John D. Fuller, P. E., P.C.
CIVIL & STRUCTURAL ENGINEERING

# DELACORE INC.
# 122 - 126 NYS ROUTE 42 & 97
# SECTION 44 BLOCK 4 LOTS 23.21 & 23.22
# TOWN OF DEERPARK
# ORANGE COUNTY, NY

## ***STORMWATER POLLUTION PREVENTION PLAN REPORT***

***Revision 0***
***March 19, 2025***

**Owner of Property:** **DELACORE INC.**
**P.O. Box 94**
**Port Jervis, NY 12771**

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## Table of Contents

*A stormwater management assessment has been conducted for the proposed project in order to protect the waters of the State of New York from the adverse impacts of stormwater runoff. This report presents an analysis of the project in accordance with the New York State Department of Environmental Conservation SPDES General Permit for Stormwater Discharges from Construction Activity Permit No. GP-0-25-001 and the New York State Stormwater Management Design Manual. As required, the Stormwater Pollution Prevention Plan is designed, where appropriate, to incorporate green infrastructure techniques that preserve natural resources and utilize the existing hydrology of the site, provide runoff reduction practices, water quality treatment practices, apply volume and peak control practices for channel protection, overbank flood control, and extreme flood control as appropriate.*

*In accordance with Appendix B, Table 2 of the SPDES General Permit for Construction Activity, GP-0-25-001, commercial developments that involve soil disturbances of one (1) or more acres of land require the preparation of a full SWPPP that includes post-construction stormwater management practices. This project involves a soil disturbance of more than one (1) acre and requires the development of a full SWPPP, including erosion and sediment controls, green infrastructure site planning techniques, runoff reduction volume practices and post-construction stormwater management practices.*

*The general contractor and subcontractors performing any activity that involves soil disturbance will be required to comply with the terms and conditions of the SWPPP for the project identified as a condition of authorization to discharge stormwater. The SPDES General Permit and SWPPP must be kept on file at the project site.*

*As required by the conditions described in the SPDES general permit, the SWPPP shall be kept current and changes made to reflect changes in the design, construction, and operation or in the maintenance of the project.*

*The complete set of construction drawings and specifications are provided as separate documents; however, they should be considered an integral component of the SWPPP and are referenced throughout this document.*

## 1.0 Owner / Operator Information

The owner and operator of this project is:

| | |
|---|---|
| Contact Name: | Paul Service |
| Company Name: | Delacore, Inc. |
| Address: | P.O. Box 94 |
| | Port Jervis, NY 12771 |
| Phone Number: | (845) 321-4663 |
| Email Address: | ps.service1017@gmail.com |

The terms "developer", "contractor", "operator", "permittee" and "owner" in the following report and on the plans refers to Paul Service of Delacore, Inc. and are used interchangeably. The duties of the operator include the following:

- Implement the SWPPP and administer the construction sequence.
- Oversee maintenance practices identified as BMP's.
- Conduct inspection and monitoring activities.
- Identify other potential pollutant sources and add to the plan.
- Identify any deficiencies in the SWPPP and make corrections.

This Stormwater Pollution Prevention Plan (SWPPP) Report is to be used with and referenced to the following documents.

- "Site Plan for Delacore, Inc., 122 & 126 N.Y.S. Routes 42 & 97, Section 44 Block 4 Lots 23.22 & 23.21, Town of Deerpark, Orange County, NY" with latest revision date**.**

## 2.0 Project Site Information

The project site consists of two parcels that will be consolidated into a single 5.18 acre lot with road frontage on NYS Route 42 & 97, Corso Road and Berme Road. The site is adjacent to parcels that have both commercial and residential uses including a day care, a junk yard and single family dwellings.

This parcel is located in NYSDEC Region 3. The coordinates of the property are 41.395885, -74.714594. The site is mainly wooded.

There is a pond and two (2) patches of federal wetlands on the site. Water flows through the site, along the roadside ditch to a culvert pipe that goes under the highway and ultimately discharges to the Delaware River. The Delaware River is not identified in the SPDES

General Permit for Stormwater Discharges from Construction Activities, Appendix E. The project is not located in a watershed identified in Appendix C.

According to the USDA Natural Resources Conservation service soil survey, the parcel contains the following soils:

| | | | Hydrologic Soil Group |
|---|---|---|---|
| • | AC | Alden extremely stony soils | 2.68 acres D (54%) |
| • | Ca | Canandaigua silt loam | 1.17 acres D (23%) |
| • | SwD | Swartswood gravelly loam, 15 to 25% slopes | 0.63 acres C (12%) |
| • | SXC | Swartswood & Mardin soils, sloping, very stony | 0.23 acres D (5%) |
| • | WuC | Wurtsboro gravelly loam, 8 to 15% slopes | 0.29 acres D (6%) |

The soil report from the USDA Natural Resources Conservation Service includes the soil summaries and appears in the Appendix.

Elevations vary from 468 feet at the southeast corner of the property up to 520 feet at the northwest side of the property. The average slope of the site is approximately 8 percent. Runoff drains to the existing culvert pipe located at the southeast corner of the property and traverses under Route 42 & 97.

## 3.0 Project Description

The name of this project is Delacore Inc. The nature of this project is the construction of new self-storage units. Runoff from the buildings and new pavement shall discharge to bioretention areas. The bioretention ponds shall treat the runoff and overflow will drain to the existing culvert pipe located at the southeast corner of the property that traverses under Route 42 & 97. No runoff will enter a combined sewer system.

The existing project site is 5.18 acres. The proposed area to be disturbed on the project site is approximately 3.64 acres. For purposes of this design, the contributing area to the storm water facilities is approximately 3.64 acres with 2.08 acres of impervious surfaces. There are no existing impervious surfaces. This is not a phased project and less than 5 acres shall be disturbed. It is anticipated that the project shall begin construction in the summer of 2025 and be completed within two (2) years.

# 4.0 Erosion & Sediment Control

## 4.1 Temporary Erosion & Sediment Control Practices

The Erosion and Sediment Control plan for the proposed development shall utilize silt fences, temporary swales and a stabilized construction entrance which are to be installed prior to and during construction. These controls will contain the silt and sediment on site. They are to be maintained during construction by the contractor and will remain in place throughout the period of construction until vegetation is established and the site is stabilized. These and other temporary practices to be utilized are outlined below:

Silt Fence: Silt Fence will be installed around all low lying areas as necessary to prevent sediment from entering them. In addition, silt fence shall be installed on the downslope side of all disturbed areas as shown on the plans.

Temporary Swales: Temporary swales shall be installed during construction to direct stormwater to the sediment traps. Upon stabilization of the site, the swale shall be removed and the site graded according to the plan specifications.

Stabilized Construction Entrance: A temporary gravel construction entrance will be installed at the entrance from M&M Road. All construction vehicles shall enter and exit from this entrance. A second construction entrance shall be installed at the edge of the paved driveway from Bloomingburg Rd when the storage building is constructed.

Grading: Grading will be required on the site. Upon completion of rough grading, the area will be temporarily vegetated if the site is to be inactive for more than 7 days. No more than 5 acres shall be disturbed at any one point of time.

Soil Stockpiling: Stripped topsoil and excavated soils shall be stockpiled. Stockpiles shall be enclosed with silt fence.

## 4.2 Permanent Erosion & Sediment Control Practices

Upon establishment of vegetation, the swales and bioretention area will provide erosion and sediment control. The grass areas will be maintained and mowed by the developer. Vegetation shall be established when the construction is completed.

## 5.0 Identification of Potential Stormwater Contaminants.

The purpose of this section is to identify pollutants that could impact stormwater during and after construction of the project and provide practices that will prevent stormwater pollution.

Petroleum Products: All on-site vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers that are clearly labeled. Any asphalt substances used on site will be applied according to the manufacturer's recommendations.

Fertilizers: Fertilizers used will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to stormwater. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

Paints: All containers will be tightly sealed and stored when not required for use. Excess paint will not be discharged to the stormwater system but will be properly disposed of according to manufacturer's instructions or state and local regulations.

Concrete: Concrete trucks will not be allowed to wash out or discharge surplus concrete or drum-wash water on the site.

Waste Disposal: All waste materials and litter will be collected and stored in a secure metal dumpster from a licensed solid waste management company. The dumpster will meet local and state solid waste management regulations. All trash and construction debris from the site will be deposited in the dumpster. The dumpster will be emptied as often as necessary and the trash will be hauled to a transfer station. No construction waste materials will be buried on site. All personnel will be instructed regarding the correct procedures for waste disposal.

Hazardous Waste: All hazardous waste materials will be disposed of in the manner specified by the local or state regulations or by the manufacturer. Site personnel will be instructed in these practices.

Sanitary Waste: Sanitary Portable units shall be provided. All sanitary waste will be collected from portable units as needed by a licensed sanitary waste management contractor.

Recyclable Waste: All recyclable waste (cardboard, wood, etc.) shall be collected and recycled.

Refueling: All refueling, repair and changing of equipment and vehicle fluids shall be conducted in a designated area if practicable. This area will be designed in a manner to

reduce the potential for contamination of on-site resources. For refueling, repair, and changing of equipment and vehicles outside of designated areas, care should be taken to avoid activities within 100-feet of wetlands, streams, water bodies or other environmentally sensitive areas.

Spill Prevention: The following practices shall be used to reduce the risk of spills or other accidental exposure of materials and substances on site during construction to stormwater runoff:

- Products will be kept in original containers with their original manufacturer's label, unless they are not resealable.
- Original labels and materials safety data sheets will be retained.
- An effort will be made to store only enough products required to do the job.
- All materials stored on site will be stored in a neat, orderly manner in their appropriate containers and if possible under a roof or other enclosure.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of a product will be used before disposing of the container.
- Manufacturer's recommendations for proper use and disposal will be followed.
- The site superintendent will inspect daily to ensure the proper use and disposal of materials on site.
- Manufacturer's recommended methods for spill cleanup will be posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area on site. Equipment and materials will include but not be limited to brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
- All spills will be cleaned immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- Spills of any size of toxic or hazardous material will be reported to the NYSDEC and/or the Town of Wallkill Building Department.

## 6.0 Stormwater Management Plan

Pre-Development
The pre-development drainage area is 3.64 acres and consists mainly of woods (3.24 acres) and grass (0.65 acres) with no existing impervious surfaces. The pre-development plan shows that the stormwater currently travels from the northwest corner of the property, through the wooded area, to the concrete culvert pipe that crosses under State Route 42 & 97. A culvert pipe crosses under Berme Rd and discharges to a drainage ditch along the northeastern edge of the drainage area. This ditch captures the stormwater from Corso Rd and carries it to the existing wetlands which also discharge to the concrete culvert pipe that crosses under State Route 42 & 97. The ditch acts as a diversion swale, diverting runoff from above the project site so that it does not contribute to the stormwater runoff volume.

Post-Development
The post-development drainage area is 3.64 acres and consists of 2.08 acres of impervious surfaces, 1.41 acres of grass, and 0.15 acres of woods. Runoff will collect in a network of catch basins, underground drainage pipes and swales that discharge to a bioretention pond. The pond has an outlet pipe that discharges to the existing wetlands.

### 6.1 Site Planning

The following site planning practices were used to prepare the final site plan for this project:

Reduction of Clearing and Grading: Clearing and grading is limited to the minimum amount needed for the proposed building, parking area, and storm water management facilities.

Location Development in Less Sensitive Areas: The locations of the proposed buildings, driveways and stormwater management facilities avoid the majority of the wetlands located on the project site.

### 6.2 Water Quality Treatment Volume

Total water quality volume for the drainage area is calculated using the following equation:

$$WQv = \frac{P * Rv * A}{12}$$

where:

| | | |
|---|---|---|
| WQv | = | water quality volume (in acre-feet) |
| P | = | 90% Rainfall Event Number |
| Rv | = | 0.05 + 0.009(I), where I is percent impervious cover |
| A | = | site area in acres (Contributing area) |

| | |
|---|---|
| Drainage Area (A) | 3.64 Acres |
| Impervious Surface | 2.08 Acres |
| P | 1.4 |
| I | 57% |
| Rv | 0.56 |
| WQv | **0.238 Ac-ft (10,367 ft$^3$)** |

### 6.3 Runoff Reduction Techniques

Runoff reduction is achieved by the Standard SMP's with RRv Capacity (see Section 6.5).

### 6.4 Minimum RRv Required

For this project, the minimum RRv is $RRvmin = \frac{P*Rv*Aic*S}{12}$

where:
P = 1.4, Rv = 0.95, the new impervious area (Aic) is 2.08 acres, and S = 0.2.

$RRvmin = \frac{1.4*0.95*2.08*0.2}{12} =$ **0.046 Ac-ft** (2,003 ft$^3$)

### 6.5 Standard SMP's with RRv Capacity

A bioretention area shall be constructed to the north of the existing wetlands area 'B'. A bioretention area is a shallow stormwater basin or landscaped area which utilizes engineered soils and vegetation to capture and treat runoff.

The required bioretention area is computed using the following equation:

**Af=WQv*(df)/[k*(hf+df)(tf)]**

where:

| | | |
|---|---|---|
| Af | = | Required Surface Area (sf) |
| WQv | = | Water Quality Volume (cf) = 10,367 ft$^3$ |
| df | = | Soil Media Depth (ft) = *2.5 ft* |
| hf | = | Ponding Depth (ft) = *0.5 ft* |
| tf | = | Volume through the filter media (days) = *2 days* |
| k | = | Hydraulic Conductivity = *1.0* |

Af = 4,320 sf  A 4,500 sf bioretention area is provided.

The 4,500 sf bioretention area provides 4,320 $ft^3$ of runoff reduction, greater than the minimum runoff reduction required. The remaining runoff is treated and discharged to the existing wetlands.

The bioretention area will be mulched and landscaped. There shall be an emergency spillway to prevent overtopping of the pond during extreme storm events.

Water Quantity Analysis

The following table summarizes the differences between the pre-construction and post-construction discharge for the 1-year, 2-year, 10-year and 100-year storms.

| | Pre-Development (cfs) | Post-Construction (cfs) | Net Difference |
|---|---|---|---|
| 1 Year | 2.69 cfs | 0.68 cfs | - 2.01 cfs |
| 2 Year | 4.24 cfs | 0.93 cfs | - 3.31 cfs |
| 10 Year | 9.17 cfs | 1.80 cfs | - 7.37 cfs |
| 100 Year | 22.15 cfs | 13.74 cfs | - 8.41 cfs |

The post-construction runoff is less than or equal to the pre-construction runoff in all cases. Please see the attached HydroCAD Calculations provided in the Appendix.

### 6.6 Stream Channel Protection Volume

The Hydrograph provided in the attached HydroCAD Calculations demonstrates that the post-construction stormwater runoff volume is managed to prevent erosion of downstream channel by providing extended detention and gradually released over a 24-hour period.

### 6.7 Overbank Flood Control

The attached HydroCAD Calculations demonstrate that the post-construction stormwater management facilities attenuate the post-development 10 year, 24-hour peak discharge rate to less than the pre-development rates.

### 6.8 Extreme Flood Control

The attached HydroCAD Calculations demonstrate that the post-construction stormwater management facilities attenuate the post-development 100 year, 24-hour peak discharge rate to less than the pre-development rates.

# 7.0 Maintenance & Inspection Procedures

## 7.1 Inspections & Training

Inspection procedures and schedules as stated in the New York State Stormwater Management Design Manual shall be employed for this project.

Specifically, visual inspections of all cleared and graded areas during construction should be performed daily and within 24 hours of significant storm event of ½" of rain or more. The inspections should be conducted by a representative of the SWPPP operator or a Licensed Professional. The inspections should focus on the condition of the BMP's and identify repairs prior to the next storm event. The inspections should also identify areas where sediment needs removal and stockpiled.

In the absence of major storm events, weekly inspections should be performed to confirm condition of BMP's due to other factors such as groundwater, wind, and other structural factors. Reseeding and mulching should be given special attention in exposed areas that do not have permanent stabilization.

The inspections should also place special emphasis on potential pollutants of construction materials and products such as petroleum and concrete waste.

Inspection reports should be maintained on a weekly basis and recorded for future reference.

## 7.2 Maintenance

Maintenance responsibility for the stormwater management facilities shall be vested with a responsible authority by means of a legally binding and enforceable maintenance agreement that is executed as a condition of plan approval. Continued maintenance of the facilities shall be included in the proposed parcel deed. If the lot is sold, the new owners shall be provided with a maintenance checklist in the Appendix.

- Sediment removal shall occur every five to six years or after 50% of total capacity has been lost.
- All required safety elements must be inspected and maintained on an annual basis.

## 8.0 Appendix

- **8.1 Aerial Map**
- **8.2 Topography Map**
- **8.3 Soils Report**
- **8.4 Site Drainage Maps**
- **8.5 Stormwater Worksheets**
- **8.6 HydroCAD Calculations**

# 122-126 Rte 42 & 97 Aerial Map


March 21, 2025

Address Points

Municipal Boundaries

Parcel Boundaries

N

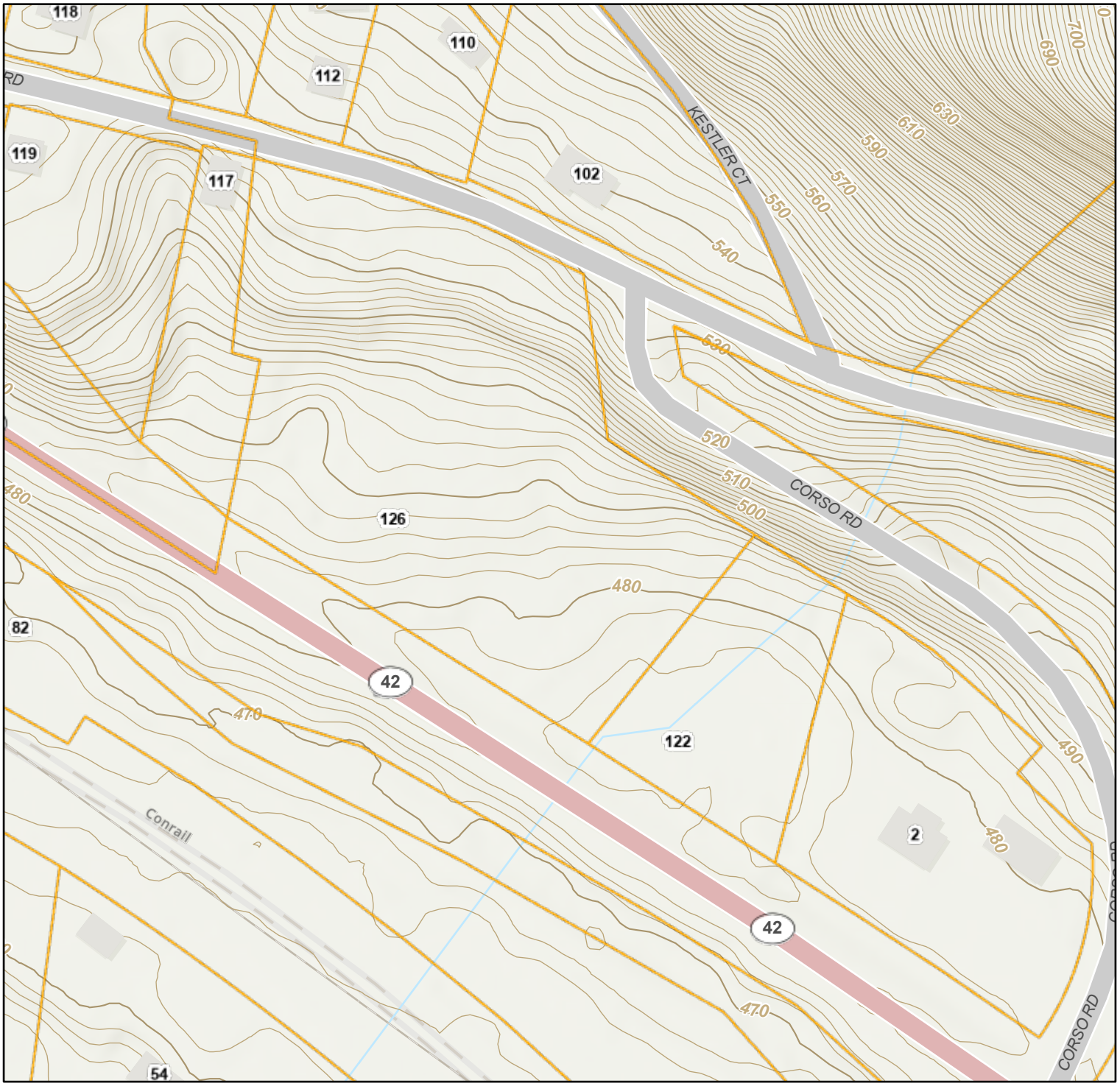
1:2,257

0 0.010.01 0.03

Miles

CREDITS: Orange County, OCGIS, New York State, Maxar, Microsoft, Esri Community Maps Contributors, Orange County, NY, data.pa.gov, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, Sources: Esri, Maxar,

# 122-126 Rte 42 & 97 TopographicalMap




March 21, 2025

Address Points

Municipal Boundaries

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Miles

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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 Orange County, New York


January 17, 2025

# 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.

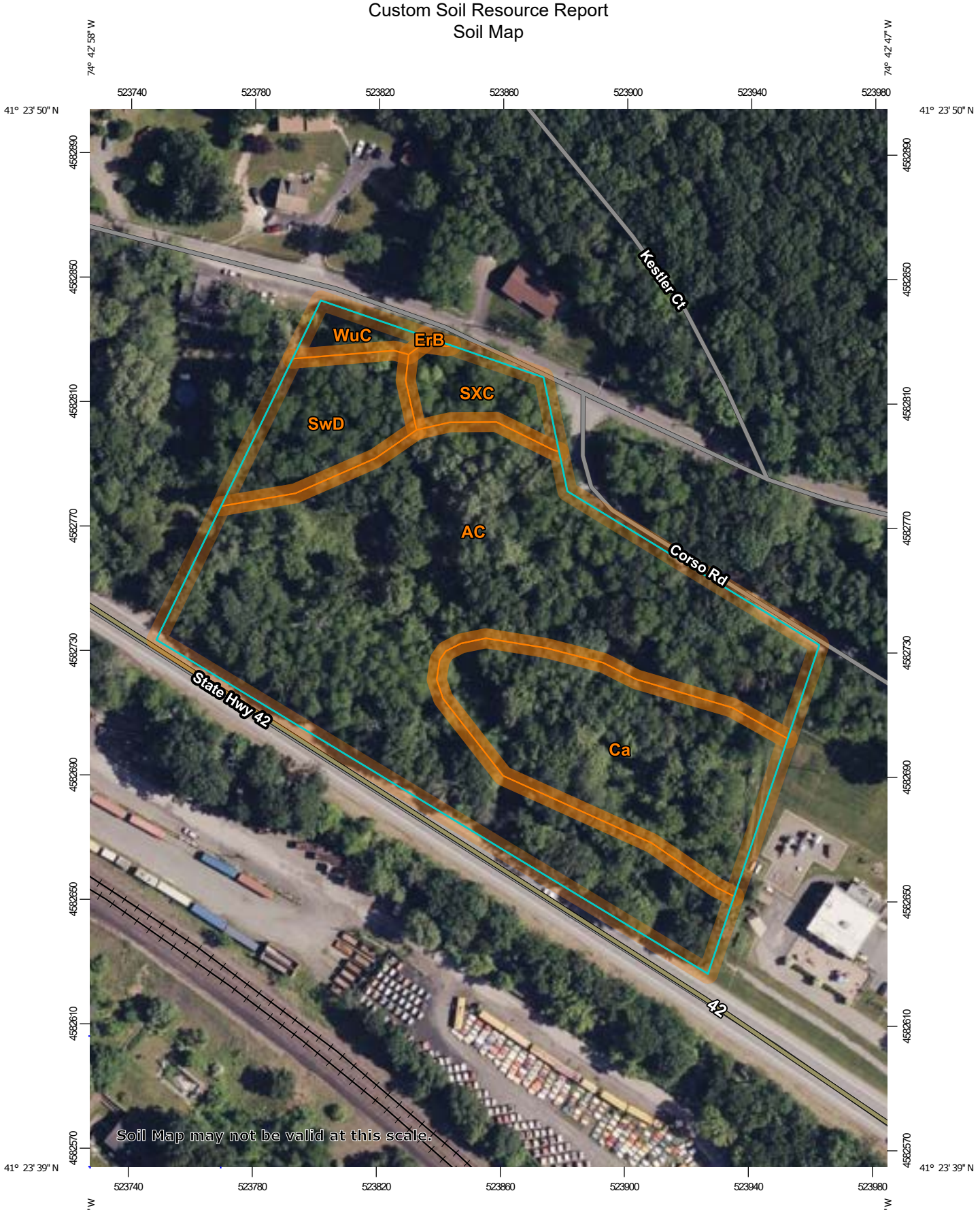
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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.

# Custom Soil Resource Report
## Soil Map




Map Scale: 1:1,660 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

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 INFOR

The soil surveys that comprise your
1:15,800.

Warning: Soil Map may not be valid

Enlargement of maps beyond the sc
misunderstanding of the detail of ma
line placement. The maps do not sh
contrasting soils that could have bee
scale.

Please rely on the bar scale on each
measurements.

Source of Map: Natural Resources
Web Soil Survey URL:
Coordinate System: Web Mercator

Maps from the Web Soil Survey are
projection, which preserves direction
distance and area. A projection that
Albers equal-area conic projection, s
accurate calculations of distance or

This product is generated from the U
of the version date(s) listed below.

Soil Survey Area: Orange County,
Survey Area Data: Version 25, Aug

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

Date(s) aerial images were photogra
27, 2022

The orthophoto or other base map o
compiled and digitized probably diffe
imagery displayed on these maps. A
shifting of map unit boundaries may

# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| AC | Alden extremely stony soils | 3.8 | 64.9% |
| Ca | Canandaigua silt loam | 1.2 | 20.8% |
| ErB | Erie gravelly silt loam, 3 to 8 percent slopes | 0.0 | 0.0% |
| SwD | Swartswood gravelly loam, 15 to 25 percent slopes | 0.5 | 7.9% |
| SXC | Swartswood and Mardin soils, sloping, very stony | 0.3 | 4.4% |
| WuC | Wurtsboro gravelly loam, 8 to 15 percent slopes | 0.1 | 1.9% |
| **Totals for Area of Interest** | | **5.9** | **100.0%** |

# Map Unit Descriptions

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

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

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

was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

# Orange County, New York

## AC—Alden extremely stony soils

### Map Unit Setting

*National map unit symbol:* 9vtd
*Elevation:* 130 to 1,480 feet
*Mean annual precipitation:* 42 to 52 inches
*Mean annual air temperature:* 46 to 52 degrees F
*Frost-free period:* 135 to 215 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

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

### Description of Alden, Extremely Stony

#### Setting

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

#### Typical profile

*H1 - 0 to 9 inches:* silt loam
*H2 - 9 to 36 inches:* silt loam
*H3 - 36 to 60 inches:* gravelly fine sandy loam

#### Properties and qualities

*Slope:* 0 to 3 percent
*Surface area covered with cobbles, stones or boulders:* 9.0 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Very poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.57 in/hr)
*Depth to water table:* About 0 inches
*Frequency of flooding:* None
*Frequency of ponding:* Frequent
*Calcium carbonate, maximum content:* 1 percent
*Available water supply, 0 to 60 inches:* High (about 9.2 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 7s
*Hydrologic Soil Group:* C/D
*Ecological site:* F144AY040NY - Semi-Rich Very Wet Till Depressions
*Hydric soil rating:* Yes

### Minor Components

#### Canandaigua

*Percent of map unit:* 5 percent

*Landform:* Depressions
*Hydric soil rating:* Yes

**Lyons**

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

**Palms**

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

**Wayland**

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

**Erie**

*Percent of map unit:* 5 percent
*Landform:* Depressions
*Hydric soil rating:* No

## Ca—Canandaigua silt loam

### Map Unit Setting

*National map unit symbol:* 9vtq
*Elevation:* 130 to 1,330 feet
*Mean annual precipitation:* 42 to 52 inches
*Mean annual air temperature:* 46 to 52 degrees F
*Frost-free period:* 135 to 215 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

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

### Description of Canandaigua

#### Setting

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

#### Typical profile

*H1 - 0 to 8 inches:* silt loam
*H2 - 8 to 35 inches:* silty clay loam
*H3 - 35 to 60 inches:* fine sand

**Properties and qualities**

*Slope:* 0 to 1 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 1.98 in/hr)
*Depth to water table:* About 0 inches
*Frequency of flooding:* None
*Frequency of ponding:* Frequent
*Calcium carbonate, maximum content:* 15 percent
*Available water supply, 0 to 60 inches:* Moderate (about 7.6 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* B/D
*Ecological site:* F101XY010NY - Wet Lake Plain Depression
*Hydric soil rating:* Yes

**Minor Components**

**Alden**

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

**Halsey**

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

**Madalin**

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

**Palms**

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

**Raynham**

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

## ErB—Erie gravelly silt loam, 3 to 8 percent slopes

**Map Unit Setting**

*National map unit symbol:* 9vv9
*Elevation:* 100 to 1,390 feet
*Mean annual precipitation:* 42 to 52 inches

*Mean annual air temperature:* 46 to 52 degrees F
*Frost-free period:* 135 to 215 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

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

**Description of Erie**

**Setting**

*Landform:* Drumlinoid ridges, hills, till plains
*Landform position (two-dimensional):* Summit, footslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Parent material:* Loamy till derived from siltstone, sandstone, shale, and limestone

**Typical profile**

*H1 - 0 to 9 inches:* gravelly silt loam
*H2 - 9 to 18 inches:* channery silt loam
*H3 - 18 to 54 inches:* channery silt loam
*H4 - 54 to 70 inches:* channery silt loam

**Properties and qualities**

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* 10 to 21 inches to fragipan
*Drainage class:* Somewhat poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
*Depth to water table:* About 6 to 18 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 15 percent
*Available water supply, 0 to 60 inches:* Very low (about 2.4 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* D
*Ecological site:* F144AY037MA - Moist Dense Till Uplands
*Hydric soil rating:* No

**Minor Components**

**Alden**

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

**Bath**

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

**Mardin**

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

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

## SwD—Swartswood gravelly loam, 15 to 25 percent slopes

### Map Unit Setting
*National map unit symbol:* 9vx5
*Elevation:* 1,000 to 1,800 feet
*Mean annual precipitation:* 42 to 52 inches
*Mean annual air temperature:* 46 to 52 degrees F
*Frost-free period:* 135 to 215 days
*Farmland classification:* Not prime farmland

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

### Description of Swartswood

#### Setting
*Landform:* Hills, till plains
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Loamy till derived mainly from quartzite, conglomerate, and sandstone

#### Typical profile
*H1 - 0 to 1 inches:* gravelly loam
*H2 - 1 to 28 inches:* gravelly fine sandy loam
*H3 - 28 to 60 inches:* gravelly fine sandy loam

#### Properties and qualities
*Slope:* 15 to 25 percent
*Depth to restrictive feature:* 20 to 36 inches to fragipan
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.57 in/hr)
*Depth to water table:* About 23 to 31 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water supply, 0 to 60 inches:* Very low (about 2.8 inches)

#### Interpretive groups
*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 4e
*Hydrologic Soil Group:* C

*Ecological site:* F140XY024NY - Moist Dense Till
*Hydric soil rating:* No

**Minor Components**

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

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

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

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

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

## SXC—Swartswood and Mardin soils, sloping, very stony

**Map Unit Setting**
*National map unit symbol:* 2v30r
*Elevation:* 330 to 2,460 feet
*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 180 days
*Farmland classification:* Not prime farmland

**Map Unit Composition**
*Swartswood, very stony, and similar soils:* 41 percent
*Mardin, very stony, and similar soils:* 39 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Swartswood, Very Stony**

**Setting**
*Landform:* Hills, till plains
*Landform position (two-dimensional):* Shoulder
*Landform position (three-dimensional):* Crest
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Loamy till derived mainly from quartzite, conglomerate, and sandstone

**Typical profile**

*H1 - 0 to 3 inches:* gravelly loam
*H2 - 3 to 31 inches:* gravelly fine sandy loam
*H3 - 31 to 60 inches:* gravelly fine sandy loam

**Properties and qualities**

*Slope:* 8 to 15 percent
*Surface area covered with cobbles, stones or boulders:* 1.6 percent
*Depth to restrictive feature:* 20 to 36 inches to fragipan
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.57 in/hr)
*Depth to water table:* About 23 to 31 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water supply, 0 to 60 inches:* Low (about 3.1 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 6s
*Hydrologic Soil Group:* C
*Ecological site:* F140XY030NY - Well Drained Dense Till
*Hydric soil rating:* No

**Description of Mardin, Very Stony**

**Setting**

*Landform:* Hills, mountains
*Landform position (two-dimensional):* Shoulder, backslope
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy till

**Typical profile**

*A - 0 to 4 inches:* gravelly silt loam
*Bw - 4 to 15 inches:* gravelly silt loam
*E - 15 to 20 inches:* gravelly silt loam
*Bx - 20 to 72 inches:* gravelly silt loam

**Properties and qualities**

*Slope:* 8 to 15 percent
*Surface area covered with cobbles, stones or boulders:* 1.6 percent
*Depth to restrictive feature:* 14 to 26 inches to fragipan
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)
*Depth to water table:* About 13 to 24 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water supply, 0 to 60 inches:* Low (about 3.6 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 6s
*Hydrologic Soil Group:* D
*Ecological site:* F144AY008CT - Moist Till Uplands

*Hydric soil rating:* No

**Minor Components**

**Bath, very stony**

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

**Volusia, very stony**

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

**Wurtsboro, very stony**

*Percent of map unit:* 5 percent
*Landform:* Hills, till plains
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Crest
*Down-slope shape:* Concave
*Across-slope shape:* Convex
*Hydric soil rating:* No

**Lordstown**

*Percent of map unit:* 5 percent
*Landform:* Mountains, hills
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Mountainflank, nose slope, side slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## WuC—Wurtsboro gravelly loam, 8 to 15 percent slopes

**Map Unit Setting**

*National map unit symbol:* 9vxm
*Elevation:* 1,000 to 1,800 feet
*Mean annual precipitation:* 42 to 52 inches
*Mean annual air temperature:* 46 to 52 degrees F
*Frost-free period:* 135 to 215 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

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

**Description of Wurtsboro**

**Setting**

*Landform:* Hills, till plains
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Crest
*Down-slope shape:* Concave
*Across-slope shape:* Convex
*Parent material:* Loamy till derived mainly from acid quartzite, conglomerate, and sandstone

**Typical profile**

*H1 - 0 to 8 inches:* gravelly loam
*H2 - 8 to 21 inches:* loam
*H3 - 21 to 60 inches:* gravelly loam

**Properties and qualities**

*Slope:* 8 to 15 percent
*Depth to restrictive feature:* 19 to 27 inches to fragipan
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
*Depth to water table:* About 16 to 24 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water supply, 0 to 60 inches:* Very low (about 2.5 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3e
*Hydrologic Soil Group:* D
*Ecological site:* F144AY008CT - Moist Till Uplands
*Hydric soil rating:* No

**Minor Components**

**Mardin**

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

**Bath**

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

**Erie**

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

**Lordstown**

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

**Swartswood**

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

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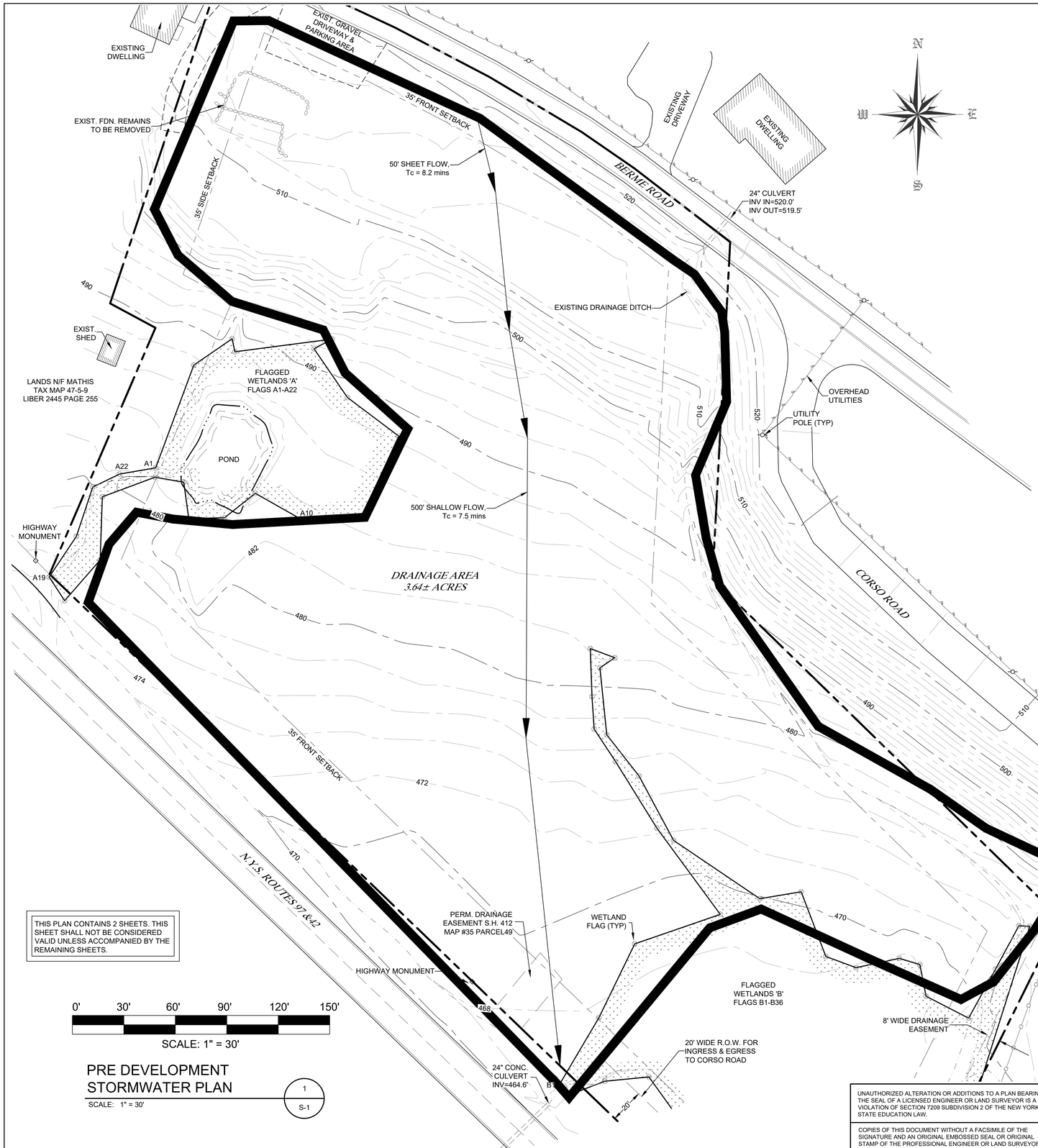



*LEGEND*

- N/F NOW OR FORMERLY
- PROPERTY LINE
- SETBACK LINE
- OVERHEAD UTILITIES
- UTILITY POLE
- EXISTING CULVERT
- DRAINAGE DITCH
- EXISTING FENCE
- DRAINAGE AREA
- EXISTING BUILDING
- 450 CONTOUR LINES
- WETLAND BOUNDARY
- A1 WETLAND FLAGS

## PRE DEVELOPMENT DRAINAGE AREAS

| DESCRIPTION | PRE-DEVELOPMENT AREA |
|---|---|
| WOODS, FAIR HSG C | 3.24± ACRES |
| 50 -75% GRASS COVER HSG C | 0.40± ACRES |
| | |
| | |
| TOTAL | 3.64± ACRES |

THIS PLAN CONTAINS 2 SHEETS. THIS SHEET SHALL NOT BE CONSIDERED VALID UNLESS ACCOMPANIED BY THE REMAINING SHEETS.

0' 30' 60' 90' 120' 150'

SCALE: 1" = 30'

PRE DEVELOPMENT STORMWATER PLAN

SCALE: 1" = 30'

1 / S-1

*TOWN OF DEERPARK PLANNING BOARD APPROVAL*

| REVISIONS | | | | |
|---|---|---|---|---|
| DWN BY | REV | DESCRIPTION | DATE | APPROVED |
| DO | 0 | FOR APPROVAL | 02/26/25 | |



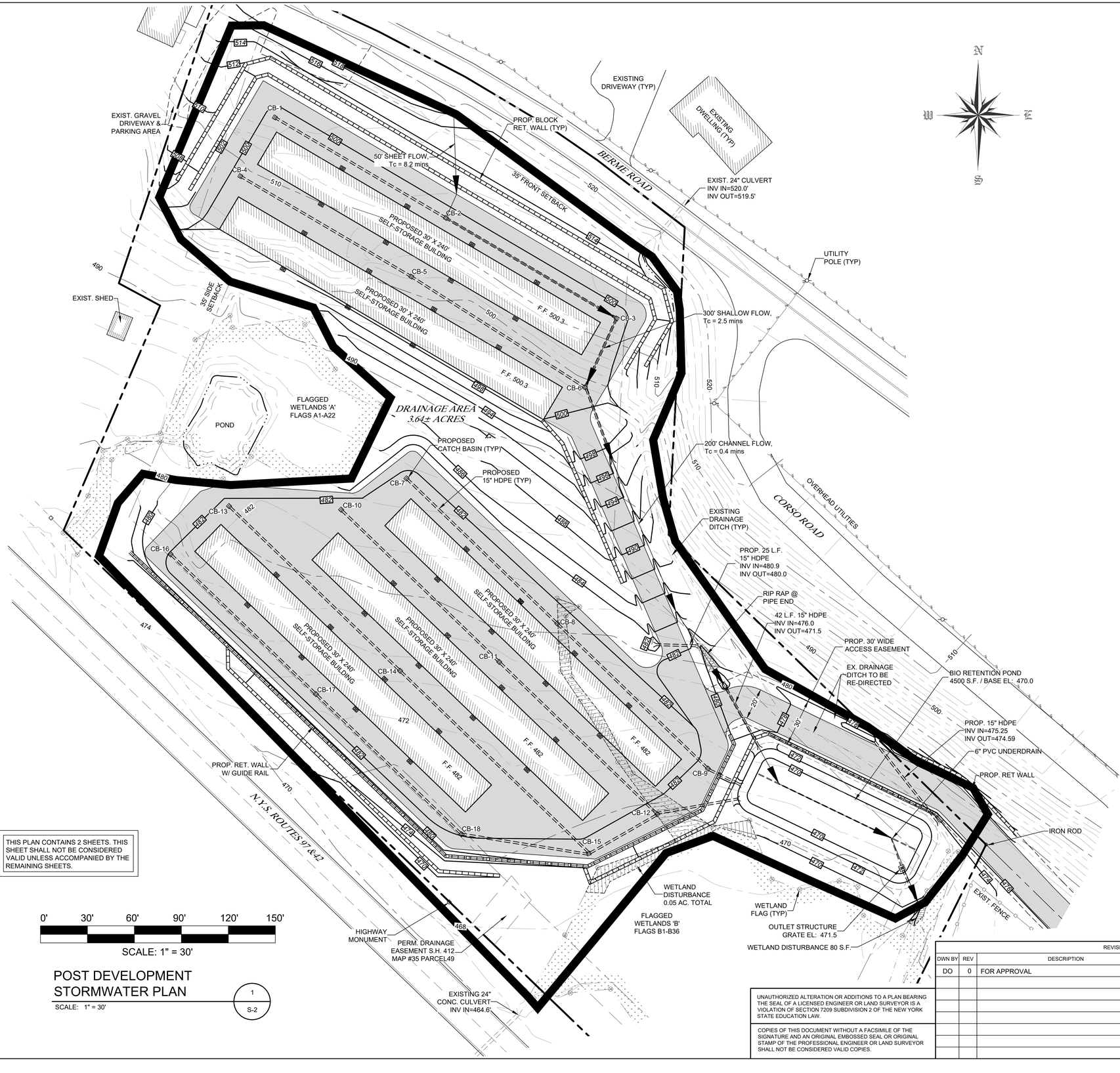
STATE OF NEW YORK · JOHN DOUGLAS FULLER · 077703-1 · LICENSED PROFESSIONAL ENGINEER

JOHN D. FULLER
REG. NO. 077703

**JOHN D. FULLER, P.E., P.C.**
4 SOUTH STREET
PORT JERVIS, NY 12771
(845) 856-1536

ROUTE 97 SELF-STORAGE
122 & 126 N.Y.S. ROUTES 42 & 97
SECTION 44 BLOCK 4 LOTS 23.22 & 23.21
TOWN OF DEERPARK, NY

DWG TITLE: PRE DEVELOPMENT STORMWATER PLAN
DWG NO.: S-1
SCALE: AS NOTED
JOB NO.: 1100.007




## LEGEND

- PROPERTY LINE
- SETBACK LINE
- OVERHEAD UTILITIES
- UTILITY POLE
- EXISTING CULVERT
- EXISTING DITCH
- PROPOSED SWALE
- PROPOSED GRADING
- WETLAND DIST. AREA
- PROPOSED WALL LIGHT
- PROPOSED BIO RETENTION POND
- DRAINAGE AREA
- EXISTING BUILDING
- PROPOSED BUILDING
- CONTOUR LINES
- WETLAND BOUNDARY
- WETLAND FLAGS
- PROPOSED RET. WALL
- PROP. GUIDE RAIL
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROP. DRAINAGE PIPE
- PROP. CATCH BASIN

## POST DEVELOPMENT DRAINAGE AREAS

| DESCRIPTION | PRE-DEVELOPMENT AREA |
|---|---|
| WOODS, FAIR, HSG C | 0.15± ACRES |
| PAVED PARKING & ROOFS | 2.08± ACRES |
| 50 - 75% GRASS COVER, HSG C | 1.41± ACRES |
| | |
| | |
| TOTAL | 3.64± ACRES |

THIS PLAN CONTAINS 2 SHEETS. THIS SHEET SHALL NOT BE CONSIDERED VALID UNLESS ACCOMPANIED BY THE REMAINING SHEETS.

0' 30' 60' 90' 120' 150'

SCALE: 1" = 30'

## POST DEVELOPMENT STORMWATER PLAN

SCALE: 1" = 30'

1 / S-2

TOWN OF DEERPARK PLANNING BOARD APPROVAL

| REVISIONS | | | | |
|---|---|---|---|---|
| DWN BY | REV | DESCRIPTION | DATE | APPROVED |
| DO | 0 | FOR APPROVAL | 02/26/25 | |



STATE OF NEW YORK · JOHN DOUGLAS FULLER · 077103 · LICENSED PROFESSIONAL ENGINEER

JOHN D. FULLER
REG. NO. 077703

**JOHN D. FULLER, P.E., P.C.**
4 SOUTH STREET
PORT JERVIS, NY 12771
(845) 856-1536

ROUTE 97 SELF-STORAGE
122 & 126 N.Y.S. ROUTES 42 & 97
SECTION 44 BLOCK 4 LOTS 23.22 & 23.21
TOWN OF DEERPARK, NY

DWG TITLE: POST DEVELOPMENT STORMWATER PLAN
DWG NO.: S-2
SCALE: AS NOTED
JOB NO.: 1100.007

# Step 2 - Calculate Water Quality Volume

| | | | | | | |
|---|---|---|---|---|---|---|
| Is this project subject to Section 4.3 of the NYS Design Manual for Enhanced Phosphorus Removal? | | | | | No | |
| What is the nature of this construction project? | | | New Construction | | | |
| Design Point: | | | *Enter 90% Rainfall Event as P* | | | |
| P= | 1.40 | inches | | | | |
| **Calculate Required WQv** | | | | | | |
| **Drainage Area Number** | **Contributing Area** (Acres) | **Impervious Area** (Acres) | **Percent Impervious** % | **Rv** | **WQv** (cf) | **SMP Description** |
| 1 | 3.64 | 2.08 | 57 | 0.56 | 10,438 | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
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| 11 | | | | | | |
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| 15 | | | | | | |
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| 17 | | | | | | |
| 18 | | | | | | |
| 19 | | | | | | |
| 20 | | | | | | |
| 21 | | | | | | |
| 22 | | | | | | |
| 23 | | | | | | |
| 24 | | | | | | |
| 25 | | | | | | |
| 26 | | | | | | |
| 27 | | | | | | |
| 28 | | | | | | |
| 29 | | | | | | |
| 30 | | | | | | |
| **Total** | 3.64 | 2.08 | 57 | 0.56 | **10438** | **Required WQv** |

# Step 4 - Calcuate Minimum RRv Required

| **Enter the Soils Data for the site** | | |
|---|---|---|
| Hydrologic Soil Group | Acres | S |
| A | 0.00 | 55% |
| B | 0.00 | 40% |
| C | 0.00 | 30% |
| D | 2.08 | 20% |
| Total Area | 2.08 | |

| **Calculate the Minimum RRv** | | |
|---|---|---|
| S = | **0.20** | |
| Impervious = | 2.08 | *acres* |
| Precipitation | 1.40 | *inches* |
| Rv | 0.95 | |
| **Minimum RRv** | **0.046** | ***af*** |
| | 2004 | cf |

# Filtration Bioretention (F-5)

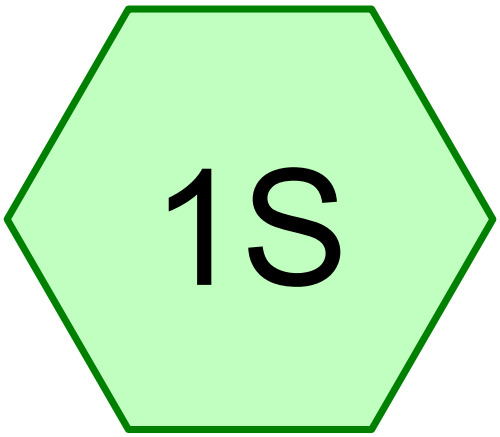
| Design Point: | |
|---|---|

| Enter Site Data For Drainage Area to be Treated by Practice | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Drainage Area Number** | **Contributing Area** (Acres) | **Impervious Area** (Acres) | **Percent Impervious** % | **Rv** | **WQv** (cf) | **Precipitation** (in) | **Description** |
| 1 | 3.64 | 2.08 | 57 | 0.56 | 10,438 | 1.40 | 0 |

| Design Criteria | | |
|---|---|---|
| Enter underlying soil infiltration rate (based on geotechnical testing, refer to Appendix D) | | |
| Is the contributing area to the practice a stormwater hotspot? | | |
| Is the practice the first in series for treatment of a Level 1 (Infiltration Restricted) hotspot? | | Refer to Section 4.14 Stormwater Hotspots |
| Is contributing area greater than max. contributing area? | No | |
| Enter depth to seasonal high water table (ft) | | |
| Enter depth to bedrock (ft) | | |
| Is pretreatment provided, in conformance with Section 6.4.3.1 | | |
| Enter average height of ponding (ft) | 0.5 | |
| Enter depth of surface layer (inches) | 3 | |
| Enter depth of filter media (ft) | 2.5 | |
| Enter depth of drainage layer (inches) | 10 | |
| Enter slope of maintenance access (%) | 10 | |
| Enter width of maintenance access (ft) | 20 | |

| Sizing Criteria | | | | |
|---|---|---|---|---|
| | | Value | Units | Notes |
| Permeability Flow Rate | k | 1 | ft/day | |
| Filter Time | tf | 2 | days | |
| Required Filter Area | Af | 4349 | sf | |
| Enter Provided Filter Area | Af | 4500 | sf | |
| Recalculated Water Quality Volume (based on provided filter area) | WQv calc | 10800 | cf | |

| Calculate Runoff Reduction | | | |
|---|---|---|---|
| **RRv Provided** | **4,320** | ***cf*** | |
| WQv Treated | 6118 | cf | This is the portion of the WQv that is not reduced in the practice. |




# Pre-Construction Drainage Area B

Subcat Reach Pond Link

**Routing Diagram for PreConstruction - EH 97**
Prepared by {enter your company name here}, Printed 3/20/2025

## Rainfall Events Listing

| Event# | Event Name | Storm Type | Curve | Mode | Duration (hours) | B/B | Depth (inches) | AMC |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 year | Type II 24-hr | | Default | 24.00 | 1 | 2.57 | 2 |
| 2 | 2 year | Type II 24-hr | | Default | 24.00 | 1 | 3.10 | 2 |
| 3 | 10 year | Type II 24-hr | | Default | 24.00 | 1 | 4.56 | 2 |
| 4 | 100 year | Type II 24-hr | | Default | 24.00 | 1 | 7.94 | 2 |

## Area Listing (all nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 0.400 | 79 | 50-75% Grass cover, Fair, HSG C (1S) |
| 3.240 | 73 | Woods, Fair, HSG C (1S) |
| **3.640** | **74** | **TOTAL AREA** |

## Soil Listing (all nodes)

| Area (acres) | Soil Group | Subcatchment Numbers |
|---|---|---|
| 0.000 | HSG A | |
| 0.000 | HSG B | |
| 3.640 | HSG C | 1S |
| 0.000 | HSG D | |
| 0.000 | Other | |
| **3.640** | | **TOTAL AREA** |

## Ground Covers (all nodes)

| HSG-A (acres) | HSG-B (acres) | HSG-C (acres) | HSG-D (acres) | Other (acres) | Total (acres) | Ground Cover | Subcatchment Numbers |
|---|---|---|---|---|---|---|---|
| 0.000 | 0.000 | 0.400 | 0.000 | 0.000 | 0.400 | 50-75% Grass cover, Fair | 1S |
| 0.000 | 0.000 | 3.240 | 0.000 | 0.000 | 3.240 | Woods, Fair | 1S |
| **0.000** | **0.000** | **3.640** | **0.000** | **0.000** | **3.640** | **TOTAL AREA** | |

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

**Subcatchment 1S: Pre-Construction** Runoff Area=3.640 ac 0.00% Impervious Runoff Depth>0.57"
Flow Length=550' Slope=0.0500 '/' Tc=15.7 min CN=74 Runoff=2.69 cfs 0.174 af

**Total Runoff Area = 3.640 ac Runoff Volume = 0.174 af Average Runoff Depth = 0.57"**
**100.00% Pervious = 3.640 ac 0.00% Impervious = 0.000 ac**

## Summary for Subcatchment 1S: Pre-Construction Drainage Area B

Pre-existing conditions.

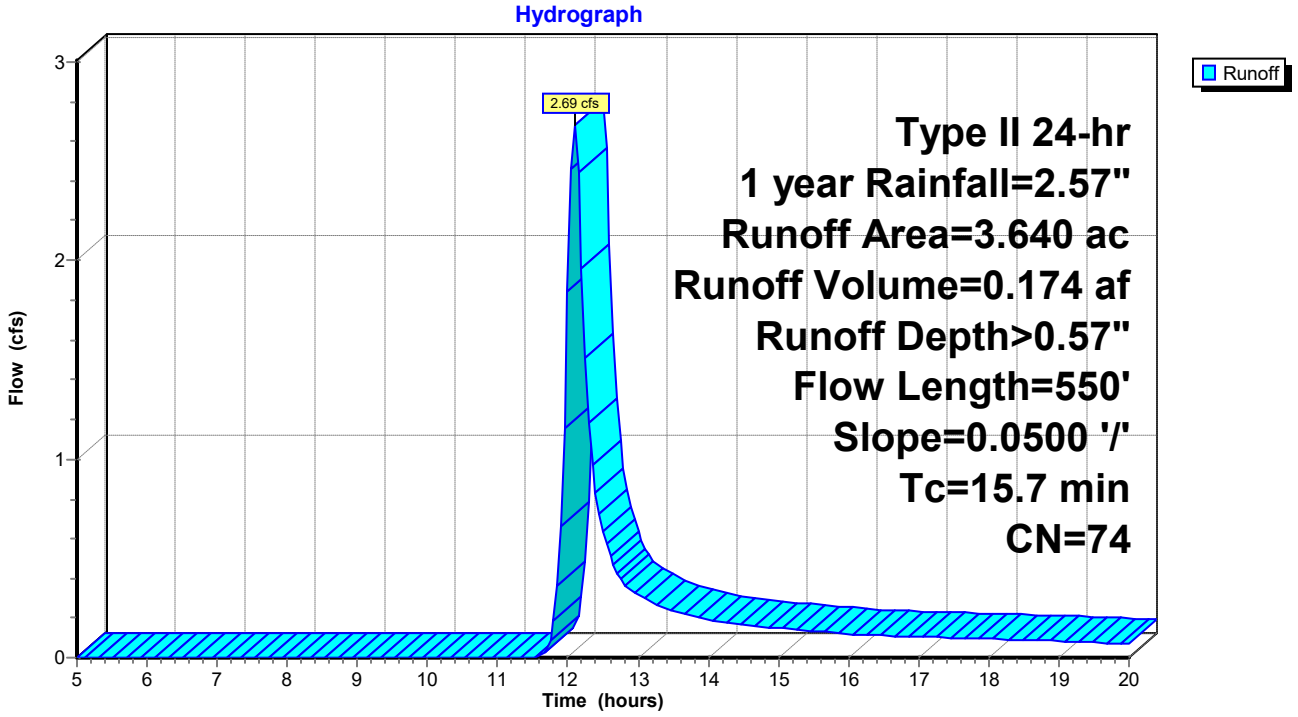
Runoff = 2.69 cfs @ 12.10 hrs, Volume= 0.174 af, Depth> 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.57"

| Area (ac) | CN | Description |
|---|---|---|
| 3.240 | 73 | Woods, Fair, HSG C |
| 0.400 | 79 | 50-75% Grass cover, Fair, HSG C |
| 3.640 | 74 | Weighted Average |
| 3.640 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 8.2 | 50 | 0.0500 | 0.10 | | **Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.50" |
| 7.5 | 500 | 0.0500 | 1.12 | | **Shallow Concentrated Flow, Shallow Flow** Woodland Kv= 5.0 fps |
| 15.7 | 550 | Total | | | |

## Subcatchment 1S: Pre-Construction Drainage Area B



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

**Subcatchment 1S: Pre-Construction** Runoff Area=3.640 ac 0.00% Impervious Runoff Depth>0.87"
Flow Length=550' Slope=0.0500 '/' Tc=15.7 min CN=74 Runoff=4.24 cfs 0.264 af

**Total Runoff Area = 3.640 ac Runoff Volume = 0.264 af Average Runoff Depth = 0.87"**
**100.00% Pervious = 3.640 ac 0.00% Impervious = 0.000 ac**

## Summary for Subcatchment 1S: Pre-Construction Drainage Area B

Pre-existing conditions.

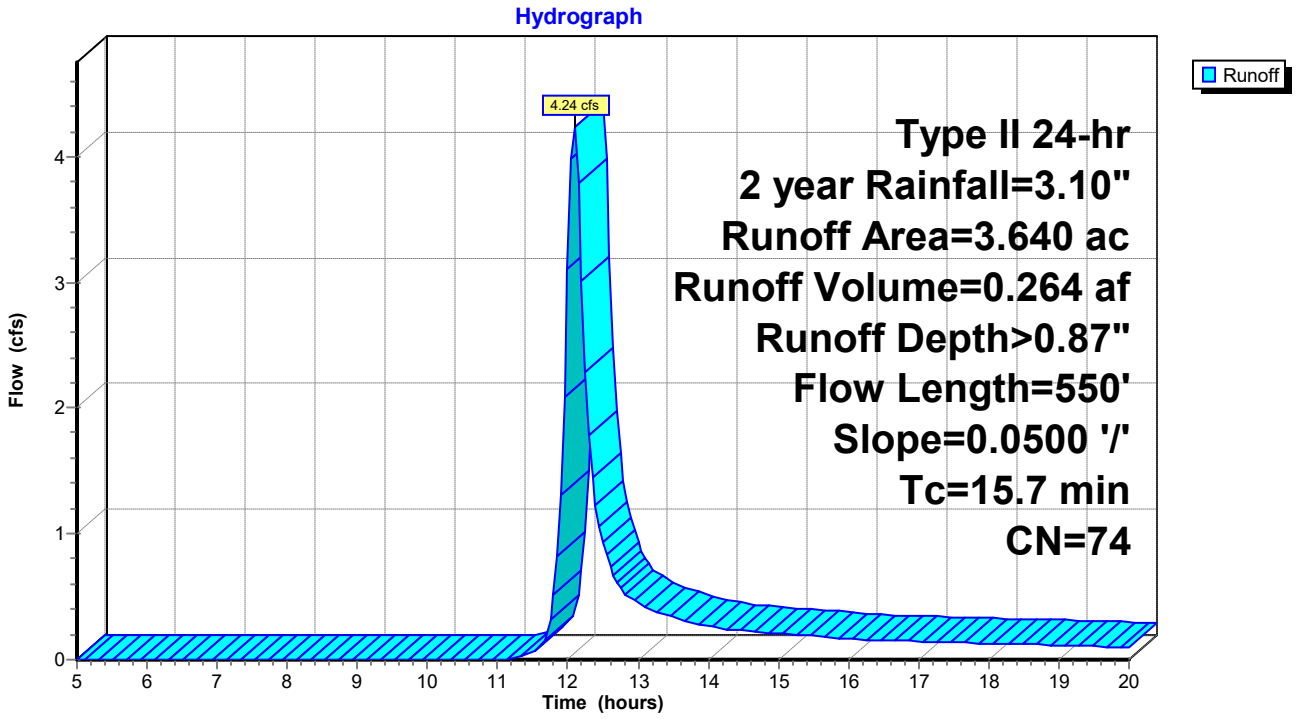
Runoff = 4.24 cfs @ 12.09 hrs, Volume= 0.264 af, Depth> 0.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 year Rainfall=3.10"

| Area (ac) | CN | Description |
|---|---|---|
| 3.240 | 73 | Woods, Fair, HSG C |
| 0.400 | 79 | 50-75% Grass cover, Fair, HSG C |
| 3.640 | 74 | Weighted Average |
| 3.640 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 8.2 | 50 | 0.0500 | 0.10 | | **Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.50" |
| 7.5 | 500 | 0.0500 | 1.12 | | **Shallow Concentrated Flow, Shallow Flow** Woodland Kv= 5.0 fps |
| 15.7 | 550 | Total | | | |

## Subcatchment 1S: Pre-Construction Drainage Area B



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

**Subcatchment 1S: Pre-Construction** Runoff Area=3.640 ac 0.00% Impervious Runoff Depth>1.84"
Flow Length=550' Slope=0.0500 '/' Tc=15.7 min CN=74 Runoff=9.17 cfs 0.558 af

**Total Runoff Area = 3.640 ac Runoff Volume = 0.558 af Average Runoff Depth = 1.84"**
**100.00% Pervious = 3.640 ac 0.00% Impervious = 0.000 ac**

## Summary for Subcatchment 1S: Pre-Construction Drainage Area B

Pre-existing conditions.

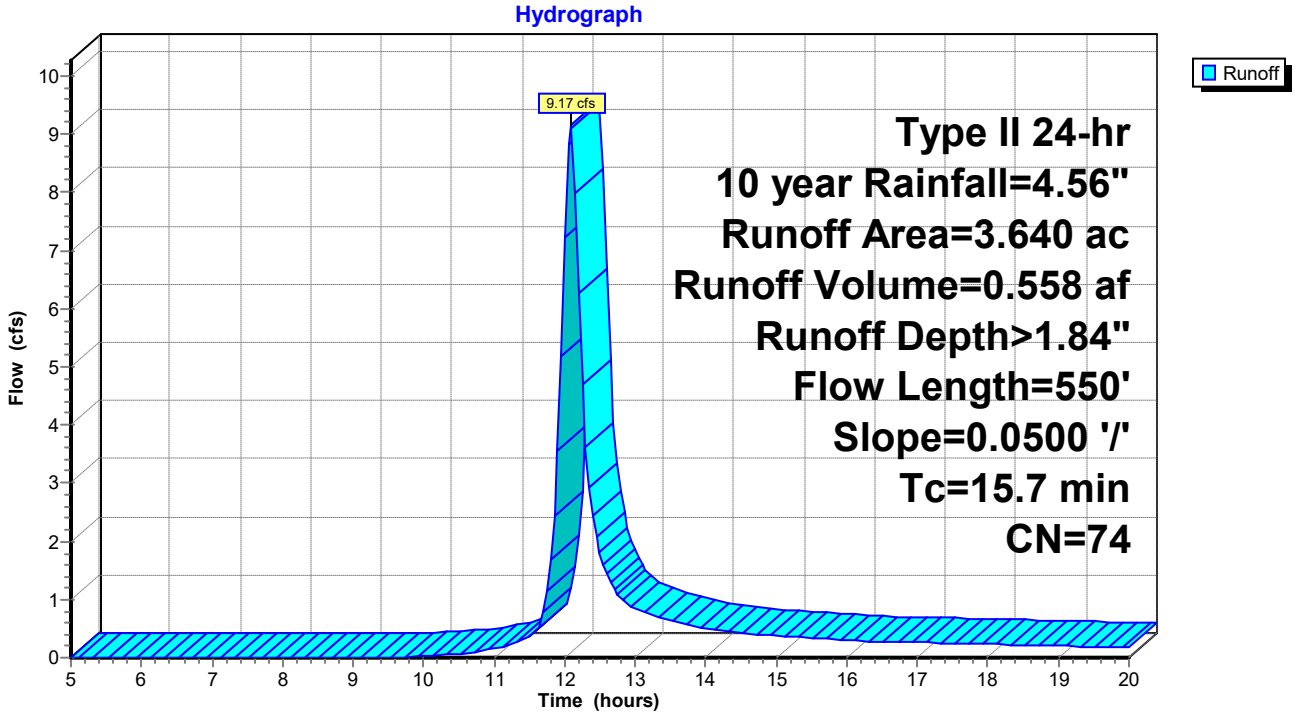
Runoff = 9.17 cfs @ 12.08 hrs, Volume= 0.558 af, Depth> 1.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 year Rainfall=4.56"

| Area (ac) | CN | Description |
|---|---|---|
| 3.240 | 73 | Woods, Fair, HSG C |
| 0.400 | 79 | 50-75% Grass cover, Fair, HSG C |
| 3.640 | 74 | Weighted Average |
| 3.640 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 8.2 | 50 | 0.0500 | 0.10 | | **Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.50" |
| 7.5 | 500 | 0.0500 | 1.12 | | **Shallow Concentrated Flow, Shallow Flow** Woodland Kv= 5.0 fps |
| 15.7 | 550 | Total | | | |

## Subcatchment 1S: Pre-Construction Drainage Area B



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

**Subcatchment 1S: Pre-Construction** Runoff Area=3.640 ac 0.00% Impervious Runoff Depth>4.51"
Flow Length=550' Slope=0.0500 '/' Tc=15.7 min CN=74 Runoff=22.15 cfs 1.369 af

**Total Runoff Area = 3.640 ac Runoff Volume = 1.369 af Average Runoff Depth = 4.51"**
**100.00% Pervious = 3.640 ac 0.00% Impervious = 0.000 ac**

## Summary for Subcatchment 1S: Pre-Construction Drainage Area B

Pre-existing conditions.

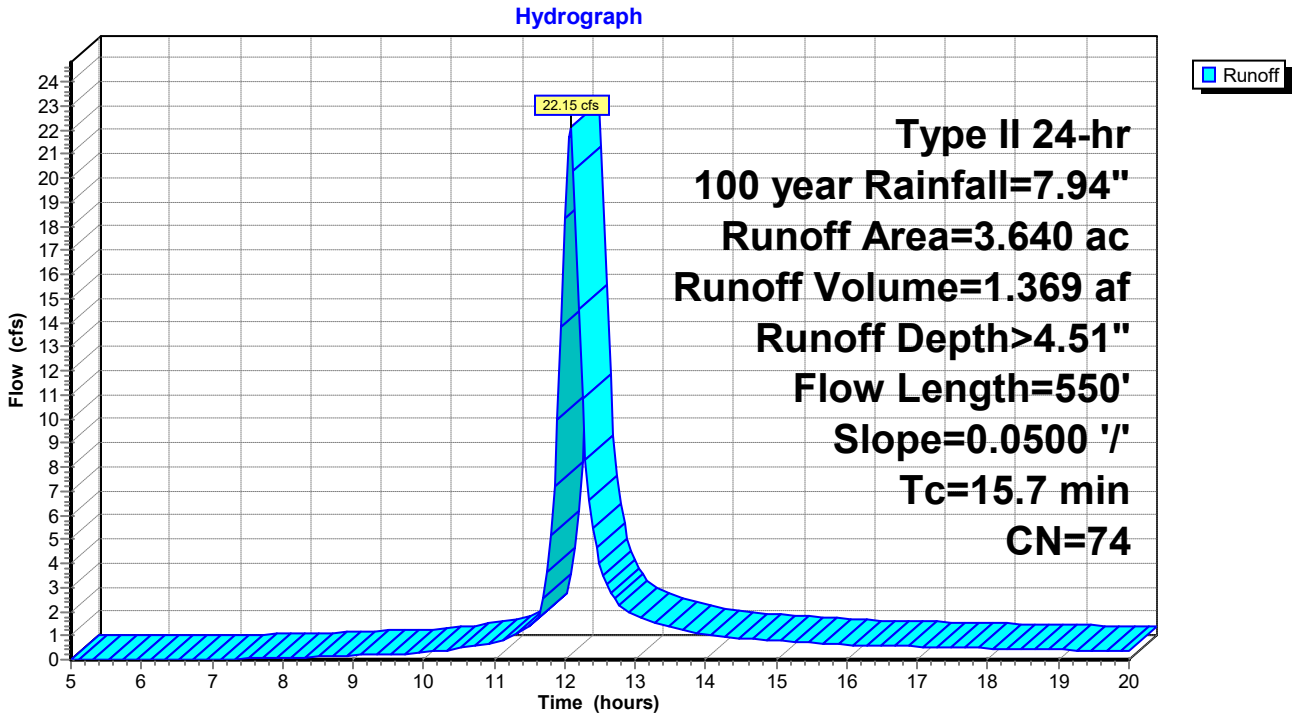
Runoff = 22.15 cfs @ 12.08 hrs, Volume= 1.369 af, Depth> 4.51"

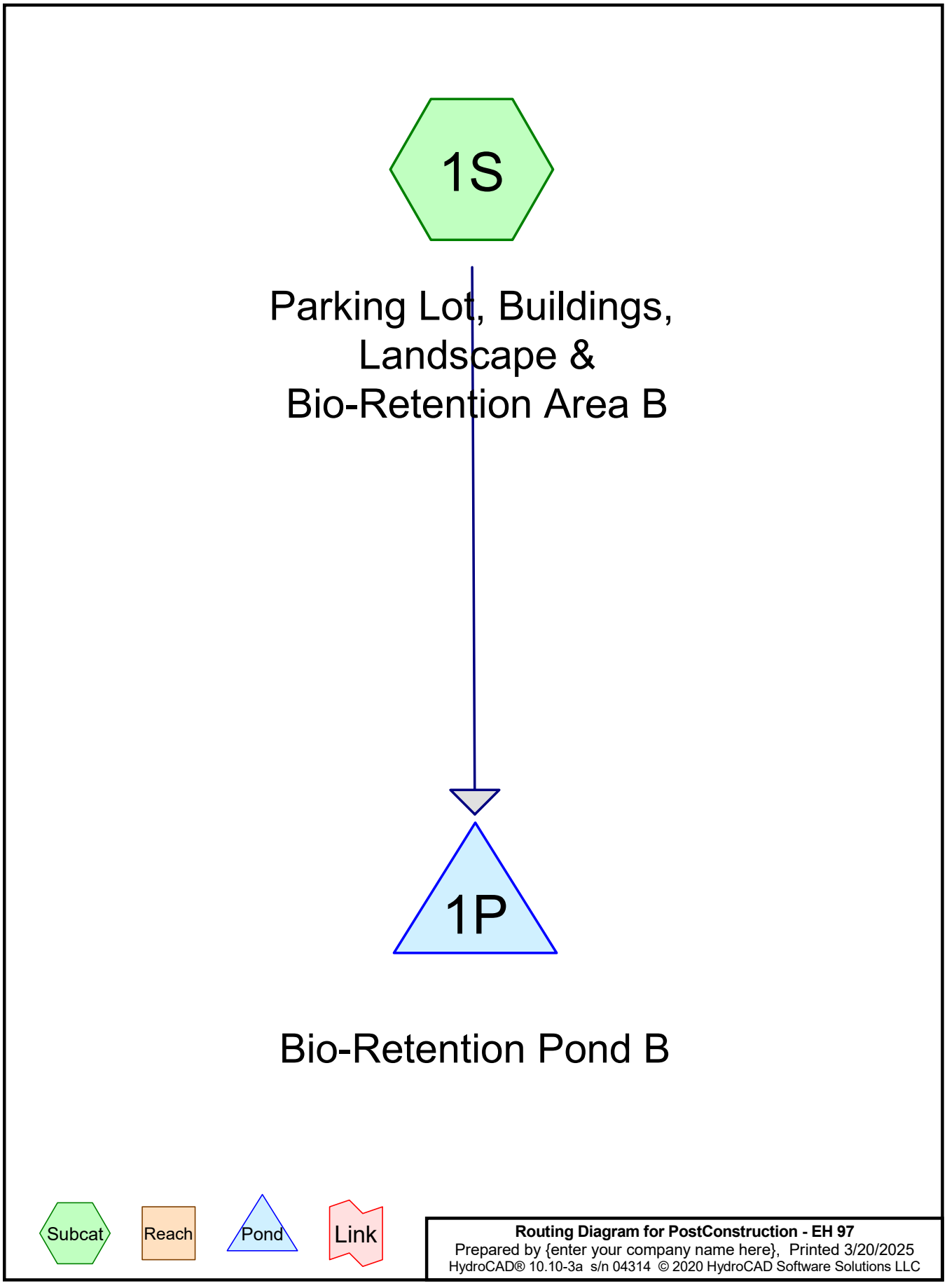
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 year Rainfall=7.94"

| Area (ac) | CN | Description |
|---|---|---|
| 3.240 | 73 | Woods, Fair, HSG C |
| 0.400 | 79 | 50-75% Grass cover, Fair, HSG C |
| 3.640 | 74 | Weighted Average |
| 3.640 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 8.2 | 50 | 0.0500 | 0.10 | | **Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.50" |
| 7.5 | 500 | 0.0500 | 1.12 | | **Shallow Concentrated Flow, Shallow Flow** Woodland Kv= 5.0 fps |
| 15.7 | 550 | Total | | | |

## Subcatchment 1S: Pre-Construction Drainage Area B






**Routing Diagram for PostConstruction - EH 97**
Prepared by {enter your company name here}, Printed 3/20/2025

## Rainfall Events Listing

| Event# | Event Name | Storm Type | Curve | Mode | Duration (hours) | B/B | Depth (inches) | AMC |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 year | Type II 24-hr | | Default | 24.00 | 1 | 2.57 | 2 |
| 2 | 2 year | Type II 24-hr | | Default | 24.00 | 1 | 3.10 | 2 |
| 3 | 10 year | Type II 24-hr | | Default | 24.00 | 1 | 4.56 | 2 |
| 4 | 100 year | Type II 24-hr | | Default | 24.00 | 1 | 7.94 | 2 |

## Area Listing (all nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 1.410 | 79 | 50-75% Grass cover, Fair, HSG C (1S) |
| 2.080 | 98 | Paved parking & Roofs, HSG C (1S) |
| 0.150 | 73 | Woods, Fair, HSG C (1S) |
| **3.640** | **90** | **TOTAL AREA** |

## Soil Listing (all nodes)

| Area (acres) | Soil Group | Subcatchment Numbers |
|---|---|---|
| 0.000 | HSG A | |
| 0.000 | HSG B | |
| 3.640 | HSG C | 1S |
| 0.000 | HSG D | |
| 0.000 | Other | |
| **3.640** | | **TOTAL AREA** |

## Ground Covers (all nodes)

| HSG-A (acres) | HSG-B (acres) | HSG-C (acres) | HSG-D (acres) | Other (acres) | Total (acres) | Ground Cover | Subcatchment Numbers |
|---|---|---|---|---|---|---|---|
| 0.000 | 0.000 | 1.410 | 0.000 | 0.000 | 1.410 | 50-75% Grass cover, Fair | 1S |
| 0.000 | 0.000 | 2.080 | 0.000 | 0.000 | 2.080 | Paved parking & Roofs | 1S |
| 0.000 | 0.000 | 0.150 | 0.000 | 0.000 | 0.150 | Woods, Fair | 1S |
| **0.000** | **0.000** | **3.640** | **0.000** | **0.000** | **3.640** | **TOTAL AREA** | |

## Pipe Listing (all nodes)

| Line# | Node Number | In-Invert (feet) | Out-Invert (feet) | Length (feet) | Slope (ft/ft) | n | Diam/Width (inches) | Height (inches) | Inside-Fill (inches) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1P | 468.17 | 468.00 | 40.0 | 0.0043 | 0.012 | 15.0 | 0.0 | 0.0 |

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: Parking Lot, Buildings,** Runoff Area=3.640 ac 57.14% Impervious Runoff Depth>1.59"
Flow Length=550' Tc=7.6 min CN=90 Runoff=9.46 cfs 0.483 af

**Pond 1P: Bio-Retention Pond B** Peak Elev=471.27' Storage=0.271 af Inflow=9.46 cfs 0.483 af
Primary=0.68 cfs 0.313 af Secondary=0.00 cfs 0.000 af Outflow=0.68 cfs 0.313 af

**Total Runoff Area = 3.640 ac Runoff Volume = 0.483 af Average Runoff Depth = 1.59"**
**42.86% Pervious = 1.560 ac 57.14% Impervious = 2.080 ac**

## Summary for Subcatchment 1S: Parking Lot, Buildings, Landscape & Bio-Retention Area B

Parking Lot, Buildings & Diversion Swales

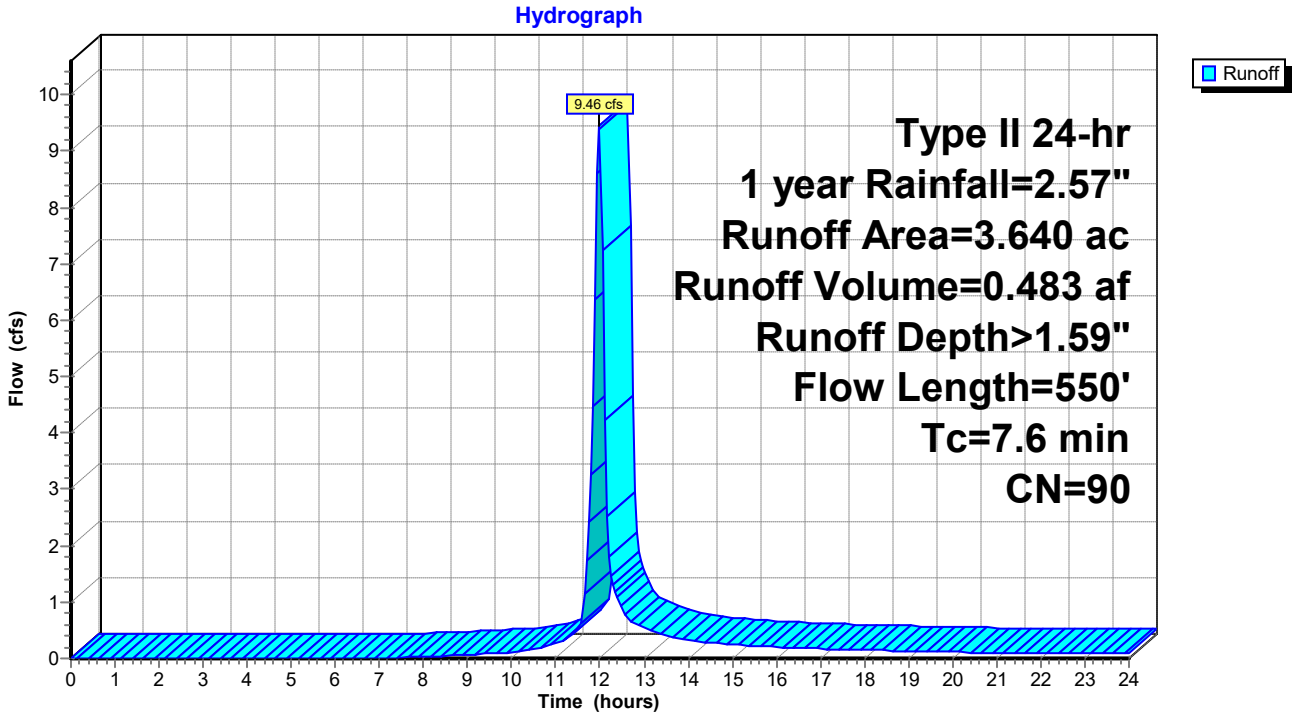
Runoff = 9.46 cfs @ 11.99 hrs, Volume= 0.483 af, Depth> 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.57"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 0.150 | 73 | Woods, Fair, HSG C |
| * | 2.080 | 98 | Paved parking & Roofs, HSG C |
| | 1.410 | 79 | 50-75% Grass cover, Fair, HSG C |
| | 3.640 | 90 | Weighted Average |
| | 1.560 | | 42.86% Pervious Area |
| | 2.080 | | 57.14% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 50 | 0.2000 | 0.18 | | **Sheet Flow, Sheet Flow**<br>Woods: Light underbrush n= 0.400 P2= 3.50" |
| 2.5 | 300 | 0.0100 | 2.03 | | **Shallow Concentrated Flow, Shallow Flow Parking Lot**<br>Paved Kv= 20.3 fps |
| 0.4 | 200 | 0.1500 | 9.26 | 26.67 | **Trap/Vee/Rect Channel Flow, Swale along edge of Parking Lot**<br>Bot.W=2.00' D=0.80' Z= 2.0 '/' Top.W=5.20'<br>n= 0.040 Earth, cobble bottom, clean sides |
| 7.6 | 550 | Total | | | |

## Subcatchment 1S: Parking Lot, Buildings, Landscape & Bio-Retention Area B



## Summary for Pond 1P: Bio-Retention Pond B

Inflow Area = 3.640 ac, 57.14% Impervious, Inflow Depth > 1.59" for 1 year event
Inflow = 9.46 cfs @ 11.99 hrs, Volume= 0.483 af
Outflow = 0.68 cfs @ 12.67 hrs, Volume= 0.313 af, Atten= 93%, Lag= 40.7 min
Primary = 0.68 cfs @ 12.67 hrs, Volume= 0.313 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 471.27' @ 12.67 hrs Surf.Area= 0.332 ac Storage= 0.271 af

Plug-Flow detention time= 247.3 min calculated for 0.313 af (65% of inflow)
Center-of-Mass det. time= 142.8 min ( 955.9 - 813.1 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 470.00' | 1.050 af | **Custom Stage Data (Prismatic)** Listed below (Recalc) |
| #2 | 468.00' | 0.060 af | **Custom Stage Data (Prismatic)** Listed below (Recalc)<br>0.300 af Overall x 20.0% Voids |
| | | 1.110 af | Total Available Storage |

| Elevation (feet) | Surf.Area (acres) | Inc.Store (acre-feet) | Cum.Store (acre-feet) |
|---|---|---|---|
| 470.00 | 0.150 | 0.000 | 0.000 |
| 472.00 | 0.200 | 0.350 | 0.350 |
| 474.00 | 0.250 | 0.450 | 0.800 |
| 475.00 | 0.250 | 0.250 | 1.050 |

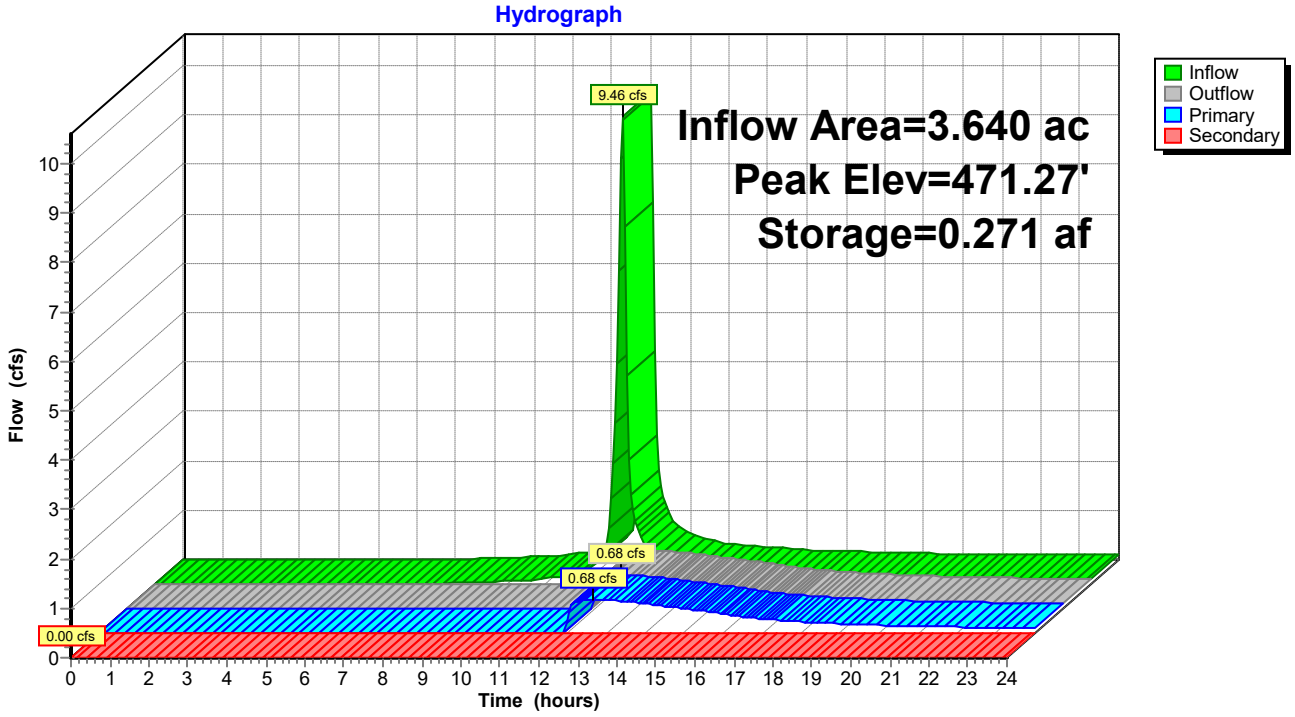
| Elevation (feet) | Surf.Area (acres) | Inc.Store (acre-feet) | Cum.Store (acre-feet) |
|---|---|---|---|
| 468.00 | 0.150 | 0.000 | 0.000 |
| 469.00 | 0.150 | 0.150 | 0.150 |
| 470.00 | 0.150 | 0.150 | 0.300 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Secondary | 474.25' | **10.0' long x 1.00' rise Sharp-Crested Rectangular Weir**<br>2 End Contraction(s) 4.0' Crest Height |
| #2 | Device 5 | 473.00' | **36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #3 | Device 5 | 470.50' | **6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #4 | Device 5 | 472.50' | **6.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #5 | Primary | 468.17' | **15.0" Round Culvert** L= 40.0' Ke= 0.500<br>Inlet / Outlet Invert= 468.17' / 468.00' S= 0.0043 '/' Cc= 0.900<br>n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf |

**Primary OutFlow** Max=0.68 cfs @ 12.67 hrs HW=471.27' (Free Discharge)
└─**5=Culvert** (Passes 0.68 cfs of 9.25 cfs potential flow)
  ├─**2=Orifice/Grate** ( Controls 0.00 cfs)
  ├─**3=Orifice/Grate** (Orifice Controls 0.68 cfs @ 3.49 fps)
  └─**4=Orifice/Grate** ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=468.00' (Free Discharge)
└─**1=Sharp-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond 1P: Bio-Retention Pond B



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: Parking Lot, Buildings,** Runoff Area=3.640 ac 57.14% Impervious Runoff Depth>2.07"
Flow Length=550' Tc=7.6 min CN=90 Runoff=12.19 cfs 0.629 af

**Pond 1P: Bio-Retention Pond B** Peak Elev=471.73' Storage=0.357 af Inflow=12.19 cfs 0.629 af
Primary=0.93 cfs 0.455 af Secondary=0.00 cfs 0.000 af Outflow=0.93 cfs 0.455 af

**Total Runoff Area = 3.640 ac Runoff Volume = 0.629 af Average Runoff Depth = 2.07"**
**42.86% Pervious = 1.560 ac 57.14% Impervious = 2.080 ac**

## Summary for Subcatchment 1S: Parking Lot, Buildings, Landscape & Bio-Retention Area B

Parking Lot, Buildings & Diversion Swales

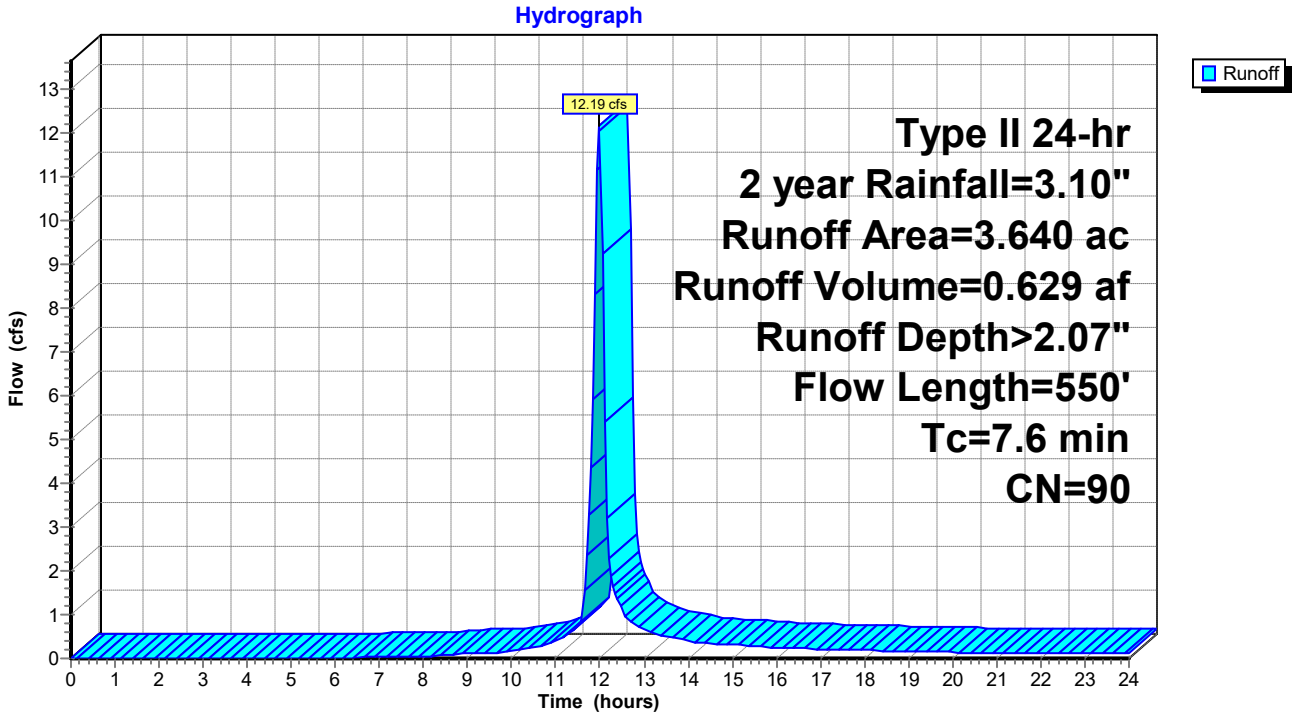
Runoff = 12.19 cfs @ 11.99 hrs, Volume= 0.629 af, Depth> 2.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 year Rainfall=3.10"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 0.150 | 73 | Woods, Fair, HSG C |
| * | 2.080 | 98 | Paved parking & Roofs, HSG C |
| | 1.410 | 79 | 50-75% Grass cover, Fair, HSG C |
| | 3.640 | 90 | Weighted Average |
| | 1.560 | | 42.86% Pervious Area |
| | 2.080 | | 57.14% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 50 | 0.2000 | 0.18 | | **Sheet Flow, Sheet Flow**<br>Woods: Light underbrush n= 0.400 P2= 3.50" |
| 2.5 | 300 | 0.0100 | 2.03 | | **Shallow Concentrated Flow, Shallow Flow Parking Lot**<br>Paved Kv= 20.3 fps |
| 0.4 | 200 | 0.1500 | 9.26 | 26.67 | **Trap/Vee/Rect Channel Flow, Swale along edge of Parking Lot**<br>Bot.W=2.00' D=0.80' Z= 2.0 '/' Top.W=5.20'<br>n= 0.040 Earth, cobble bottom, clean sides |
| 7.6 | 550 | Total | | | |

## Subcatchment 1S: Parking Lot, Buildings, Landscape & Bio-Retention Area B



## Summary for Pond 1P: Bio-Retention Pond B

Inflow Area = 3.640 ac, 57.14% Impervious, Inflow Depth > 2.07" for 2 year event
Inflow = 12.19 cfs @ 11.99 hrs, Volume= 0.629 af
Outflow = 0.93 cfs @ 12.60 hrs, Volume= 0.455 af, Atten= 92%, Lag= 36.9 min
Primary = 0.93 cfs @ 12.60 hrs, Volume= 0.455 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 471.73' @ 12.60 hrs Surf.Area= 0.343 ac Storage= 0.357 af

Plug-Flow detention time= 241.0 min calculated for 0.454 af (72% of inflow)
Center-of-Mass det. time= 147.6 min ( 953.2 - 805.6 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 470.00' | 1.050 af | **Custom Stage Data (Prismatic)** Listed below (Recalc) |
| #2 | 468.00' | 0.060 af | **Custom Stage Data (Prismatic)** Listed below (Recalc)<br>0.300 af Overall x 20.0% Voids |
| | | 1.110 af | Total Available Storage |

| Elevation (feet) | Surf.Area (acres) | Inc.Store (acre-feet) | Cum.Store (acre-feet) |
|---|---|---|---|
| 470.00 | 0.150 | 0.000 | 0.000 |
| 472.00 | 0.200 | 0.350 | 0.350 |
| 474.00 | 0.250 | 0.450 | 0.800 |
| 475.00 | 0.250 | 0.250 | 1.050 |

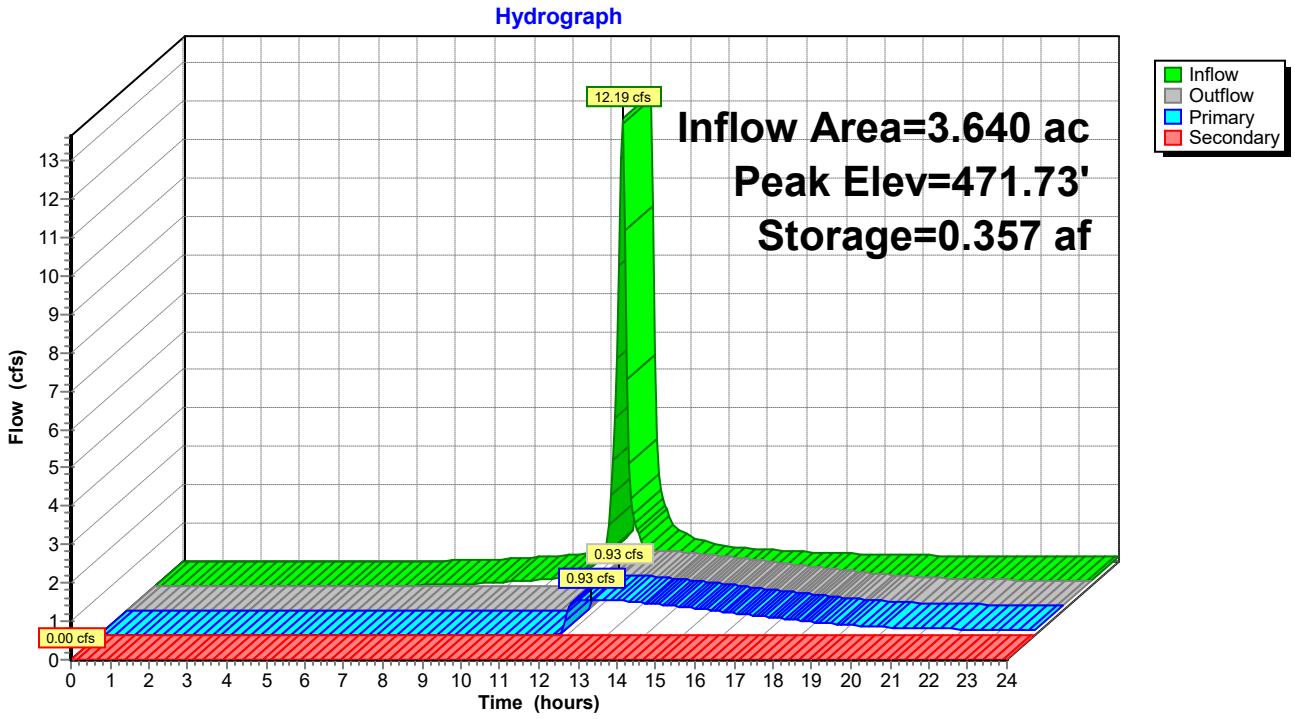
| Elevation (feet) | Surf.Area (acres) | Inc.Store (acre-feet) | Cum.Store (acre-feet) |
|---|---|---|---|
| 468.00 | 0.150 | 0.000 | 0.000 |
| 469.00 | 0.150 | 0.150 | 0.150 |
| 470.00 | 0.150 | 0.150 | 0.300 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Secondary | 474.25' | **10.0' long x 1.00' rise Sharp-Crested Rectangular Weir**<br>2 End Contraction(s) 4.0' Crest Height |
| #2 | Device 5 | 473.00' | **36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #3 | Device 5 | 470.50' | **6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #4 | Device 5 | 472.50' | **6.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #5 | Primary | 468.17' | **15.0" Round Culvert** L= 40.0' Ke= 0.500<br>Inlet / Outlet Invert= 468.17' / 468.00' S= 0.0043 '/' Cc= 0.900<br>n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf |

**Primary OutFlow** Max=0.94 cfs @ 12.60 hrs HW=471.73' (Free Discharge)
└─**5=Culvert** (Passes 0.94 cfs of 10.12 cfs potential flow)
  ├─**2=Orifice/Grate** ( Controls 0.00 cfs)
  ├─**3=Orifice/Grate** (Orifice Controls 0.94 cfs @ 4.76 fps)
  └─**4=Orifice/Grate** ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=468.00' (Free Discharge)
└─**1=Sharp-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond 1P: Bio-Retention Pond B



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: Parking Lot, Buildings,** Runoff Area=3.640 ac 57.14% Impervious Runoff Depth>3.45"
Flow Length=550' Tc=7.6 min CN=90 Runoff=19.70 cfs 1.046 af

**Pond 1P: Bio-Retention Pond B** Peak Elev=472.90' Storage=0.601 af Inflow=19.70 cfs 1.046 af
Primary=1.80 cfs 0.859 af Secondary=0.00 cfs 0.000 af Outflow=1.80 cfs 0.859 af

**Total Runoff Area = 3.640 ac Runoff Volume = 1.046 af Average Runoff Depth = 3.45"**
**42.86% Pervious = 1.560 ac 57.14% Impervious = 2.080 ac**

## Summary for Subcatchment 1S: Parking Lot, Buildings, Landscape & Bio-Retention Area B

Parking Lot, Buildings & Diversion Swales

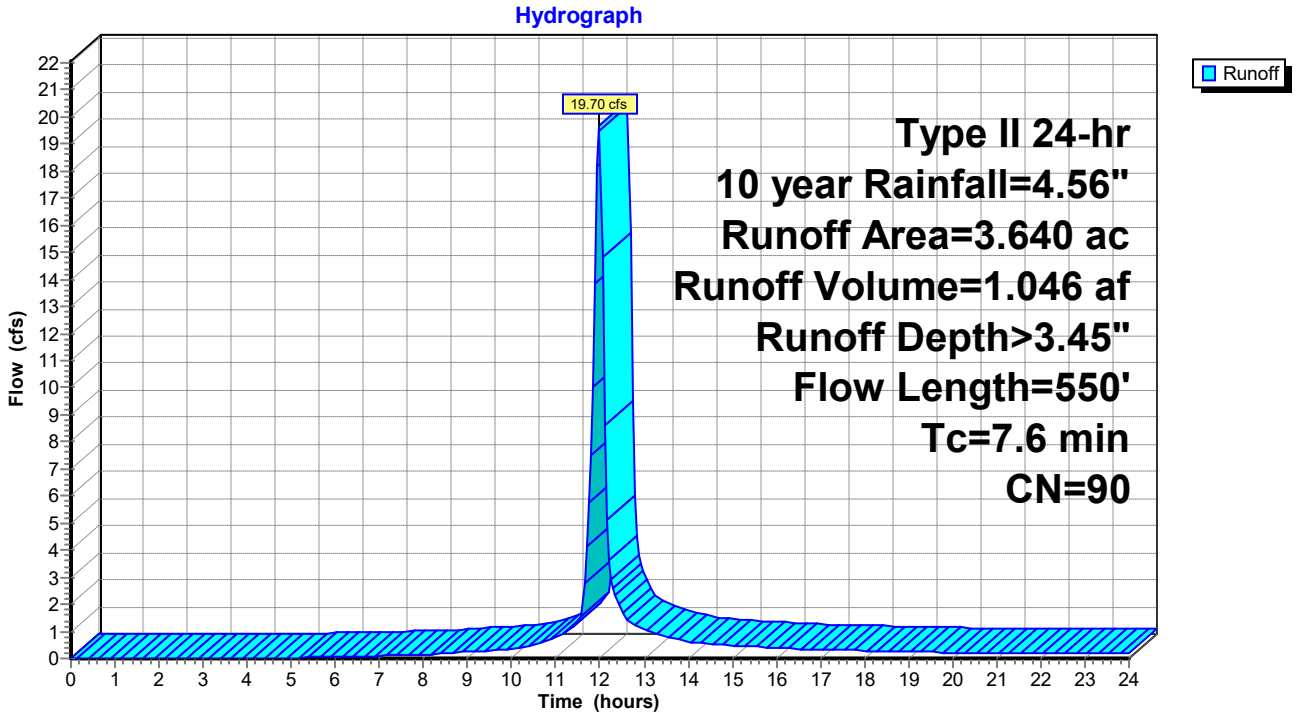
Runoff = 19.70 cfs @ 11.99 hrs, Volume= 1.046 af, Depth> 3.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 year Rainfall=4.56"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 0.150 | 73 | Woods, Fair, HSG C |
| * | 2.080 | 98 | Paved parking & Roofs, HSG C |
| | 1.410 | 79 | 50-75% Grass cover, Fair, HSG C |
| | 3.640 | 90 | Weighted Average |
| | 1.560 | | 42.86% Pervious Area |
| | 2.080 | | 57.14% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 50 | 0.2000 | 0.18 | | **Sheet Flow, Sheet Flow**<br>Woods: Light underbrush n= 0.400 P2= 3.50" |
| 2.5 | 300 | 0.0100 | 2.03 | | **Shallow Concentrated Flow, Shallow Flow Parking Lot**<br>Paved Kv= 20.3 fps |
| 0.4 | 200 | 0.1500 | 9.26 | 26.67 | **Trap/Vee/Rect Channel Flow, Swale along edge of Parking Lot**<br>Bot.W=2.00' D=0.80' Z= 2.0 '/' Top.W=5.20'<br>n= 0.040 Earth, cobble bottom, clean sides |
| 7.6 | 550 | Total | | | |

## Subcatchment 1S: Parking Lot, Buildings, Landscape & Bio-Retention Area B



## Summary for Pond 1P: Bio-Retention Pond B

Inflow Area = 3.640 ac, 57.14% Impervious, Inflow Depth > 3.45" for 10 year event
Inflow = 19.70 cfs @ 11.99 hrs, Volume= 1.046 af
Outflow = 1.80 cfs @ 12.49 hrs, Volume= 0.859 af, Atten= 91%, Lag= 30.4 min
Primary = 1.80 cfs @ 12.49 hrs, Volume= 0.859 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 472.90' @ 12.49 hrs Surf.Area= 0.373 ac Storage= 0.601 af

Plug-Flow detention time= 249.7 min calculated for 0.859 af (82% of inflow)
Center-of-Mass det. time= 175.1 min ( 966.4 - 791.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 470.00' | 1.050 af | **Custom Stage Data (Prismatic)** Listed below (Recalc) |
| #2 | 468.00' | 0.060 af | **Custom Stage Data (Prismatic)** Listed below (Recalc)<br>0.300 af Overall x 20.0% Voids |
| | | 1.110 af | Total Available Storage |

| Elevation (feet) | Surf.Area (acres) | Inc.Store (acre-feet) | Cum.Store (acre-feet) |
|---|---|---|---|
| 470.00 | 0.150 | 0.000 | 0.000 |
| 472.00 | 0.200 | 0.350 | 0.350 |
| 474.00 | 0.250 | 0.450 | 0.800 |
| 475.00 | 0.250 | 0.250 | 1.050 |

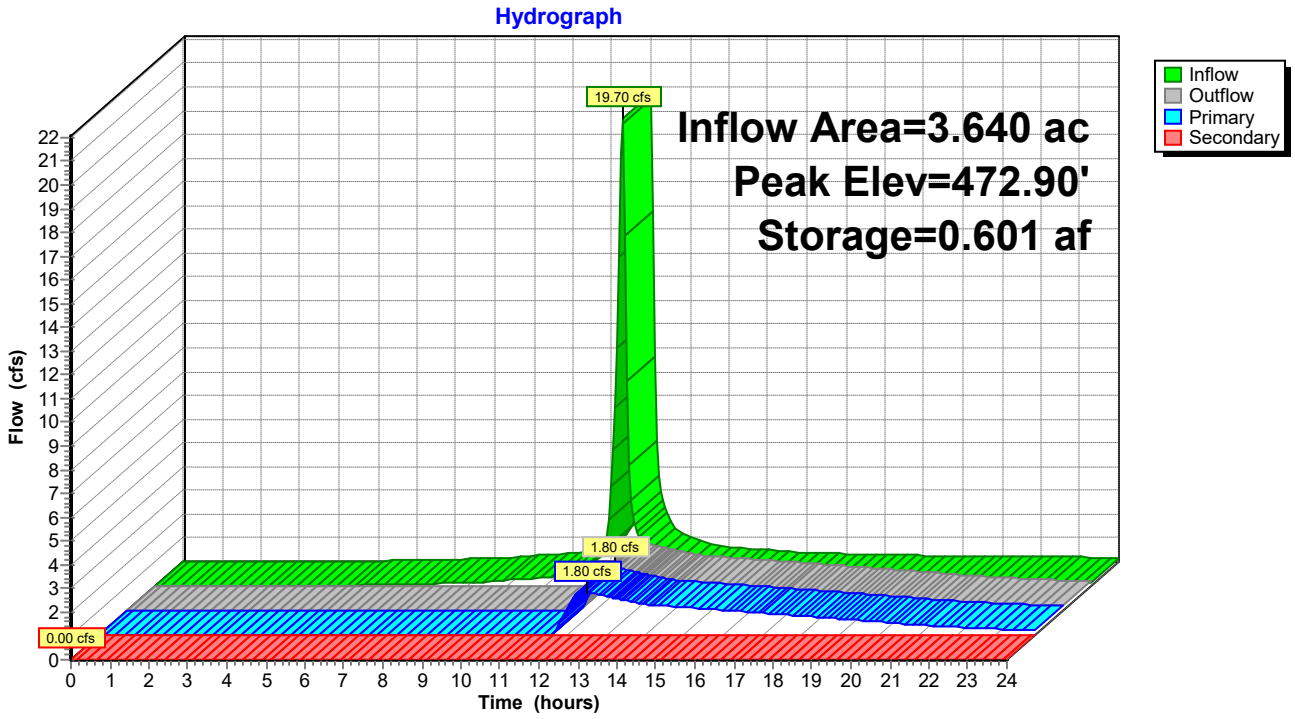
| Elevation (feet) | Surf.Area (acres) | Inc.Store (acre-feet) | Cum.Store (acre-feet) |
|---|---|---|---|
| 468.00 | 0.150 | 0.000 | 0.000 |
| 469.00 | 0.150 | 0.150 | 0.150 |
| 470.00 | 0.150 | 0.150 | 0.300 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Secondary | 474.25' | **10.0' long x 1.00' rise Sharp-Crested Rectangular Weir**<br>2 End Contraction(s) 4.0' Crest Height |
| #2 | Device 5 | 473.00' | **36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #3 | Device 5 | 470.50' | **6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #4 | Device 5 | 472.50' | **6.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #5 | Primary | 468.17' | **15.0" Round Culvert** L= 40.0' Ke= 0.500<br>Inlet / Outlet Invert= 468.17' / 468.00' S= 0.0043 '/' Cc= 0.900<br>n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf |

**Primary OutFlow** Max=1.80 cfs @ 12.49 hrs HW=472.90' (Free Discharge)
└─**5=Culvert** (Passes 1.80 cfs of 11.98 cfs potential flow)
  ├─**2=Orifice/Grate** ( Controls 0.00 cfs)
  ├─**3=Orifice/Grate** (Orifice Controls 1.39 cfs @ 7.06 fps)
  └─**4=Orifice/Grate** (Orifice Controls 0.41 cfs @ 2.04 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=468.00' (Free Discharge)
└─**1=Sharp-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond 1P: Bio-Retention Pond B



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: Parking Lot, Buildings,** Runoff Area=3.640 ac 57.14% Impervious Runoff Depth>6.74"
Flow Length=550' Tc=7.6 min CN=90 Runoff=36.87 cfs 2.044 af

**Pond 1P: Bio-Retention Pond B** Peak Elev=474.20' Storage=0.910 af Inflow=36.87 cfs 2.044 af
Primary=13.74 cfs 1.820 af Secondary=0.00 cfs 0.000 af Outflow=13.74 cfs 1.820 af

**Total Runoff Area = 3.640 ac Runoff Volume = 2.044 af Average Runoff Depth = 6.74"**
**42.86% Pervious = 1.560 ac 57.14% Impervious = 2.080 ac**

## Summary for Subcatchment 1S: Parking Lot, Buildings, Landscape & Bio-Retention Area B

Parking Lot, Buildings & Diversion Swales

[47] Hint: Peak is 138% of capacity of segment #3

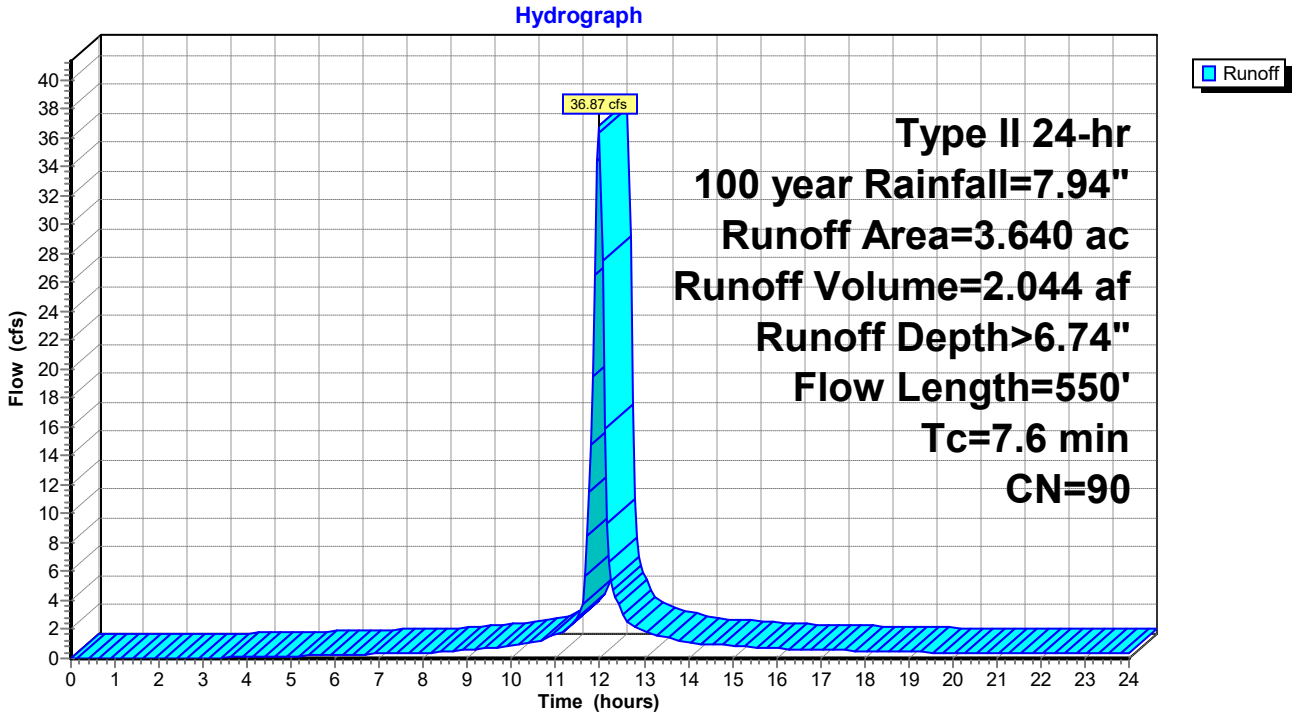
Runoff = 36.87 cfs @ 11.98 hrs, Volume= 2.044 af, Depth> 6.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 year Rainfall=7.94"

| | Area (ac) | CN | Description |
|---|---|---|---|
| | 0.150 | 73 | Woods, Fair, HSG C |
| * | 2.080 | 98 | Paved parking & Roofs, HSG C |
| | 1.410 | 79 | 50-75% Grass cover, Fair, HSG C |
| | 3.640 | 90 | Weighted Average |
| | 1.560 | | 42.86% Pervious Area |
| | 2.080 | | 57.14% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 4.7 | 50 | 0.2000 | 0.18 | | **Sheet Flow, Sheet Flow**<br>Woods: Light underbrush n= 0.400 P2= 3.50" |
| 2.5 | 300 | 0.0100 | 2.03 | | **Shallow Concentrated Flow, Shallow Flow Parking Lot**<br>Paved Kv= 20.3 fps |
| 0.4 | 200 | 0.1500 | 9.26 | 26.67 | **Trap/Vee/Rect Channel Flow, Swale along edge of Parking Lot**<br>Bot.W=2.00' D=0.80' Z= 2.0 '/' Top.W=5.20'<br>n= 0.040 Earth, cobble bottom, clean sides |
| 7.6 | 550 | Total | | | |

## Subcatchment 1S: Parking Lot, Buildings, Landscape & Bio-Retention Area B



## Summary for Pond 1P: Bio-Retention Pond B

Inflow Area = 3.640 ac, 57.14% Impervious, Inflow Depth > 6.74" for 100 year event
Inflow = 36.87 cfs @ 11.98 hrs, Volume= 2.044 af
Outflow = 13.74 cfs @ 12.12 hrs, Volume= 1.820 af, Atten= 63%, Lag= 8.1 min
Primary = 13.74 cfs @ 12.12 hrs, Volume= 1.820 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 474.20' @ 12.12 hrs Surf.Area= 0.400 ac Storage= 0.910 af

Plug-Flow detention time= 174.0 min calculated for 1.820 af (89% of inflow)
Center-of-Mass det. time= 119.8 min ( 893.2 - 773.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 470.00' | 1.050 af | **Custom Stage Data (Prismatic)** Listed below (Recalc) |
| #2 | 468.00' | 0.060 af | **Custom Stage Data (Prismatic)** Listed below (Recalc)<br>0.300 af Overall x 20.0% Voids |
| | | 1.110 af | Total Available Storage |

| Elevation (feet) | Surf.Area (acres) | Inc.Store (acre-feet) | Cum.Store (acre-feet) |
|---|---|---|---|
| 470.00 | 0.150 | 0.000 | 0.000 |
| 472.00 | 0.200 | 0.350 | 0.350 |
| 474.00 | 0.250 | 0.450 | 0.800 |
| 475.00 | 0.250 | 0.250 | 1.050 |

| Elevation (feet) | Surf.Area (acres) | Inc.Store (acre-feet) | Cum.Store (acre-feet) |
|---|---|---|---|
| 468.00 | 0.150 | 0.000 | 0.000 |
| 469.00 | 0.150 | 0.150 | 0.150 |
| 470.00 | 0.150 | 0.150 | 0.300 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Secondary | 474.25' | **10.0' long x 1.00' rise Sharp-Crested Rectangular Weir**<br>2 End Contraction(s) 4.0' Crest Height |
| #2 | Device 5 | 473.00' | **36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #3 | Device 5 | 470.50' | **6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads |
| #4 | Device 5 | 472.50' | **6.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #5 | Primary | 468.17' | **15.0" Round Culvert** L= 40.0' Ke= 0.500<br>Inlet / Outlet Invert= 468.17' / 468.00' S= 0.0043 '/' Cc= 0.900<br>n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf |

**Primary OutFlow** Max=13.71 cfs @ 12.12 hrs HW=474.18' (Free Discharge)
└─**5=Culvert** (Inlet Controls 13.71 cfs @ 11.18 fps)
  ├─**2=Orifice/Grate** (Passes < 58.80 cfs potential flow)
  ├─**3=Orifice/Grate** (Passes < 1.75 cfs potential flow)
  └─**4=Orifice/Grate** (Passes < 1.44 cfs potential flow)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=468.00' (Free Discharge)
└─**1=Sharp-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond 1P: Bio-Retention Pond B