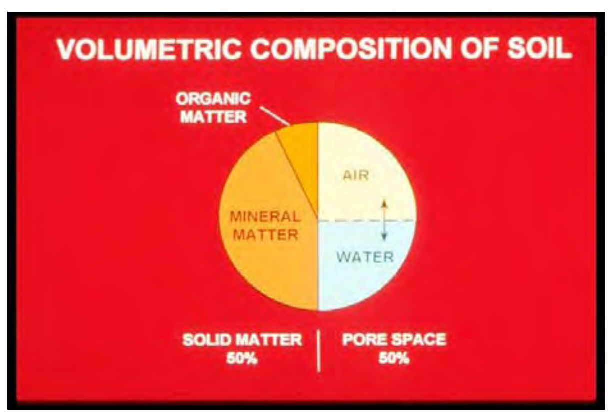

Fig. 2. About 50% of the volume of undisturbed loam surface soil is pore space, when soil is in good condition for plant growth. Brady, 2002.

Recommended Application of Practice

The objective of Deep Ripping and Decompaction is to effectively fracture (vertically and laterallly) through the thickness of the physically compressed subsoil material (see Figure 3), restoring soil porosity and permeability and aiding infiltration to help reduce runoff. Together with topsoil stripping, the "two-phase" practice of Deep Ripping and Decompaction first became established as a "best management practice" through ongoing success on commercial farmlands affected by heavy utility construction right-of-way projects (transmission pipelines and large power lines).

Fig. 3. Construction site with significant compaction of the deep basal till subsoil extends 24 inches below this exposed cut-and-fill work surface.

Soil permeability, soil drainage and cropland productivity were restored. For broader construction application, the two-phase practice of Deep Ripping and Decompaction is best adapted to areas impacted with significant soil compaction, on contiguous open portions of large construction sites and inside long, open construction corridors used as temporary access over the duration of construction. Each mitigation area should have minimal above-and-below-ground obstructions for the easy avoidance and maneuvering of a large tractor and ripping/decompacting implements. Conversely, the complete two-phase practice is not recommended in congested or obstructed areas due to the limitations on tractor and implement movement.

Benefits

Aggressive "deep ripping" through the compressed thickness of exposed subsoil before the replacement/respreading of the topsoil layer, followed by "decompaction," i.e.: "sub-soiling," through the restored topsoil layer down into the subsoil, offers the following benefits:

- Increases the project (larger size) area's direct surface infiltration of rainfall by providing the open site's mitigated soil condition and lowers the demand on concentrated runoff control structures

- Enhances direct groundwater recharge through greater dispersion across and through a broader surface than afforded by some runoff-control structural measures

- Decreases runoff volume generated and provides hydrologic source control

- May be planned for application in feasible open locations either alone or in conjunction with plans for structural practices (e.g., subsurface drain line or infiltration basin) serving the same or contiguous areas

- Promotes successful long-term revegetation by restoring soil permeability, drainage and water holding capacity for healthy (rather than restricted) root-system development of trees, shrubs and deep rooted ground cover, minimizing plant drowning during wet periods and burnout during dry periods.

Feasibility / Limitations

The effectiveness of Deep Ripping and Decompaction is governed mostly by site factors such as: the original (undisturbed) soil's hydrologic characteristics; the general slope; local weather/timing (soil moisture) for implementation; the space-related freedom of equipment/implement maneuverability (noted above in **Recommended Application of Practice**), and by the proper selection and operation of tractor and implements (explained below in **Design Guidance**). The more notable site-related factors include:

Soil

In the undisturbed condition, each identified soil type comprising a site is grouped into one of four categories of soil hydrology, Hydrologic Soil Group A, B, C or D, determined primarily by a range of characteristics including soil texture, drainage capability when thoroughly wet, and depth to water table. The natural rates of infiltration and transmission of soil-water through the undisturbed soil layers for Group A is "high" with a low runoff potential while soils in Group B are moderate in infiltration and the transmission of soil-water with a moderate runoff potential, depending somewhat on slope. Soils in Group C have slow rates of infiltration and transmission of soil-water and a moderately high runoff potential influenced by soil texture and slope; while soils in Group D have exceptionally slow rates of infiltration and transmission of soil-water, and high runoff potential.

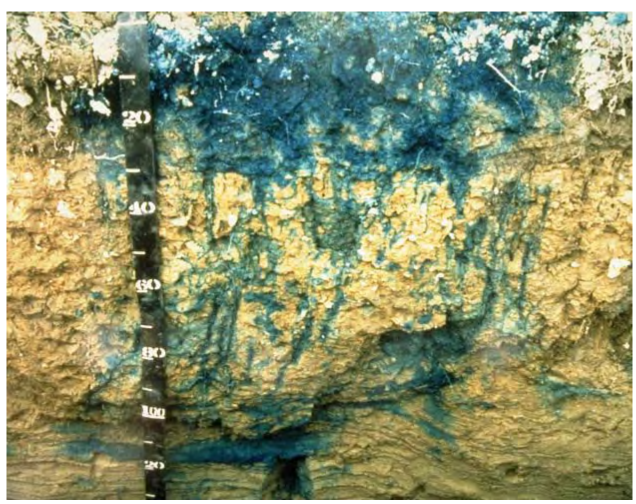

Fig. 4. Profile (in centimeters) displaying the infiltration test result of the natural undisturbed horizons of a soil in Hydrologic Soil Group C.

In Figure 4, the profile displays the undisturbed horizons of a soil in Hydrologic Soil Group C and the naturally slow rate of infiltration through the subsoil. The slow rate of infiltration begins immediately below the topsoil horizon (30 cm), due to the limited amount of macro pores, e.g.: natural subsoil fractures, worm holes and root channels. Infiltration after the construction-induced mixing and compression of such subsoil material is virtually absent; but can be restored back to this natural level with the two-phase practice of deep ripping and decompaction, followed by the permanent establishment of an appropriate, deep taproot lawn/ground cover to help maintain the restored subsoil structure. Infiltration after construction-induced mixing and compression of such subsoil material can be notably rehabilitated with the Deep Ripping and Decompaction practice, which prepares the site for the appropriate long-term lawn/ground cover mix including deep taproot plants such as clover, fescue or trefoil, etc. needed for all rehabilitated soils.

Generally, soils in Hydrologic Soil Groups A and B, which respectively may include deep, well-drained, sandy-gravelly materials or deep, moderately well-drained basal till materials, are among the easier ones to restore permeability and infiltration, by deep ripping and decompaction. Among the many different soils in Hydrologic Soil Group C are those unique glacial tills having a natural fragipan zone, beginning about 12 to 18 inches (30 – 45cm), below surface. Although soils in Hydrologic Soil Group C do require a somewhat more carefully applied level of the Deep Ripping and Decompaction practice, it can greatly benefit such affected areas by reducing the runoff and fostering infiltration to a level equal to that of pre-disturbance.

Soils in Hydrologic Soil Group D typically have a permanent high water table close to the surface, influenced by a clay or other highly impervious layer of material. In many locations with clay subsoil material, the bulk density is so naturally high that heavy trafficking has little or no added impact on infiltration; and structural runoff control practices rather than Deep Ripping and Decompaction should be considered.

The information about Hydrologic Soil Groups is merely a general guideline. Site-specific data such as limited depths of cut-and-fill grading with minimal removal or translocation of the inherent subsoil materials (as analyzed in the county soil survey) or, conversely, the excavation and translocation of deeper, unconsolidated substratum or consolidated bedrock materials (unlike the analyzed subsoil horizons' materials referred to in the county soil survey) should always be taken into account.

Sites made up with significant quantities of large rocks, or having a very shallow depth to bedrock, are not conducive to deep ripping and decompation (subsoiling); and other measures may be more practical.

Slope

The two-phase application of 1) deep ripping and 2) decompaction (deep subsoiling), is most practical on flat, gentle and moderate slopes. In some situations, such as but not limited to temporary construction access corridors, inclusion areas that are moderately steep along a project's otherwise gentle or moderate slope may also be deep ripped and decompacted. For limited instances of moderate steepness on other projects, however, the post-construction land use and the relative alignment of the potential ripping and decompaction work in relation to the lay of the slope should be reviewed for safety and practicality. In broad construction areas predominated by moderately steep or steep slopes, the practice is generally not used.

Local Weather/Timing/Soil Moisture

Effective fracturing of compressed subsoil material from the exposed work surface, laterally and vertically down through the affected zone is achieved only when the soil material is moderately dry to moderately moist. Neither one of the two-phases, deep ripping nor decompaction (deep subsoiling), can be effectively conducted when the soil material (subsoil or replaced topsoil) is in either a "plastic" or "liquid" state of soil consistency. Pulling the respective implements legs through the soil when it is overly moist only results in the "slicing and smearing" of the material or added "squeezing and compression" instead of the necessary fracturing. Ample drying time is needed for a "rippable" soil condition not merely in the material close to the surface, but throughout the material located down to the bottom of the physically compressed zone of the subsoil.

The "poor man's Atterberg field test" for soil plasticity is a simple "hand-roll" method used for quick, on-site determination of whether or not the moisture level of the affected soil material is low enough for: effective deep ripping of subsoil; respreading of topsoil in a friable state; and final decompaction (deep subsoiling). Using a sample of soil material obtained from the planned bottom depth of ripping, e.g.: 20 - 24 inches below exposed subsoil surface, the sample is hand rolled between the palms down to a 1/8-inch diameter thread. (Use the same test for stored topsoil material before respreading on the site.) If the respective soil sample crumbles apart in segments no greater than 3/8 of an inch long, by the time it is rolled down to 1/8 inch diameter, it is low enough in moisture for deep ripping (or topsoil replacement), and decompaction. Conversely, as shown in Figure 5, if the rolled sample stretches out in increments greater than 3/8 of an inch long before crumbling, it is in a "plastic" state of soil consistency and is too wet for subsoil ripping (as well as topsoil replacement) and final decompaction.

Fig. 5. Augered from a depth of 19 inches below the surface of the replaced topsoil, this subsoil sample was hand rolled to a 1/8-inch diameter. The test shows the soil at this site stretches out too far without crumbling; it indicates the material is in a plastic state of consistence, too wet for final decompaction (deep subsoiling) at this time.

Design Guidance

Beyond the above-noted site factors, a vital requirement for the effective Deep Ripping and Decompaction (deep subsoiling), is implementing the practice in its distinct, two-phase process:

1) Deep rip the affected thickness of exposed subsoil material (see Figure 10 and 11), aggressively fracturing it before the protected topsoil is reapplied on the site (see Figure 12); and

2) Decompact (deep subsoil), simultaneously through the restored topsoil layer and the upper half of the affected subsoil (Figure 13). The second phase, "decompaction," mitigates the partial recompaction which occurs during the heavy process of topsoil spreading/grading. Prior to deep ripping and decompacting the site, all construction activity, including construction equipment and material storage, site cleanup and trafficking (Figure 14), should be finished; and the site closed off to further disturbance. Likewise, once the practice is underway and the area's soil permeability and

rainfall infiltration are being restored, a policy limiting all further traffic to permanent travel lanes is maintained.

The other critical elements, outlined below, are: using the proper implements (deep, heavy-duty rippers and subsoilers), and ample pulling-power equipment (tractors); and conducting the practice at the appropriate speed, depth and pattern(s) of movement.

Note that an appropriate plan for the separate practice of establishing a healthy perennial ground cover, with deep rooting to help maintain the restored soil structure, should be developed in advance. This may require the assistance of an agronomist or landscape horticulturist.

Implements

Avoid the use of all undersize implements. The small-to-medium, light-duty tool will, at best, only "scarify" the uppermost surface portion of the mass of compacted subsoil material. The term "chisel plow" is commonly but incorrectly applied to a broad range of implements. While a few may be adapted for the moderate subsoiling of non-impacted soils, the majority are less durable and used for only lighter land-fitting (see Figure 6).

Fig. 6. A light duty chisel implement, not adequate for either the deep ripping or decompaction (deep subsoiling) phase.

Fig. 7. One of several variations of an agricultural ripper. This unit has long, rugged shanks mounted on a steel V-frame for deep, aggressive fracturing through Phase 1.

Use a "heavy duty" agricultural-grade, deep ripper (see Figures 7,9,10 and 11) for the first phase: the lateral and vertical fracturing of the mass of exposed and compressed subsoil, down and through, to the bottom of impact, prior to the replacement of the topsoil layer. (Any oversize rocks which are uplifted to the subsoil surface during the deep ripping phase are picked and removed.) Like the heavy-duty class of implement for the first phase, the decompaction (deep subsoiling) of Phase 2 is conducted with the heavy-duty version of the deep subsoiler. More preferable is the angled-leg variety of deep subsoiler (shown in Figures 8 and 13). It minimizes the inversion of the subsoil and topsoil layers while laterally and vertically fracturing the upper half of the previously ripped subsoil layer and all of the topsoil layer by delivering a momentary, wave-like "lifting and shattering" action up through the soil layers as it is pulled.

Pulling-Power of Equipment

Use the following rule of thumb for tractor horsepower (hp) whenever deep ripping and decompacting a significantly impacted site: For both types of implement, have at least 40 hp of tractor pull available for each mounted shank/ leg.

Using the examples of a 3-shank and a 5-shank implement, the respective tractors should have 120 and 200 hp available for fracturing down to the final depth of 20-to-24 inches per phase. Final depth for the deep ripping in Phase 1 is achieved incrementally by a progressive series of passes (see Depth and Patterns of Movement, below); while for Phase 2, the full operating depth of the deep subsoiler is applied from the beginning.

The operating speed for pulling both types of implement should not exceed 2 to 3 mph. At this slow and managed rate of operating speed, maximum functional performance is sustained by the tractor and the implement performing the soil fracturing. Referring to Figure 8, the implement is the 6-leg version of the deep angled-leg subsoiler. Its two outside legs are "chained up" so that only four legs will be engaged (at the maximum depth), requiring no less than 160 hp, (rather than 240 hp) of pull. The 4-wheel drive, articulated-frame tractor in Figure 8 is 174 hp. It will be decompacting this unobstructed, former construction access area simultaneously through 11 inches of replaced topsoil and the upper 12 inches of the previously deep-ripped subsoil. In constricted areas of Phase 1) Deep Ripping, a medium-size tractor with adequate hp, such as the one in Figure 9 pulling a 3-shank deep ripper, may be more maneuverable.

Fig. 8. A deep, angled-leg subsoiler, ideal for Phase 2 decompaction of after the topsoil layer is graded on top of the ripped subsoil.

Fig. 9. This medium tractor is pulling a 3-shank deep ripper. The severely compacted construction access corridor is narrow, and the 120 hp tractor is more maneuverable for Phase 1 deep ripping (subsoil fracturing), here.

Some industrial-grade variations of ripping implements are attached to power graders and bulldozers. Although highly durable, they are generally not recommended. Typically, the shanks or "teeth" of these rippers are too short and stout; and they are mounted too far apart to achieve the well-distributed type of lateral and vertical fracturing of the soil materials necessary to restore soil permeability and infiltration. In addition, the power graders and bulldozers, as pullers, are far less maneuverable for turns and patterns than the tractor.

Depth and Patterns of Movement
As previously noted both Phase 1 Deep Ripping through significantly compressed, exposed subsoil and Phase 2 Decompaction (deep subsoiling) through the replaced topsoil and upper subsoil need to be performed at maximum capable depth of each implement. With an implement's guide wheels attached, some have a "normal" maximum operating depth of 18 inches, while others may go deeper. In many situations, however, the tractor/implement operator must first remove the guide wheels and other non essential elements from the implement. This adapts the ripper or the deep subsoiler for skillful pulling with its frame only a few inches above surface, while the shanks or legs, fracture the soil material 20-to-24 inches deep.

There may be construction sites where the depth of the exposed subsoil's compression is moderate, e.g.: 12 inches, rather than deep. This can be verified by using a ¾ inch cone penetrometer and a shovel to test the subsoil for its level of compaction, incrementally, every three inches of increasing depth. Once the full thickness of the subsoil's compacted zone is finally "pieced" and there is a significant drop in the psi measurements of the soil penetrometer, the depth/thickness of compaction is determined. This is repeated at several representative locations of the construction site. If the thickness of the site's subsoil compaction is verified as, for example, ten inches, then the Phase 1 Deep Ripping can be correspondingly reduced to the implement's minimum operable depth of 12 inches. However, the Phase 2 simultaneous Decompation (subsoiling) of an 11 inch thick layer of replaced topsoil and the upper subsoil should run at the subsoiling implements full operating depth.

Fig. 10. An early pass with a 3-shank deep ripper penetrating only 8 inches into this worksite's severely compressed subsoil.

Fig. 11. A repeat run of the 3-shank ripper along the same patterned pass area as Fig. 9; here, incrementally reaching 18 of the needed 22 inches of subsoil fracture.

Typically, three separate series (patterns) are used for both the Phase 1 Deep Ripping and the Phase 2 Decompaction on significantly compacted sites. For Phase 1, each series begins with a moderate depth of rip and, by repeat-pass, continues until full depth is reached. Phase 2 applies the full depth of Decompation (subsoiling), from the beginning.

Every separate series (pattern) consists of parallel, forward-and-return runs, with each progressive pass of the implement's legs or shanks evenly staggered between those from the previous pass. This compensates for the shank or leg-spacing on the implement, e.g., with 24-to-30 inches between each shank or leg. The staggered return pass ensures lateral and vertical fracturing actuated every 12 to 15 inches across the densely compressed soil mass.

Large, Unobstructed Areas

For larger easy areas, use the standard patterns of movement:

- The first series (pattern) of passes is applied lengthwise, parallel with the longest spread of the site; gradually progressing across the site's width, with each successive pass.

- The second series runs obliquely, crossing the first series at an angle of about 45 degrees.

- The third series runs at right angle (or 90 degrees), to the first series to complete the fracturing and shattering on severely compacted sites, and avoid leaving large unbroken blocks of compressed soil material. (In certain instances, the third series may be optional, depending on how thoroughly the first two series loosen the material and eliminate large chunks/blocks of material as verified by tests with a ¾-inch cone penetrometer.)

Fig. 12. Moderately dry topsoil is being replaced on the affected site now that Phase 1 deep ripping of the compressed subsoil is complete.


Fig. 13. The same deep, angled-leg subsoiler shown in Fig. 7 is engaged at maximum depth for Phase 2, decompaction (deep soiling), of the replaced topsoil and the upper subsoil materials.

Corridors

In long corridors of limited width and less maneuverability than larger sites, e.g.: along compacted areas used as temporary construction access, a modified series of pattern passes are used.

- First, apply the same initial lengthwise, parallel series of passes described above.

● A second series of passes makes a broad “S” shaped pattern of rips, continually and gradually alternating the “S” curves between opposite edges inside the compacted corridor.

● The third and final series again uses the broad, alternating S pattern, but it is “flip-flopped” to continually cross the previous S pattern along the corridor’s centerline. This final series of the S pattern curves back along the edge areas skipped by the second series.

Maintenance and Cost

Once the two-phase practice of Deep Ripping and Decompation is completed, two items are essential for maintaining a site’s soil porosity and permeability for infiltration. They are: planting and maintaining the appropriate ground cover with deep roots to maintain the soil structure (see Figure 15); and keeping the site free of traffic or other weight loads.

Note that site-specific choice of an appropriate vegetative ground-cover seed mix, including the proper seeding ratio of one or more perennial species with a deep taproot system and the proper amount of lime and soil nutrients (fertilizer mix) adapted to the soil-needs, are basic to the final practice of landscaping, i.e: surface tillage, seeding/planting/fertilizing and culti-packing or mulching is applied. The "maintenance" of an effectively deep-ripped and decompacted area is generally limited to the successful perennial (long-term) landscape ground cover; as long as no weight-bearing force of soil compaction is applied.

Fig. 14. The severely compacted soil of a temporary construction yard used daily by heavy equipment for four months; shown before deep ripping, topsoil replacement, and decompaction.

Fig. 15. The same site as Fig. 14 after deep ripping of the exposed subsoil, topsoil replacement, decompaction through the topsoil and upper subsoil and final surface tillage and revegetation to maintain soil permeability and infiltration.

The Deep Ripping and Decompaction practice is, by necessity, more extensive than periodic subsoiling of farmland.The cost of deep ripping and decompacting (deep subsoiling), will vary according to the depth and severity of soil-material compression and the relative amount of tractor and implement time that is required. In some instances, depending on open maneuverability, two-to-three acres of compacted project area may be deep-ripped in one day. In other situations of more severe compaction and - or less maneuverability, as little as one acre may be fully ripped in a day. Generally, if the Phase 1) Deep Ripping is fully effective, the Phase 2) Decompaction should be completed in 2/3 to 3/4 of the time required for Phase 1.

Using the example of two acres of Phase 1) Deep Ripping in one day, at $1800 per day, the net cost is $900 per acre. If the Phase 2) Decompacting or deep subsoiling takes 3/4 the time as Phase 1, it costs $675 per acre for a combined total of $1575 per acre to complete the practice (these figures do not include the cost of the separate practice of topsoil stripping and replacement). Due to the many variables, it must be recognized that cost will be determined by the specific conditions or constraints of the site and the availability of proper equipment.

Resources

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- US Department of Agriculture in cooperation with Cornell University Agricultural Experiment Station. Various years. *Soil Survey of (various names) County, New York.* USDA.

Internet Access:

- Examples of implements:

V-Rippers. Access by internet search of *John Deere Ag -New Equipment for 915* (larger-frame model) *V-Rippe*; and, *for 913* (smaller-frame model) *V-Ripper*. Deep, angled-leg subsoiler. Access by internet search of: B*igham Brothers Shear Bolt Paratill-Subsoiler*. http://salesmanual.deere.com/sales/salesmanual/en_NA/primary_tillage/2008/feature/rippers/915v_pattern_frame.html?sbu=ag&link=prodcat Last visited March 08.

- Soils data of USDA Natural Resources Conservation Service. *NRCS Web Soil Survey.* http://websoilsurvey.nrcs.usda.gov/app/ and *USDA-NRCS Official Soil Series Descriptions; View by Name.* http://ortho.ftw.nrcs.usda.gov/cgi-bin/osd/osdname.cgi . *Last visited Jan. 08.*

- Soil penetrometer information. Access by internet searches of: *Diagnosing Soil Compaction using a Penetrometer (soil compaction tester), PSU Extension;* as well as *Dickey-john Soil Compaction Tester.* http://www.dickey-johnproducts.com/pdf/SoilCompactionTest.pdf and http://cropsoil.psu.edu/Extension/Facts/uc178pdf Last visited Sept. 07

APPENDIX F STORMWATER CONTROL FACILITY MAINTENANCE AGREEMENT (DRAFT INCLUDED, TO BE SIGNED IN FINAL SWPPP)

SAMPLE STORMWATER CONTROL FACILITY MAINTENANCE AGREEMENT

Whereas, the Municipality of ________________("Municipality") and the _______________ ("facility owner") want to enter into an agreement to provide for the long term maintenance and continuation of stormwater control measures approved by the Municipality for the below named project, and

Whereas, the Municipality and the facility owner desire that the stormwater control measures be built in accordance with the approved project plans and thereafter be maintained, cleaned, repaired, replaced and continued in perpetuity in order to ensure optimum performance of the components. Therefore, the Municipality and the facility owner agree as follows:

1. This agreement binds the Municipality and the facility owner, its successors and assigns, to the maintenance provisions depicted in the approved project plans which are attached as Schedule A of this agreement.

2. The facility owner shall maintain, clean, repair, replace and continue the stormwater control measures depicted in Schedule A as necessary to ensure optimum performance of the measures to design specifications. The stormwater control measures shall include, but shall not be limited to, the following: drainage ditches, swales, dry wells, infiltrators, drop inlets, pipes, culverts, soil absorption devices and retention ponds.

3. The facility owner shall be responsible for all expenses related to the maintenance of the stormwater control measures and shall establish a means for the collection and distribution of expenses among parties for any commonly owned facilities.

4. The facility owner shall provide for the periodic inspection of the stormwater control measures, not less than once in every five year period, to determine the condition and integrity of the measures. Such inspection shall be performed by a Professional Engineer licensed by the State of New York. The inspecting engineer shall prepare and submit to the Municipality within 30 days of the inspection, a written report of the findings including recommendations for those actions necessary for the continuation of the stormwater control measures.

5. The facility owner shall not authorize, undertake or permit alteration, abandonment, modification or discontinuation of the stormwater control measures except in accordance with written approval of the Municipality.

6. The facility owner shall undertake necessary repairs and replacement of the stormwater control measures at the direction of the Municipality or in accordance with the recommendations of the inspecting engineer.

7. The facility owner shall provide to the Municipality within 30 days of the date of this agreement, a security for the maintenance and continuation of the stormwater control measures in the form of (a Bond, letter of credit or escrow account).

8. This agreement shall be recorded in the Office of the County Clerk, County of _____________together with the deed for the common property and shall be included in the offering plan and/or prospectus approved pursuant to ______________.

9. If ever the Municipality determines that the facility owner has failed to construct or maintain the stormwater control measures in accordance with the project plan or has failed to undertake corrective action specified by the Municipality or by the inspecting engineer, the Municipality is authorized to undertake such steps as reasonably necessary for the preservation, continuation or maintenance of the stormwater control measures and to affix the expenses thereof as a lien against the property.

10. This agreement is effective ____________ .

________________________________   ________________________________

APPENDIX G NYSDEC NOI (DRAFT INCLUDED, TO BE SIGNED IN FINAL SWPPP)

Construction General Permit (CGP) Electronic Notice of Intent (eNOI) GP-0-25-001

version 1.18

(Submission #: HQQ-75S8-RCR0H, version 1)

Details

Originally Started By	Matthew Huntington
Alternate Identifier	Garden World—Region 5
Submission ID	HQQ-75S8-RCR0H
Status	Draft

Form Input

Eligibility

Disturbance Threshold

1. Will the construction activity involve soil disturbances listed in Part I.A.1 of GP-0-25-001?
Yes

1.a. Will any runoff from the site enter a sewer system classified as a combined sewer?
No

1.b. Is this a remediation project being done under a Department approved work plan (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.) with a SWPPP which meets the substantive requirements of GP-0-25-001?
No

1.c. Is the construction activity related to a stormwater discharge that does not require a permit as described in 40 CFR 122.3(e), e.g. non-point source agriculture or silviculture activities?
No

Other SPDES Permits

2. Will the discharge from the construction activity meet all conditions listed in Part I.A.2 of GP-0-25-001?
Yes

Threatened and Endangered Species

3. Will the construction activity potentially adversely affect a species that is endangered or threatened per Part I.A.3.?
No

State Historic Preservation Act (SHPA)

4. Is the construction activity designated by the Commissioner of the Office of Parks, Recreation and Historic Preservation (OPRHP), pursuant to 9 NYCRR §§428.12 or 428.13 as exempt from the SHPA review (see Attachment 2 of the Letter of Resolution between NYSDEC and OPRHP, dated January 9, 2015)?
No

4.a. Will the construction activity:

a) occur within an archeologically sensitive area indicated on the sensitivity map, or

b) have the potential to affect a property that is listed or determined to be eligible for listing on the National or State Registers of Historic Places, or

c) include a new permanent building on the construction site within the following distances from a building, structure, or object that is more than 50 years old and OPRHP, a Historic Preservation Commission of a Certified Local Government, or a qualified preservation professional has determined is a historically/archeologically significant building, structure, or object:

- 1-5 acres of disturbance—20 feet
- 5-20 acres of disturbance—50 feet
- 20+ acres of disturbance—100 feet?

No

4.b. Is there documentation at the construction site demonstrating:

a) that the construction activity is not within an archeologically sensitive area indicated on the sensitivity map, and that the construction activity is not immediately adjacent to a property listed or determined to be eligible for listing on the National or State Registers of Historic Places, and

b) that there is no new permanent building to be built 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 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?

Yes

State Environmental Quality Review (SEQR)

5. Is the construction activity subject to SEQR (Part I.A.5.), or the equivalent environmental review from another NYS or federal agency (Part I.A.6.)?
No

Uniform Procedures Act (UPA) Permits

6. Has the owner/operator obtained all necessary UPA permits from NYSDEC, or the equivalent from another NYS or federal agency per Part I.A.7.a. of GP-0-25-001? Select "Yes" if no UPA permits, or the equivalent, are required for this construction activity.
Yes

Steep Slope

7. Is the construction activity within the watershed of surface waters of the State classified as AA or AA-S identified utilizing the Stormwater Interactive Map on NYSDEC's website?
No

Owner/Operator Information

8. Owner/Operator Name
Frederick Troelstra

9. Owner/Operator Contact Person Information

First and Last Name	Phone	E-mail
Frederick Troelstra	8887938555	fred@gardentimeinc.com

10. Owner/Operator Mailing Address

> 191 Quaker Road
>
> Queensbury, NY 12804
>
> USA

11. Is the billing contact different from the Owner/Operator Contact?
No

12. What type of organization is the owner/operator?
Corporation

12.b. Is the owner/operator registered with the Department of State to do business in New York State?
Yes

12.b.i. Department of State ID #
61369

The Department of State ID can be found using the following link:
Department of State | Division of Corporations

Site Information

13. Project/Site Name
Garden World

14. Site Address

> 1262-1268 NY Route 9
>
> Moreau, NY 12804
>
> Saratoga

DEC Region
5

15. Site Latitude & Longitude
43.23180471159989,-73.69419031691167

Project Details

16. This eNOI submission is for:
An entire common plan of development or sale in accordance with Part I.D.1.b.

17. Does the project type fall under Table 1 or Table 2 of Appendix B of GP-0-25-001? If any portion of the construction activity falls under Table 2, regardless of the size of the disturbance, select "Table 2".
Table 2

18. Consistent with Part III.B.1.c.i. of GP-0-25-001, provide a concise overview of the project. Describe existing and proposed conditions, and include any other relevant information.
The existing site is undeveloped and consisting mostly of woodland. There is a NWI Wetland on the northeast side of the site as well as a DEC Wetland on the southern area of the site, each containing a stream. The proposed project will include construction of an office building, equipment storage, and greenhouse. To support these features, a crushed stone display area, asphalt road and parking lot, extensive stormwater management systems, and landscaped areas are to be constructed as well.

Enter the total project site acreage, the acreage to be disturbed, and the future impervious area (acreage) within the disturbed area, rounded to the nearest tenth of an acre.

19. Total Site Area (acres)
39.0

20. Total Area to be Disturbed (acres)
3.9

21. Existing Impervious Area to be Disturbed (acres)
0.0

22. Future Impervious Area Within Disturbed Area (acres)
1.3

Nature of the project:
New Construction

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

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

A (%)
0

B (%)
0

C (%)
0

D (%)
100

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

Start Date
10/01/2026

End Date
10/01/2027

26. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.
North Branch Snook Kill and tribs - 1101-0080

27. Type of waterbody identified in question 26?
Stream/Creek On Site

28. Has the surface waterbody in question 26 been identified as a 303(d) segment in Appendix D of GP-0-25-001?
No

29. Is this project located in one of the Watersheds identified in Appendix C of GP-0-25-001?
No

30. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area?
No

31. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)?
No

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

33. Is this property owned by a state authority, state agency, federal government or local government?
No

Required SWPPP Components

General SWPPP Requirements

34. Has a SWPPP been developed in conformance with the requirements in Part III. of GP-0-25-001?
Yes

35. Does the SWPPP demonstrate consideration of the future physical risks due to climate change pursuant to the CRRA, 6 NYCRR Part 490, and associated guidance per Part III.A.2. of GP-0-25-001?
Yes

36. 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

37. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the NYS Stormwater Management Design Manual?
Yes

37.a. Which version of the NYS Stormwater Management Design Manual was used to develop the SWPPP?
2024

SWPPP Preparer

39. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:
Professional Engineer (P.E.)

40. Name of the person who prepared the SWPPP
Matt Huntington

41. SWPPP Preparer Organization Name
Studio A Landscape Architecture and Engineering DPC

42. SWPPP Preparer Contact Information

First and Last Name	Phone	E-mail
Matt Huntington	5184504030	mhuntington@studioadpc.com

43. SWPPP Preparer Address

> 74 Warren Street
>
> Suite 1
>
> Saratoga, NY 12866

Download SWPPP Preparer Certification Form

Please take the following steps to prepare and upload your preparer certification form:

1) Click on the link below to download a blank certification form
2) The certified SWPPP preparer should sign this form
3) Upload the completed form
[Download SWPPP Preparer Certification Form]

44. Please upload the SWPPP Preparer Certification

> *NONE PROVIDED*
> **Comment**
> *NONE PROVIDED*

44.a. Has the SWPPP Preparer Certification Form been signed by the SWPPP preparer in accordance with Part VII.J of GP-0-25-001?
Yes

Erosion & Sediment Control Criteria

45. Has a construction sequence schedule for the planned management practices been prepared?
Yes

Post-Construction Criteria

Site Planning and Soil Restoration

46. Identify all site planning practices that were used to prepare the final site plan/layout for the project.
Preservation of Undisturbed Area
Preservation of Buffers
Locating Development in Less Sensitive Areas

47. 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.
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).

Water Quality Criteria

49. Water Quality Sizing Criteria

Total WQv required (acre-feet)	Total RRv provided (acre-feet)	Minimum RRv (acre-feet)	Total WQv provided (acre-feet)	Sum of RRv and WQv provided
0.197	0.197			0.197

Water Quantity Criteria

51. Does one of the waiver conditions apply to the channel protection for this construction activity?
No

51.b.i. CPv Required (acre-feet)
0.190

51.b.ii. CPv Provided (acre-feet)
0.385

52. Does one of the waiver conditions apply to the Qp and Qf for this construction activity?
No

Overbank Flood Control Criteria (Qp)

52.b.i. Pre-Development (CFS)
10.6

52.b.ii. Post-Development (CFS)
0

Total Extreme Flood Control Criteria (Qf)

52.b.iii. Pre-Development (CFS)
25.3

52.b.iv. Post-Development (CFS)
6.0

Operation and Maintenance

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

53.a. Identify the entity responsible for the long-term Operation and Maintenance.
Garden Time Inc.

Post-Construction SMP Identification

54. Post-Construction RR Techniques and Standard SMPs

RR Techniques and SMPs	Contributing Impervious Area (acres)	Total Contributing Area (acres)
Infiltration Basin (I-2)	1.793	

55. Alternative SMPs

Type of Alternative SMP	Manufacturer of the Alternative SMP	Name of the Alternative SMP	Contributing Impervious Area (acres)
NONE PROVIDED	*NONE PROVIDED*	*NONE PROVIDED*	*NONE PROVIDED*

Other Permits

56. Identify other permits, existing and new, that are required for this project/facility.
None

57. Is this NOI for a change in owner/operator per Part I.G.?
No

MS4 SWPPP Acceptance

59. Will the construction activities be within the municipal boundary(ies) of Traditional Land Use Control MS4 Operator(s) and discharge to the MS4(s)?
Yes

59.a. Which form is required per Part I.D.2.b.ii.?
MS4 SWPPP Acceptance Form

MS4 SWPPP Acceptance Form Download

Download the MS4 SWPPP Acceptance Form from the link below.
MS4 SWPPP Acceptance Form

60. MS4 Acceptance or No Jurisdiction Form Upload

> *NONE PROVIDED*
> **Comment**
> *NONE PROVIDED*

60.a. Has the form been signed by the principal executive officer or ranking elected official—or duly authorized representative of that person—in accordance with Part VII.J. and submitted along with this NOI?
NONE PROVIDED

Owner/Operator Certification

Owner/Operator Certification Form Download

Download the Owner/Operator Certification Form by clicking the link below.
Owner/Operator Certification Form

61. Upload Owner/Operator Certification Form

NONE PROVIDED

Comment

NONE PROVIDED

61.a. Has the Owner/Operator Certification Form from Appendix J been signed by the owner/operator, or a representative of the owner/operator in accordance with Part VII.J of GP-0-25-001 and uploaded to the eNOI?

NONE PROVIDED

Additional Project Information

62. Enter any additional pertinent project information in the text box below.

NONE PROVIDED

APPENDIX H O&M MANUAL

Infiltration Stormwater Management Practices
Level 1 Inspection Checklist

SMP ID #		**SMP Owner**		☐ Private ☐ Public

SMP Location (Address; Latitude & Longitude)				
	Latitude		**Longitude**	

Party Responsible for Maintenance	**System Type**		**Type of Site**
☐ Same as SMP Owner ☐ Other ____________________	☐ Seasonal ☐ Continuous Use ☐ Other	☐ Above Ground ☐ Below Ground	☐ Commercial ☐ Industrial ☐ Residential ☐ State

Inspection Date		**Inspection Time**	
Inspector			
Date of Last Inspection			

IN Drainage Area

Look for both pervious and impervious areas that are uphill from the Infiltration cell.

Problem (Check if Present)		**Follow-Up Actions**
	☐ Bare soil, erosion of the ground (rills washing out the dirt)	☐ Seed and straw areas of bare soil to establish vegetation. ☐ Fill in erosion areas with soil, compact, and seed and straw to get vegetation established. ☐ If a rill or small channel is forming, try to redirect water flowing to this area by creating a small berm or adding topsoil to areas that are heavily compacted. ☐ Other:

IN Drainage Area

Look for both pervious and impervious areas that are uphill from the Infiltration cell.

Problem (Check if Present)		Follow-Up Actions
		☐ Kick-Out to Level 2 Inspection: Large areas of soil have been eroded, or larger channels are forming. May require rerouting of flow paths.
☐ For Dry Wells: Leaves, sticks, or other debris in gutters and downspouts		☐ Remove all debris by hand. ☐ Other:
	☐ Piles of grass clippings, mulch, dirt, salt, or other materials	☐ Remove or cover piles of grass clippings, mulch, dirt, etc. ☐ Other:
	☐ Open containers of oil, grease, paint, or other substances	☐ Cover or properly dispose of materials; consult your local solid waste authority for guidance on materials that may be toxic or hazardous. ☐ Other:

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IN Inlets

Look for all the places where water flows into the Infiltration practice.

Problem (Check if Present)	Follow-Up Actions
	☐ Use a flat shovel to remove grit and debris (especially at curb inlets or openings). Parking lots generate fine grit that will accumulate at these spots. ☐ Pull out clumps of growing grass or weeds and scoop out the soil or grit that the plants are growing in. ☐ Remove any grass clippings, leaves, sticks, and other debris that is collecting at inlets. ☐ For pipes and ditches, remove sediment and debris that is partially blocking the pipe or ditch opening where it enters the Infiltration practice. ☐ Dispose of all material properly in an area where it will not re-enter the practice. ☐ Other:
☐ Inlets are collecting grit and debris or grass/weeds are growing. Some water may not be getting into the Infiltration practice.	☐ Kick-Out to Level 2 Inspection: Inlets are blocked to the extent that most of the water does not seem to be entering the Infiltration practice.
☐ Some or all of the inlets are eroding so that rills, gullies, and other erosion is present, or there is bare dirt that is washing into the Infiltration practice.	☐ For small areas of erosion, smooth out the eroded part and apply rock or stone (e.g., river cobble) to prevent further erosion. Usually, filter fabric is placed under the rock or stone. ☐ In some cases, reseeding and applying erosion-control matting can be used to prevent further erosion. Some of these materials may be available at a garden center, but it may be best to consult a landscape contractor. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Erosion is occurring at most of the inlets and it looks like there is too much water that is concentrating at these points. The inlet design may have to be modified.

IN Infiltration Area

Examine the surface of the infiltration area and the observation well. Note: The following Problem and Follow-Up Actions apply to infiltration practice pretreatment areas also.

Problem (Check if Present)	Follow-Up Actions
 ☐ For grass-covered Infiltration practices: grass has grown very tall, *Photo credit: Stormwater Maintenance, LLC*	☐ Mow infiltration area at least twice per year. ☐ Other:
 ☐ For grass-covered Infiltration practices: sparse vegetation cover or bare spots	☐ Add topsoil (as needed), grass seed, straw, and water during the growing season to re-establish consistent grass coverage. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Sparse vegetation cover can be a sign that the infiltration area is not infiltrating at the proper rate and water is standing too long after a storm. The surface may be saturated or squishy, and the conditions do not enable grass to grow. This situation should be evaluated by a Level 2 Inspection and likely corrected by a qualified contractor.
☐ Minor areas of sediment, grit, trash, or other debris are accumulating on the surface.	☐ Use a shovel to scoop out minor areas of sediment or grit, especially in the spring after winter sanding materials may wash in and accumulate. Dispose of the material where it cannot re-enter the Infiltration practice. ☐ If removing the material creates a hole or low area, rake the surface smooth and level. ☐ Remove trash, debris, and other undesirable materials. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Sediment has accumulated more than 2-inches deep and covers 25% or more of the surface of the Infiltration area.

IN Infiltration Area

Examine the surface of the infiltration area and the observation well. Note: The following Problem and Follow-Up Actions apply to infiltration practice pretreatment areas also.

Problem (Check if Present)	Follow-Up Actions
 ☐ There is erosion on the surface; water seems to be carving out rills as it flows across the surface of the Infiltration area or sinkholes are forming in certain areas.	☐ For minor areas of erosion, try filling the eroded areas with clean topsoil, sand, or stone (whatever the existing cover is). ☐ If the problem recurs, you may have to use larger stone (e.g., river cobble) to fill in problem areas. ☐ Other: ☐ Kick-Out to Level 2 Inspection: The problem persists or the erosion is more than 3-inches deep and seems to be an issue with how water enters and moves through the infiltration area. ☐ Kick-Out to Level 2 Inspection: The problem does not seem to be caused by flowing water but a collapse or sinking of the surface (e.g., "sinkhole") due to some underground problem.
 ☐ Observation well is damaged or cap is missing	☐ Kick-Out to Level 2 Inspection: Requires replacing pipes or caps.

IN Infiltration Area

Examine the surface of the infiltration area and the observation well. Note: The following Problem and Follow-Up Actions apply to infiltration practice pretreatment areas also.

Problem (Check if Present)	Follow-Up Actions
 ☐ Water still visible in the observation well more than 72 hours after a rain storm. The Infiltration practice does not appear to be draining properly.	☐ Kick-Out to Level 2 Inspection: This is generally a serious problem, and it will be necessary to activate a Level 2 Inspection.

IN Outlets

Locate and inspect all outlets.

Problem (Check if Present)	Follow-Up Actions
 ☐ Outlet obstructed with sediment, debris, trash, etc.	☐ Remove the debris and dispose of it where it cannot re-enter the infiltration area. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Outlet is completely obstructed; there is too much material to remove by hand or with simple hand tools.
☐ Rills or gullies are forming at outlet.	☐ For minor rills, fill in with soil, compact, and seed and straw to establish vegetation. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Rills are more than 2" to 3" deep and require more than just hand raking and re-seeding.

Additional Notes:

Inspector:____ Date: __________________

Complete the following if follow-up/corrective actions were identified during this inspection:

Certified Completion of Follow-Up Actions:

"I hereby certify that the follow-up/corrective actions identified in the inspection performed on _____________ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected."

Inspector/Operator: ________________________________ Date: ___________________

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Infiltration Stormwater Management Practices
Level 2 Inspection Checklist

SMP ID #		**SMP Owner**		☐ Private ☐ Public

SMP Location (Address; Latitude & Longitude)				
	Latitude		**Longitude**	

Party Responsible for Maintenance	**System Type**		**Type of Site**
☐ Same as SMP Owner ☐ Other ________________	☐ Seasonal ☐ Continuous Use ☐ Other	☐ Above Ground ☐ Below Ground	☐ Commercial ☐ Industrial ☐ Residential ☐ State

Inspection Date		**Inspection Time**	
Inspector			
Date of Last Inspection			

Level 2 Inspection: INFILTRATION

Recommended Repairs	Triggers for Level 3 Inspection
Observed Condition: Water Stands on Surface for More than 72 Hours after Storm	
☐ Condition 1: Small pockets of standing water For infiltration basins with soil, use a soil probe or auger to examine the soil profile. For gravel infiltration trenches or basins, use a shovel to dig into the gravel layer where the problem is occurring. If isolated areas have accumulated grit, fine silt, or vegetative debris or have bad soil or clogged gravel, try removing and replacing with clean material. If the practice is supposed to have grass cover, it will likely be necessary to replant once the problem is resolved. ☐ Condition 2: Standing water is widespread or covers entire surface Look in the observation well (if it exists) and use a tape measure to estimate the depth of water standing in the soil or gravel. Requires diagnosis and resolution of problem: • Too much sediment/grit washing in from drainage area? • Too much ponding depth? • Improper infiltration media? • Underlying soil not suitable for infiltration? As above, the resolution will likely require replanting and re-establishment of good grass cover if this is part of the design.	• Infiltration media is clogged and problem cannot be diagnosed from Level 2 inspection. • Level 2 inspection identifies problem, but it cannot be resolved easily or it is associated with the original design of the practice. ☐ Level 3 Inspection necessary
Observed Condition: Severe erosion of infiltration bed, inlets, or around outlets	
☐ Condition 1: Erosion at inlets The lining (e.g., grass, matting, stone, rock) may not be adequate for the actual flow velocities coming through the inlets. First line of defense is to try a less erosive lining and/or extending the lining further down to where inlet slopes meet the infiltration surface. If problem persists, analysis by a Qualified Professional is warranted. ☐ Condition 2: Erosion of infiltration bed This is often caused by “preferential flow paths” along the surface. The source of flow should be analyzed and methods employed to dissipate energy and disperse the flow (e.g., check dams, rock splash pads).	• Erosion (rills, gullies) is more than 12 inches deep • The issue is not caused by moving water but some sort of subsurface defect, which may manifest as a sinkhole or linear depression and be associated with problems with the underlying stone or soil. ☐ Level 3 Inspection necessary

Notes:

Inspector:_______________________ Date: ___________________

Complete the following if follow-up/corrective actions were identified during this inspection:

Certified Completion of Follow-Up Actions:

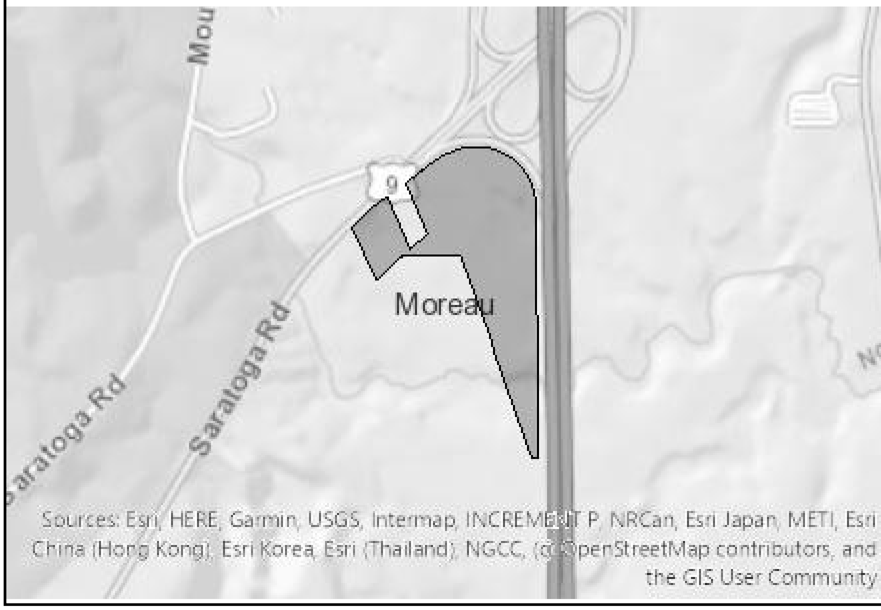
"I hereby certify that the follow-up/corrective actions identified in the inspection performed on ______________ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected."

Inspector/Operator: _______________________ Date: ___________________

APPENDIX I DOCUMENTATION OF NO THREATENED OR ENDANGERED SPECIES

EAF Mapper Summary Report

Monday, July 13, 2026 4:13 PM



Disclaimer: The EAF Mapper is a screening tool intended to assist project sponsors and reviewing agencies in preparing an environmental assessment form (EAF). Not all questions asked in the EAF are answered by the EAF Mapper. Additional information on any EAF question can be obtained by consulting the EAF Workbooks. Although the EAF Mapper provides the most up-to-date digital data available to DEC, you may also need to contact local or other data sources to confirm data provided by the Mapper or to obtain data not provided by the Mapper.

Part 1 / Question 7 [Critical Environmental Area]	No
Part 1 / Question 12a [National or State Register of Historic Places or State Eligible Sites]	No
Part 1 / Question 12b [Archeological Sites]	No
Part 1 / Question 13a [Wetlands or Other Regulated Waterbodies]	Yes - Digital mapping information on local, New York State, and federal wetlands and waterbodies is known to be incomplete. Refer to the EAF Workbook.
Part 1 / Question 15 [Threatened or Endangered Animal]	No
Part 1 / Question 16 [100 or 500 Year Floodplain]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
Part 1 / Question 20 [Remediation Site]	No
Part 1 / Question 21 [Disadvantaged Community]	No